

# 01 Research Study: Italy

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## 1. Vocational Education and Training (VET) in Italy

VET in Italy is defined as the *Istruzione e Formazione Professionale (IeFP)* system, which exactly translates to Vocational Education and Training. Italy represents a very complex case study for VET, due to the fragmentation of its educational system. Regions as well as autonomous provinces are in charge of VET programmes and most apprenticeship-type schemes. In particular, since the reform of Title V of the Italian Constitution (Constitutional Law 1/2001), which decentralised responsibilities and services for education, regions have been highly heterogeneous in the definition of VET careers, therefore generating a high level of complexity in terms of regional-specific requirements (such as degrees, certifications, etc.).

Attempts to make the VET market more uniform and structured throughout the country have started in 2003, when the Law 53/2003 (also known as 'Riforma Moratti') established a '*government mandate for the definition of the general norms regarding education and the essential performance levels in relation to vocational education and training*'. One of the main elements of Law 53/2003 has been to institutionalise a reform that would include VET pathways into the education system. Previous to this mandate, VET was not part of the national education system and was delivered through specific centres accredited for that purpose.

In Italy, students follow the same school path up to the age of 14 years old, going through elementary school (6 to 10 years old) and middle school (11 to 13 years old). Upon reaching the age of 14, students have to choose between different types of high school degrees, which are mostly defined by a stronger focus on humanities or on stem. Since the introduction of the reform brought about by the Law 53/2003, 14 years old students have now also the option to choose between a wider variety of choices in relation to VET (or, in some cases, the opportunity to switch between the two systems at given points of their schooling).

Several actions towards the definition of VET careers as well as better uniformization between regions have been implemented since the "Riforma Moratti".

In 2012, a labour market reform was implemented (Law of June 28th 2012, No 92). It included the promotion of lifelong learning activities as well as a first attempt of creating an institutional system of validation and certification of competences acquired in lifelong learning.

In 2013, Istat published the Official Classification of Professions (CP2011), based on recommendations from the European Commission, which classifies professions into 9 wide groups, and several sublevels of specialization and skills required (Istat, 2013).

A national repertory of education and training qualifications and professional qualifications was created on 16 January 2013 (art. 8 of Legislative Decree 13/2013). This has been a first concrete attempt of providing homogeneous qualifications and skills description systems through the country, linking to methods and descriptions of qualifications used in education and VET systems in order to favour standardization. The most up to date list of “professioni regolamentate” (regulated professions, meaning professions which require specific qualifications and skills for individuals to be entitled to perform them) is currently published on the official page of the Italian government: [http://www.politicheuropee.gov.it/media/3959/professioni-regolamentate-sito\\_180423.pdf](http://www.politicheuropee.gov.it/media/3959/professioni-regolamentate-sito_180423.pdf)

A new national qualifications framework (NQF) was adopted in January 2018. The aim of the NQF is to establish a way for integrating the existing different qualifications systems. This framework is supposed to give a positive impact on comparability of qualifications (nationally and regionally), legibility, transparency as well as promote professional mobility within Italy and Europe. The NQF is composed of eight levels and its level descriptors are knowledge, skills, autonomy and responsibility.

## 2. VET careers and strategic priorities

According to one of the most recent publications from Cedefop (Cedefop, 2018) concerning VET in Italy, the current scenario is described as follows:

*Regional VET is composed of three main segments (all of them available via apprenticeships as well as the school-based route):*

- *three and four year (3+1) programmes;*
- *post-secondary higher technical specialisation programmes; and*
- *post-secondary higher technical programmes.*

*Today the regional system covers a modest number of participants (both in absolute and in relative terms, compared with upper secondary national vocational programmes and national technical programmes), and it is strongly concentrated geographically. In comparison with other European countries, common factors that could affect the role of the system (such as demographic and macroeconomic challenges) seem to play a minor role. The major challenge faced is technological change, given that skills mismatch remains widespread in Italy. The VET system continues to focus on providing skills for the manufacturing sector (characterised by low to medium skilled workers) and SMEs, normally characterised by low R&D investment and a non-strategic approach towards innovation. For these reasons, internal factors such as the division of competences in the VET system at the regional and national levels remain amongst the most relevant in shaping it. The La Buona Scuola reform (2015), although largely focused on upper secondary education, also gave regional initial VET the capacity to invest in strengthening the cooperation with companies; which is potentially the most important way to address its challenges.*

More in details, according to information provided in the same report, there are currently mainly two types of VET education paths in Italy:

- IeFP programmes (*Percorsi triennali e quadriennali di istruzione e formazione professionale*) last three or four years under the remit of the Regions and Autonomous Provinces, as a consequence of the latest reforms in 2011. They are characterised by national level standards concerning basic, as well as technical and vocational skills for both, Certificate (three years) and Diploma (one additional year), and for granting nationally valid final certifications. They are targeted at learners aged 14-17 years, and 17-18 years respectively;

and

- post-secondary higher technical training, i.e. IFTS (acronym for *Istruzione e Formazione Tecnica Superiore* - High Technical Specialisation programmes) and ITS (*Istituti Tecnici Superiori* - Higher Technical Institutes which deliver higher training programmes). These programmes are organised by Regions and Autonomous Provinces in cooperation with the Ministry of Education following territorial plans updated every three years. They were last reformed in 2008, and award a higher technical specialisation certificate and a higher technical education diploma respectively. They target people from 18 years onwards.

Some interesting data are also provided concerning the current situation of National VET in Italy (2015). In particular, it is interesting to notice that:

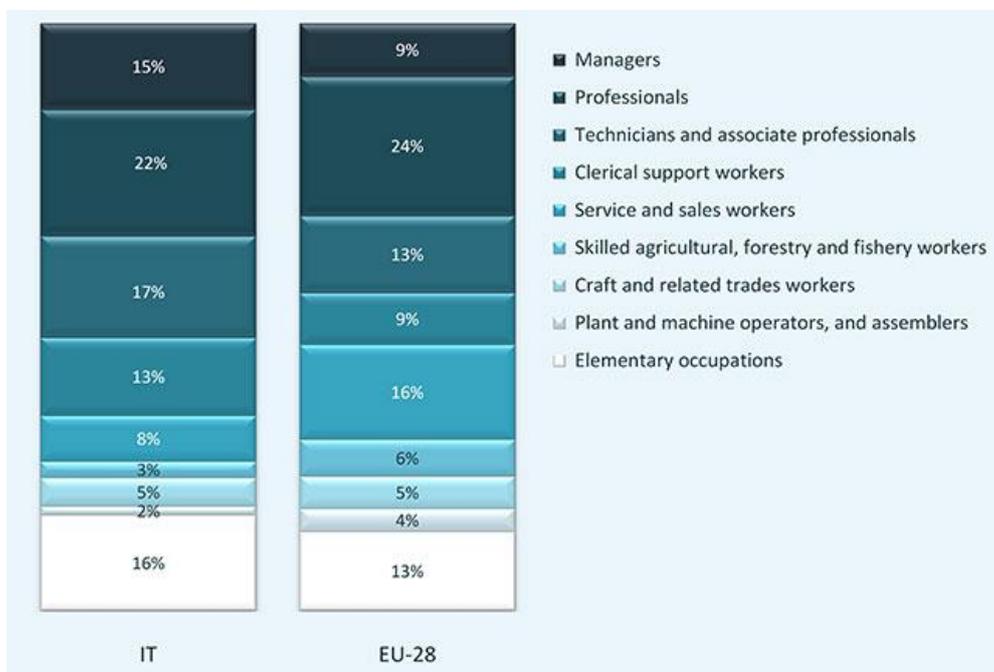
- More than half of young people (15-24 years old) are enrolled in higher education in Italy.
- 55.8% of upper secondary students are enrolled in vocational programmes.
- In vocational training nearly half of the students are one year late in their training, an indication that academic 'weaker' students choose vocational training.
- 64.1% of 20 to 34 years-old graduates from upper vocational secondary and post-secondary non-tertiary education are employed.
- Over-education seems to be structural and a relevant share of individuals is mismatched even after many years in employment

Finally, when looking at national strategies, Italy's official priorities linked to VET for the timeframe 2016-20 are:

- integrate training and employment of young people within a dual system by reinforcing those apprenticeships linked with the education and training system, and particularly within initial vocational education and training (IVET) pathways;
- reinforce apprenticeship for higher training/education and research;
- introduce elements of flexibility to simplify the actual legislation and boost the attractiveness of apprenticeship among enterprises;
- set up a specific pedagogical methodology aimed at reinforcing the schoolwork alternance.

According to data published in 2015 (Cedefop 2015), between now and the year 2025 in Italy most job opportunities (22%) will be for professionals (meaning high level occupations in science, engineering, healthcare, business and teaching), followed by around 17% for technicians and associate professionals (occupations applying for

scientific or artistic concepts, operational methods and regulations in engineering, healthcare, business and the public sector), as shown in the figure below:



Distribution of total job opportunities by occupation, 2013-2025, Italy and the EU (%).  
Source: Cedefop skills forecast (2015)

## STEAM AND VET

STEAM and VET are treated as two separate fields in Italy. While there are studies available on students' choices regarding STEM studies and careers (most of which involve a university level degree, as shown in the following chapter), there is no information available on how much STEM subjects are studied within VET qualifications. Most of the reflections around VET careers in Italy focus on the importance of linking this type of studies to apprenticeships and to concrete needs of the job market.

### 3. STEM subjects' uptake and current policies for the promotion of STEAM careers

Data concerning STEM careers in Italy are mostly provided by Doxa, a private company specialized in marketing, statistical analysis and opinion polls, as well as Istat (the Italian National Institute of Statistics) and Eurostat. Statistical data available focuses mostly on the lack of women in STEM careers.

According to one of the most recent studies published (Istat, 2017), despite Italy having a rather low gap between women and men achieving technical and scientific university degrees, only very few women work in STEM careers: 31,71% of women opposite to 68,29% of men, meaning that there are 2,15 male scientists/engineers for every female scientist/engineer employed. According to the study, the main reasons for this are gender inequalities within families and a very unbalanced distribution of household tasks between men and women.

According to the same study, in 2015 only 13,5 per thousand 20-29 years old inhabitants had a bachelor's degree in STEM-related fields, placing Italy in one of the lowest positions within Europe. The percentage has raised to 18 per thousand in 2017.

Lots of concerns have recently been raised by a study titled "Osservatorio delle competenze digitali 2018", carried out by Aica, Anitec-Assinform, Assintel and Assinter Italia, in collaboration with MIUR and AGID. According to the study, 88,000 job opportunities will become available in Italy between 2018 and 2020 within the field of ICT (Information and Communication Technology). The demand for digital skills is raising also within the service sector, while profiles such as cyber security officer, big data specialist and service development manager and more and more sought for: job offers for ICT developers have raised of 19% over the past year. Despite those encouraging numbers, the gap between demand and offer remains very high. While in 2018 Italian companies will be looking for between 12,800 and 20,500 ICT experts with a university degree, only 8,500 will complete their university studies in ICT in the same year. The situation is quite different regarding entry level high school diploma jobs, where the offer will be of 16,000 new candidates, while job offers will only sum up to 12,600. According to the researchers, the main problem mainly lies within universities, and the 4 key strategies suggested to face the situation mostly focus on making ICT university degrees more modern, up to date and attractive to students. It is also suggested to strengthen the relationships between universities and companies who will need to employ ICT graduates, in order to better address their needs.

469,000 new jobs will be available in Italy in the upcoming five years in the STEM field. If nothing changes, a big percentage of these positions will not be filled by Italian graduates: 33% of professionals sought for by Italian companies is already missing nowadays. A part for ICT and the pharmaceutical field, some of the most required professions in the upcoming years will be industrial engineers, mechanics, assemblers, repairers, manufacturers, electrical engineering and technicians, as well as leather and shoes specialists. Only one out of four students choose scientific and technical disciplines for his/her university degree; within OCSE, Italy is one of the countries with the highest number of graduates in humanities and social sciences.

It is interesting to notice how, according to a study by McKinsey (McKinsey, 2014), in Italy only 29% of students choose their university degree based on career opportunities and documented information on employment statistics. According to the study, this is one of the main reasons for Italy's youth unemployment. McKinsey underlines the need for better information being provided to students about job opportunities, focusing mostly on how STEM disciplines, and in particular ICT, engineering and business, will be the most valuable for finding a job.

The study "Universum Most Attractive Employers Italy 2018", published in October 2018 by Universum Global (Universum Global, 2018), also provides some interesting data concerning Italian young students' future dream jobs. According to outcomes of interviews with 40 thousand university students from 44 Italian universities, as well as 11,400 professionals, the top two companies where they dream to work one day are Google and Apple. Most of students attending business schools would like to find a job at Ferrero. Students in STEM dream about landing a job at Ferrari, in Italy, or at Google, Amazon and Microsoft in Italy or abroad.

### The Lombardy Region

The Lombardy Region has published in 2017 a research study titled "Donne STEAM: evoluzione e scenari in Lombardia" (Doxa, 2017), carried out by Centro Studi di Assolombarda and the Istituto per la Ricerca Sociale. According to the study, only 30% of all students following STEM subjects and courses (at high school and university level) within the Lombardy region are women. Women with a bachelor's degree in STEAM perform better than men and achieve higher grades. Nevertheless, they face more difficulties in finding a job within the field and they are less present in the labour market. According to the researchers, the main reasons for this are to be found in cultural elements, as well as job insecurity and precarious employment, which oblige women to choose between career or family.

Limited action has been taken by local authorities to overcome this situation. In 2017 Assolombarda has launched the campaign “*STEAMiamoci*”, providing 10 scholarships to outstanding women scholars to attend a bachelor’s degree in informatics at Bicocca University Milan (only 10% of all students in this bachelor’s degree are women). The city of Milan has also launched the campaign “*STEM in the City*”, in spring 2018, organizing several events aimed at promoting STEM careers in general, and motivating girls in particular.

## 4. Italy-specific VET careers suggested for the RAISE app

A list of official trainings as well as 176 official professional qualifications is available on the “Atlante del Lavoro e delle Qualificazioni” website ([http://atlantelavoro.inapp.org/atlante\\_repertori.php](http://atlantelavoro.inapp.org/atlante_repertori.php)). We have been exploring this list and we provide below two suggested VET careers to focus on for each of the STEAM acronyms.

When choosing these careers, the most difficult element has been to link official professions with jobs which are accessible through VET. As explained above, VET in Italy takes a different path than the “general education system”. This means that all bachelor and university degrees in general are not considered VET in Italy. Nevertheless, data shows that most of future job opportunities will be available for citizens with a higher level of education, which is often not achievable through VET. For example, only completion of the 5 years long Technical and vocational school programmes (which are programmes combining VET and general education) allows students to access higher levels of education, such as Bachelors, Masters and PhDs. An easily understandable summary of all these different paths is provided on the Cedefop website, within the latest “Spotlight on VET in Italy” short report ([http://www.cedefop.europa.eu/files/8123\\_en.pdf](http://www.cedefop.europa.eu/files/8123_en.pdf)). It has also been quite difficult to define which of the 176 official professions are accessible through VET (and which specific type of training is required), as very little information was provided on the Atlante Lavoro platform.

Therefore, based on data provided so far, we consider that in the case of Italy it is important to focus on technology (ICT), medicine and engineering when promoting STEM and VET careers. In the case of ICT, and informatics in particular, special attention should be paid to empowering women to pursue this type of career.

All professions described below can be achieved through VET (such as, for example, the 5 years long Technical and vocational high school programmes), although it is important to mention that since VET limits so much the educational level achievable, only very few of these professions allow to access further training through the “general education system” (i.e. university degrees) in case individuals might want to continue with their studies.

### SCIENCE

#### 1. Operatore delle calzature

[http://atlantelavoro.inapp.org/dettaglio\\_profilo.php?id\\_profilo=12096](http://atlantelavoro.inapp.org/dettaglio_profilo.php?id_profilo=12096)

Livello: EQF 3

Settore: Tessile, abbigliamento, calzaturiero e sistema moda

Repertorio: Istruzione e Formazione Professionale triennale – IeFP Triennale

This profession does not have a specific translation into English, and it was not possible to find a comparable profession within the EU Single Market Regulated Professions Database. Professionals achieving this degree will be experts in footwear, with a specific focus on leather shoes. They will be able to conceive and produce specifically tailored footwear, and all its components. This profession can be achieved through a regional, 3-years long secondary training course (14 to 18 years old).

## **2. Tecniche di monitoraggio e gestione del territorio e dell'ambiente**

[http://atlantelavoro.inapp.org/dettaglio\\_profilo.php?id\\_profilo=12135](http://atlantelavoro.inapp.org/dettaglio_profilo.php?id_profilo=12135)

Livello: EQF 4

Settore: Servizi di public utilities

Repertorio: Istruzione e formazione Tecnica Superiore – IFTS

This profession does not have a specific translation into English. Within the EU Single Market Regulated Professions Database, the profession which seems to correspond the most is “[Environmental health officer](#)”. Technicians within this field will have a general knowledge of environmental issues and will be capable of contributing to the management of sewage and waste management systems. The safety and protection of the local territory, and all related issues, are his/her main competences. This profession can be achieved through a national, 1 yearlong post-secondary training course (19+).

## **TECHNOLOGY**

### **1. Tecniche per la progettazione e lo sviluppo di applicazioni informatiche**

[http://atlantelavoro.inapp.org/dettaglio\\_profilo.php?id\\_profilo=12140](http://atlantelavoro.inapp.org/dettaglio_profilo.php?id_profilo=12140)

Livello: EQF 4

Settore: Servizi di informatica

Repertorio: Istruzione e formazione Tecnica Superiore – IFTS

This profession does not have a specific translation into English, and it was not possible to find a comparable profession within the EU Single Market Regulated Professions Database. Professionals achieving this degree will be software application developers and will also learn how to perform team work to achieve outcomes through design

methods. This profession can be achieved through a national, 1 yearlong post-secondary training course (19+).

## **2. Tecnico superiore per le architetture e le infrastrutture per i sistemi di comunicazione**

[http://atlantelavoro.inapp.org/dettaglio\\_profilo.php?id\\_profilo=12100](http://atlantelavoro.inapp.org/dettaglio_profilo.php?id_profilo=12100)

Livello EQF 5

Settore: Servizi di informatica

Repertorio: Istruzione Tecnica Superiore - ITS

This profession does not have a specific translation into English. Within the EU Single Market Regulated Professions Database, the profession which seems to correspond the most is “[Telecommunications infrastructure planner](#)”. Technicians within this field will have a background in ICT and will be capable of developing communication systems and applications which respond to territorial and industrial needs. They will also be knowledgeable of specific norms within the field. This profession can be achieved through a national, 2-3 years long post-secondary training course (19+).

## **ENGINEERING**

### **1. Tecnico per l'automazione industriale**

[http://atlantelavoro.inapp.org/dettaglio\\_profilo.php?id\\_profilo=12067](http://atlantelavoro.inapp.org/dettaglio_profilo.php?id_profilo=12067)

Livello: EQF 4

Settore: Meccanica, produzione e manutenzione di macchine, impiantistica

Repertorio: Istruzione e Formazione Professionale quadriennale – IeFP quadriennale

Perito industriale in costruzioni ambiente e territorio.

This profession does not have a specific translation into English. Within the EU Single Market Regulated Professions Database, the profession which seems to correspond the most is “[Chartered technician](#)”. In this specific case it refers mostly to technicians specialised in industrial automation, who can provide advice on safety, technical specificities of industrial machineries, and monitoring of industrial automation processes. This profession can be achieved through a regional, 4-years long secondary training course (14 to 18 years old).

### **2. Tecnico superiore per il controllo, la valorizzazione e il marketing delle produzioni agrarie, agro-alimentari e agro-industriali**

[http://atlantelavoro.inapp.org/dettaglio\\_profilo.php?id\\_profilo=12118](http://atlantelavoro.inapp.org/dettaglio_profilo.php?id_profilo=12118)

Livello EQF 5

Settore: Produzioni alimentari

Repertorio: Istruzione Tecnica Superiore – ITS

Within the EU Single Market Regulated Professions Database, the profession which seems to correspond the most is “[Agricultural expert/technician](#)”. Professionals within this field will be capable of providing technical solutions to ameliorate products’ life cycle, in particular within the field of food production, as well as to favour production processes within the agri-food sector which are eco-compatible and sustainable. They will also have knowledge of national and European regulations within the field. This profession can be achieved through a national, 2-3 years long post-secondary training course (19+).

## ARTS

### 1. Tecnico superiore per la produzione/riproduzione di artefatti artistici

[http://atlantelavoro.inapp.org/dettaglio\\_profilo.php?id\\_profilo=12117](http://atlantelavoro.inapp.org/dettaglio_profilo.php?id_profilo=12117)

Livello: EQF 5

Settore: Area comune

Repertorio: Istruzione Tecnica Superiore - ITS

This profession does not have a specific translation into English, and it was not possible to find a comparable profession within the EU Single Market Regulated Professions Database. Professionals achieving this degree will have technical skills focused on the production and reproduction of artefacts. They will have competences in history, design, environmental issues, planning and cultural aspects. This profession can be achieved through a national, 2-3 years long post-secondary training course (19+).

### 2. Tecniche di allestimento scenico

[http://atlantelavoro.inapp.org/dettaglio\\_profilo.php?id\\_profilo=12128](http://atlantelavoro.inapp.org/dettaglio_profilo.php?id_profilo=12128)

Livello: EQF 4

Settore: Servizi culturali e di spettacolo

Repertorio: Istruzione e formazione Tecnica Superiore – IFTS

This profession does not have a specific translation into English, and it was not possible to find a comparable profession within the EU Single Market Regulated Professions Database. Technicians specialised in the construction of sceneries will have skills in planning, construction, safety, materials, theatrical staging, as well as team work. This

profession can be achieved through a national, 1 yearlong post-secondary training course (19+).

## MATHEMATICS

### 1. Tecnico superiore per la produzione di apparecchi e dispositivi diagnostici, terapeutici e riabilitativi

[http://atlantelavoro.inapp.org/dettaglio\\_profilo.php?id\\_profilo=12107](http://atlantelavoro.inapp.org/dettaglio_profilo.php?id_profilo=12107)

Livello: EQF 5

Settore: Servizi socio-sanitari

Repertorio: Istruzione Tecnica Superiore – ITS

Within the EU Single Market Regulated Professions Database, the profession which seems to correspond the most is “[Manufacture of medico-surgical instruments and equipment and orthopaedic appliances](#)”. Professionals within this field are knowledgeable of health, environmental and safety norms required for medico-surgical instruments, as well as patenting processes, technical documentation and will be able to contribute to research and treatment processes. This profession can be achieved through a national, 2-3 years long post-secondary level training course (19+).

### 2. Operatore delle produzioni chimiche

[http://atlantelavoro.inapp.org/dettaglio\\_profilo.php?id\\_profilo=12095](http://atlantelavoro.inapp.org/dettaglio_profilo.php?id_profilo=12095)

Livello: EQF 3

Settore :Chimica

Repertorio: Istruzione e Formazione Professionale triennale – IeFP triennale

Within the EU Single Market Regulated Professions Database, the profession which seems to correspond the most is “[Chemical laboratory technician / Chemical laboratory work](#)”. Operators of chemical productions will have competences in basic chemistry and will be particularly focused on either chemical processes of fuel production / drugs development / dangerous chemical materials. This profession can be achieved through a regional, 3 years long secondary training course (14 to 18 years old).

ONE ADDITIONAL INTERESTING VET PROFESSION:

### **Tecnico grafico**

[http://atlantelavoro.inapp.org/dettaglio\\_profilo.php?id\\_profilo=12071](http://atlantelavoro.inapp.org/dettaglio_profilo.php?id_profilo=12071)

Livello: EQF 4

Settore: Stampa ed editoria

Repertorio: Istruzione e Formazione Professionale quadriennale – IeFP quadriennale

Within the EU Single Market Regulated Professions Database, the profession which seems to correspond the most is "[Graphic Designer](#)". Technicians in this field will learn how to use specific software for graphic design, how to interact with clients, and develop design project for different types of communication channels. This profession can be achieved through a regional, 4 years long secondary training course (14 to 18 years old).

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