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IO 2: Country report

VENETO REGION (ITALY)

version (EN)

HOW ARE INDUSTRY 4.0 REQUIREMENTS IMPLEMENTED IN THE
VOCATIONAL EDUCATION AND TRAINING SYSTEM

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Country Report

EDU4future

Please identify the author(s) and association of this Country Report:

Sofia Marchesini, Marco Braga, Chiara Remundos, T2I

Please identify your country (and/or region):

Veneto Region, Italy

Please identify your applicable industry sector(s) by providing the NACE (Nomenclature of Economic Activities) Code(s). For details, please check: <https://nacev2.com/en>:

J – Information and
Communication

However, the structures and processes of innovation in VET programs are the same for all sectors.

1. VET System in Veneto Region

Which of these options best describe the VET system in your country (C) and specific to your sector(s) [INSERT applicable NACE code(s)]?

	C
dual system or very similar	<input checked="" type="checkbox"/>
mostly school-based	<input checked="" type="checkbox"/>
mostly work-based	<input type="checkbox"/>
differs greatly between sectors	<input type="checkbox"/>
differs greatly between occupations	<input type="checkbox"/>

In Veneto Region, as well as in Italy, the Vocational Education and Training (VET, in Italian: *Istruzione e Formazione Professionale, leFP*), with EQF3, takes place mostly at school and in-company training is limited to a few months of internship. VET centres¹ are the providers of the VET education.

There is no distinction between the different sectors since training is organized in a homogeneous way inside the region regardless of the field. However, it is important to note that out of 300 leFP (EQF3) courses, 24 apply a dual system. Some exceptions are made in other experimental courses organized by the training centres.

¹ In the report VET centres and training centres are used interchangeably to indicate the regional schools in charge of VET.



As for the fourth year of the leFP, which guarantees the EQF4 qualification, the system is mainly very similar to the dual one.

Please provide an estimate on the approximate ratio between work- and school-based learning in the VET system of your country generally and your sector (if applicable).

leFP (EQF3)

	R
work-based learning	8-13 %
school-based learning	92-87%
	100%

More precisely, the teaching hours are distributed as it follows:

	General Subjects	Technical and Professional subjects ²	Stage/Internship /Traineeship	Total h/year
Year 1	435	555		990
Year 2	420	420	160	990
Year 3	367	383	240	990
Total h/type of learning activity	1222	1358	400	2970
%	41%	46%	13%	100%

leFP (EQF4, and 24 courses EQF3)

	R
work-based learning	50%
school-based learning	50%
	100%

Which types of vocational schools exist to train workers in the industry sector in your country? Please provide detailed information for each type of vocational school in the following table (please copy and paste the table for further entries).

² Including laboratories and therefore practical activities.



At the age of 14, Italian students completing their lower-secondary school must choose an upper-secondary school. Those willing to join the labour market as soon as possible, and therefore interested in learning a profession, can decide to continue their studies through the leFP in a VET centre. The course lasts 3 years. Alternatively, lower-secondary school students can attend a 5 year technical or professional institutes. Technical and professional institutes are a national concern, so they respond to the Ministry of Education, University and Research, while leFP courses are a regional concern, so they respond to the different regions in which they are settled. At the end of the third years of the leFP, students receive a regional professional qualification (EQF3), while at the end of the 5 years of technical or professional institutes they are given a diploma (EQF4), which will guarantee them access to university, higher technical courses, or other tertiary education courses. Students who have received an EQF3 professional qualification can continue their regional training for another year so that they can get an EQF4 degree. Currently, however, access to university or tertiary studies with this type of qualification is not allowed because of the professionalizing and practical nature of these courses. The Regions provide adult professional education and training courses too, which also guarantee an EQF3. This report will only focus on regional leFP paths, particularly on the initial training ones of the Veneto Region, excluding the adult training.

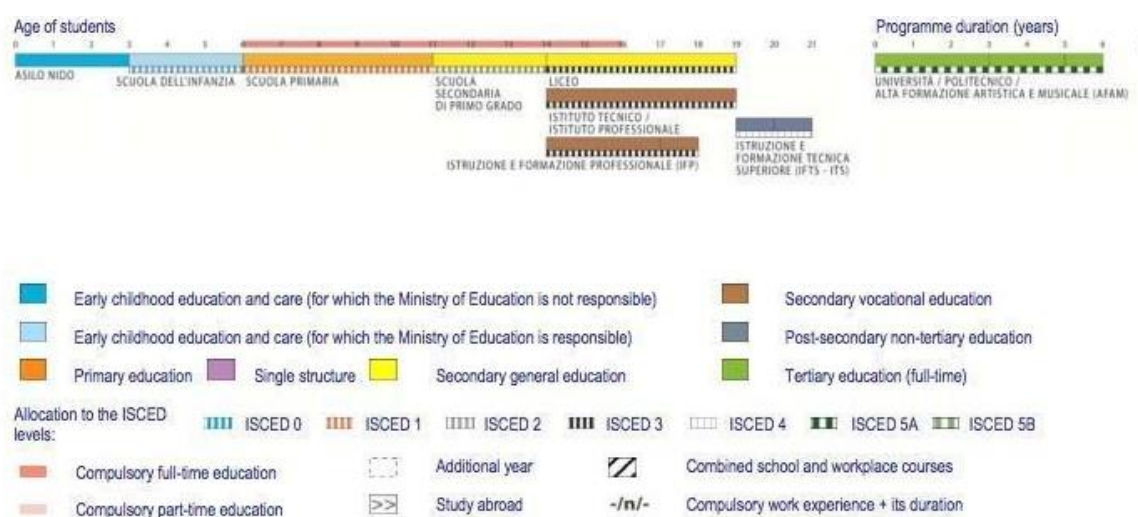


Figure 1 - Italian Educational System (Eurydice)

leFP (EQF 3) – Initial training

Training for occupation of following NACE sector(s) ³ :	A - Agriculture, Forestry and Fishing C – Manufacturing F- Construction D – Electricity, gas, steam, and air conditioning
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³ In the Italian version of the report, it is possible to read the different qualifications that guarantee access to the different occupational sectors for all the school paths (EQF3, EQF4).



	<p>supply</p> <p>E- Water supply, sewerage, waste management and remediation activities</p> <p>G – Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles</p> <p>H – Transportation and Storage</p> <p>I – Accommodation and food service activities</p> <p>J- Information and Communication</p> <p>N – Administrative and support service activities</p> <p>S – Other service Activities</p> <p>R – Arts, Entertainment and recreation</p>
Ratio between work- and school-based learning:	8%-13% work-based/ 87% school-based (in 24 courses out of 300 50%-50%)
Initial or further education:	Initial
EQF Level of school-leaving qualification:	EQF3
Entry requirements:	Lower-Secondary school diploma (Licenza media)
Additional information:	<p>Attending these courses is useful for completing compulsory education (until the age of 16 in Veneto Region) and learning a profession. In Italy it is not possible to work or have work-based training before the age of 15. For these reasons, the dual system is difficult to apply in this program, because, in their first year, students can be 14 years old. For this reason, in those courses (24 out of 300) that apply a dual system, students learn within a simulated enterprise in their first year.</p>

leFP (EQF 4)

Training for occupation of following NACE sector(s):	<p>A - Agriculture, Forestry and Fishing</p> <p>C – Manufacturing</p> <p>F- Construction</p> <p>E- Water supply, sewerage, waste management and remediation activities</p> <p>D – Electricity, gas, steam, and air conditioning supply</p>
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	<p>G – Wholesale and Retail trade; Repair of Motor Vehicles and Motorcycles</p> <p>H – Transportation and Storage</p> <p>I – Accommodation and food service activities</p> <p>J- Information and Communication</p> <p>N – Administrative and support service activities</p> <p>S – Other service Activities</p> <p>R – Arts, Entertainment and recreation</p>
Ratio between work- and school-based learning:	50,5% work-based (500 hours)/ 49,5% school-based (490 hours)
Initial or further education:	Initial
EQF Level of school-leaving qualification:	EQF4
Entry requirements:	Qualifica professionale EQF3
Additional information:	

Professional Institute (EQF4)

Training for occupation of following NACE sector(s):	<p>A - Agriculture, Forestry and Fishing</p> <p>C – Manufacturing</p> <p>E- Water supply, sewerage, waste management and remediation activities</p> <p>D – Electricity, gas, steam, and air conditioning supply</p> <p>G – Wholesale and Retail trade; Repair of Motor Vehicles and Motorcycles</p> <p>H – Transportation and Storage</p> <p>I – Accommodation and food service activities</p> <p>J- Information and Communication</p> <p>Q – Human Health and Social Work Activities</p> <p>N – Administrative and support service activities</p> <p>R – Arts, Entertainment, and recreation</p>
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Ratio between work- and school-based learning:	100% at school. However, students have to spend a total of 210 hours on experiences that can help them develop soft skills, give them career guidance (Percorsi per Competenze Trasversali e l'Orientamento – PCTO). It is possible to spend these hours in the labour market.
Initial or further education:	Initial
EQF Level of school-leaving qualification:	EQF4
Entry requirements:	Lower-Secondary school diploma (Licenza media)
Additional information:	<p>If students with an EQF4 from the IePF (regional qualification) want to attend tertiary education, they can ask to continue their studies in the national professional institute and take some supplementary exams.</p> <p>More information can be found here Istituti Professionali - Miur</p>

Technical Institute (EQF 4)

Training for occupation of following NACE sector(s):	<p>Technical institutes focus on two macro-sectors: the economic and the technological one. The following subsectors can be identified:</p> <p>A - Agriculture, Forestry and Fishing</p> <p>C – Manufacturing</p> <p>E - Water supply, sewerage, waste management and remediation activities</p> <p>D – Electricity, gas, steam, and air conditioning supply</p> <p>F - Construction</p> <p>G – Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles</p> <p>H – Transportation and Storage</p>
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	<p>I – Accommodation and food service activities</p> <p>J- Information and Communication</p> <p>M – Professional, Scientific and Technical Activities</p> <p>N – Administrative and support service activities</p> <p>R – Arts, Entertainment and recreation</p>
Ratio between work- and school-based learning:	100% at school. However, students must spend a total of 210 hours for experiences that can help them develop soft skills and give them career guidance (Percorsi per Competenze Trasversali e l'Orientamento – PCTO). It is possible to spend these hours in the labour market.
Initial or further education:	Initial
EQF Level of school-leaving qualification:	EQF4
Entry requirements:	Lower-Secondary school diploma (Licenza media)
Additional information:	Istituti Tecnici - Miur

leFP, Adult Education (EQF3)

Training for occupation of following NACE sector(s):	<p>The courses are focused on the following macro-areas:</p> <ul style="list-style-type: none"> - Health and wellness - Security and Hygiene - Trade and services - Culture and Art <p>The following NACE sectors are targeted:</p> <p>E - Water supply, sewerage, waste management and remediation activities</p> <p>F - Construction</p> <p>G – Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles</p> <p>K- Financial and Insurance activities</p>
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	Q – Human Health and Social Work Activities M – Professional, Scientific and Technical Activities R – Arts, Entertainment and recreation S – Other service Activities R – Arts, Entertainment and recreation
Ratio between work- and school-based learning:	The ratio depends on course to course. Generally, the total amount of hours is from 800 and a traineeship of 120 to 320 hours is required.
Initial or further education:	Further
EQF Level of school-leaving qualification:	EQF3
Entry requirements:	Lower-Secondary school diploma (Licenza media)
Additional information:	Cerco Corso - Regione del Veneto

Is VET regulated by law in your country?

yes	<input checked="" type="checkbox"/>
no	<input type="checkbox"/>

If applicable, provide details regarding the law(s) in place to regulate VET in your country and/or sector(s). Which aspects of VET are regulated?

- The Agreement stipulated in the State-Regions Conference between the Minister of Education, University and Research, the Minister of Labour and Social Policies, the Regions and the Autonomous Provinces of Trento and Bolzano concerning the integration and modification of the National repertoire of reference figures for professional qualifications and diplomas, updating of minimum standards relating to basic skills and models of intermediate and final certification of Vocational Education and Training paths. This is a modification and integration of the previous repertoire dated July 27, 2011. In the repertoire, it is possible to find specific figures, “indirizzi” and profiles. There is a minimum national standard that each region must reach, represented by the figure or, if this is defined by specific “indirizzi”, the standard is defined by the figure with at least one “indirizzo”. The regional profiles are adapted to the regional territory⁴;

⁴ The figure represents the Qualification and Diploma standard defined at the national level and included in the National Directory of VET offer; the “indirizzo” constitutes the possible articulation of the figure, and is determined in relation to specific areas / processes / products / services. The “indirizzo” is also defined at national level; the profile” represents the declination / articulation at the regional level of the figure / “indirizzo” with respect to the specificities and territorial characterizations of the labour market. The regional profile can be



- Agreement signed in the Conference of Regions and Autonomous Provinces on 18 December 2019 n. 19/210 / CR10 / C9 relating to the table of confluence between professional qualifications and diplomas and for the definition of personal, social, learning, and entrepreneurial competence in the context of education and vocational training courses;
- Legislative Decree 13 April 2017, n. 61, that is a review of vocational education paths in compliance with article 117 of the Constitution, as well as connection with vocational education and training paths, pursuant to article 1, paragraphs 180 and 181, letter d), of the law of 13 July 2015, n. 107;
- Regional Law 31 March 2017, n. 8 "The educational system of the Veneto Region", as amended by regional law 20 April 2018, n. 15;
- Legislative Decree 17 October 2005, n. 226 "General rules and essential levels of performance relating to the second cycle of the education and training system, pursuant to article 2 of the law of 28 March 2003, n. 53";
- Regional Law 9 August 2002, n. 19 "Establishment of the regional list of accredited training bodies" and subsequent amendments;
- MIUR decree of 17 May 2018, published in the Official Gazette n. 216 of 17 September 2018, which adopts the "General criteria to favour the connection between the professional education system and the professional education and training system and for the realization, on a subsidiary basis, of education and professional training courses for the issue of the qualification and the four-year professional diploma ", following the Agreement n. 64 sanctioned in the State Regions Conference in the session of 8 March 2018, with which the general terms and conditions of the subsidiary offer of VET by educational institutions are defined as well as the general criteria for the preparation of the Agreements referred to in cited Legislative Decree no. 61/2017;

As studied by Salerno⁵, and confirmed by the exchange with stakeholders, the framework of interinstitutional relations in VET is complex because it is necessary to maintain territorial autonomy and pluralism (represented by the Regions, constitutionally competent bodies) and the need for regulatory indications of a unitary nature at the national level (by constitutional will). Regional and national laws in some cases leave a regulatory vacuum. In the Veneto region, the following is recognized:

- the simultaneous presence of two distinct systems of professional education (leFP and IP) (see article 1, paragraph 4, article 2, paragraph 1, and article 7, paragraph 1, Legislative Decree n. 61/2017 and art. 1, paragraph 3 of regional law n. 8/2017);
- The different identity and the equal order of the two vocational education systems, leFP and FP (see art.7, paragraph 3, Legislative Decree no. 61/2017 and art. 2, paragraph 2 regional law no. 8/2017);
- That the leFP contributes to the fulfilment of the right and duty to education and training art. 2, paragraph 1, Legislative Decree n. 61/2017 and art. 10, paragraph 1 Regional law n. 8/2017)

constituted: a) as an extension of an "indirizzo"; b) as a grouping of several "indirizzi"; c) as a specific territorial articulation of a figure that does not provide a required "indirizzo".

⁵ Salerno, G. (2020) *Le Regioni al voto di fronte alla leFP: Puglia, Toscana e Veneto*. RASSEGNA CNOS 2/2020



- The right of choice for students between VET and IP after secondary school (Article 2 paragraph 1, Legislative Decree No. 61/2017 and Article 2, 6, 8 of Regional Law n. 8/2017) ;
- The right to choose between the fourth year of the leFP and the fourth year of the IP after the qualification of the leFP (Article 8 paragraph 7, Legislative Decree n. 61/2017 and Article 10 of the Regional Law n. 8/2017). The general rule also provides for the possibility of attending courses, at the expense of the regions, to access the state exam after the achievement of the professional diploma at the end of the leFP course: in this sense, the regional discipline does not include relevant aspects in this regard, including financial ones and needs to be integrated;
- VET courses are provided by accredited training institutions (VET centres) and, on a subsidiary basis, by professional institutes, always subjected to regional accreditation (Article 4 paragraph 4, Legislative Decree No. 61/2017 and Article 15 of the law regional no. 8/2017). The general rule should also incorporate the conditions to which the provision of VET courses is subordinate to the Professional Institutes. The two vocational education systems (IP and VET) are supported and connected through appropriate "steps" which are governed by the "general criteria" dictated by the legislative decree itself and which will be governed, in the individual "phases", by a specific agreement in place of the State-Regions Conference (see Article 8, paragraphs 1 et seq., Legislative Decree no. 61/2017). The transposition of this provision into regional law is still under discussion: the processes of monitoring, innovation and creation of paths are not yet well defined.

1.1 Workers' competences needed for the Industry 4.0 work environment

Workers need particular competencies to succeed in the Industry 4.0 work environment. It is useful to organise competencies into four overarching competency levels: technical skills, data and IT skills, social competence and personal skills. In a comparative analysis of 26 studies and research reports, key competencies of relevance for Industry 4.0 were identified⁶. These are used in the following section as a basis for the questions. Regarding the occupation-specific competencies, you can use the ESCO⁷ classification of occupations for support.

According to the Repertoire (Atti n. 155/CSR del 1° Agosto 2019), competences acquired with compulsory education regards basic competences in language, mathematics, science, technology, social science, and economy. Digital and Citizenship skills are also included among the basic ones. In this section, competencies from the Repertoire will be organized according to the ESCO related competencies. For those competences which do not have a specific correlation with the ESCO classification, a translation will be given.

Technical competencies are all those skills that relate to basic and specialist knowledge from a particular discipline, sector or job profile (e.g. understanding of processes, production system knowledge, process management, quality assurance).

Related to your sector(s), which specific technical competencies have been identified as particularly relevant to Industry 4.0?

General technical competencies (please identify general technical competencies, relevant to all

⁶ For more, see Schmid (2017) [What type of competencies will Industry 4.0 require?](#)

⁷ [ESCO classification of occupations.](#)



occupations).

In the National Repertoire, the following skills are common to all courses:

Identify the distinctive culture and opportunities of one's work environment, in the context and in the territorial and overall socio-economic system, related to the ESCO "**working environment**" competence.

Reading one's own territory and historical-cultural and working context (both in a diachronic dimension through the comparison between eras and in a synchronic dimension through the comparison between geographical and cultural areas) is in correlation with the following ESCO secondary skills:

- **socio-economic trends in your sector**
- **history**
- **do historical research**
- **historical methods**
- **find trends in geographic data**
- **geographical areas**
- **geography**

Using mathematical concepts, simple calculation, and analysis procedures to describe and interpret reality data and to solve problematic situations of various types related to one's daily and professional life context is in correlation with the ESCO **mathematical / numerical literacy** competence and therefore with the following ESCO secondary skills:

- **Carry out work-related calculations**
- **Carry out work-related measurements**
- **Manage quantitative data**
- **Communicate mathematical information**
- **Make numerical calculations**
- **Statistics**
- **Use mathematical tools and equipment**
- **Develop strategies to solve problems**

Using simple scientific concepts and procedures to read phenomena and solve simple problems



related to one's daily and professional life context while respecting the environment is in correlation with the ESCO **scientific research methodology** and therefore with the following ESCO secondary skills:

- **Analyse environmental data**
- **Perform chemical experiments**
- **Chemistry**
- **Biology**
- **Electricity and Energy**
- **Scientific modelling**
- **Apply statistical analysis techniques**
- **Keep updated on innovations in various business sectors**

Operate safely and in compliance with the rules of hygiene and environmental protection, identifying and preventing risky situations for oneself, for others and for the environment

Skills:

- Identify figures and standards of reference to the sector prevention/protection system
- Identify the risk situations related to your own and the possible repercussions on other people
- Identify the main prohibition, danger, and prescription signs typical of the sector
- Adopt work behaviours consistent with the rules of hygiene and safety at work and with the environmental protection/sustainability of the sector
- Adopt the behaviours foreseen in emergency situations
- Use the individual and collective protection devices of the sector
- Implement the main first aid interventions in emergency situations

Knowledge:

- Reference legislation for the safety and hygiene of the sector
- Individual and collective protection devices for the sector
- Methods for identifying and recognizing risk situations in the sector
- Environmental legislation and sector pollution factors
- Notions of first aid
- Prohibition signs and related sector regulations

Occupation-specific technical competences (please clearly identify these in relation to specific



occupational profiles).

Here, the specific technical skills for the EQF3 – IT Operator

Recursive technical-professional skills:

Defining and planning the operations phases to be carried out, in compliance with safety legislation, based on the received instructions, the supporting documentation (diagrams, drawings, procedures, materials bills) and the reporting system.

Skills:

- Use support indications (diagrams, drawings, procedures, models, materials bills) and/or instructions to arrange the different processing /service phases
- Apply the work organizing standards relating to the peculiarities of the work/services to be performed and the working / organizational environment
- Apply the processes/services planning and organizing methods and activities in compliance with sector-specific safety, hygiene and environmental protection regulations
- Apply methods and techniques for the management of working times

Knowledge:

- Safety, hygiene, sector/process environmental protection regulations
- Main technical terminologies of the sector/process
- Processes, work cycles and roles in sector / process operations
- Professional communication elements
- Planning techniques

Prepare, monitor and take care of the ordinary maintenance of tools, equipment and machinery necessary to the different processing/service phases based on the type of materials to be used, the indications/procedures envisaged, the expected result

Skills:

- Identify tools, equipment, machinery for the different processing phases based on the support indications (diagrams, drawings, procedures, models)
- Apply procedures and techniques for the preparation of tools, equipment, machinery, sector tools



- Adopt methods and behaviours for the ordinary maintenance of instruments, tools, equipment, the machinery of the sector
- Use methods to identify usury levels on any tools and machinery operating anomalies

Knowledge:

- Preparation/start-up methods and techniques
- Principles, mechanisms and operating parameters of instruments, tools, machinery and equipment in the sector
- Tools and conventional graphic representation systems of the sector
- Types of main equipment, machinery, sector tools
- Types and features of the materials used
- Monitoring procedures and techniques, identification, and evaluation of the operation of the main equipment, machinery, tools
- Techniques and ordinary maintenance methods of the main equipment, machinery, tools

Operate safely and in compliance with the standards of hygiene and environmental protection, identifying and preventing risky situations for self, for others and for the environment

Skills:

- Identify figures and reference standards to the sector prevention/protection system
- Identify risk situations relating to your own person and the possible repercussions on other people
- Identify the main prohibition, danger and prescription signs typical of the sector
- Adopt work behaviours consistent with the rules of hygiene and safety in the workplace and with the environmental protection / sustainability of the sector
- Adopt behaviours foreseen in emergency situations
- Use individual and collective protection devices of the sector
- Implement the main first aid interventions in emergency situations

Knowledge:

- Reference legislation for safety and hygiene of the sector
- Individual and collective protection devices for the sector
- Methods to identify and recognize risk situations in the sector
- Environmental legislation and pollution factors
- First aid notions
- Prohibition signs and related sector regulations



Connotative technical-professional skills:

To install, configure and use computer hardware and software supports typical of office automation and digital communication based on the specific needs of the customer

Skills:

- Analyse PC components, assemble and configure them and the related software
- Install, configure, and apply the features of the main Office Automation software
- Configure, manage, and apply the functionalities provided by the operating systems
- Apply techniques and methods to configure a PC peripheral and the installation of the related software
- Provide assistance, instructions and support to the user
- Identify, throughout the web, the services useful for solving the detected problems
- Apply techniques for the implementation and integration between data acquisition and processing systems

Knowledge:

- Features and purposes of use of the hardware elements and peripherals used
- Features, methods of use and specific functions of application software
- Main functionalities of an operating system and the management of its file system
- Techniques and procedures for implementation and integration of data acquisition and processing systems
- Network cabling techniques and procedures
- Assembling techniques of a PC and of hardware components of a client and a server
- Saving techniques of incremental and full back-up data

Perform ordinary and extraordinary maintenance of systems, networks, devices, and user terminals, identifying possible anomalies or operating problems

Skills:

- Apply techniques and procedures for analysis and diagnosis, incompatibilities and malfunctions
- Apply network cabling techniques and procedures
- Identify defective and / or faulty components
- Find necessary information in the documentation and maintenance log of your system or network



- Identify possible solutions and recovery procedures
- Use measuring tools
- Use simulation software to test the functionality of mobile networks

Knowledge:

- CEI sector regulations
- Maintenance records
- Techniques and measurement and control tools
- Maintenance techniques
- System/network safety techniques
- Systems and networks verification technique
- Principles of networks functionality
- Types and functionality of networks

Carry out the processing, maintenance and transmission of data managed by digital archives

Skills:

- Define and carry out queries on the database
- Process and update data
- Use data transmission protocols
- Apply data maintenance procedures in computer archives
- Use tools to analyse data stored in databases

Knowledge:

- Set theory and relational logic applied to databases
- Basics of relational algebra
- Principles of information systems, information, and data
- Database components
- Primary and secondary keys
- Notes on data backup and restore techniques
- Hints on how to import/export data from other databases

Data and IT competencies are all types of knowledge and skills that relate to data collection, analysis and protection as well as the monitoring, usage and maintenance of data-based systems (e.g.



documentation, cloud-computing, use of analysis and digital tools, programming, software development, artificial intelligence, 3D printing, IT support, user experience design).

Related to your sector(s), which specific data and IT competences have been identified as particularly relevant to Industry 4.0?

General Data and IT competencies (please identify general technical competencies, relevant to all occupations).

Digital competence, i.e. that of using information technologies for communication and reception of information, is organized into the following **skills**:

- Use basic programs and apps on PCs, tablets, and smartphones
- Carry out the most common operations of research, management and organization, processing, representation and transmission of data and information.
- Use the internet for interpersonal and professional communication activities and to participate in social life
- Recognize the constraints and risks of using the network
- Apply defined basic security measures on privacy
- Use tools to manage a network of contacts on a social network

Knowledge:

- PC architecture, basic operating organs, and writing, computing and graphics applications for the production of multimedia documents
- Information, data and coding, methods, and systems of documentation, archiving and transmission
- Functions and characteristics of the internet network. Search engines
- Main tools for professional interpersonal communication: e-mail, forum, social network, blog, wiki,
- Limits, risks and safe use of the internet, behavioural and regulatory elements on privacy, copyright and netiquette
- Social networks and new media as a phenomenon and communication tool.

Social networks and new media as a phenomenon and communication tool

Digital competence is related to the primary competence of ESCO **browsing, searching and filtering digital data**, which in turn includes:

- **Search for information online**
- **Use IT tools**



- **Creatively use of digital technologies**
- **Share through digital technologies**
- **Manage data, information and digital content**
- **Collaborate through digital technologies**
- **Digital communication and collaboration**
- **Interact through digital technologies**
- **Protect personal data and privacy**
- **ICT safety**

Occupation-specific Data and IT competences (please clearly identify these in relation to specific occupational profiles).

These skills refer to the European ESCO framework, thank to which it is possible to analyze the required competences for specific sectors. Data and IT skills for the IT operator can be identified among the technical-specific competences.

Social competencies are all those skills that relate to communication and collaboration activities (e.g. interdisciplinary and intercultural collaboration, translation and transfer competences, user-oriented engagement, motivating innovation and performance).

Related to your sector(s), which specific social competencies have been identified as particularly relevant to Industry 4.0?

General social competencies (please identify general social competencies, relevant to all occupations).

Social skills are in an experimental phase and are not yet certified and assessed at the end of the courses in the Veneto Region.

Working with others in a constructive way.

Working with others in a constructive way involves knowledge of the codes of conduct and communication norms generally accepted in different environments and societies, as well as skills such as managing conflict, working and collaborating as a team and independently, negotiate, express and understand different points of view, empathize, be resilient, manage uncertainty and stress, manifest tolerance, build trust.

With the primary competence ESCO "working team" brings together several secondary



competencies:

- Interact with others
- Give advice to others
- Support colleagues
- Negotiate compromise
- Demonstrate consideration
- Accept constructive criticism
- Apply knowledge of human behaviour

Occupation-specific social competencies (please clearly identify these in relation to specific occupational profiles).

The skills refer to the European ESCO framework, thank to which it is possible to analyze the required competences of specific sectors. At a regional level, however, specific social skills do not appear for the IT profiles, but reference is made to the skills common to all paths.

Personal competencies are all types of knowledge and skills related to personal dispositions and capacities (e.g. willingness for continuous improvement and lifelong learning; holistic, analytical and creative thinking; problem-solving; self-guided learning, recognition of transferable skills; tolerance of ambiguity; flexibility).

Related to your sector(s), which specific personal competencies have been identified as particularly relevant to Industry 4.0?

General personal competencies (please identify general personal competencies, relevant to all occupations).

Personal skills are in an experimental phase and are not yet certified and evaluated at the end of the courses in the Veneto Region.

It is possible to consult the personal competencies in the agreement between the regions and the autonomous provinces of Trento and Bolzano Agreement 18 December 2019 n.19 / 210 / CR10 / C9.

Managing your learning and professional development.



Managing your learning and professional development involves knowledge about the different ways to develop skills, the different types and methodologies of learning, as well as skills such as: managing time and information effectively, being aware of strategies to organise learning, seeking education, training and career opportunities, identifying the forms of guidance and support available, seeking support when appropriate, identifying one's skills and needs for skills development, managing complexity and uncertainty, focus, reflect critically and on oneself, make decisions, persevere, evaluate and share.

“Manage personal professional development”, according to ESCO, involves:

- **Identify support mechanisms to develop your personal practice**
- **Demonstrate the willingness to learn**
- **Demonstrate curiosity**
- **Use learning strategies.**

Acting in an entrepreneurial and innovative way.

Acting in an entrepreneurial and innovative way implies knowledge about ethical principles and opportunities, social and economic difficulties faced by organizations and individuals, as well as skills such as: strategic thinking and problem solving, motivate others and valuing their ideas, mobilizing resources, maintaining the pace of business, making financial decisions related to costs and values, caring for people and the world, accepting responsibility, making decisions, expressing creativity and imagination, reflecting in a critical and constructive way, being aware of one's strengths and weaknesses, managing uncertainty, ambiguity and risk, expressing a spirit of initiative and proactivity, being far-sighted and having courage and perseverance in achieving goals.

This competence is attributable to the ESCO competence **show entrepreneurial spirit** is divided into the following secondary competencies:

- **Identify opportunities**
- **Think creatively**
- **Process qualitative information**
- **Manage time**
- **Make decisions**

Develop and maintain your physical and emotional well-being.

Developing and maintaining your physical and emotional well-being involves the knowledge of the elements that make up a healthy mind, body and lifestyle such as: setting up a lifestyle to safeguard the health, physical, and emotional well-being, preventing risky behaviours, recognizing and managing the causes and effects of stress and reflecting critically and about oneself, managing emotional relationships with respect for oneself and for others.



There is no priority competence among those ESCOs that can be identified as related to this. Among the secondary ones, however, it is possible to find:

- **Deal with uncertainty**
- **Manage time**
- **Cope with pressure**
- **Attend to hygiene**

Occupation-specific personal competencies (please clearly identify these in relation to specific occupational profiles).

The skills refer to the European ESCO framework, thank to which it is possible to analyze the required competences of specific sectors. At the qualification level and professional diploma, however, specific personal skills do not appear for the IT profiles, but reference is made to the skills common to all paths.



1.2 Labour market requirements

This section is dedicated to collecting content related to labour market requirements on a general (European or even global) and country-specific or regional level.

If applicable, what labour market requirements related to Industry 4.0 have generally been identified in your country/region?

The Veneto Demand Report, drawn up by Unioncamere⁸, defines the skills required by companies in 2020; among these, we find the following, which are considered in line with the development of industry 4.0:

- **Use mathematical and computer languages and methods**
- **Use digital skills**
- **Apply “4.0” technologies to innovate processes**

These skills are required respectively by 50.3%, 58.0% and 33.7% in all professions.

Below is a table showing the percentage demand per professional figure.

Table 1 - Industry 4.0-related competences required by the labour market (Unioncamere 2020)

	All	Managers and intellectual and scientific professions	Technical professions	Office workers	Trade and commercial service professionals	Specialized workers	Machines and plants operators	Non-qualified professions
Apply mathematical and computer languages and methods	50,3	83,2	80,5	77,9	54,3	48,6	37,8	24,5
Apply digital skills	58,0	94,0	93,2	90,4	53,5	50,9	45,0	30,9
Apply “4.0” technologies to innovate processes	33,7	66,8	54,5	48,1	24,8	39,4	26,6	14,9

⁸ Unioncamere (2020), The employment and training needs of industrial and service companies - Veneto Region

In the following table, the percentages of the roles where the Industry 4.0-related skills were required are shown.

Table 2 - Industry 4.0-related competencies highly required by the labour market (Unioncamere 2020)

	All	Managers and intellectual and scientific professions	Technical professions	Office workers	Trade and commercial service professionals	Specialized workers	Machines and plants operators	Non-qualified professions
Apply mathematical and computer languages and methods	14,9	50,4	38,2	33,2	7,7	10,2	6,9	2,3
Apply digital skills	19,4	71,0	63,2	54,3	8,5	7,5	3,3	0,0
Apply “4.0” technologies to innovate processes	9,3	30,9	20,1	15,8	3,8	10,8	5,8	1,9

It is, therefore, possible to ascertain that, despite these skills are mostly required to managerial or highly specialized figures, they're considered relevant for about one out of 10 skilled workers.

What specific labour market requirements related to Industry 4.0 have been identified in your sector(s)?

Again, thanks to the Unioncamere report⁹, it's possible to observe the different skills demand in the various sectors covered by the IeFP EQF3/4 in Veneto Region. In the tables, the demand for skills related to industry 4.0 in the IT sector. The data are shown in Table 3.

Table 3 - Industry 4.0-related competencies highly required by the labour market per professional field (Unioncamere 2020)

	Professionals in natural and physical science, mathematics, IT, chemistry.	Technician in IT and communication
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⁹ Unioncamere (2020), The employment and training needs of industrial and service companies - Veneto Region



Apply mathematical and computer languages and methods	96,0	84,3
Apply digital skills	100,0	100,0
Apply “4.0” technologies to innovate processes	88,2	74,6

1.3 Fair opportunities

This section provides space for descriptions of changes and/or trends in the labour market regarding the provision of fair opportunities and their relevance for Industry 4.0.

If applicable, which types of programmes have there been in the last 5-7 years that deal with the gender gap or changing demographics (particular focus on age) in relation to Industry 4.0?

There have been 14 projects worth €5 Million during the years 2017-2018, within a program focusing on fair opportunities in a changing labour market, investing in women employment.

Name of the programme:	DGR 254/16 “Fair opportunities in a changing labour market”
Initiator/creator of the programme:	European social fund, Veneto Region (Area of economic policies, human capital and communitarian programs)
Which sector does the programme come from?	No specific sector
How does it address Industry 4.0 or relevant competencies?	<ul style="list-style-type: none"> - Spreading a healthy work-life balance culture - Requalification and training of men and women - Promotion of a territorial and company welfare, - Introduction of new forms of work-life conciliation - Development of territorial network to support the work-life conciliation - Development of new services and opportunities



Transfer potential of the Good Practice (GP):	Possible in the EU countries.
What are the results achieved by or recommendations of this programme?	<ul style="list-style-type: none"> - The realisation of a regional network of welfare services for the work-life balance - The experimentation of new types of organisation of work supporting the work-life balance - The realisation of actions creating new employment opportunities, new services and new businesses.
Link (website, where to find more information):	
Additional information:	

For the years 2019-2020, 61 projects (of €5,5 Million value) have been activated under the programme “Protagonists of change – tools for people and organisations”. The objective of the programmes was not exclusively focused on fair opportunities, like in the biennium before but also:

- to develop new organisational working models and or/and actions that would meet the stakeholders’ needs;
- to find agreement in the rearrangement of work
- to create new opportunities for employment, development, and innovation

The programme, however, recognised as *protagonists of change* both companies and people, and among the latter two categories of actions have been identified:

- one focusing on resilience, change, and the development of transversal, linguistic and digital competencies;
- the other focusing on women, specifically in employment opportunities to reduce the gender gap in the digital professions.

In this last category, tailor-made projects have been activated to strengthen specific technical competencies and soft skills for unemployed women to facilitate their integration and permanence within the labour market.

Name of the programme:	DGR 254/16 “Fair opportunities in a changing labour market”
Initiator/creator of the programme:	European social fund, Veneto Region (Area of economic policies, human capital and communitarian programs)
Which sector does the programme come from?	STEM sectors



<p>How does it address Industry 4.0 or relevant competences?</p>	<p>With specific activities such as:</p> <ul style="list-style-type: none"> - career guidance, promotion and evaluation of relevant competences. - Training and guidance (through traineeship, cooperative learning, experiences. - The development of a series of event to raise awareness about STEM and women.
<p>Transfer potential of the GP:</p>	<p>Possible in UE countries</p>
<p>What are the results achieved by or recommendations of this programme?</p>	<ul style="list-style-type: none"> - increasing of women employment (both as employees and self-employed) - strengthening and acquisition of soft skills and specific technical competences - Contribute to a cultural shift to reduce stereotypes
<p>Link (website, where to find more information):</p>	<p>#fse1420 - 8 marzo (regione.veneto.it)</p>
<p>Additional information:</p>	

2. Actors involved in VET reform processes

2.1 Decision-making bodies

Rank these decision-making bodies according to the level of responsibility in the processes of transferring Industry 4.0 competencies to the VET sector? (1 = most involved, x = not involved at all)

Ministry of Education	2
Ministry of Economic Development	3
Ministry of Work and Social Policies	3
School board	3
Trade unions	3
Employer associations	2
Agency of labour/employment office	2
Teacher associations	3
Student representation	3
VET providers (school-based)	1
VET providers (work-based)	1
Industry (representatives)	2
Teachers	2

The main actors involved in the process are the leFP providers, both in school and in the labour market. According to Law 8 of March 31 2017 (art. 4 and 23), the Region controls the educational system by carrying out activities of:

- “monitoring of the education and training needs emerging from local communities and from the social, cultural and productive forces of the business system and the work world”;
- “planning of education and training services”;
- “planning, promotion and implementation of training activities aimed at developing advanced technological skills for both young and adult people”;
- “planning and promotion of a structured system for verifying the employment outcomes of the educational system”
- “collaboration in defining the determination standards for the workforce and assignment staff to public education and training institutions”
- “assignment of financial resources to the educational system services providers”
- “evaluation of the educational system”
- “assistance and support to educational and training institutions”

Overall, the region "regulates the subsystem of professional education and training, in particular through the definition of the courses and actions of the training offer, the related training and delivery standards, as well as through resources assignment and system evaluation".

The central decision-making role of the Region on the leFP is therefore clear. However, the Veneto Region recognizes the independence and ability of individual training centres to succeed, with local companies and in line with regional objectives, in ensuring the inclusion of the skills requested by



industry 4.0 where these are required. Moreover, discussion with the ministry at the national level, from which funding comes, is still ongoing on different matters, as will be seen later on.

2.2 Cooperation between different actors

*In your desk research and exchange with stakeholders, which general and specific **strengths or achievements** have been identified in terms of collaboration and/or communication between the different actors involved in VET reform processes?*

Cooperation was considered indispensable for innovation and change and there's a better functioning in the bottom-up networks, as the actors recognize themselves in more evident common objectives.

Companies are realising that the staff is increasingly inadequate and that their role in training is essential to overcome this situation. They often need trainees and therefore workers trained by VET centres.

The relationship between companies and the training centres who have been working together for years has consolidated and has been well defined by now, giving birth to a strong informal local cooperative network. The bureaucratic processes to define contracts for traineeships is the only legal formalisation of the cooperation.

It is also clear that it is always necessary to try to identify new, diverse, and innovative types of cooperation which, despite the challenges, can lead to surprising results.

*In your desk research and exchange with stakeholders, which general and specific **challenges or barriers** have been identified in terms of collaboration and/or communication between the different actors involved in VET reform processes?*

Communication problems: different actors usually have different knowledge and skills in the field where they have to collaborate, and sometimes it is difficult to find a common goal that goes beyond the interests of individuals. VET centres sometimes find it difficult to communicate and collaborate with labour consultants, who often do not seem to cooperate and have adequate or updated information on the possibilities of collaboration.

Cooperation must be continuously implemented, with **continuous research** for new players in the area who can give added value.

Sometimes some companies do not consider the importance of training because they do not want to allocate **time** for it. They lack awareness and knowledge of training centres and the potentiality of cooperation. Sometimes it may be easier not to collaborate in the Veneto region, in particular in a system with a labour market that in any case "works". This situation creates a comfort zone that



slows the change.

Institutional or **top-down networks** often work less, due to stereotypes and poor recognition between actors.

Not all the innovation **opportunities** that exist, in particular, those coming from the EU, are **exploited**.

Another barrier is due to the IeFP system, which is regional in nature and is often excluded from activities that arise from the Ministry of Education: "territorially it is difficult to be recognized, there is no consideration by the school offices". The **value** of vocational training is often **not perceived**. All the actors interviewed mentioned the problem of the stereotypical perception of the IeFP programmes by the community.

*In your desk research and exchange with stakeholders, what **suggestions and/or recommendations** were identified with the aim of improving collaboration and/or communication between the different actors involved in VET reform processes?*

Cooperation must be cultivated every day: it is necessary to evaluate established relationships and new potential relationships that can arise in the area and be valuable to students.

Bottom up networks work best because stakeholders recognize each other. The institutionalized ones are a little more difficult to maintain, because the interests of the singles emerge over those of the network.

It is easy to cooperate with people who are enthusiastic and motivated to achieve concrete results. It is important to focus on what is the motivation and the result and therefore the definition of a clear goal. It could therefore be useful to organize activities that facilitate cooperation between local actors, and therefore allow them to develop adequate skills, also for:

- improve communication and sharing of skills;
- implement systemic thinking and the logic of social forecasting to look to the future through a common approach;
- learn about new opportunities for collaboration.

Offering adequate information to companies and employment consultants can be another helpful tip. Trade associations could contribute to training in this sense by organizing training events for employment consultants.

Good promotion of VET pathways is essential.

3. Processes

This section focuses on the various processes involved in the (re)shaping of the VET sector across your country/region more generally as well as your particular sector(s).

3.1 Revision and reform processes

Under revision and reform processes we mainly understand the processes involved in revising existing VET programmes and reforming them with new VET programmes.

*In your sector, which actors are generally the **drivers of innovation** (e.g. instigating change and making proposals for VET reforms)? Please assign the approximate percentages to show the different levels of contribution from the various actors.*

Ministry of education	X
Ministry of finance and economy	X
Ministry of work and social policies	X
school board	x
trade unions	X
employer associations	X
agency of labour/employment office	x
teacher associations	x
student representation	x
VET providers (school-based)	X
VET providers (work based)	X
industry (representatives)	X
Regions	X
ANPAL	X
	100% ¹⁰

It is difficult to set a percentage since all the actors can be considered drivers of innovation. At a national level, it is possible to identify the main one as the National Agency for Work Active Policies¹¹ (ANPAL) that is the National Coordinator for the EQF. ANPAL elaborates technical proposals for the innovation of curricula and transmits them to the Ministry of Work and Social Policies.

*What mechanisms are in place to ensure the revision of **existing VET programmes** in your country? Do revisions take place regularly and at specified intervals?*

Revision should be done every three years. Currently, the responsibility of the different actors is being discussed.

Veneto Region, through “Veneto Lavoro”¹², is monitoring the working placement of students who have graduated from IeFP. The analysis results help the region understand the efficiency of certain study paths related to the needs of the geographical area. Veneto Region distributes funds based on the results of these analyses, which allow comprehending which and how many courses should be initiated in a specific area.

¹⁰ Being difficult to evaluate the percentage for the many different actors, a more visual way have been used to identified their contribution: smaller x for those actors that gives a minor contribution and capital X for those whose contribution is more important.

¹¹ [Agenzia Nazionale Politiche Attive Lavoro - ANPAL](#)

¹² Veneto Lavoro - Database [Silv - Veneto Lavoro](#)



*Briefly describe the review and revision process of **existing VET programmes** in your country. In which way(s) are adjustments brought forward, considered, implemented? How long can these process(es) take? Are the conditions set for it in the law or by-laws? Feel free to visualise this process in a flow chart.*

The process has not been defined yet, and it is being discussed. However, it can be said that:

At a regional and national level, the process of assessment and reviewing leFP programs requires cooperation between different actors. It is not a simple and linear process. Methods and timescales are continuously discussed by the different players. The consultation occurs between the regions, the Ministry of Education, University and Research, the Ministry of Labour, and Social Policies and the Ministry of Economy and Finance. The region can rely on the identification, the monitoring activity, the evaluation of the educational needs of the area, and the suggestion of proposals related to the formative courses offered by the province. Based on the normative, an update should be done every three years¹³.

The revision of 2011 programs have been updated and modified only in 2019, and immediately applied by the training centres. The preliminary results of these changes will be noticed only after 3-4 years from their introduction.

As stated in the Repertoire¹⁴, the revision has considered the following:

- Processes and working areas of the “Atlas of work”¹⁵, to ensure the close connection with the changes in the working environment and the required correlation with ISTAT classifications about economic activities¹⁶ and occupations¹⁷.
- The profile of both the Operator and Technician, and their characterization related to the area of competence and the level of responsibility and independence.
- Competencies previously identified¹⁸.

At the VET-centres level, programs are revised and improved periodically, bringing innovation to the teaching activity and to the courses that guarantee successful understandings and competencies required by the region and the companies in the area.

*Briefly describe the introduction process of **new VET programmes** in your country. How long does this process (usually) take? Please include any relevant laws, regulations and stakeholders. Feel free to visualise this process in a flow chart.*

The process of introduction of new courses and the actors involved are the same as the reviewing process. These two processes are conducted concurrently.

¹³ Regional law n.8 31 March 2017

¹⁴ Repertorio Atti n. 155/CSR del 1° agosto 2019

¹⁵ [Home | Atlante Lavoro | INAPP](#)

¹⁶ [Classificazione delle attività economiche Ateco 2007 \(istat.it\)](#)

¹⁷ [Classificazione delle professioni \(istat.it\)](#)

¹⁸ Decreto M. 8 gennaio 2018



Which of the following aspects are **taken into consideration** in the revision and reform processes of the VET sector in your country/region generally and your sector(s) more specifically?

	C
infrastructure	<input type="radio"/>
technology	X
staff availability	X
staff competences	X
wording of professional profile	X
European standards (e.g. ESCO, ISCO....)	X
VET provider needs	X
industry / labour market needs	X
staff needs	X
student needs	X
evidence-based research	X
European trends	X
International trends	X
local / regional / national politics	X

Which three of the above-mentioned aspects receive the **most attention** in the transfer processes in your country or sector(s)?

Industries/labour market needs
 Wording of professional profile
 Staff Availability

Which three of the above-mentioned aspects receive the **least attention** in the transfer processes in your country or sector(s)?

Infrastructural needs
 Local/regional/national politics
 Staff needs

What mechanisms are in place to ensure the **needs of VET providers, teachers and students** are met and their voices are heard? How are their perspectives translated to policy?

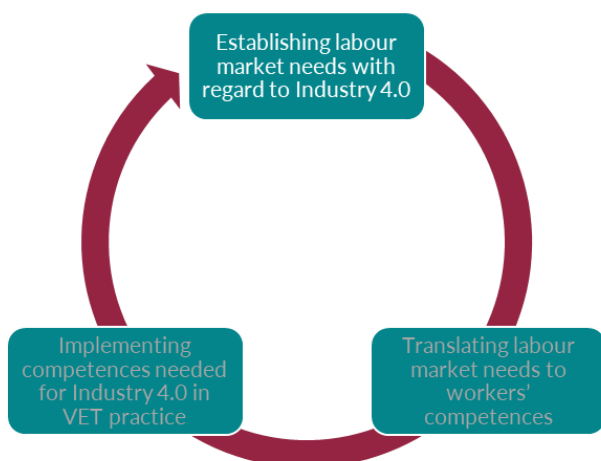
Teachers' and students' needs are considered by the providers of the IeFP. Each training centre collects these data independently in different ways: in certain cases in an informal way, in others in a more formal way, with a standardised method. However, results are not shared outside the



single centres, so they do not have any role on a regional or national level.

Teachers, in most cases, have consistent experience in the education field, and a direct connection with the labour work: they are considered strategic players by VET centres.

3.2 Mechanisms for establishing labour market needs with regard to Industry 4.0



Which of the following actors are predominantly responsible for the mechanisms in place to establish labour market needs in your country and in your specific sector(s)?

	C
Ministry of education	<input type="radio"/>
Ministry of economy	X
ministry of ...	X
school board	<input type="radio"/>
trade unions	<input type="radio"/>
employer associations	X
agency of labour / employment office	<input type="radio"/>
advisory board of ...	<input type="radio"/>
teacher associations	<input type="radio"/>
student representation	<input type="radio"/>
VET providers (school-based)	x
VET providers (work-based)	X
industry (representatives)	X

What **general mechanisms** are in place to establish labour market needs in your country and in your specific sector(s)?

The Italian Union of Chambers of Commerce, Industry, Crafts and Agriculture (Unioncamere) is a public body that represents and unites the Italian chamber system. Unioncamere has created the Excelsior project (Information system for employment and training) which provides forecast data on the progress of the labour market and on the professional needs of companies. The flexible survey methodology is CAWI (Computer Aided Web Interview) and is performed on a monthly basis. The strategy used is to carry out the monthly survey, formulate estimates for a mobile forecast quarter (Unioncamere n.d.). With CAWI interviews, data is collected on:



- employment situation (employee and non-employee) at the date of the last update of the administrative sources
- contract activation for professional figure and/or any terminations expected in the quarter following the month of the survey
- characteristics of the professional figures expected to enter during the quarter following the month of the survey
- Pathways for transversal skills and orientation (Alternation between school and work)

Veneto Lavoro is the Veneto regional agency for employment. It is a body ?? of the region that aims to study and improve the region's labour market. The main tasks of Veneto Lavoro are in fact:

- Observation on the labour market
- Management of information systems for the labour market e
- Assistance to operators so that the service network can function at its best.

Every three months Veneto Lavoro publishes “a compass”¹⁹: a document where it is possible to read the transformations of the market in terms of hiring, terminations, contractual transformations and balances of the employment positions of workers in the various provinces and in the various production sectors. The flows of workers in the labour market are detected by an automatic monitoring system. Veneto Lavoro then carries out, in collaboration with ISTAT, Unioncamere and other statistical centres, specific extraordinary reports.

The Atlas of Employment and Professions contains all the professions and related skills²⁰.

*If applicable, which **specific mechanisms** were used to establish labour market needs with regard to Industry in 4.0 in your country and in your specific sector(s)?*

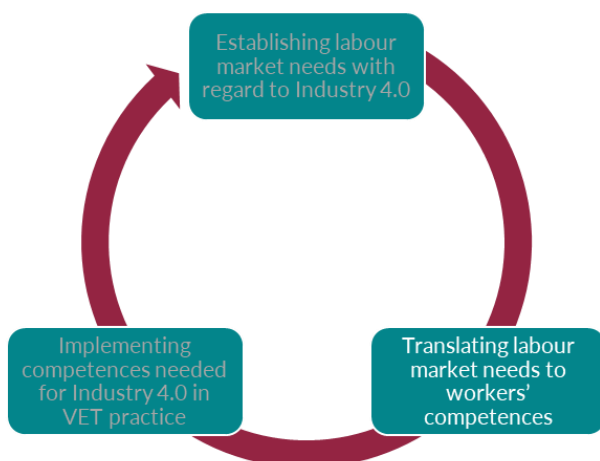
Unioncamere has included in its interviews with companies to detect the skills required by workers the competence "applying" 4.0 "technologies to innovate processes"²¹.

¹⁹ [Bussola - Veneto Lavoro](#)

²⁰ [Home | Atlante Lavoro | INAPP](#)

²¹ Unioncamere (2020), I fabbisogni occupazionali e formativi delle imprese dell'industria e dei servizi – Regione Veneto

3.3 Processes for translating labour market needs to workers' competences



Which of the following actors are predominantly responsible for translating labour market needs to key competences in VET practice of your country and your specific sector(s)?

	C
ministry of education	<input type="radio"/>
ministry of economy	<input type="radio"/>
school board	<input type="radio"/>
trade unions	<input type="radio"/>
employer associations	<input type="radio"/>
agency of labour / employment office	<input type="radio"/>
Examples from others schools systems	x
teacher associations	<input type="radio"/>
student representation	<input type="radio"/>
VET providers (school-based)	X
VET providers (work-based)	X
industry (representatives)	<input type="radio"/>

What processes **generally regulate or organise** the translation of labour market needs to competences in your country and in your specific sector(s)?

The Atlas of Employment and Qualifications²² organizes the needs of the market into specific skills by professional figure, managed by the National Institute for Public Policy Analysis²³ (INAPP).

The main actors involved in this process are however those at the territorial level, which thanks to their synergy contribute, in a more or less formal way, to translating the needs of the local market into skills. Despite national standards, therefore, it is with bottom-up cooperation that this process takes place.

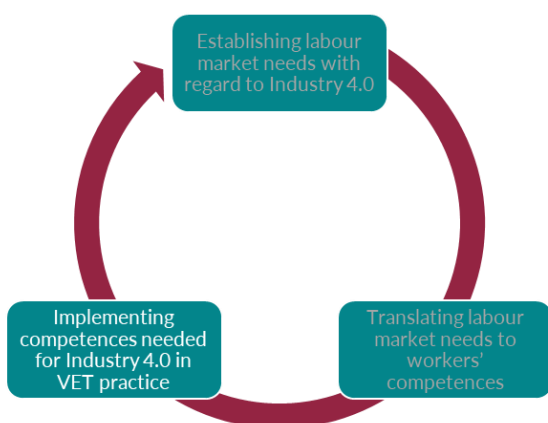
²² [Home | Atlante Lavoro | INAPP](#)

²³ [Home | INAPP](#)



Training centres try to create alternative and innovative paths based not only on the demands of the local market in a specific sector, but also on what is seen by other regions, and nations.

3.4 Processes for implementing competences needed for Industry 4.0 in VET practice



Which of the following actors are predominantly responsible for the processes regulating or organising the implementation of key competences in VET practice of your country and your specific sector(s)?

	C
ministry of education	x
ministry of work and social policies	x
Veneto Region	x
school board	<input type="radio"/>
trade unions	<input type="radio"/>
employer associations	<input type="radio"/>
agency of labour / employment office	<input type="radio"/>
advisory board of ...	<input type="radio"/>
teacher associations	<input type="radio"/>
student representation	<input type="radio"/>
VET providers (school based)	<input type="radio"/>
VET providers (work based)	<input type="radio"/>
industry (representatives)	<input type="radio"/>
other [insert here]	<input type="radio"/>

What processes **generally regulate or organise** the implementation of new competences in your country and in your specific sector(s)? How are competencies usually transferred from policy to VET practice?



The leFP repertoire²⁴ defines the professional figures and training standards that must be achieved in each region. The document, as previously mentioned, is drawn up in agreement between the State and the Regions. Here are collected the skills necessary to achieve the VET title. New skills are introduced with the revision of the programs, in ways that are still under discussion, but which should take place every three years.

The Veneto region then monitors and organizes the leFP courses, distributing the funds to the VET courses in the area.

Individual centres providing VET courses cooperate with local companies, organize internships and modulate their training courses based on the needs of the local market while meeting the skills of the minimum standards. Local companies cooperate in different ways with VETs: they share their needs in terms of required skills, programs or machines used most commonly, host and train students for internships and apprenticeships.

*If applicable, which **specific processes** regulated or organised the implementation of competencies needed for Industry 4.0 in VET practice of your country and your specific sector(s)? What technical, infrastructural and personnel measures were provided and by whom to implement these changes at VET institutions?*

In the latest national repertoire, STEM skills have been enhanced, through the process of reviewing the paths explained in 3.3.1. However, no particular technical, infrastructural and personnel measures were noted.

²⁴ Repertorio Atti n. 155/CSR del 1° agosto 2019

4 Examples of good practice (GP)

This section is dedicated to the collection of specific examples from your region and/or country. We are interested in any good practice that you may already know as well as the ones you have identified in your desk research and feedback from stakeholders; with a particular focus on upper secondary education (ISCED level 3, equivalent to EQF level 3-4) programmes. These should cover projects, initiatives and programmes that were already in place, as well as those that have been instantiated despite, or precisely because of, the added pressures caused by the Covid-19 pandemic.

4.1 Revisions of existing VET programmes

How specifically (if at all) did the new labour market needs and requirements of Industry 4.0 translate into changes to existing VET programs in the last 5-7 years? Please identify existing programmes that have been revised to accommodate Industry 4.0 labour market requirements. Please copy and paste the table for additional entries.

Since 2011, the programs have been revised with the 2019 reform, which have given rise to a new repertoire of technicians and operators.

In 2011, 22 operators were identified, six of which were characterized by addresses (maximum 3 per figure) for a total of 13 “indirizzi”. In 2019, the figures of operators have become 26, 9 of which with an “indirizzo” (maximum 6 per figure) for a total of 36 “indirizzi”.

Among the reasons for the revision, there was certainly the will of

- filling the need for up-to-date or missing professional figures in the world of work. The inclusion of skills for industry 4.0 is part of this review.
- aligning the courses with the figures of the Atlas of professions²⁵,
- being able to develop a dual system and a vocational training chain
- recalibrating the skills of the various degree
- adapting the paths for the regulated professions.

However, all the figures are reviewed in terms of skills and knowledge, and a greater inclusion of the needs of industry 4.0 is clear, in particular in the following figures:

- industrial automation technician
- technician for the planning and management of plants

Name of the VET programme:	Industrial automation technician
Initiator/creator of the revised programme:	Veneto Region, Ministry of Education, Ministry of Labour and Social Policies
Which sector does the programme come from?	C- Manufacturing
What new elements have been added to this	The connotative skills have been revised and

²⁵ [Atlante e Professioni | Atlante Lavoro | INAPP](#)



<p>programme that addresses Industry 4.0 or relevant competencies?</p>	<p>adapted to the needs of industry 4.0.</p> <p>2011 – Develop the software program for command and control of the automation system via PLC.</p> <p>Skills:</p> <ul style="list-style-type: none">- Use the PLC programming language to create the command and control program for the automation system- Use simulation models to test / test the software program <p>Knowledge:</p> <ul style="list-style-type: none">- The PLC programming language- PLC programming techniques- Techniques for simulated testing of a program <p>In 2019 the competence is expanded and renamed in:</p> <p>Intervene in programming, installation and reprogramming phases of the automation software system, checking the operating parameters. (In green the added and expanded skills and knowledge)</p> <p>Skills:</p> <ul style="list-style-type: none">- Use the PLC programming and application language to create the command and control program for the automation system- Use the programming and application language for robotics to create the command and control program of the automation system- Use simulation models to test / test the software program- Carry out the wiring of automation with PLC and robotics- Program the PLC on the basis of the indications relating to the automation (P&I) and robotics process- Apply reprogramming techniques
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	<p>Knowledge:</p> <ul style="list-style-type: none"> - Language, software and programming techniques of PLCs and robots - Technical and functional characteristics of the software components of an automation system - Types, related connection interfaces and signal acquisition methods - Automation processes also with P&I diagrams <p>It is possible to notice how the competence now includes robotics, the ability to reprogram and a more varied range of knowledge that can guarantee the possibility for the technician to be able to move more effectively and efficiently in the industry 4.0.</p>
<p>What makes this initiative a GP?</p>	<p>The update of the guidelines in line with the demands of industry 4.0</p>
<p>Transfer potential of the undertaken revisions:</p>	<p>Medium-High</p>
<p>What are the results achieved by or recommendations of this programme?</p>	<p>A more updated profile for companies in the sector.</p>

4.2 New VET programmes

Which new VET programs with a particular focus on Industry 4.0 have emerged in the last 5-7 years in your country? Please copy and paste the table for additional entries.

In 2019, with the emergence of new operator and technician figures, new programs were born:

- Operator in the processing of leather goods, operator in the processing of stone materials, operator in the processing of gold and precious materials, operator of water management and environmental remediation,
- IT and telecommunications operator (replaces the electronic and telecommunications operator)

The introduction of this latest program responds particularly to the needs of industry 4.0. As for the technician figure, in 2011, 29 were established from 21. In 2011 there were no addresses to characterize them, while in 2019 21 addresses were born (maximum 6 per figure). Therefore, new figures were born, and among these, in line with industry 4.0 were born:



- Computer technician
- Modelling and digital fabrication technician
- Logistic services technician
- Renewable energy technician

Name of the VET programme:	T and telecommunications operator / IT technician
Initiator/creator of the new programme:	Veneto Region, Ministry of Education, Ministry of Labour and Social Policies
Which sector does the programme come from?	J - Information and communication
How does it address Industry 4.0 or relevant competencies?	The technical-professional skills of the operator/technician, in compliance with the reference standards, will allow the use of the title acquired in industry 4.0 and in those sectors that seek to digitize different processes.
What makes this programme a GP?	This program is a good practice as it responds to the demand of employees in the IT sector while guaranteeing future operators to enter other sectors as well: communication and media, support to companies in data management and digitization processes.
Transfer potential of the GP:	Insertion of new training courses when market forecasts foresee the need
What are the results achieved by or recommendations of this programme?	The first operators with the new profile will receive the qualification in this 2021/2022 school year
Link (website, where to find more information):	IeFP – Ufficio Scolastico Regionale per il Veneto (istruzioneveneto.gov.it)
Additional information:	The requirements are defined at the regional level and are respected by the training centers at the territorial level, which adapt the courses to the territorial reality.

4.3 Other Projects / Initiatives

What projects or initiatives have taken place in the country aimed at the VET sector at the national, regional and/or sectoral level, which for example:

- identify competencies relevant to Industry 4.0 (perhaps with a focus on a particular sector),
- analyse new labour market requirements with regard to Industry 4.0,

- provide instructions on how to implement Industry 4.0 relevant competencies in VET teaching.

Which GP (projects, initiatives or similar) are you perhaps already aware of or have you identified in your desk research and exchange with stakeholders? Please copy and paste the table for additional entries.

Name of the GP:	“Teacher agenda”
Initiator/creator of the GP:	ENAIP (Training centre)
Which sector does the GP come from?	Not a specific sector
Which general topics or topic areas does this good practice cover?	Working groups are organized in order to produce “the teacher agenda”, a document that is used as a guideline by all trainers who in turn can informally make changes based on the territory and their teaching style. Every year, the agenda is reviewed by groups of teachers in a sector on the basis of the experiences and information collected during the year in local companies and classrooms. By communicating with course designers, teachers support a different formulation of the courses. According to that, training courses for the teachers can be organized as needed.
What makes this initiative a GP?	It is a way of monitoring VET at the level of the training centres.
How does it address Industry 4.0 or relevant competences?	The teachers recognize the market trends and the skills required by the world of work. In the teacher agenda, everything that is considered valid for the best success of the courses is collected.
Transfer potential of the GP:	High, it is needed the willingness of teachers to cooperate
What are the results achieved by or recommendations of this GP?	Collection of teachers' needs, updating of paths based on the needs registered by teachers in the labour market.

Name of the GP:	Operative Manual
Initiator/creator of the GP:	Veneto Region
Which sector does the GP come from?	Not a specific one
Which general topics or topic areas does this good practice cover?	All skills and qualifications are translated in a more “practical” version, to facilitate companies in their understanding. The manual is not only



	useful to facilitate the entry of VET students into the world of work, but also to make the training experience in the company more effective.
What makes this initiative a GP?	It facilitates communication between the world of work and the world of education
How does it address Industry 4.0 or relevant competences?	It facilitates the understanding and potential of the skills acquired in VET in industry 4.0. It allows a more effective development of these skills in in-company training.
Transfer potential of the GP:	High. Especially useful for those contexts with different small / medium enterprises
What are the results achieved by or recommendations of this GP?	A greater understanding of qualifications by companies, greater training effectiveness in the company.



5 Conclusion

You can use this chapter to reflect on some of the insights you have gained in the description process. These could give you an overview of the way Industry 4.0 requirements are implemented in your country's VET system and can support the development of recommendations that could improve transfer and implementation processes.

Regarding the effectiveness of the conditions and processes described, what works really well (e.g. cooperation between actors) and why?

Despite the innovations introduced a few years ago and the ongoing discussion on the different responsibilities of the processes, it can be said the individual players involved are very well motivated to offer a service in line with the market requirements. The training centres are very motivated to create solid local networks to guarantee training for their students and create experiments and new projects to innovate "bottom-up" training courses. Other stakeholders external to the VET centres, underline the many opportunities for cooperation, innovation and experimentation on the regional territory.

A strong value base and the motivation of individuals are therefore able to guarantee diversity between the different territories, in line with the local needs and the national and regional standards.

Regarding the effectiveness of the conditions and processes described, what do you think could be improved and how?

The monitoring structure is not yet well established and under discussion and, at the interinstitutional level, it is difficult to mediate among the different actors. This difficulty is closely linked to the territorial nature of the VET, which from the stakeholders is considered an important plus, that guarantees the employability of people and the satisfaction of the local labour market needs.

The perception of the VET should be improved: all the stakeholders interviewed, with different roles and working on different levels, emphasize how VET is poorly considered and characterized by many negative stereotypes. It may be useful to try to promote the paths more effectively.

The regional nature of the courses leaves VET excluded from national educational development initiatives in many cases. Greater communication should take place to ensure the visibility of VET.

Did you come across any aspects that are not sufficiently taken into consideration when changes in the VET sector are implemented (see 3.3.1)?



It could be effective to maintain contact with former students to understand the difficulties they have found in the world of work or in their education once their training path is complete.

According to some stakeholders, the regional nature of VET should be empathized and the changes for innovation should start from the local instead of the national level. Discussion considering other directions of development could be taken into consideration still guaranteeing and equal innovation throughout the country.

Which existing changes have you identified and how difficult was their implementation (see 3.3.1)?

A review of the Repertoire²⁶, and therefore the skills and qualifications were implemented in 2019. Their implementation was well received by the VETs, but the results of this change will only be seen at the end of the 2021/2022 school year.

The monitoring model, the roles, and responsibilities of the various actors involved are being discussed: this aspect requires a lot of time and negotiation between the various and numerous actors involved.

²⁶ Repertorio Atti n. 155/CSR del 1° agosto 2019



Matrix of references to the Country report Veneto Region

The following table contains a brief description of the key factors (ie councils, processes, actors, etc., if they exist) at national, regional, local and sector level, which ensure the identification of the changing technological requirements of the labour market (Industry 4.0) and their transfer to vocational training and preparations.

Level:	Brief description	Note
<p>National:</p>	<p>(Description) At national level, what key factors: (i.e. councils, processes, actors, etc., if any)</p> <p>On a national level, the following actors are involved:</p> <p>The Ministry of Labour and Social Policies, the Ministry of Education, the Ministry of University and research are involved on a strategical point of view together with the Regions and the autonomous Provinces on a Regional level.</p> <p>Operational implementation of new standards is in the hands of Anpal Punto di Coordinamento Nazionale EQF, as well as the monitoring, evaluation, and updating of the standards.</p> <p>The new proposals are made considering the works of ISTAT (National Institute of Statistics) and Unioncamere and INAPP (Atlante del Lavoro)</p> <p>Quality guarantee and the independent evaluation of the new standards’ proposals have been carried by INAPP Istituto Nazionale Analisi delle Politiche Pubbliche.</p> <p>Conferenza Stato-Regioni is where the main discussion about processes and new laws have been discussed.</p>	<p>Sections: 2.1 3.1 3.2 3.3 3.4</p>
<p>Regional</p>	<p>(Description) At district/regional level, what key factors: (i.e. councils, processes, actors, etc., if any)</p> <p>On a regional level, the following actors are involved:</p> <p>Regions and the autonomous Province are involved in the strategical definition together with the Ministry of Labour and Social Policies, the Ministry of Education, the Ministry of University and Research on a national level.</p> <p>Regions defined standards and courses from a qualitative and quantitative point of view, thanks to statistics on the regional market (Veneto Lavoro).</p>	<p>Section: 2.1 2.2 3.1 3.2 3.4</p>



Local	<p>(Description) At local what key factors: (i.e. councils, processes, actors, etc., if any)</p> <p>Schools and companies have a main role in the innovation processes. The labour market innovates naturally and students can have experience of that, moreover companies interested in hiring new work force are interested in cooperating with schools. Some difficulties in this kind of cooperation have been highlighted, but, overall, on a local level stakeholders cooperate more smoothly than actors on a higher level.</p> <p>The province is and interlocutor between the need of the above-mentioned local actors and the regional actors.</p>	<p>Sections: 2.2 3.1 3.3 3.4</p>
Sectoral	<p>(Description) At specific sector levels, what key factors: (i.e. councils, processes, actors, etc., if any)</p> <p>Trade associations and trade unions can have a role on a local level together with the schools in the innovative application of regional standards.</p>	<p>Sections: 2.2</p>



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