SKILLS IN THE ITALIAN LABOUR MARKET[1]

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Abstract. The skills of the workforce play a strategic role in the economic and social progress of a country. In this context, Italy faces a disadvantage compared to other developed countries. Italian workers, in particular, are noted to have lower levels of education and qualification (Istat, 2022). Additionally, Italy performs weakly in international rankings with regard to the share of human capital employed in scientific or technical fields (European HRST indicator; Istat, 2023). There is also an evident challenge in aligning skills supply with demand, leading to a significant proportion of workers being either underqualified or overqualified for their roles.
In this context, the data of the 2022 ad hoc module of the Labour Force Survey conducted by Istat, which focuses on the skills used in their job by individuals, can be analysed. Respondents were asked to indicate, based on their perception, the time allocated to specific activities, serving as a proxy measure for possessing particular skills.
The investigated skills are related to digital activities, reading, calculate, hard physical work, finger dexterity, internal and external communication and training. In addition, the study explores the way work is performed, observing the degree of autonomy in influencing the way work is carried out, as well as the prevalence of repetitive tasks or tasks ruled by rigid procedures.
The proposed contribution aims to analyse data from the module for employed people, using also a multiple correspondence analysis to explore the connections between the main skill-related variables and other employment characteristics.

1 Introduction

In the era of knowledge, the full utilization of qualified skills becomes a central factor in the economic and social development of a country. Monitoring the skills possessed by the workforce and matching supply and demand of skills represent useful indicators to assess the health of the labour market.

On this front, Italy finds itself at a disadvantage compared to other developed countries. Specifically, Italian workers are reported to be less educated (Istat, 2022)

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and less qualified. Besides Italy ranks among the lowest in the international standings for indicator HRST (Human resources in Science & Technology), the proportion of human capital employed in scientific or technical professions – those falling under major groups 2 and 3 of the International Standard Classification of Occupations – ISCO-08 (Istat, 2023).

Furthermore, there is often a mismatch between supply and demand of skills, meaning a significant portion of workers is either under-qualified or over-qualified for the specific skills required in their jobs (Galletti F., Gualdi F., 2017). At the same time on the business front, demand for qualified skills is low, indicating a lack of investment in human capital (Brunello & Wruuck, 2021; OCSE, 2018).

Investing in skill development and aligning supply with demand boosts business productivity and improves individual well-being through better job satisfaction and wages. In addition, a robust skills assessment system is essential for monitoring and enhance the labour market, as outlined in the European Skills Agenda for sustainable competitiveness, social fairness, and resilience (European Commission, 2022).

The debate on this topic includes the 2022 ad hoc module of the Labour Force Survey conducted by Istat, dedicated to skills applied in one's job. This module consists of additional questions beyond the standard part of the survey, aimed at exploring a specific theme and administered simultaneously across all European countries (Istat, 2024).

The objective of this article is to analyse the concentration or absence of specific skills among the employed population in Italy. Data from the labour force survey allow to highlight differences that emerge across key socio-demographic variables such as gender, educational attainment, citizenship, as well as variables closely related to work such as occupation.

2. Data and methods

The ad hoc module on *Job skills* was included in the Labour Force Survey conducted in 2022. It was administered to persons aged 16 to 74 years old, whether employed or not employed for less than two years. Participants were asked to indicate the time spent on a series of activities, referring to their usual situation in their main job.

Specifically, it involves information on the amount of time spent using digital tools, reading technical documents, performing complex calculations, doing physically demanding activities or tasks requiring dexterity and precision, participating in communicative and training-related interactions, and aspects defining the work approach such as autonomy level, task repetitiveness and standardization of tasks (follow strictly defined procedures).

The measurement of time spent on performing a specific activity has been used as a proxy for a specific skill. The ability to perform certain activities has therefore been observed from the perspective of output, or what is actually practiced in the course of one's work.

The skills addressed in the module are categorized into thematic areas or domains. For instance, reading and calculation skills fall under the broader area of cognitive abilities, which are processes through which an individual registers, retains, retrieves, and uses information. Similarly, physical strength and dexterity fall under the domain of manual skills, highlighting abilities related to physical tasks and precise coordination of movements (Table 1).

For all questions in the module, respondents' perceptions were captured, meaning they chose the response option they considered most appropriate, using a five-point scale[2]. The degree of usage was then grouped into three levels: high, low, and absent[3]. Each skill can be practiced either synchronously or asynchronously with respect to another.

The analysis of skills, focusing on employed persons, examines both socio-demographic characteristics (age, gender, educational attainment, citizenship) and the occupation performed, using the Classification of Occupations (CP2011)[4].

Following an initial descriptive analysis, the study further explores the relationships between the modes of the main variables using Multiple Correspondence Analysis (MCA). Finally, the findings concerning the Italian context are compared with those of other European countries.

[2] Specifically, for all questions asking "How much time did you spend doing ...?", the response options were: a) all or most of the work time; b) half of the work time or slightly more ; c) some of the work time; d) little of work time; e) none of the work time. For questions asking "To what extent can you...?", the response options were: a) to a very large extent; b) to a large extent; c) to some extent; d) to little extent; e) no extent.

[3] The "high" level groups together the responses: a) all or most of the work time and b) half of the work time or slightly more, as well as the responses: a) to a very large extent and b) to a large extent.
The "low" level groups together the responses: c) some of the work time and d) little of work time, as well as the responses: c) to some extent and d) to little extent.
The "absent" level corresponds to the response: e) none of the work time or e) no extent.

[4] The Istat Classification of Occupations (CP), which is linked to the International Classification of Occupations ISCO-08, is the tool for classifying labour market occupations into specific occupational groupings, which is useful for the communication, dissemination and integration of statistical and administrative data on occupations, while ensuring comparability at international level. In this work, focused on the year 2022, the CP2011 Classification of Occupation is used. Since 2023, Istat has adopted the CP2021, the result of a revision of the previous version (CP2011) and further alignment with ISCO-08.

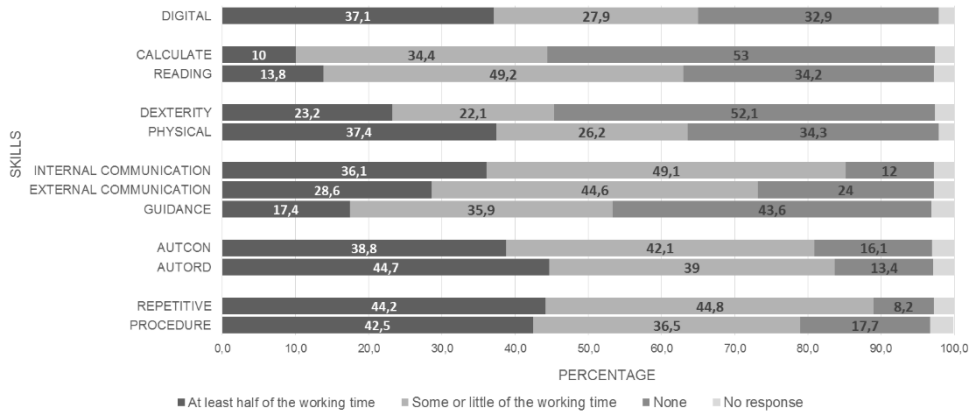
Table 1 - *The professional skills of the employed*

DIGITAL SKILLS	
DIGITAL	time spent on working on digital devices, i.e. use of digital technologies: computer, tablet, phablet or smartphone.
COGNITIVE SKILLS	
READING	time spent on reading work-related manuals and technical documents, i.e. documents that require specific skills or knowledge to be understood (technical complaints, acts, contracts, technical guidelines, etc).
CALCULATE	time spent on doing relatively complex calculations in main or last job, i.e. manipulation and transformation of numeric information.
MANUAL SKILLS	
PHYSICAL	time spent on doing hard physical work, i.e. manual tasks that primarily require energy and strength or intense muscular power.
DEXTERITY	time spent on tasks involving finger dexterity, i.e. ability to make precisely coordinated movements that implies a certain extent of accuracy (coordination of small muscles, synchronization of hands and fingers, with the eyes
SOCIAL SKILLS	
INTERNAL COMMUNICATION	time spent on interacting with people from the same enterprise or organization, i.e. verbal communication, situation where two or more people communicate with each other simultaneously.
EXTERNAL COMMUNICATION	time spent on interacting with people from outside the enterprise or organisation i.e. verbal communication, situation where two or more people communicate with each other simultaneously.
GUIDANCE	time spent on advising, training or teaching other people in formal and informal setting and on any topic, situation where two or more people communicate with each other simultaneously
AUTONOMY SKILLS	
AUTCON	degree of autonomy in influencing the contents of the job, i.e. how far the respondent can influence the way work is carried out in choosing contents.
AUTORD	degree of autonomy in influencing the order of the tasks, i.e. how far the respondent can influence the way work is carried out in term of sequence of work tasks.
MANAGEMENT SKILLS	
REPETITIVE	repetitiveness of tasks, i.e. this respondent implements similar tasks in the same way (work task that is implemented frequently without any variation/change/adaptation).
PROCEDURE	tasks precisely described by strict procedures; it provides a measure of standardization of tasks in different types of jobs (strict procedures are intended as rules specifying the timing and order of actions, the method to be used to perform a task and the use and communication of its results).

3. Skills and socio-demographic characteristics of the employed

Regarding digital skills, it emerges that 37.1% of employed persons use digital devices for at least half of their work time, while 32.9% never use such devices (Figure 1[5]). Those most likely to extensively use digital tools for work are persons aged 30-44 while the 15-29 age group has the highest percentage of those who do not use this ability (36.5%). Besides, the percentage of women using digital skills for at least half of their working time is significantly higher than that of men (42.1%, compared to 33.4%).

Figure 1- *Employed persons by time spent on different skills in their job. Year 2022 (age group 15-74, percentage of total employment).*



Source: Istat, Labour Force Survey

Cognitive skills in reading and calculate are used for more than half of the work time by one in five employed, with no significant differences by gender or age. Among the various age groups, adults aged 30 to 44 are the most likely to use reading and calculate skills, with 14.5% and 11.5%, respectively, spending at least half of their working time on these tasks. In contrast, these skills are less used by younger (16-29 years) and those over 60. About 39% of younger workers and nearly 37% of those aged 60 and over do not use reading at work, while around 56% of both age groups do not use calculate.

Manual skills are assessed based on intensity (physical) and precision (dexterity). Regarding physical, 37.4% of employed persons use this skill for half or more of their work time; while dexterity is applied by 23.2%. These skills are more

[5] For further details, see also https://www.istat.it/wp-content/uploads/2024/06/Stat_Focus_Competenze-professionali.pdf

prevalent among men: 41.6% spend at least half of their work time on physically demanding tasks (compared to 31.6% of women); and 25.3% are engaged in jobs requiring finger dexterity (compared to 20.2% of women). While no significant variations can be found analysing data by age groups. Employed persons who devote at least half of their time to activities requiring relational skills account for 47.9%. Regarding verbal interactions with colleagues within the same organization, about 36% of workers use this skill for most of their work time, nearly half have a low level of use, and only 12% do not use it at all. Communications with external parties are generally less common: among all employed, 28.6% is frequently engage in verbal exchanges with people from outside the enterprise, while 24.0% never do.

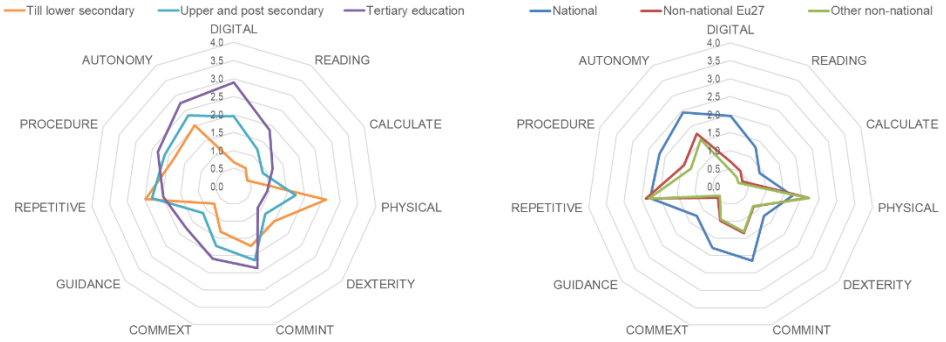
Training, teaching, and providing advice (both formally and informally) are activities performed by over half of employed, but only 17.4% do these activities frequently during their work time; 43.6% never do them.

The two dimensions of autonomy – one concerning the sequence of tasks and the other regarding freedom in defining contents – appear closely associated, although the former is generally more prevalent. 44.7% of employed have significant influence over the order of tasks they perform within their job, while 38.8% have significant influence over contents. Both components increase with age: 28.9% of persons aged 15-29 have a high degree of autonomy in deciding the order of tasks, and 24.7% in defining content, with a notable increase to 43.7% and 37.4%, respectively, for those aged 30-44. This further rises to 48.0% and 41.6% for persons aged 45-59, and reaches 54.2% and 49.1% for those aged 60 and above.

Regarding aspects related to work management, the study examines the repetitiveness of tasks and the frequency of activities that require adherence to procedures. Specifically, 44.2% of employed persons indicate performing repetitive tasks for half or more of their work time, with a higher proportion among women (47.1% versus 42.1% among men). Additionally, 42.5% of employed persons report frequently following standardized procedures.

Relevant differences are found when analysing the data by levels of education and citizenship. In particular, as Figure 2 shows, a strong link can be observed between the level of education attained and the average intensity of using/applying a given skill. The higher the level of education, the more time is spent using digital devices, reading or performing complex calculations, engaging in autonomous tasks, executing protocols with responsibility, conducting training or communication activities, while less time is spent on repetitive tasks or those requiring precise finger movements or intense physical work. Similarly, foreign workers have significantly lower scores compared to Italians across all dimensions - without appreciable variations between Eu27 and non-Eu citizens - except for physically demanding activities and the degree of task repetitiveness, where they surpass them.

Figure 2 - *Employed persons by time spent on different activities in their job by citizenship and by level of education. Year 2022 (mean score).*



Source: Istat, Labour Force Survey

4. A multivariate analysis

Multiple Correspondence Analysis (MCA) was conducted to investigate the associations between the modes of the main variables related to skills and those concerning the key characteristics of the employed. In particular, the analysis focused on the level of use of cognitive skills (synthesis of reading and calculate), physical skills, dexterity, social skills (synthesis of internal and external communication), digital skills and training. Variables related to the frequency of procedural application, task repetitiveness, and degree of autonomy were also included. For all listed skills, modes were categorized into three levels: absent, low, and high. Other considered characteristics included age, sex, education level, citizenship, employment status (employee/self-employed), and occupation at the first digit level (see Appendix for details).

The first two dimensions explain a variance of 89.5%, with the first dimension explaining 76.5% and the second dimension explaining 13%.

The horizontal axis discriminates between advanced intellectual/digital skills (on the left) and manual/unskilled abilities (on the right). Well-represented on this axis are the modes related to digital, cognitive, and manual (as well as social) skills in the high and absent categories, and educational attainment ranging from a university degree to lower secondary education (Figure 3).

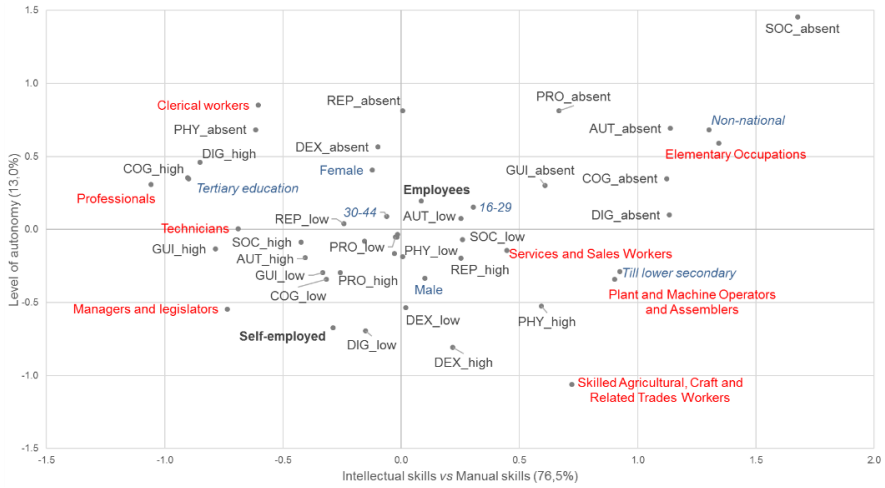
The vertical axis is primarily characterized by modes related to employment status, particularly self-employment, as well as modes of physical (high/absent) and dexterity (high/absent) skills, and occupational categories such as artisans and clerical workers. It identifies the dichotomy between work autonomy (upper part)

and non-autonomy (lower part), specifically represented by clerical workers on one side and artisans on the other, in their more detailed versions.

In the first quadrant, we find individuals with absent digital and cognitive skills, lack of autonomy, non-national, and unskilled professions such as ushers, warehouse workers, and domestic workers, also characterized by absence of social interaction.

The second quadrant identifies profiles with high levels of digital and cognitive skills, while physical and dexterity skills are absent, with low or absent repetitiveness. In this quadrant, we find professionals (such as science, engineering and information and communications technology professionals, teachers, legal, social and cultural professionals and business and administration professionals) and clerical workers. Technicians (such as science and health associate professionals, information and communications technicians, business and administration associate professionals) are positioned on the x-axis, predominantly on the left side. Clerical workers spend more time using digital equipment, but are also those who need to perform complex calculations during their work, along with legislators, managers and entrepreneurs.

Figure 3 - *Multiple Correspondence Analysis.*



Source: Istat, Labour Force Survey

The third quadrant is characterized by managers and legislators and also by self-employment, with profiles defined by high autonomy, strong communication skills, both internal and external, low levels of use of cognitive and digital skills, though not absent.

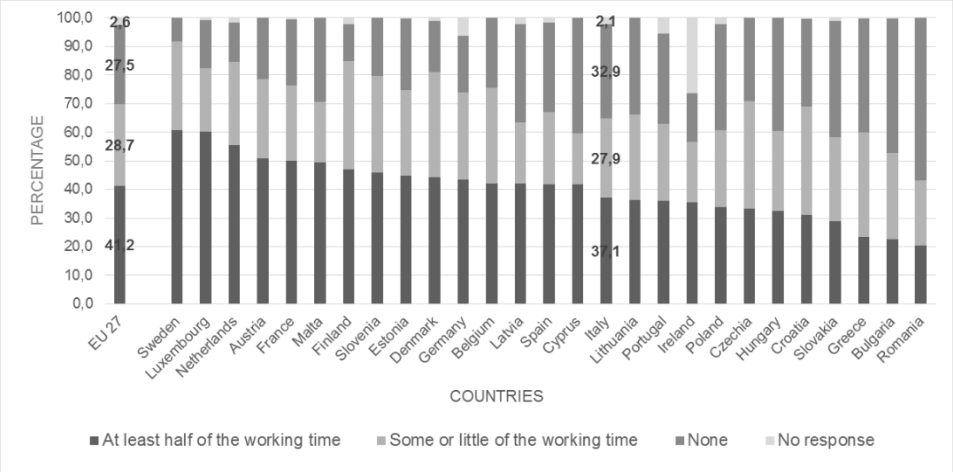
The fourth quadrant defines the professional profiles of skilled agricultural, craft and related trades workers, associated with high levels of dexterity and physical

strength, such as handicraft and printing workers, precision-instrument makers and repairers, musical instrument makers and tuners, jewellery and precious metal workers, food, processing, woodworking, garment, leather and other craft and related trades workers. It also includes services and sales workers (shop salespersons, personal care workers in health services) and plant and machine operators and assemblers with lower education levels (up to lower secondary education) and characterized by a high degree of task repetitiveness.

5. Digital, cognitive and manual skills: Italy in the European scenario

The Job Skills module, harmonised among European countries, allows for data comparison enabling to observe Italy's ranking in relation to the Eu average and other countries. In 2022, 41.2% of employed persons in the Eu27 aged 15-74 reported using digital devices for at least half of their working time and nearly 30% for the entirety or most of their working time (Figure 4).

Figure 4 - *Employed persons by working time spent on using digital devices in Eu27. Year 2022 (age group 15-74, percentage of total employment).*



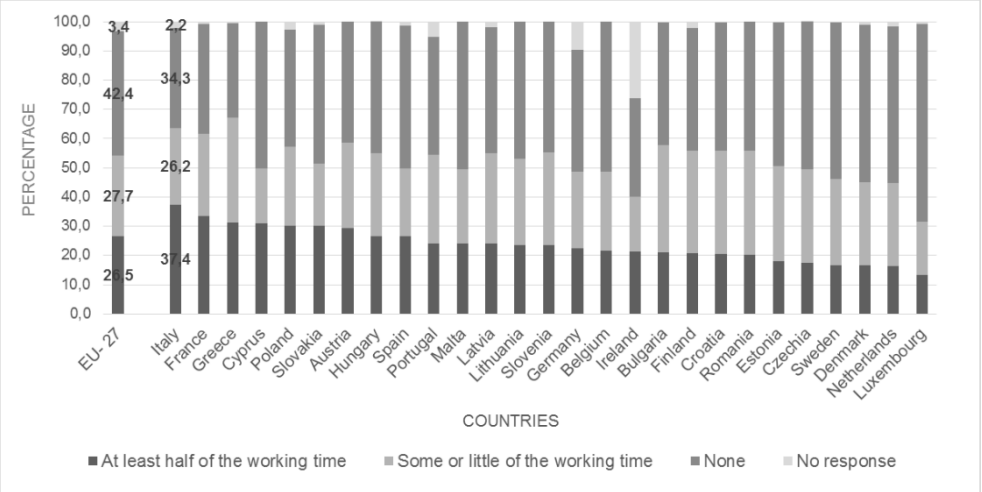
Source: Eurostat (ad hoc extraction 2022 Eu-LFS module)

With 37.1%, Italy had a share similar of the Eu27 of employed persons aged 15-74 who reported using digital devices for at least half of their working time. At country level, Sweden and Luxembourg had the highest share with 60% of employed persons who spent all or at least half of their working time using digital devices. Conversely, Greece, Bulgaria, and Romania had the lowest rates.

However, in Italy, approximately one third of the employed do not use digital devices (32.9%), higher than the European average of 27.5%.

Referring to the cognitive skills, within the Eu, one in ten employed persons aged 15-74 dedicated more than half of their working time to performing relatively complex calculations and approximately three out of twenty employed dedicated more than half of their working time reading work-related documents. The highest percentages for both measures were recorded in Austria, France, Luxembourg, Latvia and Malta. Italy is very close to the European average both for calculation and for reading. In addition, for many European countries, there is a strong positive correlation between the percentage of employed persons who spend more than half of their working time reading documents and the percentage of those engaged in complex calculations.

Figure 5 - *Employed persons by working time spent on doing hard physical work in Eu27. Year 2022 (age group 15-74, percentage of total employment).*



Source: Eurostat (ad hoc extraction 2022 Eu-LFS module)

Regarding the physical skills, nearly one fourth of employed persons in the Eu aged 15-74 reported doing hard physical work for the entirety or at least half of their working time. With 37.4%, Italy had the highest share of employed people aged 15-74 in the Eu who spent all or at least half of their working time doing hard physical tasks, followed by the France and Greece and Cyprus, with percentages also exceeding 30% (Figure 5). In contrast, in the same situation were less than one in seven of their counterparts in Luxembourg (13.3%), followed by the Netherlands (16.4%), and Denmark (16.7%).

Also for dexterity skills, Italy has a higher percentage of employed persons who use them for the majority of their time compared to the Eu, which stands at 16.8%; Italy has 23.2%, placing second after Slovenia.

6. Conclusions

The 2022 ad hoc module provided a comprehensive overview of the skills applied in the Italian labour market and facilitated a comparison between the Italian and European situations.

Italy ranks among the lowest in Europe for the use of digital skills, which is a significant concern in an increasingly digital world. Conversely, Italy stands out for its high use of physical skills, and also dexterity, characteristic of craft professions. This highlights a distinctive aspect of the Italian labour market, which remains deeply rooted in traditional craftsmanship.

Italy experiences high levels of skill mismatch compared to other European countries. Many Italian employed are in jobs that do not align with their educational qualifications, leading to underutilization of their skills. This mismatch is particularly pronounced in Italy's productive system, which is predominantly composed of small, family-run businesses with limited propensity to invest in research and development. Consequently, the relatively few graduates in Italy often have difficulty finding suitable employment that matches their qualifications.

In summary, Italy faces major challenges in aligning its workforce skills with the demands of the modern labour market. Addressing the digital skills deficit and reducing the high levels of skill mismatch are crucial steps for Italy to enhance its productivity and competitiveness. By fostering a culture of continuous learning and encouraging investment in research and development, Italy can better leverage its rich heritage of craftsmanship while also embracing the digital future.

Appendix

Multiple Correspondence Analysis: partial contributions to inertia for the column points.

Variables	Modes	Dim1	Dim2
DIGITAL	DIG_absent	0.1060	0.0014
	DIG_high	0.0699	0.0363
	DIG_low	0.0017	0.0649
COGNITIVE	COG_absent	0.0958	0.0163
	COG_high	0.0402	0.0110
	COG_low	0.0129	0.0265
PHYSICAL	PHY_absent	0.0345	0.0756
	PHY_high	0.0330	0.0460
	PHY_low	0.0000	0.0043
DEXTERITY	DEX_absent	0.0014	0.0783
	DEX_high	0.0027	0.0666
	DEX_low	0.0000	0.0299
PROCEDURE	PRO_absent	0.0206	0.0545
	PRO_high	0.0074	0.0170
	PRO_low	0.0001	0.0005
AUTONOMY	AUT_absent	0.0339	0.0224
	AUT_high	0.0218	0.0087
	AUT_low	0.0061	0.0010
REPETITIVE	REP_absent	0.0000	0.0251
	REP_high	0.0072	0.0078
	REP_low	0.0070	0.0004
SOCIAL	SOC_absent	0.0366	0.0490
	SOC_high	0.0222	0.0017
	SOC_low	0.0079	0.0010
GUIDANCE	GUI_absent	0.0416	0.0184
	GUI_high	0.0292	0.0015
	GUI_low	0.0104	0.0145

Variables	Modes	Dim1	Dim2
EDUCATION	Upper and post secondary	0.0000	0.0002
	Till lower secondary	0.0579	0.0100
	Tertiary education	0.0546	0.0146
EMPL. STATUS	Employees	0.0014	0.0135
	Self-employed	0.0048	0.0462
OCCUPATION	Managers and legislators	0.0043	0.0042
	Professionals	0.0469	0.0070
	Technicians	0.0207	0.0000
	Clerical workers	0.0116	0.0408
	Services and Sales Workers	0.0097	0.0018
	Skilled Agricultural, Craft and Related Trades Workers	0.0184	0.0707
	Plant and Machine Operators and Assemblers	0.0156	0.0040
	Elementary Occupations	0.0467	0.0160
CITIZENSHIP	National	0.0054	0.0027
	Non-national	0.0458	0.0223
SEX	Female	0.0017	0.0337
	Male	0.0014	0.0276
AGE	16-29	0.0024	0.0011
	30-44	0.0003	0.0011
	45-59	0.0000	0.0006
	60 and over	0.0000	0.0015

References

BRUNELLO G., WRUUCK P. 2021. Skill shortages and skill mismatch: a review of the literature, *J Econ Surv.* 2021, Vol. 35, pp. 1145–1167.

EUROPEAN COMMISSION. 2022. *European Skills Agenda for sustainable competitiveness, social fairness and resilience*. European Skills Agenda - Employment, Social Affairs & Inclusion - European Commission (europa.eu)

GALLETTI F., GUALDI F. 2017. *Skills Mismatch in Italia. Analisi e scelte di policy in uno scenario in rapida evoluzione*. Milano: Action Institute.

ISTAT. 2024. *Le competenze professionali nel mercato del lavoro italiano. Anno 2022. Statistica focus*.

ISTAT. 2023. *Rapporto Annuale 2023. La situazione del paese*, Roma.

ISTAT. 2022. *Livelli di Istruzione e ritorni occupazionali. Anno 2021, Statistiche Report*.

OECD. 2018. *OECD Skills Strategy Diagnostic* Report: Italy 2017, OECD Skills Studies, Paris: OECD Publishing.

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