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## **O1D2 REPORT ON USING ICT IN VET TRAINING**

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## **EXECUTIVE SUMMARY**

“Report on using ICT in VET Training” is based on desk research and literature review for under the Project “VR-WAMA - Improve the Efficiency and the Attractiveness of Environmental Engineering and Waste Management Training with Game Based Virtual Reality” (ERASMUS + 2019-1-SK01-KA202-06079) and is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike (CC-BY-NC-SA) 4.0 International License.

The ICT infrastructure developed in the last 10 years a lot, being more and more used in all the fields, including education, changing the way of teaching and learning.

The report identifies the key elements in VET Training and how they are applied in each partner country (Romania, Slovakia, Greece, and Italy) and to have a deep overview of the impact of new technologies in the last years in this area of training.

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# 1 AT A GLANCE - MAIN TRENDS, DEVELOPMENTS AND CHALLENGES

## 1.1 An overview about the last developments

ICT refers to technologies that provide access to information through telecommunications, focusing primarily on communication technologies like Internet, wireless networks, cell phones, and other communication mediums.

In the last 10 years, the ICT tools and technologies developed rapidly, influencing and enhancing processes in all the fields, from administration, business, medicine, entertainment to education.

Nowadays, people can connect and socialize in real time through ICT technologies globally, can have interactive experiences, can be more flexible and gain much more knowledge and approach differently the concepts, processes and day by day activities.

The spread and prevalence of the application of ICT are also currently varied across Europe and across different socio-economic groups.

The new tendencies are to use with frequency mobile devices, cloud computing (data stored on servers hosted by third party providers rather than on the computer user's local machine), social media and different applications. The information is now just “on click away” from the final user regardless the area of interest, location or age of the consumer. Today 67% of the world's population use these devices — according to data from GSMA Intelligence, organisers of the Mobile World Congress (MWC) — and the technology of the future, entwined with these objects, is just around the corner.

The most eagerly-awaited innovations of the last decade are strategic, mainly focused on the user, on his capacity to use technology to increase the productivity and to have free time for personal development also.

Main technological (ICT) trends in the last decade (<https://www.iberdrola.com/innovation/technology-trends>):

- **Hyper automation** - automating business processes as far as possible to make them more precise, more efficient and up to 10 times faster by combining

technologies like RPA (Robotic Process Automation), Artificial Intelligence (AI) and machine learning

- **Multixperience** - Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) are transforming our way of perceiving the digital world and interacting with it.
- **Democratisation of the use of technology** - Access by people to technical and business experience will take place without expensive requirements and will revolve around four big areas: data and analysis, development, design and know-how.
- **Human perfection** - Technological trends also involve the use of innovation to improve our physical and cognitive abilities, from subcutaneous implants to greater access to information.
- **Transparency and traceability** - Consumers are demanding greater control over their personal data. Transparency and traceability are fundamental in this sense to meet regulatory requirements, maintain ethics in the use of technology and halt the increase in mistrust of companies.
- **Edge computing** - This branch of IT will have a big impact on the Internet of Things (IoT) by making it possible for data generated by devices to be processed locally, without it needing to be uploaded to the cloud or sent to an external data centre.
- **Hybrid clouds** - We will be seeing the decentralisation of most cloud services. However, the provider of the source public cloud will retain responsibility for the operation, control, updating and evolution of the services.
- **Autonomy of things** - As social acceptance grows, and so far as regulations and technological progress allow, we will be seeing more autonomous vehicles, drones, robots and the like on the streets.
- **Blockchain** - Blockchain stands out for its ability to undertake secure Internet transactions without intermediaries, such as smart contracts that can be used in urban management.

- **Artificial Intelligence (AI) and Cybersecurity** - The popularisation of AI and machine learning will bring new challenges to information security since they will considerably increase system vulnerability.

Education is one of the most important areas for each country and internal system. The impact of the ICT on this field changed both the way of teaching and learning, the expectations of teachers and students, the evaluation system. Nowadays the education process is centred more on practical experiences, interactivity and creativity, using more and more the opportunities that ICT creates for us, by simulating different type of situations or concepts in virtual environments, more attractive for students.

ICT became a lifestyle choice for much of the population. In addition, this lifestyle choice is changing the way we communicate, increasing the rate of consumerism, and changing how we interact and gather information.

## **1.2 Advantages and disadvantages of ICT**

ICT impact is visible in each field of our daily activities and enhance our life and experience in ways that in the past we were not thinking of. The education field has a big potential to integrate ICT on a large scale and in different way, in order to enhance the teaching-learning process, to stimulate and encourage performance in schools and make more pleasant the time spent in the classroom.

Today, ICT has progressed to become an integral part of the education system, being a key aspect not only in the teaching-learning process, but in the administration and management of institutions, too. We are now facing the era of “smart classroom” which implies to enhance stimulating and engaging multi-grade classroom methods and mainly. The objectives of ICT is to connect the gap between the parents, educators, and students by prompting viable, cooperative and straightforward modes of communication.

All the parties from the educational system (teachers, students, parents, educational centers etc.) experience the benefits of the new technologies, both with advantages and disadvantages. The most important thing is that ICT, even if sound as a corporate concept, is understood and appreciated as a way of development at its maximum potential by all the parties implied in education.

The advantages of ICT in education are more than the disadvantages, from many points of view: from technical aspects to personal development.

Some of the advantages are highlighted below, being easy to perceive and simple to implement:

- Enhanced the modes of communication
- Cost-efficient
- Paperless: Eliminate the usage of paper. Eco-friendly
- Better teaching and learning methods
- Enhanced data and information security
- Minimize cost and save time
- Easy student management
- Automatic solutions to manual paper-based process and procedures
- Interactive and collaborative teaching and learning methods
- Direct classroom teaching
- Spread awareness of the social impact of technological change in education
- Web-based LMS tools connect students, educators, scholars and researchers, and education personal together
- Enhance E-learning and learning management system (LMS)
- Independent learning platforms for students
- Teachers can teach better with images, videos and graphics while delivering lessons
- Educators can create engaging, interesting and well-designed classroom activities
- Improve the administration and enhance the quality and efficiency of education
- Promote and improve the digital culture in schools, colleges, and universities

ICT, as any technology, has disadvantages, too. Some educators are emphasizing on putting aside the few disadvantages and use them at their full potential, meanwhile others are focusing on the disadvantages. Among them we can mention the followings:

- Misleading and misguiding information
- Risk of cyber attacks and hacks

- A risk to the traditional book and handwriting methods
- Implementing computers and the internet for ICT replace the convention education curriculums
- Managing courses online is difficult
- Misuse of technology
- Not accessible everywhere
- Teachers require experience to handle ICT
- Implementing computers and the internet is expensive
- Few believe that computers can limit imagination

Despite the disadvantages, many students are already engaged in using technology to extend their knowledge. Integrating ICT in the education process, make teaching and learning more effective and challenging.

In modern society, ICT became an important key aspect in education for many reasons (<https://www.ictesolutions.com.au/blog/why-schools-should-invest-in-ict/>):

1. **E-learning or Online Learning:** The presence of ICT in education allows for new ways of learning for students and teachers. E-learning or online learning is becoming increasingly popular and with various unprecedented events taking place in our lives, this does not only open opportunities for schools to ensure that students have access to curriculum materials whilst in the classroom but also allows them to ensure students outside the classroom such as at home or even in hospitals can learn.
2. **ICT brings inclusion:** The benefits of ICT in education is of such that students in the classroom can all learn from the curriculum material. Students with special needs are no longer at a disadvantage as they have access to essential material and special ICT tools can be used by students to make use of ICT for their own educational needs.
3. **ICT promotes higher-order thinking skills:** The effective use of ICT in education demands skills such as explaining and justifying the use of ICT in producing solutions to problems. Students need to discuss, test, and conjecture the various strategies that they will use.

4. **ICT enhances subject learning:** It is well known these days that the use of ICT in education adds a lot of value to key learning areas like literacy and numeracy.
5. **ICT use develops ICT literacy and ICT Capability:** The best way to develop ICT capability is to provide them with meaningful activities, embedded in purposeful subject-related contexts.
6. **ICT use encourages collaboration:** ICT naturally brings children together where they can talk and discuss what they are doing for their work and this in turn, opens up avenues for communication thus leading to language development.
7. **ICT use motivates learning:** Society's demands for new technology has not left out children and their needs. Children are fascinated with technology and it encourages and motivates them to learn in the classroom.
8. **ICT in education improves engagement and knowledge retention:** When ICT is integrated into lessons, students become more engaged in their work. This is because technology provides different opportunities to make it more fun and enjoyable in terms of teaching the same things in different ways.
9. **ICT use allows for effective Differentiation Instruction with technology:** We all learn differently at different rates and styles and technology provide opportunities for this to occur.
10. **ICT integration** is a key part of the national curriculum

One of the concerns when talking about the ICT implementation in classroom is a conventional assumption that technology will replace the role of teachers in class. ICT has to be seen as a tool for increasing the efficiency of the education process and to use it at its maximum potential.

Besides using ICT for scaffolding their students, teachers should use ICT for their professional development. Using ICT in class demands teachers to have technical skill and knowledge besides their content subject knowledge. As stated by OECD (2000, p. 16) “teachers must have a range of technical and pedagogical skills, with continuous up-dating to match advances in the technology and modes of use.”

Despite the common assumption that developed countries has none or only few difficulties in implementing ICT in education, many of them have some:

School level barriers	Teacher level barriers
<ul style="list-style-type: none"> <li>– Insufficient time</li> <li>– Insufficient access to technological resources</li> <li>– Insufficient effective training</li> <li>– Problems in technical operation</li> </ul>	<ul style="list-style-type: none"> <li>– Insufficient time (overload work of the teachers)</li> <li>– Has little confidence</li> <li>– Technological refusal due to negative perceptions</li> <li>– Do not believe on the potential benefits of ICT</li> <li>– Insufficient personal access to technological issues.</li> </ul>

### 1.3 From the classic learning to a high-tech approach

Step by step, in the last decades, e-learning gain more and more place in the education field and the teaching-learning process online became very used. E-learning is now applicable not only to learn academics but also to conduct extra-curricular activities for students, informative online sessions, online conferences, and webinars.

#### 1.3.1 Benefits of Online Learning

The demand for e-learning has risen significantly and will continue doing so. As with most teaching methods, e-learning also has its positives and negatives.

Nr.crt.	Benefit	Description
1	Convenience	<ul style="list-style-type: none"> <li>– Very easy to attend classes, submit projects and sit for certification exams</li> <li>– online classes that are independent of any physical location</li> <li>– instant access to study materials, online classes, assignments and timetables</li> </ul>

		<ul style="list-style-type: none"> <li>– able to schedule your study time without disturbing your personal or official commitments</li> </ul>
2	Efficiency	<ul style="list-style-type: none"> <li>– use of videos, sharing of resource links, serving assessment tests can all be done at the click of a button</li> <li>– the lectures can be recorded and shared for reference with a wide range of audiences.</li> </ul>
3	Student-Centric	<ul style="list-style-type: none"> <li>– enjoy a great deal of flexibility</li> <li>– the learning needs of different types of students are taken into consideration</li> <li>– a number of interesting and stimulating activities for students to learn and grasp</li> <li>– students focus on the topics that need to be mastered.</li> </ul>
4	Affordability	<ul style="list-style-type: none"> <li>– the course or study material is all available online and you can access it as many times as you want</li> <li>– eliminates at least 2 important costs: real estate and transportation</li> </ul>
5	Feedback as a Data Point	<ul style="list-style-type: none"> <li>– regular online assessments and teacher's evaluations become benchmarks to your steady progress</li> <li>– you can track your progress easily</li> </ul>
6	Encourages shy kids	<ul style="list-style-type: none"> <li>– they are far more forthcoming with their questions and participation</li> </ul>

### 1.3.2 Challenges of Online Learning

eLearning comes with challenges for both sides, too. As to any technology, the challenges become opportunities by approaching them positively.

Nr.crt.	Challenge	Description
1	The Survival of the Fittest	<ul style="list-style-type: none"> <li>– there can be technical glitches with regard to internet connectivity or system problems</li> <li>– no time constraints for online courses, so it is important for online students to exercise strong time management skills</li> <li>– completion of online courses requires an ability to manage computer databases and files</li> </ul>
2	Focus Deficit	<ul style="list-style-type: none"> <li>– some students tend to lose focus for a longer period during virtual lectures</li> <li>– boredom occurs easily</li> </ul>
3	Lack of Personal Interactions	<ul style="list-style-type: none"> <li>– lacks personal interactions between you, the tutor and your classmates</li> <li>– these conversations cannot be placed on par with those that happen in the traditional classroom setup</li> </ul>
4	Teacher training	<ul style="list-style-type: none"> <li>– demands the teachers to be technology-friendly, which, unfortunately, is not the case always</li> <li>– eachers need to invest more time in aligning themselves with the latest technology updates to ensure they can conduct their online classes seamlessly</li> </ul>
5	Not appropriate for all	It is a well-known fact that students have a dominant learning style. E-learning which requires a child to

		sit in front of a device and understand the lesson, may not be suited to all learning styles
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The most common way of eLearning is the Learning Management System, a software application for the administration, documentation, tracking, reporting, automation and delivery of educational courses, training programs, or learning and development programs.

## 1.4 Virtual reality in education

The traditional way of teaching students online was replaced in the last years with some other ways, more interactives and engaging, like Virtual Reality (VR) and Augmented Reality (AR).

Virtual Reality is an innovative concept in education and not only, which offers a unique student-friendly interface, gesture controls, embedded educational resources and simple-to-use teacher controls. Virtual reality is the term used to describe a three-dimensional, computer generated environment which can be explored and interacted with by a person. That person becomes part of this virtual world or is immersed within this environment and whilst there, is able to manipulate objects or perform a series of actions. The main objective of the VR is to raise engagement and increase knowledge retention for students of all ages.

Augmented reality (AR) is defined as an interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory, haptic, somatosensory and olfactory.

### 1.4.1 Differences between VR and AR

AR	VR
The system augments the real-world scene	Completely immersive virtual environment
In AR User always have a sense of presence in the real world	In VR, visual senses are under control of the system

AR is 25% virtual and 75% real	VR is 75% virtual and 25% real
This technology partially immerses the user into the action	This technology fully immerses the user into the action
AR requires upwards of 100 Mbps bandwidth	VR requires at least a 50 Mbps connection
No AR headset is needed.	Some VR headset device is needed.
With AR, end-users are still in touch with the real world while interacting with virtual objects nearer to them.	By using VR technology, VR user is isolated from the real world and immerses himself in a completely fictional world.
It is used to enhance both real and virtual worlds.	It is used to enhance fictional reality for the gaming world.

Source: <https://www.guru99.com/difference-between-ar-vr.html#5>

### 1.4.2 What Are the Benefits of AR and VR in Education?

Growing evidence suggests that AR and VR in education, as well as the combination of both technologies known as mixed reality, can improve student outcomes, too.

Another benefit of AR/VR is that students can exercise their creativity and imagination, and they are much motivated to explore new academic interests.

Less boundaries (cultural, in terms of communication) encourage students to take contact with people from other countries and learn about their cultures, traditions, values and approaches.

## **2 USE OF ICT IN THE SCHOOL EDUCATION SYSTEM**

Education, regardless of the continent, is a key aspect for the social and economic context and the development of each country.

In Europe and across the globe, the education systems are different, each with their own attitudes and approaches to educating their population. Cultural aspects play an important role in the education system and how the latest trends and technologies are included and used in the teaching-learning process.

Nowadays the new technologies and ICT are changing very fast, and are present in any field of the day by day activities, including the education. The old blackboard was replaced by the interactive boards and some other features were developed in order to enhance the teaching-learning process, such as: learning management systems, teleconferencing, artificial intelligence, virtual and augmented reality.

All these new features are based on the Internet connection and implies virtual collaboration between students and teachers and new devices. If in the past there were specific courses and laboratories of Informatics and ICT, now students and teachers can use the new technologies from devices like mobile phones and tables, both in classroom or at home, with minimum costs. Also, students can bring them from home and use it at school.

Teachers are using a range of interactive approaches for 'presenting' in classrooms. While interactive whiteboards (IWBs) are still fit for purpose when used effectively, technologies such as Apple TV or other mirroring approaches can enable teacher or student screens to be mirrored wirelessly to a large screen.

These days we are talking about "digitalization" and "digital skills", two concepts that are significantly changing the students and education. Schools use a diverse set of ICT tools to communicate, create, disseminate, store, and manage information.

Transforming education requires pedagogical, organisational and technological innovation, and one of the basic conditions for enabling learning practices is to build an efficient infrastructure, to have ICT equipment, tools and networks.

## 2.1 Last technologies in education – overview

Nr.crt.	Technology	Description	Benefits
1	Learning management system (LMS)	a software application for the administration, documentation, tracking, reporting, automation and delivery of educational courses, training programs, or learning and development programs.	identify training and learning gaps automated recommendations for courses based on a user's skill profile
2	Teleconferencing	“interactive electronic communication among people located at two or more different places.”; there are 4 types: - audioconferencing; - audio-graphic conferencing, - videoconferencing; - Web-based conferencing	involves the live (real-time) exchange of voice and video messages facilitate teacher-learner and learner-learner discussions
3	Virtual reality	is a simulated experience that can be similar to or completely different from the real world and can be used for entertainment or educational purposes	Realistic scenarios Innovative and enjoyable Suitable for different learning styles

4	Augmented reality	is an interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory, haptic, somatosensory and olfactory	increases engagement and interaction provides a richer user experience
5	Flipped Classrooms	involves lecture and practice at home via computer-guided instruction and interactive learning activities in class	can allow for an expanded curriculum

## 2.2 Challenges for teachers, learners and providers

Using ICT in training brings benefits for both teachers and learners, stimulating the creativity, interactivity, thinking skills of the students, preparing them to deal with ongoing technological change in society and the workplace. On the other hand, teachers have to develop their digital skills, to increase their ability to use ICT for formative learning assessments, individualized instruction, accessing online resources, and for fostering student interaction and collaboration.

It is necessarily a practical subject that involves the use of computer resources which are both hardware and software that are already in use in school for a variety of purposes. There is a need to explore how computers communicate across networks and with locally attached peripheral devices. Learners need to experience practical problem solving to develop the associated learning.

### **2.2.1 Teachers` main challenges**

In the educational process teachers face many challenges from the social ones to the technological ones. They have to keep learning and they have to integrate the new technologies in their daily teaching activities in order to enrich the student experience and increase the efficiency. An old teaching method is not so attractive for the students nowadays if it is not bringing them a practical and realistic approach. This need can be fulfilled with the help of new technologies.

In order to use the latest technologies, teachers need to have at least basic digital skills, in order to share the educational materials online with the students, develop online classes and evaluate them, using as well an automated system.

Another challenge is the way in which teachers keep involving students in the process. Some of the students, because they are not physically in the classroom, are not paying attention or they experience a lack of attention, which can be an important issue for both sides.

The evaluation of the students` work is also a challenge because students can access more information through the Internet and their work is not reflecting their level of knowledge or skills.

### **2.2.2 Students` main challenges**

When working from day to day students need to be able to manage the versions of the program they are working on and the files.

Some of the students, because they are not in the classroom, with the direct connection with the teacher, tend to be superficial or to pay less attention to their duties and activities. It is a challenge to keep on with the deadlines of the live meetings and the other activities.

Other students can experience technical issues, affecting their learning process.

### **2.2.3 Providers` main challenges**

Any technology has some basic requirements for using it in a good manner.

Schools' ICT infrastructure is procured, implemented, configured and maintained in a wide range of settings by a large variety of in-house and 3rd party providers in a seemingly infinite number of ways.

Providers has to ensure that the users can access the platform/technology and use it in the teaching-learning process so as to reflect a correct assessment.

Also, another important challenge is to secure the personal data used on the platforms and prevent the cyber attacks and data theft, such as (<https://www.computingatschool.org.uk/data/uploads/CASInfrastructure.pdf>):

- Viruses or malicious software designed to steal or change data or make systems unstable;
- Hardware and software systems designed to steal passwords or impersonate one user while connected as another such as keyloggers;
- Software tools and configurations designed to bypass the normal access and filtering
- controls such as web proxy servers; and
- Software applications that can disrupt the availability of the network for other users if used carelessly or inappropriately such as a DHCP server.

### 3 PERSPECTIVE ABOUT VET

According to the national statistics on enrolment in identified programmes higher VET is (Study on higher Vocational Education and Training in the EU, p. 8):

- **Growing** in Austria, Belgium-FR and Belgium-NL, Denmark, Germany, Spain, France, Ireland, Italy, Luxembourg, Malta, Netherlands, Romania;
- **Stable** in Czech Republic, Greece, Finland, Lithuania, Latvia, United Kingdom;
- and **Decreasing** in Bulgaria, Estonia, Croatia, Hungary, Portugal, Poland, Sweden, Slovenia, Slovakia.

Higher VET is a sector of the overall education which is in a continuous development in many countries, many people being not so interested in following a vocational training program. There are many external factors influencing VET, such as (Study on higher Vocational Education and Training in the EU, p. 8):

- **Clarification of the position of higher VET** in the rest of the education system. The development of NQFs led to discussions about the relationship between higher VET and other qualifications, in particular those from higher education;
- **Growing demand from the side of learners and employers** linked to mostly positive employment prospects though the trend here is not unanimous;
- **Development of work-based learning programmes** at higher levels. This is linked to the growing recognition of the benefits of work-based learning for employability but also the development of professional identity.

CEDEFOP defines vocational education and training as ‘education and training which aims to equip people with knowledge, know-how, skills and/or competences required in particular occupations or more broadly on the labour market’.

Higher VET often contains aspects of both professionally oriented and academically oriented aspects, but with a dominance of professionally oriented aspects (in terms of profile and content of a programme or qualification). These programmes/qualifications are often characterised by intense integration with the world of work in several aspects

The way higher VET is understood varies from a country to another and highly depends on the country context.

Higher VET combines types of programmes with a long tradition as well as recently created programmes. It is a dynamic area of qualification development but also an area that in some countries is strongly rooted in tradition.

### **3.1 Development of higher VET-part of education systems**

The current field of evolution and development is the relationship between higher VET and the rest of the education and training sector, this being a current topic of discussion. This ambiguous relationship between higher vocational education, specifically the vocational programs covered by the EEA framework and higher education, has been widely debated in connection with the diversification of higher education and the topic of vocational and academic derivation. The two tensions are explained as follows: a first premise is that institutions that traditionally non-academically provide vocational education and training at higher levels have increasingly emerged as higher education institutions, so that they are considered on an equal footing with universities; and a second premise is that concerns about the employability of higher education graduates have prompted more traditional universities to develop programs that were more clearly career-oriented.

Another topic that influences the relationship between higher VET and the rest of the system is the development of NQFs. NQFs should show the relationship between qualification levels according to learning outcomes, rather than according to pathways or duration of studies. Their development should be an opportunity for higher professional qualifications to achieve a clearer position compared to the rest of the education system. There are countries where the discussion about placing higher VET qualifications offered outside higher education at the same levels as higher education qualifications has been controversial and has led to the decision to create two different NQF "branches" for levels 6, 7 and 8, one for the "Bologna qualifications" and the other for professional or vocational qualifications.

There are currently three situations regarding the inclusion of higher VET offered outside of higher education in the NQF:

- Some countries have closed levels 6 and above other “awarding” bodies than higher education institutions (restricted to qualifications according to the Bologna cycles). The example of countries such as Romania and Bulgaria;
- Some countries have an NQF, which has parallel cables for some higher VET qualifications. The example of countries such as Austria;
- Other countries have opened all levels to all types of qualifications. However, in most countries, in all practices, not all levels have qualified for FP. For example, in Germany, there are currently no FP qualifications equivalent to EQF 8 level. In Ireland or the Netherlands, this is the case above level 6.

#### Higher VET and NQFs:

Country	Higher VET in the NQF
Romania	Level 6 and above restricted to higher education.
Italy	All levels are open to VET
Slovakia	All levels are open to VET
Greece	Level 6 and above restricted to higher education.

Source: <https://eacea.ec.europa.eu/>

### 3.2 Outcomes and Earnings of higher VET

Data on the employment rates of higher VET graduates show positive trends. In most cases, the numbers reported by the few countries that have such a database refer to types of short-cycle or professional license qualifications. In general, the employment rates of VET graduates are either slightly lower than in higher education or equivalent. In some

countries and in some fields of study, the employment results of higher VET graduates are even better than those of higher education graduates.

Data on pay gaps between higher VET graduates and higher education graduates were surveyed only in a few countries. In all these countries, higher vocational education graduates have higher incomes than secondary school graduates, but lower than university graduates.

Barriers and challenges for development of higher VET.

Country reports mentioned issues related to the education system and its regulation, for example:

In Romania:

- Romania may not provide sufficient short-cycle postsecondary VET to meet potential demand;
- There is a gap in provision for adults who want to re-enter the labour market and displaced workers. Programmes are not usually offered part-time;
- Transitions between post-high school programmes and university programmes can be challenging and credits are not easily portable;
- Recent changes in initial teacher education requirements may not ensure a good balance between pedagogical skills and up-to-date industry experience for teachers in vocational subjects;
- There is no clear rationale determining the mix of fee-paying and free provision within the system;

In Italy:

- Lack of national steer at policy level;
- In some institutions, teachers work in relative isolation which increases the burden and reduces the support available to development of higher VET;
- There are insufficient data to inform the system and to guide students;
- Lack of work placements.

In Greece, Slovakia:

- Low socioeconomic status backgrounds;
- Very few involvements that have focused on the students' perspectives of transitioning from lower-level VET courses to higher-level VET;

- One impact of the crisis has been to reduce the amount of public funding available for VET.

Young people report significant difficulties in finding out, accessing and maintaining their involvement in VET courses:

- 98% said that young people were hired in FP to get a job for the first time;
- 82% said that increased financial support (free courses or scholarships) would help disadvantaged young people to access a qualification;
- 74% stated that literacy and numbering issues were significant barriers to completing VET qualifications;
- 78% identified better career guidance as a key strategy for guiding and retaining students.

### 3.3 Trends for development of higher VET

The nature of jobs in Europe changes and employers are searching for candidates with higher levels of skills and qualifications. At the same time learners want to achieve higher qualifications as a way to better and well paid jobs. However not all learners are ready and have the possibility to enrol in long programmes. Therefore shorter programmes and possibly also work-based learning programmes that offer remuneration are a welcome alternative.

One of the developments in higher VET is the **increasing number of apprenticeship-type programmes at higher levels**. These programs are provided exclusively by employers, without them these programs would not exist.

#### **In Romania:**

Adult vocational training is offered by authorised private and public providers taking into account the needs of employers and basic skills needs of adults. Companies actively engage in VET, they include dual VET, a form of the three-year VET programmes leading to EQF level 3 qualifications that is relatively new to Romania. The training offer takes into account demand from companies interested in providing practical training for learners and in hiring future graduates. 14% of all learners in the three-year VET

programmes will have the opportunity to enrol in dual programmes. Companies take full responsibility for practical training in dual VET.

**In Italy:**

The number of participants increase in training activities provided by enterprises, in the number of training hours, and in the investment in training by the enterprises. However, there was a slight reduction in the number of enterprises offering training to their employees, significant since the reduction mirrored the deepening economic downturn. However, companies that regularly invest in training have maintained their levels of investment.

Data on employer-provided training confirm that Italian enterprises have been investing in human capital but still at a lower level than in most EU Member States. As a result, the training market, particularly its private nonState-regulated sector, has expanded in demand and supply.

The number of enterprises with at least 10 employees that offered training to their workers is growing.

**In Slovakia:**

In the dual education system, the role of employers is strengthened. They are fully responsible for the organization practical training, its content and quality. They are also involved in the creation school curricula, which are prepared in close collaboration with employers and their associations Rooms. In addition to the benefits related to availability of a higher qualified workforce in the near future, employers can benefit from tax incentives that takes the form of tax exemptions. The companies offer practical training in certified training centers.

**In Greece:**

The company's involvement in apprenticeship programs, highlight the problems that characterize the company's commitment. A major problem identified is the lack of a wide range of incentives, not just financial, that would motivate companies to offer apprenticeships.

However, employers have the legal obligation to implement the work-based component of apprenticeship programmes, comply with strict rules for the safety and protection of apprentices, and cancel the apprenticeship contract, if the apprentice interrupts her/his studies or is not consistent with her/his obligations during work-based training.

### **3.4 Developments in higher VET - Entrepreneurship**

Entrepreneurship includes creativity, innovation, risk-taking, the ability to plan and manage projects to achieve goals. In recent years, the role of entrepreneurship in contributing to growth and well-being has gained increasing attention at European and national level. Historic entrepreneurship was associated with founding and running a business and became an entrepreneur. In the last fifteen years, entrepreneurial skills refer to a more general set of skills that focus on initiative and innovation, creativity, problem-solving ability and tenacity.

Higher vocational education programs not only prepare individuals for employment, but also for independent activities and managerial positions. The importance often consists in: stimulating entrepreneurial competence in general, focusing on the sense of initiative, critical thinking and analysis of business situations and identification of solutions; specific knowledge related to start-ups and business planning; creativity and innovation. Entrepreneurship plays an important role in higher vocational education:

#### **In Romania:**

Romania have programs that support entrepreneurship for VET students. Here are special programs designed for young entrepreneurs: financial support for starts a company LTD - Starting company (SRL-D in Romanian). The target group is formed by people under 30 who started the first company. These programs offer free registration of the company in the National Trade Register. Until 2017, these programs also offered subsidies for start-ups, the intensity of support was 50%. The Romanian Government has replaced the programs with the new "Start-up nation 2017 - 2020".

**In Italy:**

Youth entrepreneurship support enjoys a high profile in Italy due to a set of National Youth Plans. The efforts to streamline the regulatory environment are paying-off in terms of a simplified process of business registration. This will be further improved with recent legislation that increases the opportunities to meet regulatory requirements online. Youth entrepreneurs stand to be among the groups that benefit the most from these efforts. Youth can generally access a wide-range of entrepreneurship supports. Entrepreneurship training outside of the formal education system is quite accessible for youth, especially for youth entrepreneurs with innovative business projects. Similarly, coaching and mentoring is readily available, often provided with training as part of an integrated package. In addition, access to start-up financing is improving for youth entrepreneurs with two recent developments: a rapid growth of online crowdfunding platforms and recent regulatory changes to create a microfinance sector.

**In Slovakia:**

The National Reform Programme of Slovakia sets entrepreneurship, and the need to create more linkages between education and the labour market, as one of its priorities. Entrepreneurship education in Slovakia is recognised as a cross-curricular objective at all school levels. In primary schools, entrepreneurship competencies are developed in the compulsory subject "Work education", in secondary education they are embedded in the compulsory subjects "Technology", "World of work" and "Civics". The focus of entrepreneurship education is predominantly on secondary schools and VET, while primary schools are less involved in entrepreneurial teaching and learning. Although Slovak schools are autonomous, there are also a number of top down initiatives in the country to support the implementation of the curriculum. This includes curriculum guidance for entrepreneurship. As well as more formal actions developed by government or its agencies strong in Slovakia, with examples of programmes such as the "Slovak Centre for Training Firms".

**In Greece:**

Entrepreneurship is a key aspect of the development process in the modern Greek economy. The Greek Ministry of Education collaborates with other major stakeholders, in order to establish a connection between the education and entrepreneurship. The main objective is to help students engage more in entrepreneurship, so as to dream of a better future. With a new framework, the Ministry is setting a common strategy for modern vocational education and training, tailored to the needs of students for professional rehabilitation and development. Entrepreneurship is an important pillar of a country's economy and social development as it contributes to job creation and enhances its overall growth. Especially Greece, coming out of a 10 year economical crisis, now help young entrepreneurs with new businesses.

## **4 STATISTICAL INFORMATION ON VET - NATIONAL PERSPECTIVES**

According to the *Study on higher Vocational Education and Training in the EU*, in 2013, there were roughly 4.8 million persons enrolled in programmes that could be considered, according to their ISCED 2011 classification, as higher VET (ISCED levels 4, 5, 6 and 7), representing 20% of total enrolment in post-secondary education and training at ISCED levels 4, 5, 6 and 7 (excluding level 8 – doctoral studies and equivalent).

As a part of the education system in each country, VET is influenced both by internal factors, related to the culture and features of each country and a number of external factors, like (source: [https://www.cedefop.europa.eu/files/5567\\_en.pdf](https://www.cedefop.europa.eu/files/5567_en.pdf)):

- demographic change (including migration);
- the business cycle;
- globalisation/offshoring;
- technical change/digitisation/robotics;
- organisational change within workplaces and within sectors (including sectoral restructuring);
- public policy (e.g. systems of social protection that use VET as part of their efforts to combat social exclusion, macroeconomic policy).

A deep research in the education and VET system of different countries in Europe highlights the fact that VET has not the same importance when training students and some countries are much more orientated on VET than others.

Innovation and new technologies lead to a new approach of the VET, enhancing the creativity, flexibility and way of learning of the students and, on the other hand, encourage teachers to use technology not only for teaching, but for personal development, also.

## **4.1 European countries – overview of the VET System in Romania, Greece, Slovakia and Italy**

### **4.1.1 ROMANIA**

#### **Distinctive features of VET**

VET System in Romania has the following features:

- VET has a double role: promoting economic and social development in the country; it supports addressing challenges linked to very low participation in lifelong learning and a high share of early leavers from education and training;
- training standards were updated in 2016 to increase the relevance of qualifications to the labour market.

Initial VET's main goals are to ensure:

- learners' personal and professional development;
- equal access opportunities to VET;
- high-quality provision, organisation and development.

Initial VET qualifications are based on training standards, which were revised in 2016, to help increase VET labour market relevance by ensuring a better match between qualifications and the reality of working life after graduation.

Social partners are part of the sector committees and participate in partnerships at regional level (regional consortia) and local level (local committees for social partnership development in VET).

Romania makes steps towards a network of providers acting as validation/assessment centres, centers which are actually working in other countries in Europe.

#### **Challenges**

The most important challenges that Romania is facing in the present regarding VET are the following:

- few investments to support the institutional development of education and training

- unequal access to education and training and the high rate of early leaving
- to reduce youth unemployment by fostering skills acquisition
- unemployment
- the attractiveness of adults
- the lowest participation in lifelong learning in EU

### External factors influencing VET

Nr.crt.	Factor	The way is influencing
1	Demography	<ul style="list-style-type: none"> <li>– negative natural growth and emigration</li> <li>– the population is ageing</li> <li>– the old-age dependency ratio is expected to increase from 25 in 2015 to 57 in 2060</li> </ul>
2	Economics	<ul style="list-style-type: none"> <li>– most companies are micro and small-sized</li> <li>– services are the main economic sector</li> <li>– main export sectors: <ul style="list-style-type: none"> <li>○ machinery/mechanical appliances, electronics, electrical equipment and its parts (28.4% of total export in 2017);</li> <li>○ transportation means and associated equipment (18.1%);</li> <li>○ base metals and their products (8.5%)</li> </ul> </li> </ul>
3	Labour market	<ul style="list-style-type: none"> <li>– unemployment is distributed unevenly between those with low- and high-level qualifications</li> <li>– employers value formal qualifications that are often a prerequisite for hiring qualified staff</li> </ul>

Source: <https://www.cedefop.europa.eu/en/tools/vet-in-europe/systems/romania>

### **VET within education and training system**

The education and training system comprises:

- early education (ISCED level 0):
  - early pre-school level (age up to three);
  - pre-school education (age three to six);
- primary education (ISCED level 1):
  - preparatory grade (age six to seven);
  - grades 1 to 4;
- secondary education (ISCED levels 2 and 3):
  - lower secondary education (ISCED 2, grades 5 to 8)
  - upper secondary education (ISCED 3), which comprises VET programmes;
- post-secondary VET programmes (ISCED level 4)
  - higher education (ISCED levels 5, 6, 7, and 8).

### **Apprenticeship at workplace**

The public employment service has been managing continuing ‘apprenticeship at workplace’ programmes since 2005.

### **Traineeship for higher education graduates**

After graduation from a higher education institution, learners may take six-month traineeship programmes to practice their profession in a real work environment.

### **Adult training courses**

Adult training courses are offered by authorised training providers or by employers to adults willing to obtain a qualification, specialisation or key competences.

### **VET qualifications**

Initial VET qualifications (excluding vocational programmes) are based on training standards. The national qualifications register currently comprises 131 qualifications at EQF level 3, 69 at EQF level 4 and 203 at EQF level 5.

Training standards play a key role in designing VET curricula, assessing learning outcomes and awarding qualification certificates.

Curricula for each qualification have two main components:

- core curriculum designed at national level by education working groups;

- local (school) curriculum designed by schools and local businesses to adapt training to the requirements of the local and regional labour market.

Continuing VET qualifications are based on occupational standards, validated by the sectoral committees and approved by the National Authority for Qualifications.

### Teachers and learners

Nr.crt.	Level	Type of teacher	Description
1	Initial	teacher	same requirements as for teachers in general education
		practical training instructor	
2	Upper secondary and post-secondary	teacher	a master degree in a field related to the VET qualification two psycho-pedagogical modules, totalling 60 ECTS
		Practical training instructors	a post-secondary education diploma in a field related to the VET qualification two psycho-pedagogical modules, totalling 60 ECTS
4	Continuing VET	Trainer	the national qualifications framework level of education equal to or higher than the level of the training programme they undertake; a qualification in the training programme's field of activity; any form of certificate for the following occupations: instructor/trainer/trainer of trainer or the certificates for the teaching profession

5	Continuing professional development of teachers/trainers		the second teaching degree is awarded after at least four years of service  the first teaching degree is awarded after at least four years after awarding the second degree
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Source: <https://www.cedefop.europa.eu/en/tools/vet-in-europe/systems/romania>

Learners are motivated to study VET in different ways:

- Professional scholarship for three-year professional programmes
- Dual VET allowance
- High school scholarship
- Euro 200 scholarship
- Local public transport

## 4.1.2 GREECE

### Distinctive features of VET

VET in Greece is strongly state-regulated and it is offered, after the completion of compulsory schooling, mainly at upper secondary and post-secondary level.

VET has been characterised by higher dropout rates; multiplicity and complexity of the legal framework; challenges regarding the design and implementation of VET-related policies; and impediments to linking with the labour market. It remains a second choice and often attracts low performers, who may also come from lower economic backgrounds.

Today, Greece achieved early school leaving goals.

### Challenges

The most important challenges that Greece is facing in the present regarding VET are the following:

- high unemployment rates;

- high NEETs (people not in employment, education or training) rates (24.2% in 2017);
- unexpected influx of refugees halted on Greek territory (requiring training and education programmes, which are currently being designed and implemented);
- ageing population;
- increased brain drain (highly qualified and mostly young people).

### External factors influencing VET

Nr.crt.	Factor	The way is influencing
1	Demography	<ul style="list-style-type: none"> <li>– population decrease of approximately 2.4%, due to negative natural growth</li> </ul>
2	Economics	<ul style="list-style-type: none"> <li>– most companies are medium and small-sized with some large sized companies</li> <li>– VET specialties belong mainly to the following sectors: Technician of electrical systems, installations and networks, Administration and Financial, Vehicle technician, IT application technician, Nurse assistant, Plant production technician</li> </ul>
3	Labour market	<ul style="list-style-type: none"> <li>– many occupations/professions are regulated although a lot of diplomas are not connected to professional rights</li> <li>– in the private sector both diplomas and skills are taken into consideration.</li> </ul>

Source: <https://www.cedefop.europa.eu/en/tools/vet-in-europe/systems/greece>

**VET within education and training system**

NQF levels of education and training system:

- elementary school certificate (NQF level 1);
- lower secondary school certificate (NQF level 2);
- vocational school certificate (EPAS) / vocational upper secondary school degree and certificate (EPAL) / general upper secondary school certificate (NQF level 4)
- vocational upper secondary school degree, apprenticeship class / vocational training diploma (IEK) after graduates' certification / post-secondary and not higher education diploma or degree (NQF level 5)
- bachelor's degree (NQF level 6)
- bachelor's degree of 5 years / master's degree (NQF level 7)
- doctorate (NQF level 8)

Two to four-year higher professional programmes are offered by higher professional schools, under the supervision of the competent ministry.

Formal VET leads to qualification level 4 and non-formal VET to qualification level 5 (of NQF and EQF).

**VET qualifications**

Greece has a strongly need of upgrading the quality of curricula.

Upper secondary vocational programmes (EPAL) offer specialties that are defined by law and the specialties of apprenticeship programmes were decided by the National committee for VET and apprenticeships, based on recommendations by the Technical committee.

Several factors, such as demand for existing specialties and regional recommendations were taken into account.

The curricula of post-secondary VET programmes (IEK) are developed by the General Secretariat for vocational education, training and lifelong learning and certified by the National Organisation for the Certification of Qualifications and Vocational Guidance.

**Teachers and learners**

The following main categories of teachers and trainers are at play in VET programmes:

Nr.crt.	Type of teacher	Description
1	General subject teachers	are required to hold a higher education degree and pedagogical and didactical expertise
2	Vocational subject teachers	are required to hold either a higher education degree and pedagogical and didactical expertise, or a lower vocational degree and relevant work experience
3	Teachers of practical training	
4	Post-secondary VET teachers	one comprising holders of the teaching competence certification trainers who possess specific qualifications
5	In-company trainers	

Source: <https://www.cedefop.europa.eu/en/tools/vet-in-europe/systems/greece>

Learners are motivated to study VET in different ways:

- rReinforcing the permeability for graduates of upper secondary vocational education - They have at least a 20% quota for technological bachelor and higher professional programmes.
- Post-secondary year - apprenticeship class” for EPAL graduates - Apprentices receive a salary of 75% of the legal minimum wage and full insurance coverage

### 4.1.3 ITALY

#### **Distinctive features of VET**

VET in Italy has the following features:

- education and employment ministries lay down the rules and general principles but the regions and autonomous provinces are in charge of VET programmes and apprenticeship- type schemes;
- there are three types of apprenticeship with one type (Type 2) not corresponding to any education level but leading only to occupational qualifications recognised by the labour market;
- continuing VET is mainly directed towards employed people;
- the recent adoption of the national qualifications framework (January 2018) is a catalyst for re-designing qualifications.

Title V (article 117) of the Constitution provides for ownership either by the State, the regions or mechanisms for cooperation between the different institutions, in relation to the type of training supply:

- the State establishes general rules and determines the fundamental principles of education;
- the regions have legislative power over VET;
- education falls under the scope of concomitant legislation, except for the autonomy of education institutions.

#### **Challenges**

Challenges that the VET system faces:

- integrating the training and employment of young people within a dual system by reinforcing apprenticeships;
- reinforcing apprenticeship for higher training/education;
- simplifying current legislation and boost the appeal of apprenticeship for enterprises;
- developing innovative pedagogical methodologies;
- reducing early leaving from education and training;

- training teachers and trainers;
- promoting the assessment of education and training outcomes (processes and results) through implementation of a national plan for quality assurance in education and training and in line with the European Quality Assurance Reference Framework for Vocational Education and Training recommendation;
- training staff involved in all stages and procedures of the validation of non-formal and informal learning;
- increasing public awareness of the potential benefits of validation of non-formal and informal learning especially to those target groups who could benefit most;
- improving cost-effectiveness of validation of non-formal and informal learning procedures;
- improving monitoring of VET outcomes and adjust VET provision to each learner's training needs;
- developing evaluative analytical tools on the impact of training policies.

### External factors influencing VET

Nr.crt.	Factor	The way is influencing
1	Demography	<ul style="list-style-type: none"> <li>– the population is growing;</li> <li>– the population is aging;</li> <li>– old-age dependency ration is expected to increase from 34 in 2015 to 61 in 2060.</li> </ul>
2	Economics	<ul style="list-style-type: none"> <li>– most companies are micro and small-sized;</li> <li>– export:very relevant for Italy and comprises several sectors, mainly machinery and equipment, textiles, furniture, transport equipment and vehicles, metalworking, food and beverage, electronics and components and others;</li> <li>– The sectors most linked to VET are electronics and components, information and communications,</li> </ul>

		financial and insurance activities, machinery and equipment, transport equipment and vehicles, chemicals.
3	Labour market	<ul style="list-style-type: none"> <li>– most of occupations and professions are regulated;</li> <li>– several series of legislative reforms, have been introduced with the aim of introducing more elements of flexibility into active labour market policies, as well as new social security instruments;</li> <li>– Unemployment is distributed unevenly between those with low- and high-level qualifications.</li> </ul>

Source: <https://www.cedefop.europa.eu/en/tools/vet-in-europe/systems/italy>

### **VET within education and training system**

The education and training system comprises:

- preschool education (ISCED level 0);
- integrated primary and lower secondary education (ISCED levels 1 and 2) (hereafter first cycle of education);
- upper secondary education (ISCED level 344, EQF 4 for general education)(ISCED levels 353-354, EQF 3-4 for vocational upper secondary options)(also called second cycle of education);
- post-secondary education (IFTS- only vocational – ISCED level 453, EQF 4);
- higher education (ISCED level 453, EQF 5 for higher technical programmes), ISCED level 667, EQF 6, ISCED levels 667-767 EQF 7, ISCED level 768-864, EQF 8).

*Compulsory education* in Italy lasts 10 years, until the age of 16 and includes the first two years of upper secondary general education or Vocational Education Training, which young people usually begin at the age of 14, when they have completed lower secondary education. They then have to go through a state exam to acquire a certificate (EQF level

1) which grants admission to the upper secondary level where young people have to make a choice between general education or vocational education.

*Secondary education*, the first compulsory cycle of schooling takes place over an 8-year period and includes primary school (5 years) and secondary school (3 years), finishing with a final examination. Pupils can then choose:

- To continue their studies in the upper secondary school for 5 years ending with the state exam.
- To enrol for vocational training under the aegis of the regions for 3 years in order to prepare a vocational qualification. This enables them to start working or to go to upper secondary school to continue their studies or specialization in a post-qualification course. This specialization gives students the possibility to join the IFTS (*Istruzione Formazione tecnica superiore/non-university higher technical training*) and the ITS (*Istituti tecnici superiori*).
- To enrol in vocational training which alternates between work experience and the classroom and allows young people to acquire basic knowledge plus skills they will be able to put into practice on the job market.

In Italy for *Higher education*, vocational training centres have been set up in the regions where schools, universities, enterprises and research teams collaborate on the same theme. Higher technician diplomas can be awarded after 4 to 6 semesters of courses according to the speciality studied in the higher technical institutes (ITS – *Istituti tecnici superiori*). Higher vocational training leading to a diploma (2 semesters) is offered by the regions in relation to local and regional requirements in the frame of the IFTS. Universities propose vocational diplomas in the field of health, paramedical sciences and the arts, over a variable duration, and also profession-oriented Master's degrees.

### **VET qualifications**

Italy adopted a national qualifications framework, a tool to define and classify the qualifications issued within the national system of certification of competences, which will make it possible to create the national repertory of education and training qualifications and professional qualifications hereinafter the national repertory.

Education and vocational training qualifications, which fall within the competence of the regions, are included in the national register of qualifications.

Below specific information for VET programmes is presented:

- Initial VET programmes (IeFP);
- Technical and vocational school programmes;
- Higher technical education and training programmes;
- Higher Technical Institutes (ITS).

The apprenticeship system includes three types of contracts:

- apprenticeships leading to a professional operator certificate and a professional technician diploma, an upper-secondary school diploma, a higher technical specialisation certification (IFTS) – level I apprenticeship;
- professional training apprenticeships: this targets 18 to 29-year-olds who want to acquire a qualification provided for in collective bargaining agreements and required on the labour market;
- higher education and research apprenticeships. This leads to an array of qualification levels encompassing European qualifications framework levels 4-8.

### Teachers and learners

Nr.crt.	Type of teacher	Description
1	VET teachers	<ul style="list-style-type: none"> <li>– are regulated on a national level and are employed by the education ministry;</li> <li>– they work in State vocational schools and in centres for adult education;</li> <li>– the minimum requirement for accessing the teaching profession is now a five year bachelor degree in specific teaching subjects.</li> </ul>

2	VET trainers	<ul style="list-style-type: none"> <li>– they work in vocational training centres;</li> <li>– they work in companies, consultancy agencies, non-profit organisations and public employment services;</li> <li>– minimum requirements: a degree or an upper secondary school diploma plus professional experience in the relevant sector.</li> </ul>
3	Company tutors	<ul style="list-style-type: none"> <li>– the company tutor is the key figure for the apprentice in workplace training;</li> <li>– they must have ‘suitable training and skills’, according to national legislation or, in the absence of this, a national collective labour contract;</li> <li>– they must have a minimum skills like: to be familiar with the regulatory context concerned with alternance systems; understand their own functions within their role of training; manage the reception of the apprenticeships, fostering their placement within the business environment; manage relationships with people outside of the company that are involved in the apprentice's training.</li> </ul>

Source: <https://www.cedefop.europa.eu/en/tools/vet-in-europe/systems/italy>

Learning forms:

- school-based learning;
- work practice (practical training at school and in-company practice);
- self-learning;
- apprenticeships.

Learners are motivated to study VET in different ways:

- Individual vouchers and other subsidies;

- Incentives for the unemployed;
- Incentives for employees;
- Study leave.

#### **4.1.4 SLOVAKIA**

##### **Distinctive features of VET**

The main features are:

- Employment rate of 20- to 34-year-old VET graduates has increased since 2014;
- Almost 7 out of 10 upper secondary learners are in VET programmes;
- The share of early leavers from education and training has significantly increased during the last decade;
- Dual VET was introduced in 2015/16 and it is gradually expanding;
- Participation in lifelong learning is well below the EU-28 average.

The distinctive features are:

- IVET is strongly State-regulated, predominantly school-based, combining provision of general education and developing key competences with vocational skills;
- Ties between VET schools and the business world loosened during the early period of economic transformation in the 1990s. Since then, with new legislation, involvement of social partners in VET has been increasing in programming, curriculum design and qualification award. Since 2015, social partners have been also more actively involved in VET governance;
- Stronger engagement of the business world in informing VET schools about skill needs via sectoral (skills) councils should help IVET better adjust to a rapidly changing labour market.

##### **Challenges**

The most important challenges that Slovakia is facing in the present are:

- decreasing performance in reading, mathematics and science;

- early leaving from education and training data of Eastern Slovakia deteriorated extremely, being in a long-term over the EU 2020 target;
- ‘Slovak dual system trainees’ have status of a student of secondary specialised school and not of a company employee, which can create tensions between schools and companies in organisation learning;
- participation in lifelong learning is well below the EU-28 average.

### External factors influencing VET

Nr.crt.	Factor	The way is influencing
1	Demography	<ul style="list-style-type: none"> <li>– population increased by 0.6% since 2013;</li> <li>– the population is ageing;</li> <li>– an old-age dependency ratio is expected to increase from 20 in 2015 to 59 in 2060.</li> </ul>
2	Economics	<ul style="list-style-type: none"> <li>– most companies are micro sized;</li> <li>– the Slovak economy is among the most open economies in the EU heavily depending on exporting industry products, mostly automotive- the country is a world leader in manufacturing of cars per capita;</li> <li>– main economic sectors are:manufacturing;wholesale and retail trade; repair of motor vehicles;construction;health and social work activities;transportation and storage.</li> </ul>

3	Labour market	<ul style="list-style-type: none"> <li>– unemployment is distributed unevenly between those with low- and high-level qualifications;</li> <li>– the crisis influenced medium- and high-qualified young people more than low-qualified;</li> <li>– the unemployment rate of people with medium-level qualifications aged 15 to 24 is significantly lower than the unemployment rate of tertiary education graduated aged 15 to 24.</li> </ul>
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Source: <https://www.cedefop.europa.eu/en/tools/vet-in-europe/systems/slovakia>

### **VET within education and training system**

*Compulsory education* starts at the age of six and includes nine years of basic education.

*Lower secondary VET:* learners without completed lower secondary education can enrol in 2-3-year programmes offering qualifications that allow performing simple and auxiliary tasks provided by secondary VET schools. They can also enrol in a 1-year bridging programme provided by secondary VET schools and in lesser amount also by the general education stream, allowing access to upper-secondary education.

*Upper-secondary VET:* is mainly school-based and offered to basic education graduates as:

- school-based 4-year (rarely 5-year) programmes (ISCED 354) with a focus on VET theory and a lower share of work-based learning, for example, in school labs, workshops and short-term internships; they award 'maturita' school leaving certificates;
- 4-year (rarely 5-year) programmes (ISCED 354) with a minimum of 36.4% workbased learning; they can be school-based or offered as dual VET and completed with both 'maturita' school leaving certificate and a "certificate of apprenticeship";
- 3-year (rarely 4-year) programmes (ISCED 353) with minimum 50.5% of workbased learning; they can be school-based or also be offered as dual VET; they lead to a "certificate of apprenticeship" .

*Post-secondary VET* programmes are offered by secondary VET schools. There are five types of post-secondary non-tertiary programmes:

- follow-up programmes (ISCED 454; EQF 4);
- programmes leading to a (2nd) VET qualification (ISCED 454; EQF 4);
- ‘refresher’ programmes (ISCED 454; EQF 4) ;
- specialising programmes (ISCED 554; EQF 5);
- ‘higher’ professional programmes (ISCED 554; EQF 5).

*Higher (tertiary) VET* distinguishes between:

- universities offering bachelor, master and PhD studies, and basic and applied research;
- higher education institutions offering mainly bachelor and master studies, and basic and applied research;
- “higher” professional education institutions offering mainly bachelor studies and applied research; they do not offer PhD studies.

*Art education:* performing arts studies are offered within integrated programmes offering higher professional level of education (ISCED 554) and the title DiS.art.

*Apprenticeship:* there is no genuine apprenticeship in Slovakia although learners in school-based 3-year programmes comprising a high share of work-based learning were traditionally called “apprentices”. This term however disappeared from legislation. According to the legislation all initial VET learners are considered “students”.

### **VET qualifications**

Slovakia has three sets of standards:

- Educational standards are composed of so-called content and performance standards. Performance standards can be seen as learning outcomes that students are supposed to achieve during their studies and demonstrate when completing them. Assessment standards are considered a tool to help evaluate whether learners have achieved the performance standards. Assessment standards are to be developed by schools and set within school educational programmes specifying criteria and assessment procedures for achieving performance standards corresponding to respective school environment.
- Occupational standards have an important information function and contributed also to improved information of job seekers within the information system on the

labour market managed by the labour sector. However, occupational standards have no normative power for recognition of qualifications.

- Qualification standards inform the education sector and in particular schools in updating their school educational programmes.

### I.6. Teachers and learners

Nr.crt.	Type of teacher	Description
1	Initial VET teachers	In initial VET, there are: <ul style="list-style-type: none"> <li>– teachers of general subjects;</li> <li>– teachers of vocational subjects; trainers in school;</li> <li>– in-company trainers.</li> </ul>
2	Training of teachers/trainers	<ul style="list-style-type: none"> <li>– initial training: Initial teacher training is offered by universities. University graduates from nonpedagogical programmes need to complement these with pedagogic studies to obtain a full VET teacher qualification;</li> <li>– continuing training: specified four career levels for teachers/trainers: beginner, independent teacher and attested teacher (first and second (advanced) level attestation).</li> </ul>

3	Training of in-company trainers (instructors)	<ul style="list-style-type: none"> <li>– instructors are employees of companies that provide training for VET learners;</li> <li>– they are not considered pedagogic staff;</li> <li>– they can train up to three learners in cooperation with the supervising trainer of VET school.</li> </ul>
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Source: <https://www.cedefop.europa.eu/en/tools/vet-in-europe/systems/slovakia>

Learners are motivated to study VET in different ways:

- learning vouchers;
- Requalification Passport (RE-PAS);
- The “KOMPAS”-provision of courses aimed at strengthening key competencies important for transition into the labor market.

## 5 CONCLUSIONS

VET systems in Romania, Italy, Greece and Slovakia have both similarities and differences and also, challenges to be addressed and solved. It is often seen as a 'second best' choice for those who were not accepted to traditional academic universities and is also an issue with general awareness and understanding of these qualifications. While in Greece and Slovakia, VET is strongly state-regulated, in Italy and Romania VET is still a growing field, not so well regulated. Also, early leaving from education and training, unemployment, developing innovative pedagogical methodologies, a low level of attractiveness are only few challenges that the mentioned countries are facing now.

ICT is a useful tool, with great potential, which can be used to increase the attractiveness of Vocational Education and Training and train students in a way very close to reality. In the last years, VR and AR were seen as an innovative and useful tools, not only in education, but in many other fields too, increasing the involvement of students in the educational activities. In this new environments, students can experience situations from real life and practice their skills based on the gamification rules.

VET is an important part of the education system and will be developed and regulated in the following years in many countries, in order to meet the needs of the labour market. Also, as we can already notice, the eLearning and new technologies gained ground in the education field.

In the following years, the VET and ICT can be successfully combined to achieve new education and training goals in areas not so much explored until now.

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