2 The Regional Training Catalogue and its supply of training: A descriptive analysis

This chapter offers an overview of the courses provided in the Regional Training Catalogue (RTC) by the Umbrian regional agency for active labour policies (ARPAL). The analysis shows for which occupations training is available, and the corresponding number of training hours. Furthermore, leveraging Natural Language Processing (NLP) techniques, the chapter utilises algorithms and computational models to process and analyse the content of the courses described in the RTC in order to identify the skills that are provided in the training options available therein. Additionally, the chapter presents information on the cost, duration and class-sizes for the courses listed in the RTC, also highlighting the differences between the provinces of Perugia and Terni.

Highlights

- The Umbrian regional agency for active labour policies (ARPAL) provides training and education programs in the Regional Training Catalogue (RTC) to assist job seekers in the region. The RTC offers training for 81 different ISCO (International Standard Classification of Occupations) four-digit level occupations across low, medium, and high-skill levels and the programmes have varying time commitments and costs and cover a range of different topics, including technical and soft skills.
- Despite the RTC only targeting 11 low-skill occupations, 33.3% of all training hours are for low-skill jobs. The largest number of training hours is allocated to beauticians and related workers, followed by hairdressers and cooks. Training options targeting low-skilled occupations often have a longer duration than the other two skill-levels, which contributes to this result.
- The RTC focuses strongly on some medium-skilled occupations. Training courses for motor vehicle mechanics and repairers accounts for 13.8% of all medium-skill training hours and has by far the largest number of training courses that are currently offered (72 courses) across the whole RTC.
- When looking at high-skilled occupations, the RTC focuses intensely on training for ICT user support technicians, advertising and marketing professionals and web technicians, signalling that focus has been put on developing training opportunities for individual to train for digital occupations.
- Training cost is typically linked to the course duration. Among the most expensive courses are those for software developers (EUR 4 500), tailors, dressmakers, furriers and hatters (EUR 5 937), and beauticians and related workers (EUR 4 828). More inexpensive training courses are often shorter and are typically related to health and safety in the workplace (42%) or are refresher/update courses (38%).
- A large part of RTC training modules are aimed at developing skills potentially useful in a wide variety of job contexts such as “knowledge of contractual aspects in self-employed work”, and “evaluating the quality of service provision”. Results also show that five digital skills are among the most typically taught in the RTC but the share of individuals that could enroll in courses that explicitly teach these skills remains limited, as this ranges from 2.5% to 1.9% of the total available training spots.

The Umbrian regional agency for active labour policies (ARPAL) offers a range of training and education programmes to help people in the region find jobs in the Regional Training Catalogue[1] (RTC). These programmes cover various topics, from technical skills to soft skills, and have different time commitments and costs associated with them. A large part of the programmes is designed to prepare participants for specific occupations, and therefore, help them acquire the necessary skills and knowledge to enter or advance in the labour market.

It is worth noting that such training and education programmes are essential for supporting the development of a skilled workforce, which is a key driver of economic growth and social well-being. In many cases, individuals who lack the necessary skills to perform certain jobs are at a disadvantage when it comes to accessing employment opportunities. Through training programmes, these individuals can acquire the skills and knowledge they need to compete in the job market.

Moreover, the availability of training and education programmes is essential for employers too, as it helps them to find qualified candidates to fill their vacancies. By investing in the skill development of their employees, companies can also improve productivity and competitiveness, which ultimately contributes to the growth of the economy.

Table 2.1 shows the type of information that is available about each training in the catalogue, and specifically which variables are used for the analysis in this chapter and in Chapter 3.

Table 2.1. Information in the RTC

Number	Variable name in Italian	Description	Number of observations/Missing values
1	ID Progetto	Unique identifier of the education course	1.649 unique IDs
2	Titolo Progetto	Title of the education course	Missing for 0% of training courses
3	Denominazione UFC	The "Learning Unit of Competence." The variable contains a very short and general description of what is taught in each part of the course.	Missing for 0% of training courses
4	Denominazione UC	Competence Unit. This variable contains more detailed descriptions of what is taught in each part of the course.	Missing for 19% of training courses
5	ISTAT Profilo	ISTAT profile related to the education course.	Missing for 36% of training courses
6	Numero max Destinatari	The maximum number of students that can attend the course	Missing for 7% of training courses
7	Costo	Cost per participant for the entire course	Missing for 7% of training courses
8	Durata UFC	Duration of each entire course	Missing for 0% of training courses
9	Sede provincial sigla	Whether the training is offered in the region Perugia (PG) or Terni (TR)	Missing for 0% of training courses

Source: OECD calculations based on information provided by ARPAL Umbria.

Three of these variables will be explained in further detail, to show how they are used, and what kind of information can be learned from them: ISTAT Profilo, Learning Unit of Competence, and Competence Unit.

Each training programme targets a specific profession, classified using the ISTAT (2021[1]) occupational taxonomy. ISTAT created the *classifcazione delle professioni CP2021* specifically for the Italian labour market, and the classification therefore does not correspond one-to-one to the ISCO classification that was used in Chapter 1. However, (Giabelli et al., 2022[2]) have provided a framework on how to properly align the ISTAT classification with the ESCO/ISCO occupation taxonomy. Their mapping has been used in this report.

It is important to note that the majority of training programmes in the RTC is assigned to a specific ISTAT profile which represents the occupation of reference for which the content of the training has been developed. The association of each course to a 'destination' occupation is done to support beneficiaries in their decisions relative to what course to follow and for the PES, to track the skill area related to the training programmes from a statistical point of view.

It is also worth noting that the content of a course can be valuable for multiple job roles, even if it is only associated with one specific ISTAT occupation profile. For example, a course aimed at project managers can be classified into the ISTAT code 3.3.1.1.1 for "segretari amministrativi e tecnici degli affari generali" (administrative and technical secretaries of general affairs), but the content of this course could be valuable for project managers in both the public and private sectors. The fact that courses are classified in only one ISTAT occupation profile can affect some of the statistics in this chapter. For instance, the statistics on the training offer at the occupation level may be biased downwards as each course, despite being potentially useful for multiple occupations, is only associated with one ISTAT profile in the database of the RTC.[2]

All ISTAT codes have been mapped onto ISCO four digit level occupations for the purpose of the analysis in this chapter and consistency with the rest of the report that uses ISCO as the primary occupational taxonomy. This mapping, however, results in some loss of granularity in cases. For example, training courses for the ISTAT-occupations of coach builders (Carrozzieri), tyre fitters (Gommisti) and motor mechanics and motor vehicule repairers (Meccanici motoristi e riparatori di veicoli a motore) are all captured under the same ISCO four-digit occupation of motor vehicle mechanics and repairers, while the separate Italian ISTAT profiles show more nuance.

It is also interesting to notice that a large share of courses (36%) does not report targeting any specific occupation. One of the reasons behind this result is that most of those training opportunities are actually generic courses, which are for example related to health and safety in the workplace (see Box 2.1). These types of training can be followed by people in many different roles.

Box 2.1. The training offer for safety in the workplace: The Italian case

Italian employers have a legal obligation to ensure the safety of their employees. This obligation takes the form of for example mandatory surveillance of their employees' health, performing written risk assessments, making arrangements for first-aid care. Furthermore, employers are responsible for providing their employees with training and information on risks and health and safety (ILO, 2015[3]).

The emphasis on workplace safety in Italy has led to a widespread prevalence of related training programmes. For instance, 26% of funds from the Interprofessional Fund (Fondi Interprofessionali) are devoted to training in this field. Moreover, the largest interprofessional fund, Fondimpresa, shows that 49.4% of the instances where a worker was enrolled in a training program, it was focused on workplace safety (OECD, 2017[4]).

Examples of topics that are covered in RTC courses on health and safety that target low risk companies are: the concepts of risk, damage, prevention, and protection, and the rights, duties, and sanctions for different corporate subjects. Besides these conceptual topics, more concrete issues such as escape and fire procedures, or how to deal with manual handling of goods are part of the course guides of the RTC as well (ARPAL Umbria, 2022[5]).

Two variables are especially important for the analysis in this chapter: i) Titolo segment UFC (i.e. the title of the learning goal) and ii) Competence Unit (i.e. the description of the skills and objectives of the learning module). These variables describe the learning objectives and the content of any given course, including the various skills that are taught and students are expected to master at the end of the course. The analysis of the keywords in these two variables makes it possible to determine the focus of each course. An example of the kind of information contained in these two variables is in Figure 2.1.

Figure 2.1 provides an example of the information available for a course designed for aspiring "web designers". The course consists of 220 hours, divided into smaller learning units focused on specific topics. Unit five, for instance, is a 38-hour training on "web editing", as indicated by the UFC. The UC provides more detailed information about the learning unit, specifying that it covers organizing web page content, implementing web editing techniques, and testing the website.

Figure 2.1. Example of the Learning Unit of Competence and the Competence Unit

SEZIONE D

ARTICOLAZIONE DELL'OFFERTA FORMATIVA

D.1 Articolazione del percorso

Numero segmento/ UFC	Titolo Segmento/UFC	Denominazione della UC di riferimento	Costo UFC	Durata (ore)	di cui erogate in Fad
1	Segmento di accoglienza e messa a livello			2:00	
2	UFC 1. "Esercizio di un'attività lavorativa in forma dipendente o autonoma"	UC.1 "Esercitare un'attività lavorativa in forma dipendente o autonoma"		6:00	
3	UFC 2. "L'attività professionale di Web designer"	UC.2 "Gestire l'attività professionale di web designer"		8:00	
4	UFC 3. "Definizione delle caratteristiche del web	UC.3 "Analizzare le esigenze del cliente e supportare la definizione delle caratteristiche del web"		16:00	
5	UFC 4. "Negoziazione e gestione delle relazioni tecniche e di servizio con il sistema cliente	UC.4 "Negoziare e gestire le relazioni con il sistema cliente"		8:00	
6	UFC 5. "Web editing"	UC.5 "Organizzare i contenuti delle pagine, realizzare il web editing e testare il sito"		38:00	
7	UFC 6. "Elaborazione di immagini statiche"	UC.6 "Elaborare immagini statiche "		18:00	
8	UFC 7. "Animazione 2D"	UC.7 "Creare animazioni 2D"		24:00	
9	UFC 8. "Multimedialità nel web	UC.8 "Elaborare ed integrare con tenuti multimediali		36:00	
10	UFC 9. "Elementi di programmazione web"	UC.9 "Realizzare semplici funzioni ed applicazioni web		40:00	
11	UFC 10. "Gestione delle risorse informatiche"	UC.10 "Gestire le risorse informatiche impiegate per le attività di web design"		8:00	
12	UFC 11. "Sicurezza sul luogo di lavoro"	UC.11 "Lavorare in sicurezza in ambiente d'ufficio"		8:00	
13	UFC 12. "La va lutazione della qualità del proprio operato nell'ambito dell'erogazione del servizio"	UC.12 "Valutare la qualità del proprio operato nell'ambito dell'erogazione di un servizio"		8:00	
			Totale durata del percorso	220:00	0:00

Source: Data by ARPAL Umbria.

What kinds of jobs and skills are the focus of the RTC?

The occupations for which training is available in the RTC

The RTC offers training for 81 different ISCO four-digit level occupations across low, medium, and high-skill levels. This wide range of training opportunities covers various occupations of different complexities and natures.

To determine the focus of the RTC's training catalogue, the total number of training programmes offered at the occupation level has been multiplied by the duration of each training and the number of possible participants. This calculation provides the total number of training hours in each occupation, and it is a proxy of the intensity of the training supply by the RTC in Umbria.

Results in Figure 2.2 (panel A), show the top 40 occupations ranked by the total number of training hours. The data reveals that the focus of the training in the RTC is skewed towards beauticians and related workers, who receive 1.8 times more training hours than the second-most trained occupation (hairdressers).

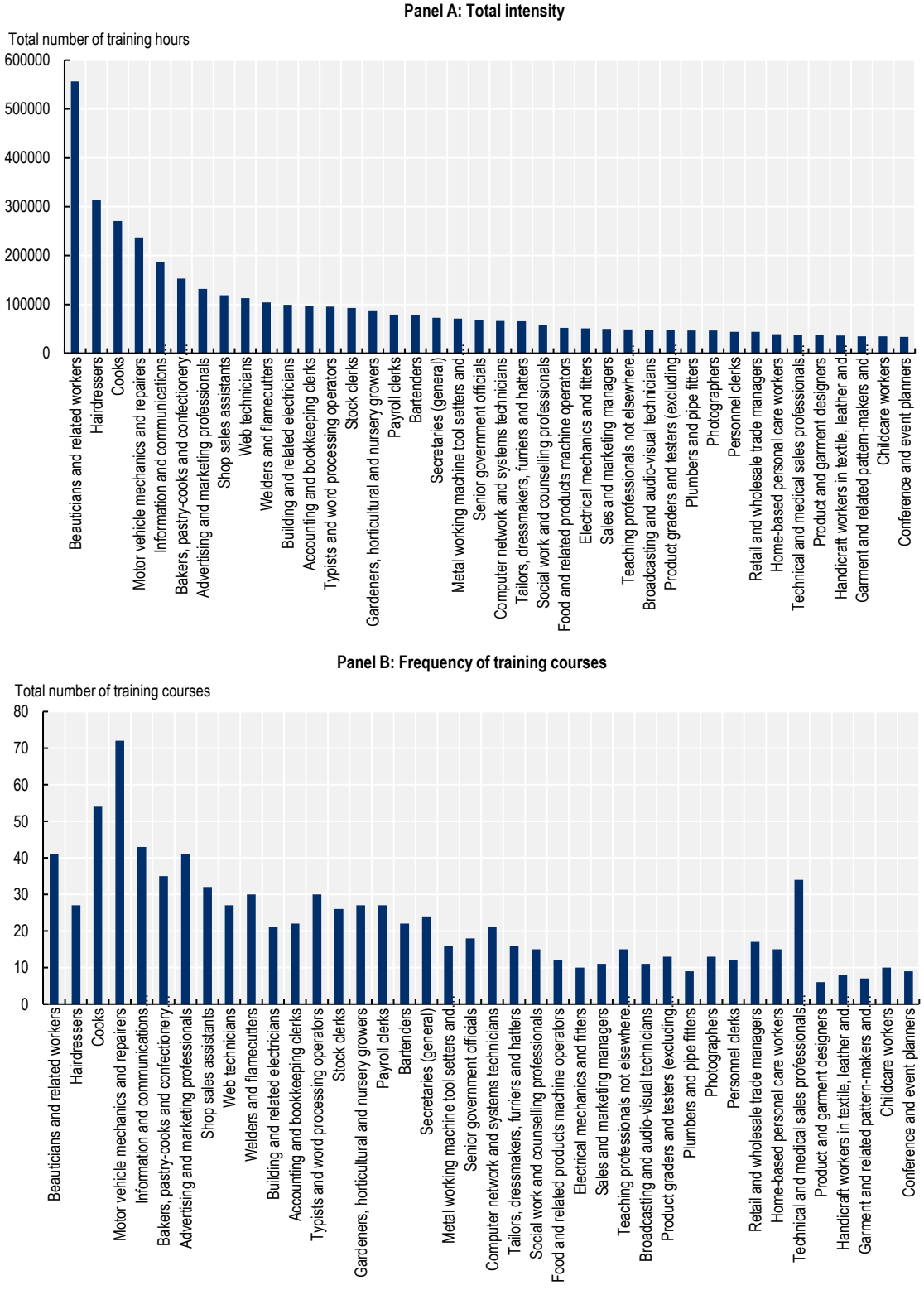
In comparison to beauticians, the number hours of training for the rest of the top-5 occupations, (hairdressers, cooks, motor vehicle mechanics and repairers, and information and communications technology user support technicians), are much lower.[3]

It is worth noting that the distribution of the number of training courses offered for each of the top 40 occupations is quite different from the distribution of training hours, as shown in Figure 2.2, panel B. Results show that the most frequent courses offered by ARPAL are for prospective motor vehicle mechanics and repairers, followed by courses for cooks. Courses for beauticians and related workers are only the fourth most frequent, despite receiving the highest number of training hours.

While the number of training hours for beauticians and related workers in Figure 2.2, panel A is significantly larger than for any of the other occupations, there are still a non-negligible number of training hours for the occupations ranking 35th to 40th in terms of intensity. The number of training hours available ranges from 34 000 for conference and event planners to 37 500 for technical and medical sales professionals (excluding ICT).

The data shows that the number of training courses offered for technical and medical sales professionals (excluding ICT) is relatively high, with a count of 34, although it ranks 35th on the list. Surprisingly, this number is almost the same as the count for courses taught to bakers, pastrycooks, and confectionery makers, which has a count of 35 and ranks 6th in terms of the RTC's focus. This suggests that the courses for medical sales professionals (excluding ICT) are either relatively short or have limited availability to participants.

Figure 2.2. Top 40 occupations on which courses in the RTC are focused

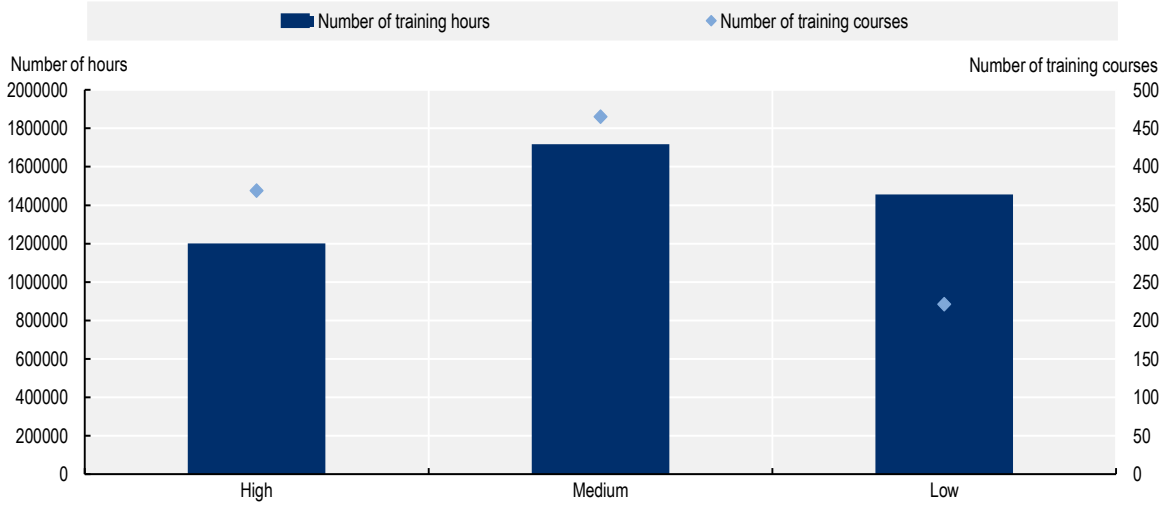


Note: Data on the RTC uses ISTAT to classify occupations, data in this graph is instead presented at the four-digit ISCO-level. One occupation in ISCO can encompass multiple ISTAT occupations. If that is the case duration and frequency for all ISTAT occupations have been added together.
Source: OECD calculations on data by ARPAL Umbria.

Data on the RTC indicates that, out of 81 occupations targeted, there is a wide variety of profiles and skill levels. While it is true that the proportion of courses offered for low-skill occupations is lower than for medium- and high-skill occupations,[4] it is important to note that this does not necessarily mean that low-skill occupations receive the least amount of attention in the RTC. The total number of training hours available for low-skill occupations is still significant, even in a context where the number of training courses is smaller. When analysing the total number of training hours, results show that low-skill occupations receive a comparable amount of attention as medium-skill occupations. Figure 2.3 shows, for instance, that while the majority of training hours is still available to medium-skill occupations (39.3%), there are more training hours for low-skill occupations (33.3%) than for high-skill occupations (27.5%), emphasising the attention paid to low skilled workers in the total amount of training made available in the RTC.

The next sections go into more detail about the differences between the three different occupational skill-levels and explore the occupations for which the largest number of training hours is currently available in the RTC.

Figure 2.3. Number of training courses and intensity per occupational skill level



Source: OECD calculations on data by ARPAL Umbria.

The courses that are available in the RTC to train for a high-skill profession

The RTC provides a significant number of training options for student to learn skills related to several high-skill occupations, particularly those in information and communications technology (ICT) user support, advertising and marketing, and web development.

These three occupations concentrate a much larger number of total training hours than any other high-skill occupation listed in Table 2.2. The total number of training hours available to train as ICT user support technicians is particularly noteworthy, as it is around five times larger than the average number of available training hours for high-skill occupations. Moreover, there are almost four times as many training programmes available for ICT user support technicians relative to the average high-skill occupation.

It should be noted that ICT user support technicians comprise two different ISTAT occupations, including application engineers (Tecnici esperti in applicazioni) and programmer engineers (Tecnici programmatori). It is important to highlight that the training programs for application engineers within this one ISCO occupation exceed twice as many training hours compared to those for programmer engineers. While each

course is associated with only one ISTAT occupation of destination, the course content could be beneficial for multiple roles, despite being classified under only one specific ISTAT occupation profile.

The focus of the RTC on digital jobs is reflective of the increasing importance of digital skills in today's labour market, as mentioned in Chapter 1. With the rapid pace of technological change, workers need to constantly upgrade their skills to keep pace with new developments. ICT user support technicians, web technicians, and computer network and systems engineers are all highly in demand, and the fact that they receive a significant proportion of training hours indicates that the RTC recognizes this trend.[5]

In addition to these digital jobs, the RTC also places emphasis on management careers. Senior government officials and sales and marketing managers are both highly valued positions in their respective sectors, and the fact that they receive above-average training hours and number of training courses indicates their importance. These two management careers jointly make up 9.8% of all available training hours to train in high-skilled occupations. It is worth noting, however, that the number of training hours for government officials is significantly higher than that for sales and marketing managers, suggesting a greater availability of potential training for roles in the public sector.

Table 2.2. Top 10 high-skill occupations with the largest availability of training hours and courses in the RTC

ISCO code	Occupation	Total training hours	Number of training courses
3512	Information and communications technology user support technicians	186525	43
2431	Advertising and marketing professionals	131626	41
3514	Web technicians	112725	27
1112	Senior government officials	68100	18
3513	Computer network and systems technicians	66370	21
2635	Social work and counselling professionals	57987	15
1221	Sales and marketing managers	49800	11
2359	Teaching professionals not elsewhere classified	48570	15
3521	Broadcasting and audio-visual technicians	48060	11
3431	Photographers	46530	13

Note: Data on the RTC uses ISTAT to classify occupations, data in this graph is instead presented at the four-digit ISCO-level. One occupation in ISCO can encompass multiple ISTAT occupations, as is the case for ISCO 3512 and 3521. For these occupations duration and frequency of the different ISTAT occupations have been added together.
Source: OECD calculations based on data by ARPAL Umbria.

The courses that are available in the RTC to train for a medium-skill profession

When analysing the training offer available to train in medium skilled professions, data on the RTC shows a significant focus on jobs such as motor vehicle mechanics and repairers, which alone make up 13.8% of all medium-skill training hours (as shown in Table 1.3). In addition, the RTC offers a significantly higher number of training courses in this area, with 72 courses available, which is 5.4 times higher than the average number of training courses offered for medium-skill jobs.

As mentioned previously, there are three different ISTAT occupations that jointly represent motor vehicle mechanics and repairers. Looking at these individual ISTAT occupations, by far the largest number of hours and number of training courses is targeting the generalist category of motor mechanics and motor vehicle repairers (*Meccanici motoristi e riparatori di veicoli a motore),* while the more specific subsets of coach builders (*Carrozzieri)* and tyre fitters (*Gommisti)* have fewer courses and training hours.

On the other hand, different roles such as clerical jobs are also well represented among the top 10 occupations by training intensity. Accounting and bookkeeping clerks, typist and word processing

operators, stock clerks, payroll clerks and secretaries (general) jointly receive 25.5% of the total training hours available for medium-skill jobs. The number of training hours for each of these occupations is also in between 1.4 and 2 times larger than average for medium-skill jobs. As discussed in Chapter 1, some clerical jobs require advanced administrative tasks (accounting and bookkeeping clerks, stock clerks, payroll clerks), while other require completing less sophisticated procedures (typist and word processing operators and secretaries (general). However, the number of training hours available for each of the clerical roles, does not seem to depend on the sophistication of the tasks the clerical roles need to perform.

Table 2.3. Top 10 medium-skill occupations with the largest available training offer in the RTC

ISCO code	Occupation	Total training hours	Number of training courses
7231	Motor vehicle mechanics and repairers	237200	72
7512	Bakers, pastry-cooks and confectionery makers	152940	35
7212	Welders and flamecutters	103890	30
7411	Building and related electricians	99000	21
4311	Accounting and bookkeeping clerks	97365	22
4131	Typists and word processing operators	95640	30
4321	Stock clerks	92655	26
6113	Gardeners, horticultural and nursery growers	86451	27
4313	Payroll clerks	79200	27
4120	Secretaries (general)	72615	24

Note: Data on the RTC uses ISTAT to classify occupations, data in this graph is instead presented at the four-digit ISCO-level. One occupation in ISCO can encompass multiple ISTAT occupations, as is the case for ISCO 7231, 7512, 7212, 7411, and 4321. For these occupations duration and frequency of the different ISTAT occupations have been added together.
Source: OECD calculations based on data by ARPAL Umbria.

The courses that are available in the RTC to train for a low-skill profession

The RTC only offers courses for eleven different low-skill occupations in total (see Table 2.4).[6] Despite the low number of different occupations, 33.3% of all training hours is available to train towards a low-skill job, as courses in for those professions show a much larger number of total training hours. The average number of total training hours per low-skill occupation is 132 423, whereas it was 49 071 for medium-skill jobs and 34 320 for high-skill jobs. In terms of the training frequency as well, each low-skill occupation in the RTC has on average 20.1 training courses allocated to it, while it was 13.3 and 10.5 for medium- and high-skill jobs respectively.

The top three low-skill occupations in Table 2.4 are also those for which the availability of training is the largest in the whole RTC. Among these occupations, beauticians and related workers have the highest number of training hours, which is significantly higher than the average. In fact, the training hours dedicated to this occupation represent 38.2% of all low-skill training hours and 12.3% of all training hours in general. Analysis presented later in the section on training duration discusses the fact that training programmes for beauticians and related workers are relatively long.

Besides the focus on beauticians and hairdressers, training for food industry jobs also receives a significant focus. Courses for cooks, bartenders and waiters amount to a share of 25.5% of all training hours for low-skill jobs, an of 8.5% of all training hours in general.[7] Restaurant cooks and waiters receive more training hours than their counterparts that work in other establishments.

Table 2.4. Focus for low-skill occupations in the RTC

ISCO code	Occupation	Total training hours	Number of training courses
5142	Beauticians and related workers	556650	41
5141	Hairdressers	313590	27
5120	Cooks	270555	54
5223	Shop sales assistants	118620	32
5132	Bartenders	78315	22
5322	Home-based personal care workers	39015	15
5311	Childcare workers	34575	10
5131	Waiters	22410	7
5414	Security guards	16200	11

Note: Data on the RTC uses ISTAT to classify occupations, data in this graph is instead presented at the four-digit ISCO-level. One occupation in ISCO can encompass multiple ISTAT occupations, as is the case for ISCO 5120, 5131 and 5414. For these occupations duration and frequency of the different ISTAT occupations have been added together.
Source: OECD calculations based on data by ARPAL Umbria.

The skills typically offered by the training courses available in the RTC

The RTC courses are designed to impart specific skills to participants, which are outlined in the course description (Learning Unit of Competence and Competence Unit). This section presents descriptive statistics of the intensity with which training programmes in the RTC focus on delivering specific skills. It does so by using both the keywords found in the RTC (in the description of the course content made by training providers) as well as by mapping those to the keywords that are typically used by employers use in online job postings.[8]

The training offer in the RTC encompasses approximately 1 375 different skills. Figure 2.4 shows the most prevalent ones[9] by presenting the percentage of all potential participants who could follow training courses in each specific skill.[10] Results in Figure 2.4 show that 48.6% of potentially available training spots in the RTC provide training modules aimed at developing transversal skills such as “Esercitare un’attività lavorativa in forma dipendente o autonoma” (ref: Attività dipendente autonoma”) that is knowledge set required to “to understand the contractual aspects of professional performance and to understand the obligations necessary for the proper exercise of a freelance or quasi-subordinate work contract[11]”. This skill includes how to handle the bureaucratic aspects of being self-employed, a skill that any self-employed person will need.

Data also show that around 51.5% of all potential participants are exposed to training focusing on safety measures in the workplace as many courses typically also have a module on safety while other courses are completely devoted to this topic. In total that means that there is the potential for 12 181 people to be trained in subjects that relate to this topic.[12]

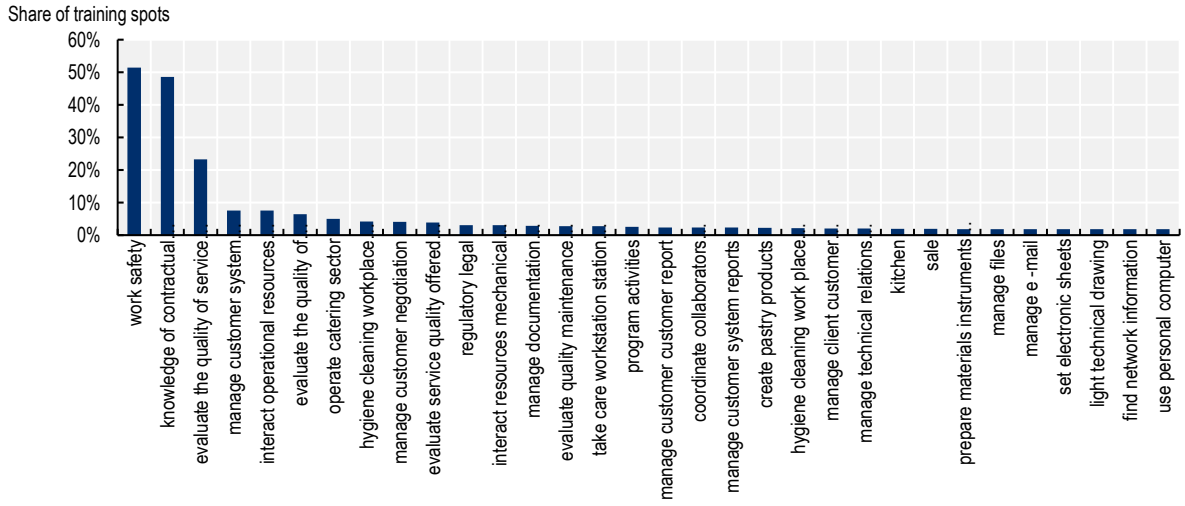
Results in Figure 1.4 also show that 23.3% of all potential participants in RTC courses are exposed to courses aimed at developing the necessary knowledge to “evaluate the quality of service provision”. Mastering this skill involves measuring performance, checking if there is anything that needs to be changed to provide a customer with a better experience. The principles of how to evaluate the quality of service will be similar between jobs, however, the specifics of the criteria on which to evaluate will differ.

Results also show that five digital skills are among the most typically taught in the RTC but the share of participants to whom learning options are made available on these digital skills remains lower than that of other skills. Programming activities, managing e-mail, creating electronic sheets, finding online information, and using a personal computer are all in the top 32 skills, but the shares of individuals that could learn them through one of the courses in the RTC ranges from 2.5% to 1.9%.[13] 2.9% of training spots is available

for programming skills, this means that there are more training options for this skill than for more basic digital skills. However, basic digital skills are fundamental to build further knowledge, and while perhaps not many job postings will explicitly mention needing to be able to use an e-mailing service, it is often an implicit skill requirement.

Around half of the skills in Figure 2.4 are technical skills specific to a narrower set of occupations or industries. The shares of potential participants learning each of these technical skills vary. The technical skill that is taught to the largest share of potential participants is "evaluating the quality of manufacturing process", which is taught to 6.4% of participants. The smallest share of participants in Figure 2.4 is learning about "light technical drawing", at 1.9%.

Figure 2.4. The most prevalent skills taught to participants of the RTC courses



Source: OECD calculations based on data by ARPAL Umbria.

Mapping the skills in the RTC to the skills mentioned in OJPs

The language that employers use to describe skills in OJPs is typically different from that used by training providers to describe the learning goals of their programmes in the RTC. To assess the alignment between the skills taught in the RTC and the skills that are in high demand in Chapter 3, this section therefore first translates all the skills in the RTC to the language of the OJPs.

To achieve this goal, the skills as described in the RTC are mapped to the skills in the terminology of the Lightcast dataset. In global terms, an algorithm is used that looks at how similar an RTC skill is to all skills that are present in the Lightcast dataset. The algorithm is able to consider the entire context of the text in the online vacancies and in the course descriptions, to decide how similar two skills are, and it assigns a similarity score between them. More detail can be found in Box 2.2 and Annex A.

Box 2.2. Mapping skills in the RTC to skills in the terminology of Lightcast

Translating the skills from the RTC to the terminology of Lightcast necessitates recovering the semantic structure of how keywords (in this case skills) are used in the description of jobs vacancies and in those used to describe the content of training courses.

At the core of the machine learning technique used in this report lies the creation of the so-called word embedding. An embedding contains the coordinates and hence the position that each skill has in a high-dimensional vector space. These coordinates make it possible to assess how close or distant every pair of skills are from each other.

As each skill is represented by a vector, the distance between two skills *A* and *B* is a measure of vector distance given by the cosine of the angle between the two, the *cosine similarity:*

$$distance(A,B) = \frac{A \cdot B}{||A||||B||}$$

where the denominator expresses product between the L2-norm (or Euclidean distance) of each n-dimensional vector.

The main computational tool used for the embedding is fastText, which is an algorithm that is able to reach a numerical representation of words by means of a prediction task. fastText can focus on subwords: smaller portion of words. The idea behind the algorithm is to predict the presence of some subwords by the presence of those that surround it. The use of fastText on subwords, combined with the large amount of textual data coming from OJPs makes it possible to detect semantic meaning, which increases the accuracy of the translation.

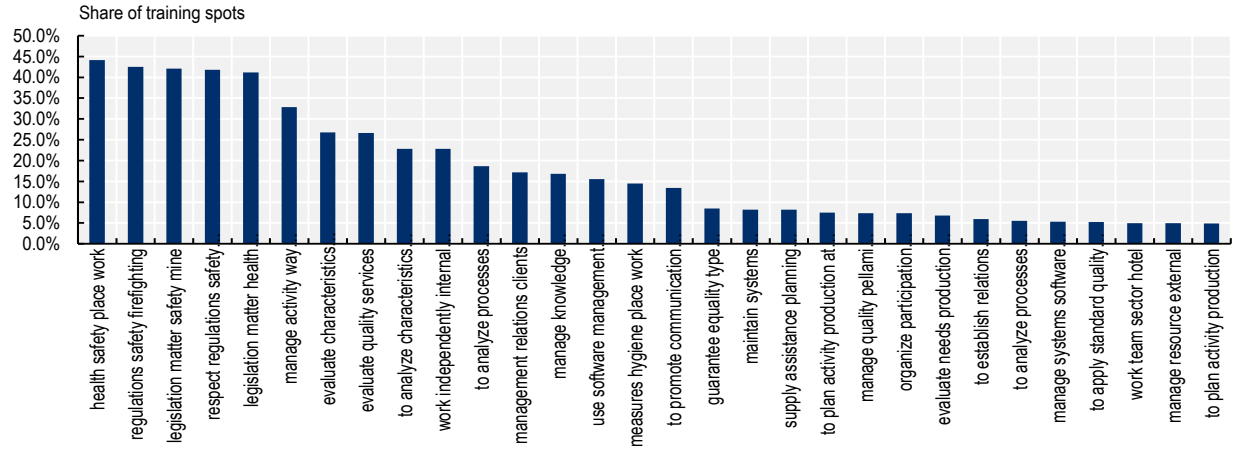
The skills in the RTC are paired with up to five skills that are extracted by Lightcast in OJPs. One RTC skill can be translated into multiple Lightcast skills as long as they are similar enough. The pairing is done between RTC and Lightcast skills that that have a cosine similarity of at least 0.7, to ensure that the skills are indeed similar. For instance, the RTC skill “make_products_pastry” is linked to “prepare_products_pastry” which has a similarity of 0.91, but also to “make_products_pastry_base_chocolate”, which has a similarity of 0.85. According to fastText’s prediction, the skill “make_products_pastry” in the RTC is likely to also cover making chocolate pasty products, although the skills “make_products_pastry” and “make_products_pastry_base_chocolate”, are less similar than “make_products_pastry” and “prepare_products_pastry” are. Including both Lightcast skills as a proxy for the RTC skill “make_products_pastry” therefore gives more information on what a course that teaches “make_products_pastry” teaches, than just including one skill would do.

Note: More information on fastText, and on the process of mapping the skills can be found in Annex A.

Figure 2.5 shows the most prevalent 30 skills supplied in RTC training programmes by using the same terminology found in OJPs.[14]

After mapping the skill keywords used in the RTC into the language of OJPs, results remain qualitatively similar as expected. In particular, Figure 2.5 shows a similar picture to Figure 2.4. Nearly two thirds of the skills in the top 30 are skills are not specific to a specific industry or job, highlighting the varied nature of the training in the RTC. Results also highlight that some 41% to 44% of available training spots provides modules about health and safety in the workplace, regulations concerning safety in firefighting, and respecting safety regulations for example.

Figure 2.5. Top 30 skills in the terminology of Lightcast, weighted by similarity score

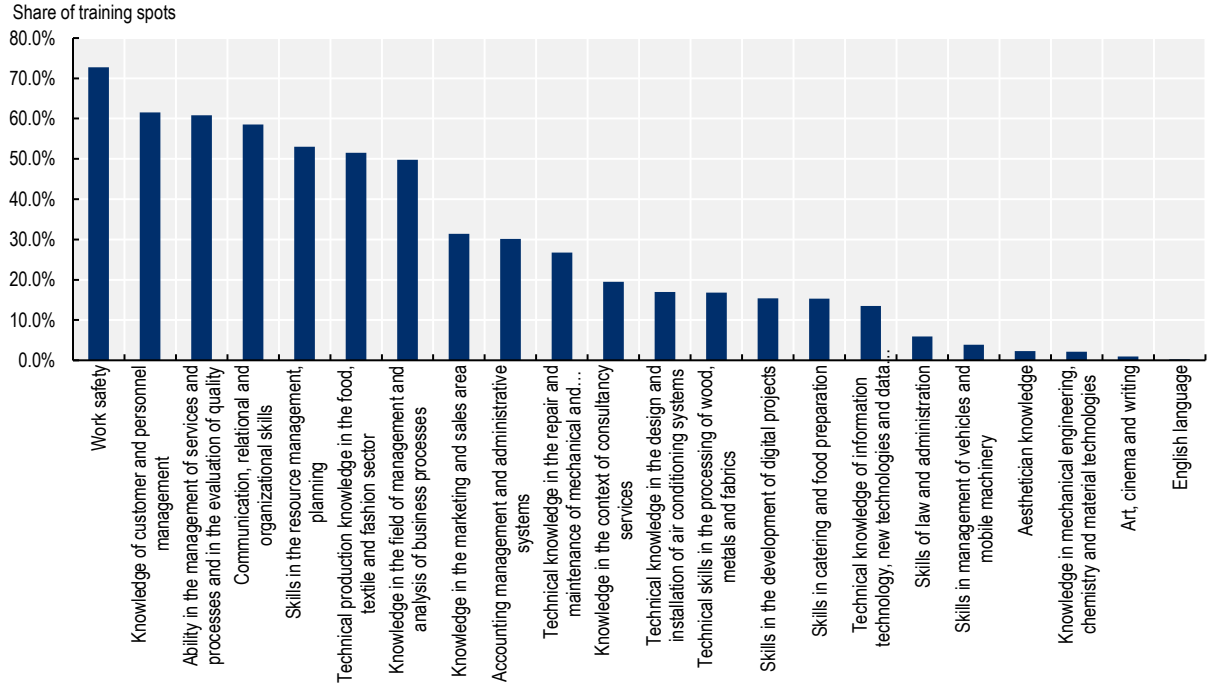


Source: OECD calculations based on Lightcast data and data by Arpal Umbria.

The RTC provides 1375 skills to its participants, and many of these skills are related to each other. To determine if certain topics receive more attention than others, a k-means algorithm[15] was used to create clusters of similar skills. The results, shown in Figure 2.6, reveal, unsurprisingly, that the RTC places the most emphasis on teaching work safety. In addition to this, around 60% of participants also receive training in customer and personnel management, service and process management, quality evaluation, communication, relational and organizational skills. This translates to approximately 14,380 individuals learning skills in these areas. However, the training offered for English language proficiency is limited, as only 0.2% of participants receive training in this subject. Similarly, training for arts, cinema, and writing is provided to only around 1% of participants.

Interestingly, the prevalence of certain clusters with job-specific skills for jobs which are a focus of the RTC as shown in the previous subsection, is rather low. For example, the cluster that relates to knowledge for beauticians is only taught to 2.3% of participants. As was previously discussed, the occupation of beauticians and related workers was ranked fourth in terms of the number of training courses. The fact that the job-specific skills beauticians are only taught to a very limited share of participants, means many of the courses aimed at beauticians are focusing on transversal skills which are a part of other clusters. As the courses for beauticians were generally quite long, it is very likely that there are sub-parts of the courses, which are only focusing on workplace safety, or how to run a business for example.

Figure 2.6. Skill clusters weighted by similarity scores



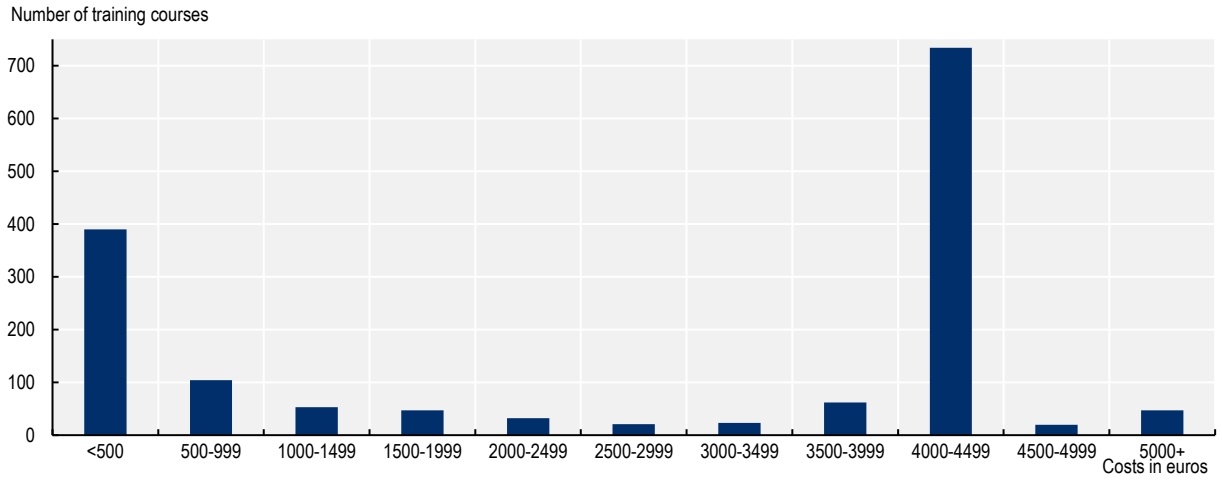
Source: OECD calculations based on data by ARPAL Umbria.

The cost and length of the training offer in the Regional Training Catalogue

Cost of training

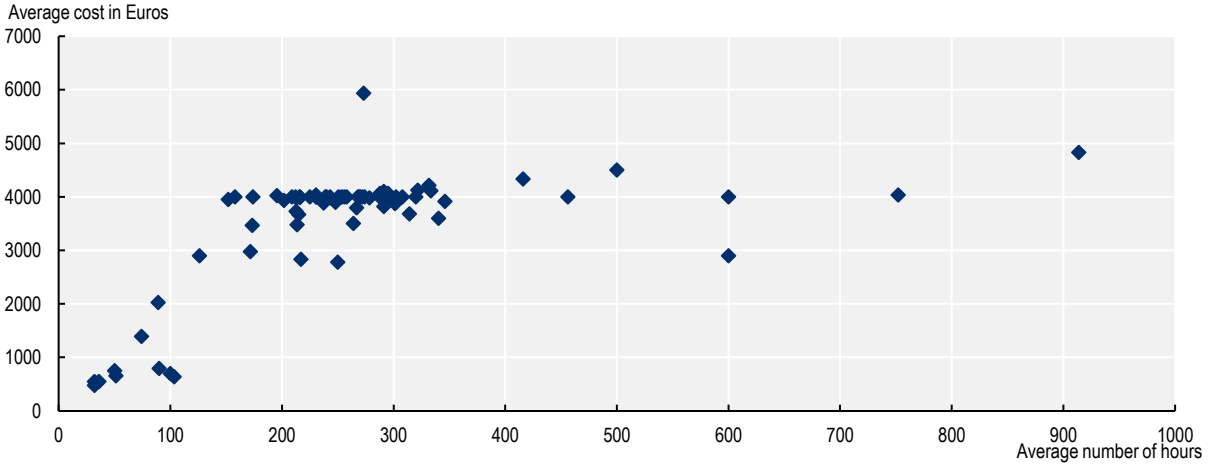
The overall cost associated with the training courses offered in the RTC ranges from inexpensive options of less than EUR 100 to expensive programmes of more than EUR 30 000 (Figure 2.7). A large share of training courses (725 out of 1 533), however, cost exactly EUR 4 000 (Figure 2.7). Among the potential reasons for this result is that several of those courses could be paid using “training vouchers” issued by the Italian government for the same amount. Several training options were hence created in such a way that they could use the full amount of the voucher.[16]

Figure 2.7. Frequencies of cost per training



Source: OECD calculations based on data by ARPAL Umbria.

Figure 2.8. Average cost per training against the average training duration



Source: OECD calculations based on data by ARPAL Umbria.

Unsurprisingly, more expensive courses are often also courses that have a longer average duration (Figure 2.8). Around 25% of courses cost less than EUR 500 (Figure 2.7), and these cheaper courses are usually not associated with a specific occupation. In fact, only 4.6% of these relatively cheap courses have an ISTAT occupation linked to it. The majority of cheaper courses are also relatively short. Some 403 training courses cost of less than EUR 400 their duration is of less than 20 hours. Table 2.5 shows an example of the kind of courses that meet these criteria.

A majority of the shorter and less expensive training courses concerns courses related to health and safety in the workplace. In fact, courses that mention health and safety, fire prevention, risk prevention or first aid are nearly 42% of the courses below EUR 400 that last less than 20 hours (see also Box 2.1).

Furthermore, a significant share of the shorter and less expensive courses are either refresher/update courses (38%) or training courses that teach how to operate heavy equipment (36%) and, in particular, training programmes focusing on learning how to operate heavy machinery like cranes and fork lifts, with nearly a third of those training courses being refresher courses. While many of these courses do not mention that they target a specific occupation, the skills that are taught are very specific and not easily transferable between many occupations. Skills to operate a self-propelled industrial forklift truck or a tracked agriculteral tractor for example are most useful for postions as lifting truck operator (ISCO 8344) and mixed crop grower (ISCO 6114). However, because the training courses are quite short, the skills should be relatively easy to learn within a limited time frame, so transferability is not a big issue.

Table 2.5. Example of training courses that take fewer than 20 hours and cost less than EUR 400

	Training name in Italian	Translation
1	Aggiornamento dei lavoratori in materia di salute e sicurezza	Update of workers on health and safety
2	Aggiornamento per addetti al pronto soccorso – aziende gruppo a	Update for first aid workers – companies of group a
3	Aggiornamento per lavoratori in materia di salute e sicurezza in riferimento all'accordo stato – regioni del 21.12.2011	Update for workers on health and safety in reference to the state – regions agreement of 12.21.2011
4	Aggiornamento teorico-pratico per lavoratori addetti alla conduzione di carrelli elevatori semoventi con conducente a bordo	Theoretical-practical update for workers involved in driving self-propelled forklift trucks with driver on board
5	Aggiornamento teorico-pratico per lavoratori addetti alla conduzione di piattaforme di lavoro mobili elevabili	Theoretical-practical update for workers involved in the operation of elevating mobile work platforms
6	Corso di formazione per i lavoratori in materia di salute e sicurezza nei luoghi di lavoro – rischio alto	Training course for workers on health and safety in the workplace – high risk
7	Corso di formazione teorico-pratica per lavoratori addetti alla conduzione di gru a rotazione sia in basso che in alto.	Theoretical-practical training course for workers involved in operating both low and high rotation cranes.
8	Corso di formazione teorico-pratico per addetti alla conduzione di gru per autocarro	Theoretical-practical training course for truck crane operators
9	Formazione per addetti alla prevenzione incendi,lotta antincendio e gestione delle emergenze.\nrischio basso	Training for fire prevention, fire fighting and emergency management personnel.\low risk
10	Corso di formazione aggiuntiva per preposti.	Additional training course for supervisors.

Source: Data from ARPAL Umbria.

On the other side of the cost distribution, it stands out that expensive courses are often courses that require internships or practical/hands on education or are training courses that provide a certain certification. They are also often longer courses, was mentioned before (Figure 2.8). Table 2.6 shows an example of the kinds of courses that are more than 200 hours and cost over EUR 800. There are 363 courses that meet these criteria, and 31% of them mention an internship or lab work as part of the curriculum. Besides that, 55% of these training courses mention that they lead to a certification, like qualified bar service employee, or that they educate someone to be able to fulfil an occupation that is specified in a certain law, like beautician – according to law 1/1990 article 3, see for instance Box 2.3. Government of Italy

Box 2.3. The skills and requirements for beauticians and related workers

Beauticians and related workers (*estetisti e truccatori*) "give clients facial and body beauty treatments, apply cosmetics and make-up and give other kinds of treatment to individuals in order to improve their appearance" (ISCO-08). To perform these tasks, they need to know for example how to give facial and body massages, how to best apply make-up to suit their clients' needs, or for example how to wax or use depilation techniques to remove unwanted hairs.

The Italian law necessitates having a specific professional qualification, before being allowed to practice as a beautician. In 1990, the Italian government passed a law which describes all the tasks and requirements of beauticians (*estetista*) (Government of Italy, 1990[6]). To obtain the professional qualification of beautician, someone needs to have passed an exam after following a course that lasts at least 900 hours, or they need to pass the exam after working as an apprentice for at least a year complemented by following at least 300 hours of training. The requirements within the law explain why so many of the courses for beauticians and related are relatively long and expensive, as well as why internships are quite common. In fact, most of the beautician courses in the RTC take around two years, which is longer than is required.

RTC Training to become a beautician costs on average EUR 4 828, and the training time is relatively long. The average yearly earnings of a beautician in Italy are around EUR 25 000 (ERI, 2022[7]), which is slightly below the average wage of 29 694 in 2021 (OECD, 2023[8]). Of course, there are more reasons why someone would want to perform a certain job, but the earnings potential of beauticians is slightly below average. Chapter 3 goes into more depth on how highly demanded beauticians are, which can influence how easy it will be to find a position as a beautician.

It is true that longer and more comprehensive training courses can provide better preparation for the labour market, as they often cover more extensive material and may require practical work experience through internships or apprenticeships. These types of programs are particularly useful for individuals who are seeking to enter new fields or industries, as they provide a more in-depth understanding of the specific skills and knowledge required for those roles. In addition, completing an accredited training program can be beneficial for obtaining a job. Accreditation provides official recognition of an individual's skills and knowledge, which can improve their chances of being hired by potential employers. This is especially true in fields such as healthcare, where accreditation is often required in order to practice in certain roles.

However, it is important to note that longer training courses can also have some disadvantages, such as a delayed entrance into the labour market. This can be due to the additional time required to complete the training, as well as the potential need to complete additional practical experience or apprenticeships. In some cases, shorter training programs may be more appropriate for individuals who are looking to quickly acquire specific skills or enter the labour market more quickly. Ultimately, the decision of whether to pursue a longer or shorter training program depends on the individual's specific career goals, financial situation, and availability of job opportunities in their field.

The topics or occupations that are covered by the longer and more expensive training courses are more varied than for the shorter and less expensive training courses. Notable career areas are jobs related to mechanics and engineering, which are around 18% of the longer and expensive courses, beauticians and hairdresser courses (13%), food industry jobs (16%), jobs related to craftsmanship or arts (9%), and clerical jobs (7%), and jobs as designers (6%). One of these craftsman jobs which has on average the most expensive courses for the medium-skill level, is the job tailor/dressmaker/furrier and hatter, more detail is provided in Box 2.4.

Table 2.6. Example of courses that take more than 200 hours and cost more than EUR 800

	Training name in Italian	Translation
1	Estetista – specializzazione (600 ore) – legge 1/1990, art. 3, comma 1 lettera a) – abilitazione all'esercizio di attività autonoma	Beautician – specialization (600 hours) – law 1/1990, art. 3, paragraph 1 letter a) – authorization to practice self-employment
2	Acconciatore. Percorso di qualifica biennale	Hairdresser. Two-year qualification course
3	Cuoco	Cook
4	Addetto qualificato al servizio bar (percorso aula e stage)	Qualified bar service employee (classroom and internship)
5	Tecnico per l'attività di Gommista delle autoriparazioni	Tire repair technician
6	Tecnico per l'attività di carrozzeria delle autoriparazioni (percorso di aula e stage) ai sensi dell'art. 7, comma 2, lett. B) della legge 5 febbraio 1992, n.122 e s.m.i dell'accordo stato regioni del 12 luglio 2018 rep. Atti n. 124/csr	Technician for the bodywork activity of car repairs (classroom course and internship) pursuant to art. 7, paragraph 2, lett. B) of the law of 5 February 1992, n.122 and subsequent amendments of the state-regions agreement of 12 July 2018 rep. Deeds n. 124/csr
7	Addetto qualificato al confezionamento – capi abbigliamento e maglieria	Qualified garment maker – clothing and knitwear
8	Addetto qualificato al front office (percorso aula e stage)	Qualified front office employee (classroom path and internship)
9	Web designer (aula+stage)	Web designer (classroom+internship)
10	Disegnatore CAD (percorso aula e stage)	CAD designer (classroom path and internship)

Source: Data from ARPAL Umbria

Box 2.4. Courses for tailors, dressmakers, furriers and hatters

Training for the ISCO occupation of tailors, dressmakers, furriers and hatters is made up of training courses for two different ISTAT occupations: garment makers (*Confezionatori di capi di abbigliamento*) and tailors (*Sarti*). The most expensive training courses are those that are particular to garment makers, which cost EUR 7 874 on average, as compared to EUR 4 000 for tailors. Garment makers take care of the areas of production that precede the finishing of the prototypes, they work on identifying the most suitable materials and small parts such as buttons and zippers, and they prepare garments for assembly by sewing machines. Garment makers cut and sew garments themselves as well. The garment maker should also be able inspect and perform quality control the produced product.

The courses for garment makers in the RTC aim to supply a variety of skills to students to enable them to understand the needs of companies and customers in the production of clothing and knitwear. The courses also aim to develop digital skills, such as the use of specialised software that helps the garment maker decide on the types of seams, the size table and washing methods and software that helps garment makers to create buttonholes, pockets, embroidery and other stylistic details that define the garments.

The job of a garment maker can be quite varied, with different types of garment makers earning different salaries. For instance, fashion designers on average earn EUR 55 000, while costume designers earn EUR 29 000 (ERI, 2022[9]). On the other hand, garment sewers have an average wage of EUR 20 500. The average wage in Italy in 2021 was 29 694 (OECD, 2023[8]). With salaries ranging from EUR 9 000 below average to EUR 25 000 above average, it is hard to say whether there is a lot of earnings potential in the role of garment maker, and whether such a large investment in the courses would pay off for every student.

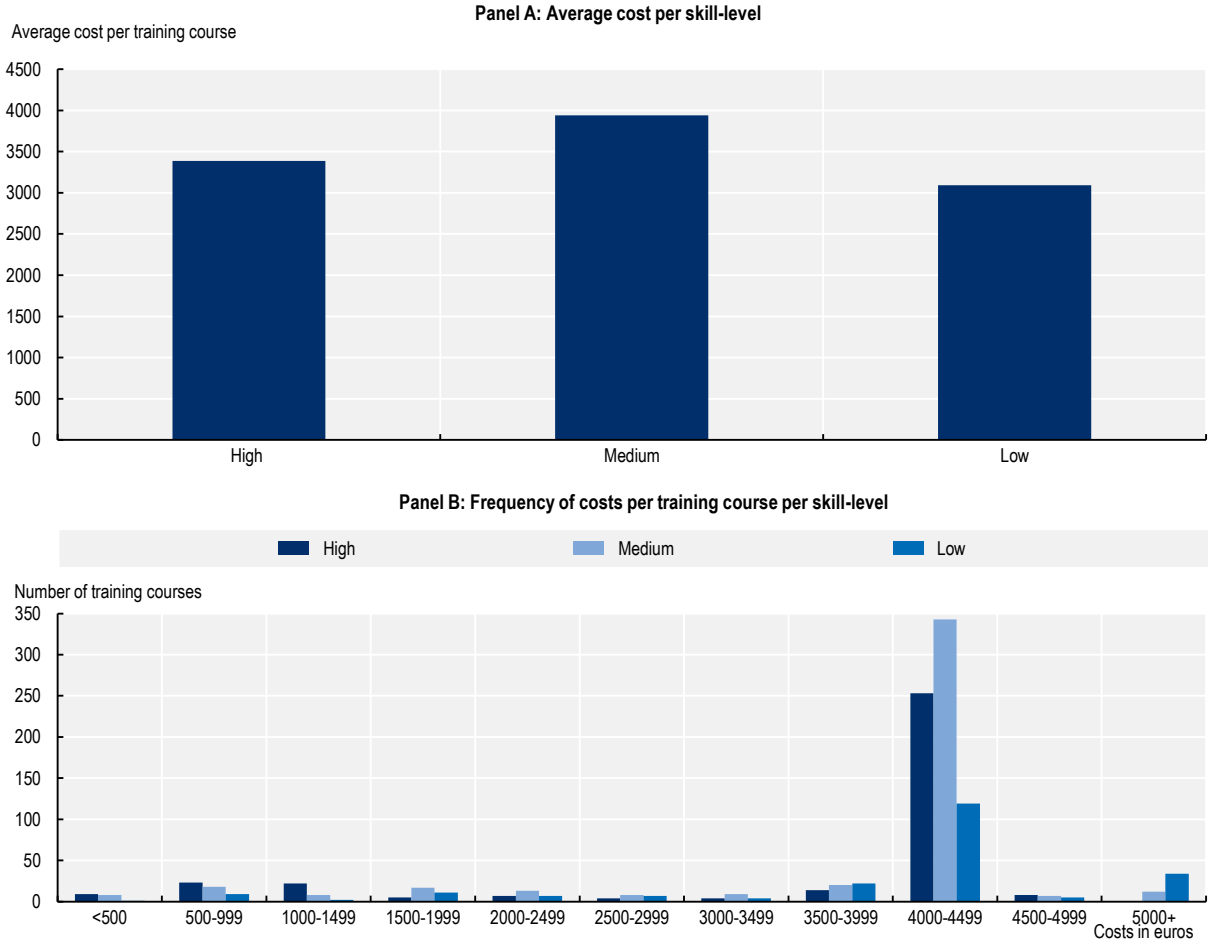
Differences in the average training cost (per worker) by high, medium and low skilled occuaptions are less than a EUR 1 000. On average, someone seeking training to perform a high-skill job would pay around EUR 3 400 to access training offered for their occupation, relative to EUR 3 940 in the case of a medium-skilled worker and EUR 3 100 for low-skilled jobs (see Figure 2.9, Panel A).

Nonetheless, the distribution of costs is quite different, especially looking at the least and most expensive courses (Figure 2.9, panel B). The least expensive courses are more prominent for high-skill occupations. The share of high-skill courses that costs less than EUR 500 is 2.6% versus 1.7% for medium-skill courses and only 0.5% for low-skill courses. Potentially, there are more courses aimed at high-skilled occupations that are shorter in terms of training hours, which could explain the difference in cost. The differences in duration per skill-level are explored in a later subsection.

While there are no training courses for high-skill occupations that cost over EUR 5 000, 2.6% of training courses for medium-skill occupations and even 15.4% of training courses for low-skill occupations come with such an expensive price tag. The low-skill and medium-skill jobs with the highest costs have been described in Box 2.3 and Box 2.4. The high-skill job with the highest average price is the role of software developer, this job is described in more detail in Box 2.5.

At the same time, courses that cost exactly EUR 4 000 are much more prominent for high-skill and medium-skill workers than for low-skilled workers. About 72% and 74% training courses for high- and medium-skilled occupations cost EUR 4 000, while only 52% of low-skilled courses costs the same. Potentially, more courses for medium- and high-skilled occupations were eligible for the use of a training voucher in the past.

Figure 2.9. Cost of training courses per occupational skill level



Source: OECD calculations based on data by ARPAL Umbria.

Box 2.5. The tasks, skills and earnings of a software developer

The most expensive courses for high-skill occupations are those targeting software developers (ISCO 2512). These courses cost on average EUR 4 500. Software developers (Analisti e progettisti di software in Italian) are responsible for researching and evaluating the requirements for existing or new software applications. They also design, develop, test, and maintain software solutions (ISCO-08).

The courses that are offered in Umbria are specifically for web designers. These professionals need to be able to tackle both the graphical design and the technical implementation of a website.It is therefore necessary to train mostly technical digital skills like the creation of 2D animations and the use of programming languages. But web designers also need to know how to target their customers' needs, how to monitor and operate the sites they developed and how to make sure that a site is in compliance with for example data security rules. In short, a wide variety of skills are needed to become a web designer.

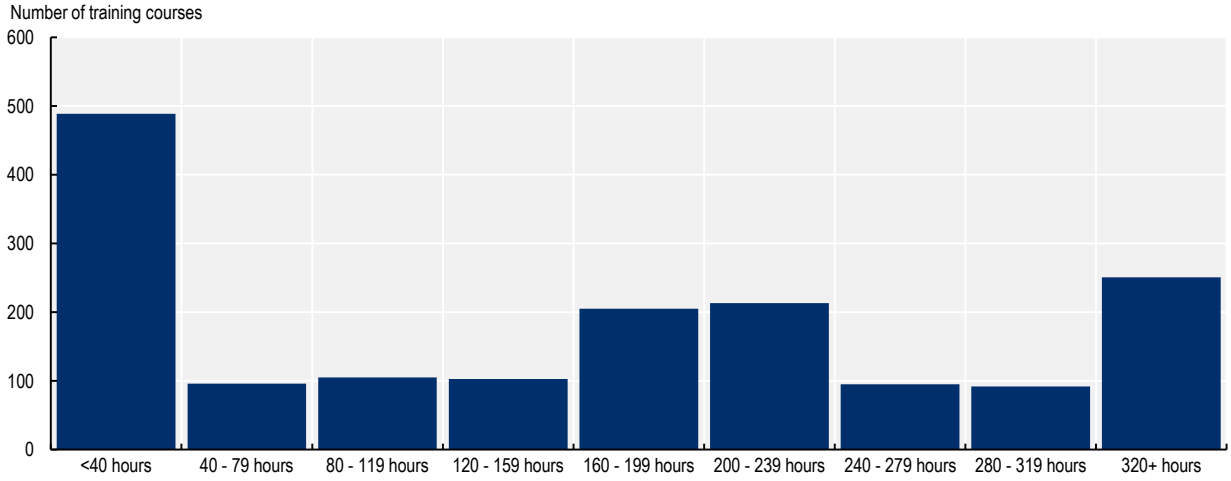
While the training courses to become a software developer are among the priciest training courses offered in the RTC, software developers also have a high earning potential. The average yearly salary for this position in Italy is reported to be EUR 63 459 (ERI, 2022[10]), compared to the average salary of EUR 29 694 in 2021 (OECD, 2023[8]).

Source: ISCO-08, Data from ARPAL-Umbria.

Duration

Like with the costs of the training courses, there is a wide range of training durations as well (Figure 2.10). The largest share of training courses (29.7%) takes less than 40 hours. At the same time 15.2% of training courses take more than 320 hours. The longest recorded duration is 1800 hours, which is equivalent to 45 workweeks. There are 13 training courses with a duration of 1 800 hours, mostly for training courses for cooks, and beauticians. The average length of a course is 187 hours, which is close to 4.5 weeks of training. Around a quarter of training courses take between 160 and 239 hours.

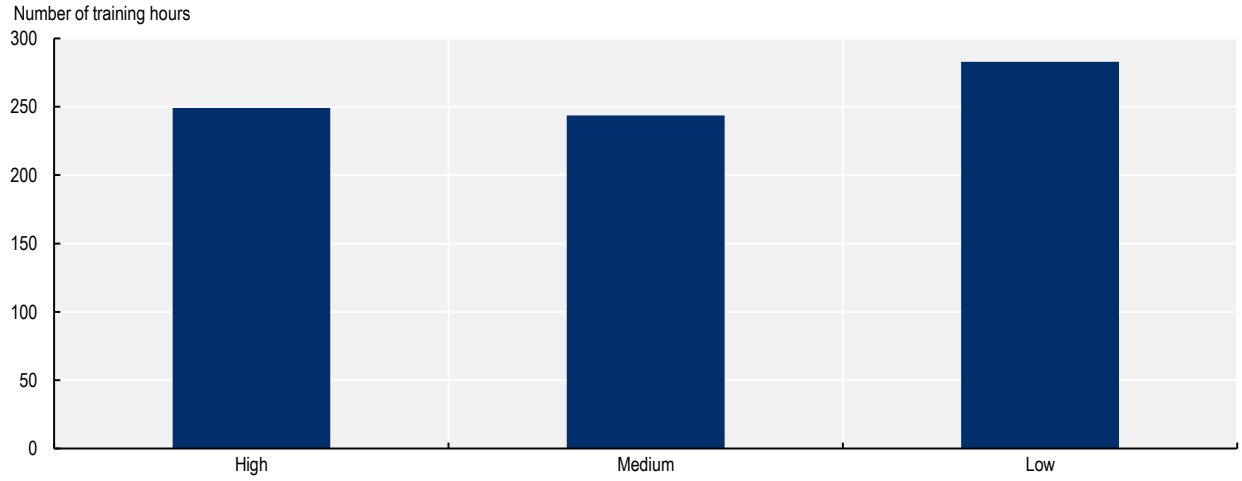
Figure 2.10. Frequencies of training duration



Source: OECD calculations based on data by ARPAL Umbria.

The data shows that training for low-skilled occupations tends to have a longer average duration compared to training for medium- and high-skilled occupations, as shown in Figure 2.11. On average, low-skilled occupation training lasts 39 hours longer than medium-skilled occupation training and 34 hours longer than high-skilled occupation training. However, it's important to note that the average costs for medium- and high-skilled occupations are actually larger than those for low-skilled occupations. This suggests that average training duration alone cannot fully explain the difference in training costs between the skill levels, although longer training programs do often come with higher costs. The relation between cost and training duration is explored in more depth for creative jobs in Box 2.6.

Figure 2.11. Average number of training hours per occupational skill level



Source: OECD calculations based on data from ARPAL Umbria

Box 2.6. The relation between cost and duration for creative jobs

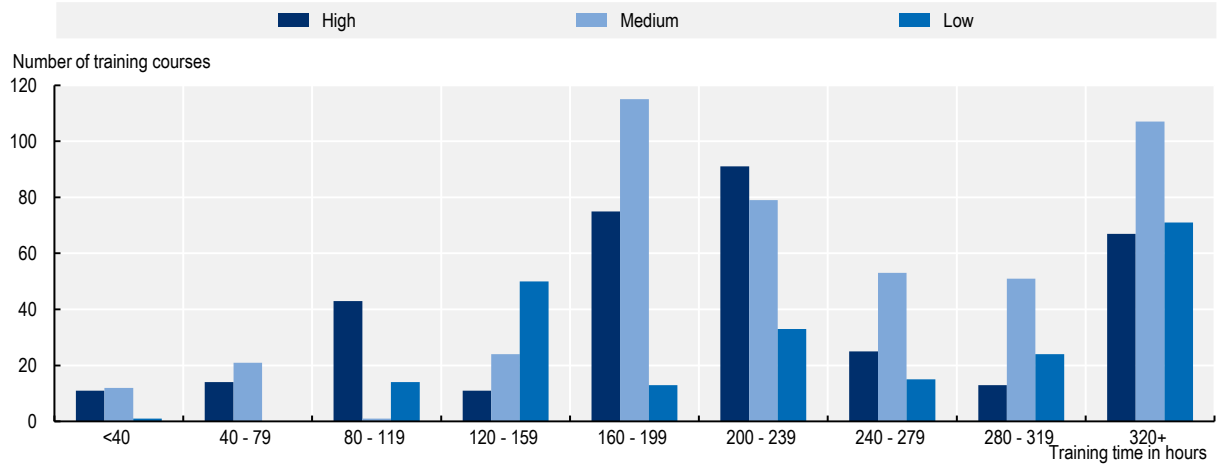
Training courses for creative jobs are generally among the most expensive training courses. For high-skilled occupations, product and garment designers, interior designers and decorators, photographers, graphic and multimedia designers and visual artists all have training courses of EUR 4 000 or more. For medium-skilled jobs, tailors, dressmakers, furriers and hatters; garment and related patternmakers and cutters; potters and related workers; jewellery and precious-metal workers, and wood treaters all have training courses that cost more than EUR 4 000 on average.

For some of these creative jobs, the high prices are accompanied by a generally large number of training hours. Following a course for garment and related patternmakers and cutters for example takes 332 training hours. Wood treaters also have training durations that are longer than average. Training courses for the high-skill jobs visual artists and product and garment designers are also in the top ten longest high-skill training courses.

However, for most of the high-skill creative jobs, and some of the medium-skill creative jobs, the training courses are not among the longest training courses. For example, the occupation with the most expensive training courses is tailors, dressmakers, furriers and hatters, which cost EUR 5 937. The number of training hours is 273 hours, which is even below average for medium-skilled jobs. Training courses for potters and related workers and jewellery and precious-metal workers also are shorter than average, while being expensive. Training for interior designers and decorators is even among the top ten shortest training courses for high-skilled jobs. Potentially, costs for materials and for software are increasing the prices for these training courses for jobs in the creative sector, instead of an increase of training hours.

Figure 2.12 provides further evidence that low-skilled occupations require longer training durations compared to high- and medium-skilled occupations. The figure displays the distribution of training durations across different skill levels, indicating that there are significantly more short training courses of less than 80 hours for high- and medium-skilled workers, while only 0.5% of low-skilled training courses fall in this category. Interestingly, the figure also shows that nearly one third of training courses for low-skilled occupations are over 320 hours, which is much higher than the corresponding percentages for medium- and high-skilled occupations. This suggests that longer training durations are indeed a common feature of training programs for low-skilled occupations, which may reflect more practical work and internships required for these jobs. Moreover, it is notable that the peak of the distribution for medium-skilled training courses is in the range of 160 to 199 hours, while for high-skilled training courses it is in the range of 200 to 239 hours. This may reflect the fact that medium-skilled occupations typically require a narrower range of specialized skills compared to high-skilled occupations, which may require more extensive training in a broader range of areas.

Figure 2.12. Frequencies of training duration by occupational skill level

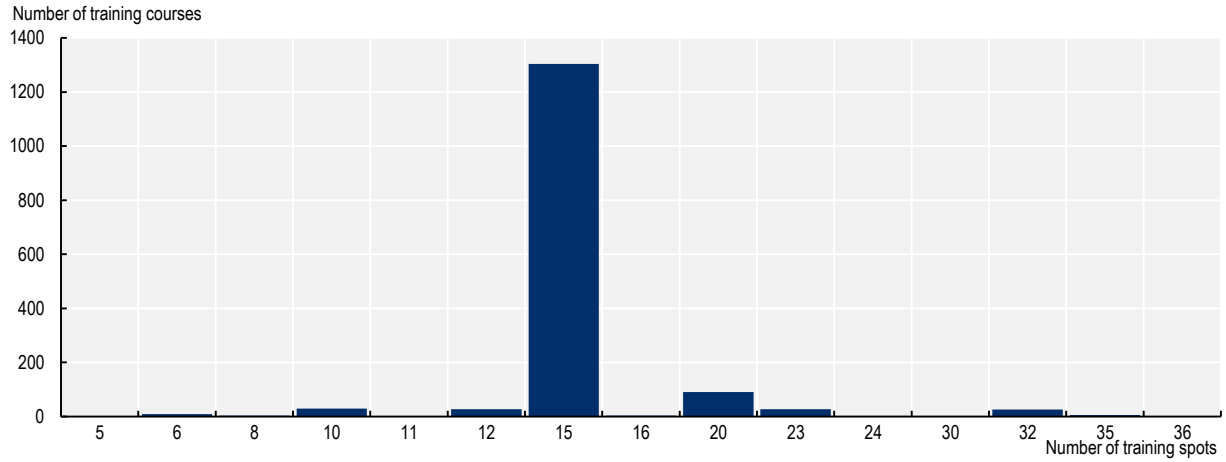


Source: OECD calculations based on data from ARPAL Umbria.

Class size

The RTC's training courses are conducted in relatively small class sizes, with most courses being open to a maximum of 15 participants. The distribution of class sizes is relatively homogenous, with courses having fewer than 10 participants or more than 32 participants being rare (see Figure 2.13).

Figure 2.13. Frequencies of the class size per training course



Source: OECD calculations based on data by ARPAL Umbria.

Research has shown mixed results regarding the impact of class size on learning outcomes. Some studies have suggested that smaller class sizes are associated with better academic performance and student engagement, while others have found no significant correlation (see also Box 2.7.). However, smaller class sizes do allow for more personalized attention from instructors and greater opportunities for student participation and interaction. Furthermore, smaller class sizes may be particularly beneficial for training courses that involve hands-on or practical learning, as it allows for greater individualized attention and support from trainers. This could be particularly important for low-skilled occupations that require more intensive training to acquire necessary skills.

Box 2.7. The class size: What is the impact on learning outcomes?

Smaller class sizes are often thought to be beneficial to students' learning outcomes (OECD, 2016[11]). Teachers can focus more on the needs of individual students when they are teaching in smaller classes. They can distinguish between stronger and weaker students and spend more time for students that lag behind. Smaller classroom sizes are especially beneficial for disadvantaged students, who really benefit from having more individualised focus. Teachers also report that they prefer working in smaller classes (OECD, 2019[12]).

At the same time, it remains hard to say what the optimal class size should be. The overall evidence for the benefit of smaller class sizes is weak (OECD, 2016[11]), and most of the research is conducted for younger pupils, like primary school kids or high school kids. In the case of courses that target labour market participants, like the ones in Umbria, it is hard to say what the impact of having a small class size of 15 students is and to what extent it is beneficial to the participants of the course.

Differences between Perugia and Terni

The RTC offers courses in both of Umbria's provinces: Perugia and Terni. There are more training courses in Perugia, which makes sense as it is the larger of the two provinces both in terms of area and in terms of population. However, in terms of on which occupations the RTC focuses the most, the differences between the two provinces are not very pronounced. Occupations that are in the top 30 for Perugia are usually also in the top 30 for Terni and vice versa (see Annex 2.A). Notable exceptions are the jobs of

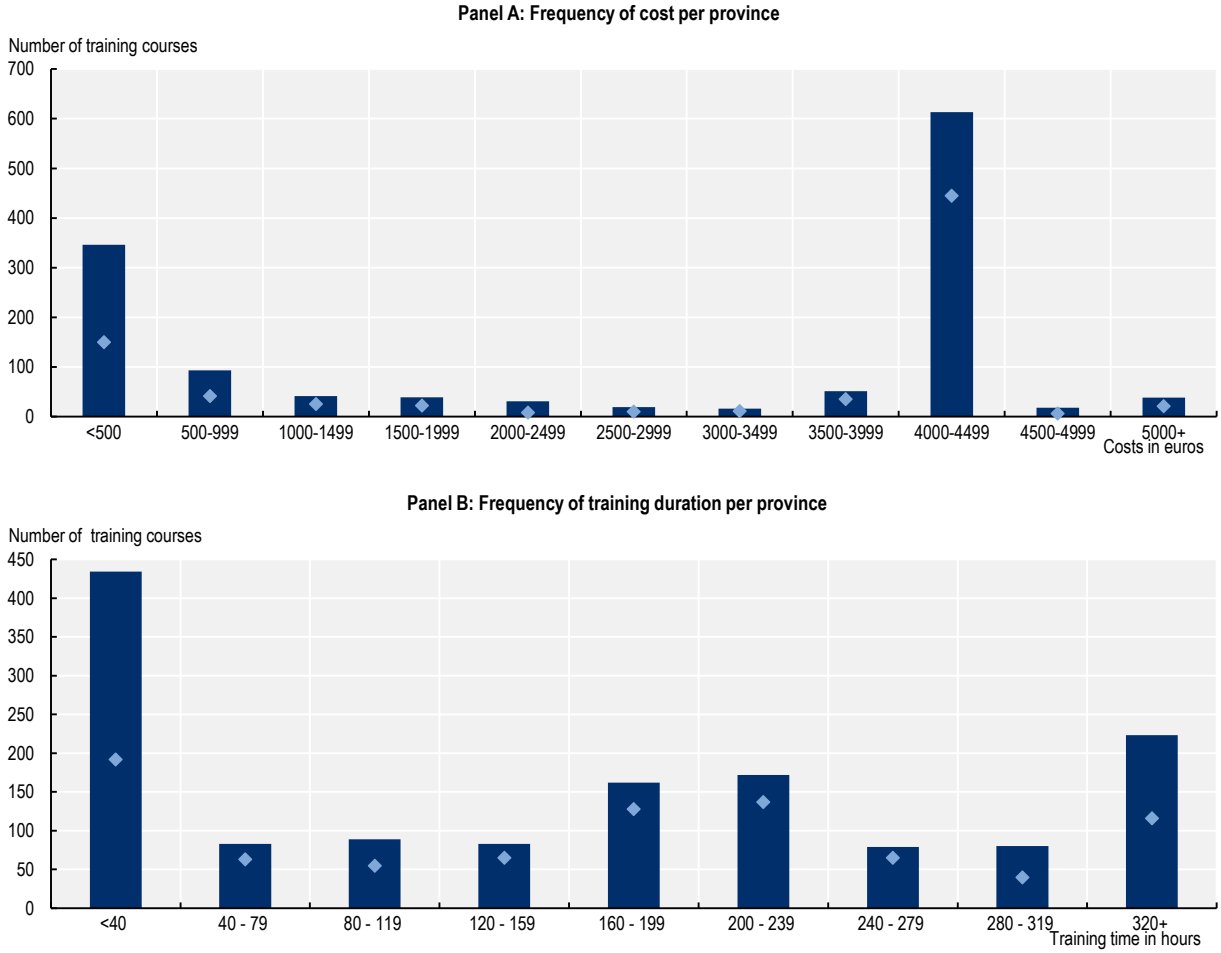
photographer, which has significantly more focus in Perugia than in Terni, and of electrical mechanic and fitter, which has more focus in Terni than in Perugia.

In terms of costs and duration however, there are noticeable differences between the two provinces. There are more relatively cheap courses in Perugia, and more relatively expensive courses in Terni (Figure 2.14, Panel A). 26.5% of courses in Perugia is below EUR 500, while the same is true for 19.4% of courses in Terni. At the same time, 46% of Perugia's courses costs EUR 4 000, compared to 57% of courses in Terni. The share of courses that cost over EUR 5 000, however, is very similar: 2.9% in PG and 2.7% in TR.

For the most part, this is likely due to the differences in course duration for the two provinces, which are presented in Figure 2.14, Panel B. There is a significantly larger percentage of short courses in Perugia, as 30.9% of courses are less than 40 hours. In Terni, only 22.3% of courses has that length. 30.8% of courses in Terni instead has a moderate length in between 160 and 239 hours, which can be said of 23.8% of courses in Perugia. From the previous analysis we know that courses of this length are more likely to be around EUR 4 000, which can explain the difference in costs that was observed. Differences in costs and duration:

At the same time, there is a larger percentage of courses of over 320 hours in Perugia than in Terni, 15.9 versus 13.5%, while the difference in the percentage of the most expensive courses was not that pronounced. That must mean that some of these longest courses in Perugia still do not pass the EUR 5 000 threshold.

Figure 2.14. Frequencies of costs and duration in the two provinces



Source: OECD calculations based on data by ARPAL Umbria.

References

ARPAL Umbria (2022), *Dataset provided to the OECD*. [5]

ERI (2022), *Beautician Salary in Italy*, https://www.erieri.com/salary/job/beautician/italy (accessed on April 2023). [7]

ERI (2022), *Computer Software Engineer Salary in Italy*, https://www.erieri.com/salary/job/computer-software-engineer/italy (accessed on March 2023). [10]

ERI (2022), *Fashion Designer Salary Italy*, https://www.erieri.com/salary/job/fashion-designer/italy (accessed on April 2023). [9]

Giabelli, A. et al. (2022), "WETA: Automatic taxonomy alignment via word embeddings", *Computers in Industry*, Vol. 138, p. 103626, https://doi.org/10.1016/j.compind.2022.103626. [2]

Government of Italy (1990), *Law 4 January 1990 n. 1 (legge 4 gennaio 1990, n. 1)*, https://www.mise.gov.it/images/stories/normativa/legge1_1990-attivita-estetista.pdf. [6]

ILO (2015), *Occupational Safety and Health (OSH) - Italy*, https://www.ilo.org/dyn/legosh/en/f?p=14100:1100:0::NO::P1100_ISO_CODE3,P1100_SUBCODE_CODE,P1100_YEAR:ITA,,2015 (accessed on March 2023). [3]

Istat (2021), *Nomenclatura e classificazione delle Unità Professionali [Nomenclature and Classification of Professional Units]*, https://professioni.istat.it/sistemainformativoprofessioni/cp2011/?db=2021. [1]

OECD (2023), "Average annual wages", *OECD Employment and Labour Market Statistics* (database), https://doi.org/10.1787/data-00571-en (accessed on 13 April 2023). [8]

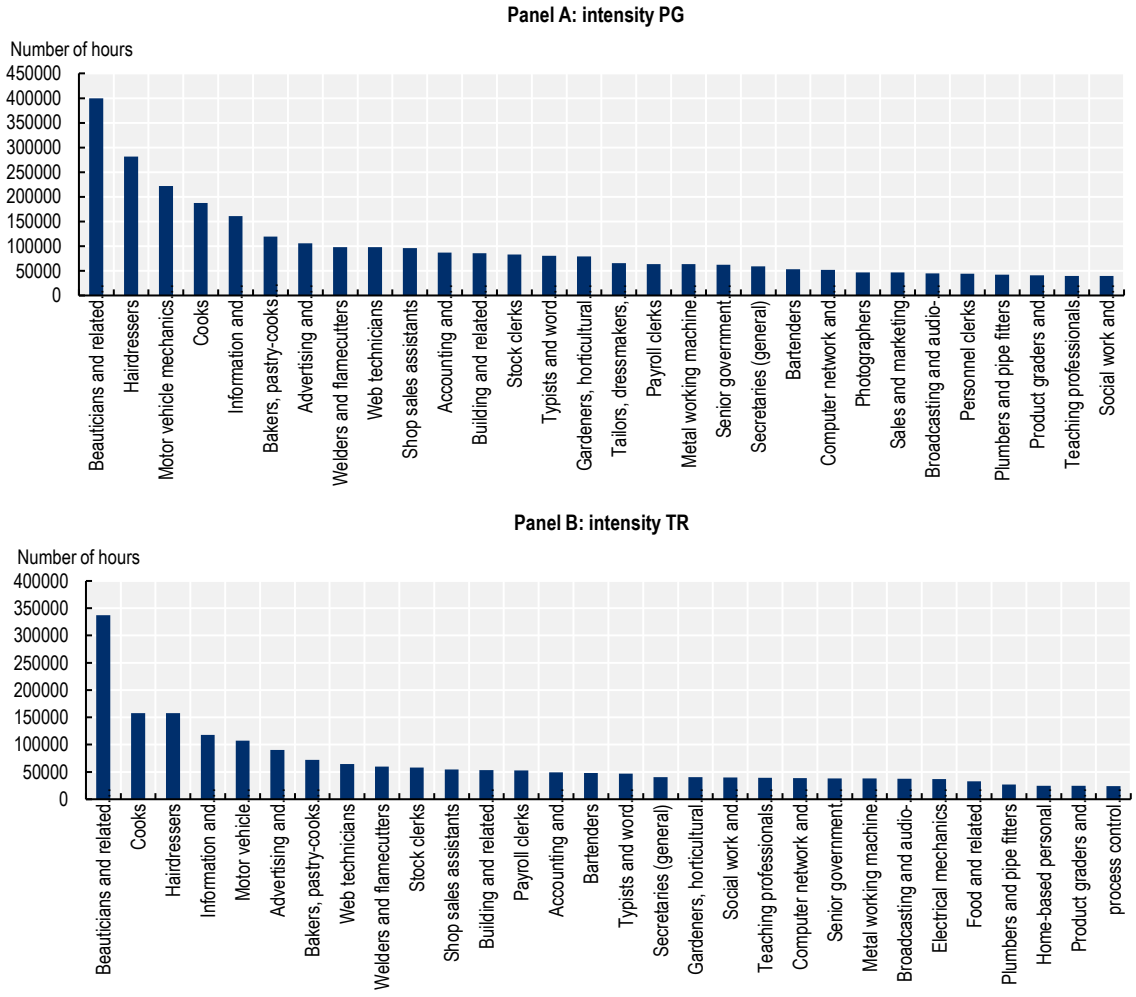
OECD (2019), *TALIS 2018 Results (Volume I): Teachers and School Leaders as Lifelong Learners*, TALIS, OECD Publishing, Paris, https://doi.org/10.1787/1d0bc92a-en. [12]

OECD (2017), *Getting Skills Right: Italy*, Getting Skills Right, OECD Publishing, Paris, https://doi.org/10.1787/9789264278639-en. [4]

OECD (2016), *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools*, PISA, OECD Publishing, Paris, https://doi.org/10.1787/9789264267510-en. [11]

Annex 2.A. Selection of results at the province level

Annex Figure 2.A.1. The top 30 occupations with the highest number of training hours per occupation in Perugia and Terni



Note: PG = Perugia; TR = Terni.
Source: OECD calculations based on a dataset by ARPAL.

Annex Table 2.A.1. Top 30 occupations in Perugia, with their training hours, number of training courses and ranking in both regions

ISCO code	ISCO name	Training hours PG	Training hours TR	Frequency PG	Frequency TR	Training hours rank PG	Training hours rank TR	Frequency rank PG	Frequency rank TR
5142	Beauticians and related workers	399390	337260	55	39	1	1	1	1
5141	Hairdressers	281640	157800	32	28	2	3	4	5
7231	Motor vehicle mechanics and repairers	221750	107300	45	29	3	5	2	3
5120	Cooks	187560	157860	31	29	4	2	6	3
3512	Information and communications technology user support technicians	161130	118005	41	33	5	4	3	2
7512	Bakers, pastry-cooks and confectionery makers	119220	72180	32	19	6	7	4	7
2431	Advertising and marketing professionals	105796	90045	27	24	7	6	7	6
7212	Welders and flamecutters	98220	59880	26	16	8	9	9	10
3514	Web technicians	98175	64425	27	19	9	8	7	7
5223	Shop sales assistants	96270	54630	25	15	10	11	10	11
4311	Accounting and bookkeeping clerks	86745	49170	24	14	11	14	12	14
7411	Building and related electricians	85920	53610	25	15	12	12	10	11
4321	Stock clerks	82935	58290	24	17	13	10	12	9
4131	Typists and word processing operators	80700	46890	21	14	14	16	14	14
6113	Gardeners, horticultural and nursery growers	78855	40176	20	12	15	18	15	17
7531	Tailors, dressmakers, furriers and hatters	65535	24060	17	7	16	31	17	27
4313	Payroll clerks	63750	52725	19	15	17	13	16	11
7223	Metal working machine tool setters and operators	63495	37950	17	10	18	23	17	22
1112	Senior government officials	62340	38040	16	10	19	22	19	22
4120	Secretaries (general)	59325	40530	16	12	20	17	19	17
5132	Bartenders	53505	48150	15	14	21	15	21	14
3513	Computer network and systems technicians	51750	38695	15	10	22	21	21	22
3431	Photographers	46530	20760	13	6	23	36	23	35
1221	Sales and marketing managers	46425	22275	13	7	24	34	23	27
3521	Broadcasting and audio-visual technicians	44700	37740	13	11	25	24	23	20
4416	Personnel clerks	43800	23400	13	7	26	32	23	27
7126	Plumbers and pipe fitters	42330	26670	12	7	27	27	27	27

ISCO code	ISCO name	Training hours PG	Training hours TR	Frequency PG	Frequency TR	Training hours rank PG	Training hours rank TR	Frequency rank PG	Frequency rank TR
7543	Product graders and testers (excluding foods and beverages)	41055	24660	12	7	28	29	27	27
2359	Teaching professionals not elsewhere classified	39840	39210	11	11	29	20	29	20
2635	Social work and counselling professionals	39687	40080	11	12	30	19	29	17

Source: OECD calculations based on a dataset by ARPAL.

Notes

[1] https://www.arpalumbria.it/catalogo-regionale-dellofferta-formativa#

[2] In addition, data show that not all training programmes are classified into an ISTAT occupation. Out of all training courses in the RTC, 64% target a specific occupation. More details are provided throughout the text.

[3] They range between around 313 000 hours to 186 000 hours.

[4] Courses for high skilled occupations represent the 34.9% of the total courses offered, while those for low skilled workers are approximately 20.9% (Figure 2.3). The majority of training opportunities (44.1% of the total) instead targets medium-skill occupations.

[5] Jointly, these four jobs receive 41.4% of all high-skill training hours, showing the attention that the RTC is paying attention to the strengthening of people's digital skills, which are increasingly important due to the impact of digitalisation.

[6] This makes it possible to present them all instead of showing a selection. Showing just the top ten would give the impression that the RTC for example focuses quite many training hours on the position of waiter, as it is tenth on the list. However, this occupation would not make the top 10 in any of the other skill levels, although it is ranked 47th out of all 81 occupations.

[7] It should be noted that, in ISCO, cooks and waiters are combinations of multiple ISTAT occupations. The distinction within ISTAT is made based on where the jobs are being performed. There are separate ISTAT codes for cooks in hotels and restaurants and for cooks who work in shops and fast-food restaurants for example Cuochi in alberghi e ristoranti, Addetti alla preparazione, alla cottura e alla vendita di cibi in fast food, tavole calde, rosticcerie ed esercizi assimilate. The same also holds for waiters, Camerieri di ristorante, Esercenti di ristoranti, fast food, pizzerie ed esercizi assimilati.

[8] This makes it possible for Chapter 3 to look at the relative alignment between the skills taught in the RTC and the skills that are demanded in OJPs.

[9] A list with the top 32 skills is reported instead of a top 30, as the last 7 skills all have the same share.

[10] In this analysis, the number of potential participants for a course is equal to the number of open training spots in that course. This means that the shares in Figure 2.4 do not to add up to 100%, as courses often teach more than one skill, and skills can overlap between different training courses. So, a participant in a course for cooks can for example learn how to operate in the catering sector as well as learn proper hygiene in cleaning the catering workplace, and a participant in a course for waiters could likewise learn hygiene in cleaning the catering workplace. In this example, one person learned how to operate in the catering sector, and 2 people learned how catering workplace hygiene, even though there were only 2 participants in the training courses.

[11] The description in Italian reads as: "Acquisire le conoscenze utili a definire gli aspetti contrattuali della prestazione professionale e a comprendere gli adempimenti necessari al corretto esercizio di un contratto di lavoro autonomo o parasubordinato".

[12] Health and safety in Italy have been discussed in more detail in Chapter 1.

[13] The skill of managing files (gestire file) is potentially another digital skill, but it is not possible to establish that for certain.

[14] The similarity between the RTC skill and the skills into which they are mapped is taken into account to create the new statistics. This is done by weighing the results in Figure 2.5 by the similarity score. For example, directly after mapping the RTC skills to the Lightcast skills, the skill "regulations_safety_firefighting" is taught to 53% of potential participants. The skill "regulations_safety_firefighting" is a match for five different skills in the RTC, including for example work_safety, and "fire_prevention_firefighting_emergency_management", which add up to 53% of potential participants. However, because "regulations_safety_firefighting" is not an exact match for any of these five skills which are described in the language of the RTC, its prevalence is adjusted downwards to 42.5%.

[15] More details can be found in Annex A. Manual investigation of the results led to the correction of a number of cases.

[16] It remains, however, unclear whether the price of some of those courses was aligned to their market value or if, instead, simply aligned to the resources made available the government. Training vouchers are not active anymore and courses are not currently subsidised. The data on the RTC does not, however, allow to track whether discontinuing training vouchers has had any impact on training cost.