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José María Pino Suárez 400-2 esq a Lerdo de Tejada. Toluca, Estado de México. 7223898475
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TÍTULO: Acceso, uso y aprendizaje con tecnologías digitales. Una comparación entre Italia y los demás países de la OCDE del área mediterránea.

AUTOR:

1. PhD. Agostino Sorbara.

RESUMEN: El estudio compara el acceso y uso de tecnologías digitales entre Italia y otros países de la OCDE pertenecientes al área mediterránea, tanto en entornos educativos como en contextos laborales, investigando también las oportunidades que ofrecen las tecnologías digitales para el desarrollo del aprendizaje en diversos contextos (formal, no formal, informal), la integración de tecnologías digitales en el aula, y el uso de la educación abierta, en particular a través de cursos MOOC. Este artículo se basa en una investigación teórica y una investigación documental, y los datos para la elaboración de este estudio fueron extrapolados de las bases de datos, encuesta y cuestionario.

PALABRAS CLAVES: OCDE, TIC, tecnologías digitales, educación digital, área mediterránea.

TITLE: Access, use and learning with digital technologies. A comparison between Italy and the other OECD countries of the Mediterranean area.

AUTHOR:

1. PhD. Agostino Sorbara.

ABSTRACT: The study compares the access and use of digital technologies between Italy and other OECD countries belonging to the Mediterranean area, both in educational environments and in work contexts, also investigating the opportunities offered by digital technologies for development of learning in various contexts (formal, non-formal, informal), the integration of digital technologies in the classroom, and the use of open education in particular through MOOCs courses. This paper is based on theoretical research and documental research. The data for the preparation of this study were extrapolated from the databases, survey, and questionnaire.

KEY WORDS: OECD, ICT, digital technologies, digital education, Mediterranean area.

INTRODUCTION.

Digitization, globalization, and demographic transformations have profoundly changed the job market; it is fundamental to face the low growth of productivity and wages. In Italy, more and more companies are relocating to the countries of Eastern Europe and Asia.

The OECD employment strategy provides useful recommendation to help member countries address these challenges. It goes beyond the amount of jobs and considers the quality and inclusiveness of work as strategic priorities, emphasizing the attention of resilience and adaptability to good economic performance and the job market in an evolving world.

With the introduction of new technologies in the job market, the skills of workers must also be readjusted, just as new technologies can improve learning opportunities, they can also represent a risk.

Internet, video, and app have facilitated access to knowledge and changed the way people learn. Open Educational Resources (OER) can be used in teaching and research. These activities can help people use their knowledge to learn informally throughout life (lifelong learning).

Given that technology (Smartphone, tablet, computer, etc.) is present in workplaces, in the classroom, and in everyday life, then it is important to understand how technology changes the way people learn, and how it can benefit people to develop the digital skills and complementary skills they need.

DEVELOPMENT.

Aim of the study.

The study compares the use, access and learning with digital technologies in the OECD countries of the Mediterranean area, and in the OECD partner countries of the Mediterranean area. With regards to learning, this study also examines the issues related to formal, non-formal and informal learning, and which perspectives for work activity. An investigation is carried out on the use of digital technologies in work contexts.

The research objectives of this study are:

- The access and use of computers in schools.
- The intensity of the use of Information and Communication Technologies (ICT) during work.
- Type activity through the use of Information and Communication Technologies (ICT) in the lessons by Italians teachers.
- To what extent teachers need training to acquire skills for the use of Information and Communication Technologies (ICT) in teaching.
- How teachers performed their training activities to acquire digital skills.
- The risks for workers deriving from the little use of Information and Communication Technologies (ICT).

Research methodology.

The research is mainly based on two research methods:

- Theoretical research.

- Documental research.

The theoretical research was necessary for the preparation of the 2019 digital skills questionnaire.

The 2019 digital skills questionnaire for teachers was prepared following a theoretical line with a substantially deductive, sequential and thematic approach. It is divided into two parts:

- The first part where general and contextual information is collected, and the data is qualitative.
- The second part where the data are quantitative and specific.

The questionnaire was administered in 2019 to a group of Italians teachers belonging to each school order.

Research documental aims to extract data from the databases. At this stage, the study was conducted using a quantitative approach. The quantitative approach is fundamental as it allows us to compare the survey elements of the various countries and formulate statistics. The archive data comes from the OECD-PISA 2015 database, the OECD- PIAAC 2015 database, the TALIS 2013 database, the TALIS 2018 database and the 2019 digital skills questionnaire.

1. Data collection and analysis.

The OECD countries of the Mediterranean area.

There are seven OECD countries in the Mediterranean area, France with about 68.3 million inhabitants, Greece with about 10.7 million inhabitants, Israel with about 8.3 million inhabitants, Italy with about 60.3 million inhabitants, Slovenia with about 2.1 million inhabitants, Spain with about 47.2 million inhabitants and Turkey with about 82 million inhabitants. Altogether these countries reach a population of about 279 million inhabitants, compared to a total population of the Mediterranean area of about 452 million inhabitants, and represent 62% of the population of this area. With the other eight OECD partner countries in the Mediterranean area, Albania with 2.9 million inhabitants, Algeria with 42 million inhabitants, Croatia with 4.1 million inhabitants, Cyprus with 1.1

million inhabitants, Lebanon with 4.2 million inhabitants, Malta with 0.5 million inhabitants, Montenegro with 0.6 million inhabitants and Tunisia with 11.5 million inhabitants, the total population is 346 million inhabitants, equal to 77% of the population of the Mediterranean area.

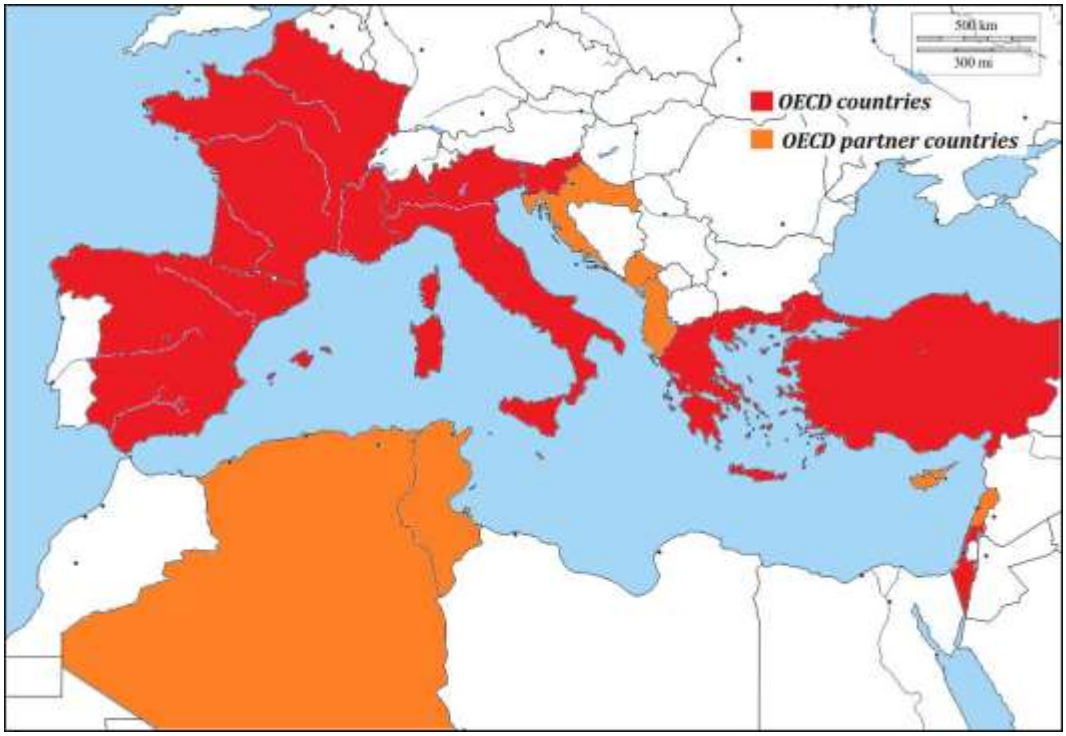

Figure 1 - OECD countries and OECD partner countries in the Mediterranean area.

Access and use of computers in schools.

Digital tools have been widely introduced in schools (computers, IBW, tablets, etc.). In 2015, in the OECD countries of the Mediterranean area, students who had access computers for learning during lessons were around 85%, while 64% used them. The students who had the most access were those of Greece with 96% of students, followed by Spain with 88% of students, then France and Israel with 84%, Italy with 83%, and finally, Slovenia with 66% of students that had access to computers. As for the use of computers for teaching during lessons, the country that mostly used it was Greece with 75% of students, followed by France with 68%, then Spain 62%, Italy 61%, Israel 60%, and Slovenia 56%.

Italy with 83% of students who had access to computer was positioned slightly below the average (85%) of the OECD countries of the Mediterranean area. With regard to the use of computer, the average number of students in the Mediterranean area was 64.3%, and Italians students, even in this case, had a slightly lower value than the average (61%).

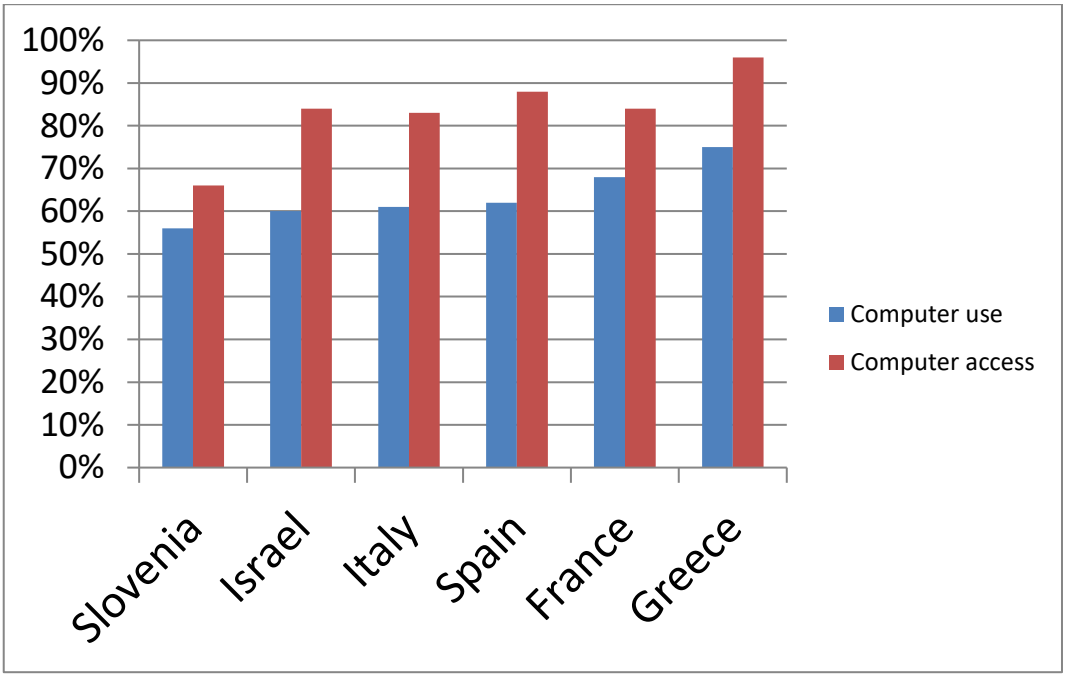

Figure 2 - Computer use and Computer access in OECD countries - Data source: OECD-PISA 2015 database.

While the number of student computers for teaching activities during the lessons in the OECD countries of the Mediterranean area was on average 0.51 computers per student, while in the OECD partner countries of the Mediterranean area, it was 0.14 computers per student, while the average of all OECD countries was 0.77 computers per student. The OECD country of the Mediterranean area with the largest number of computers available per student was France with 0.81 computers per student, followed by Spain with 0.74, then in descending order, Slovenia with 0.59, Italy with 0.50, Israel with 0.43, Greece with 0.25 and Turkey with 0.16. Among the OECD partner countries of the Mediterranean area, the country that had the largest number of computers available per student was

Cyprus with 0.68 computers per student, followed by Malta with 0.56 computers per student, then Croatia with 0.31 computers per student, Montenegro with 0.20, Tunisia 0.16, Albania 0.15, and Algeria with 0.10.

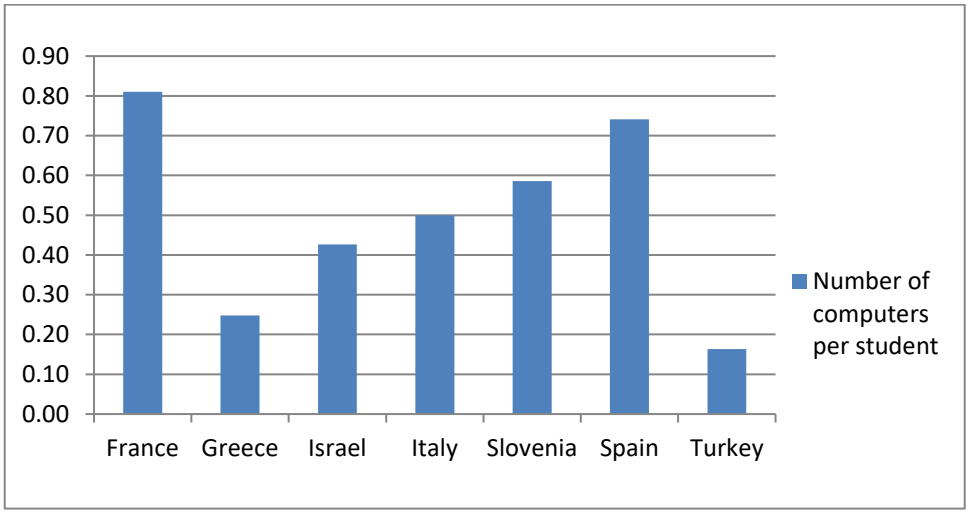

Figure 3 - Number of computers per student in OECD countries of the Mediterranean area. Data source: OECD-PISA 2015 database.

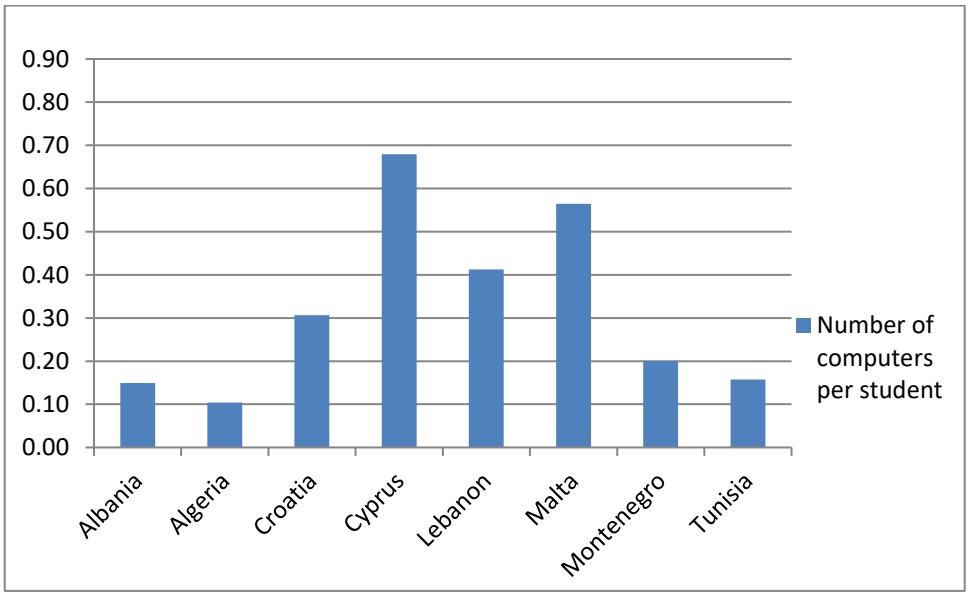

Figure 4 - Number of computers per student in OECD countries partner of the Mediterranean area. Data source: OECD-PISA 2015 database.

On average in the OECD countries in the Mediterranean area, 94.6% of computers were connected to the Internet, while in OECD partner countries in the Mediterranean area the average was 68.6%. The OECD country of the Mediterranean area that had the highest percentage of computers connected to the internet was Slovenia with 99.3%, followed by Spain with 98.8%, then Greece with 98.1%, France with 97.7%, Italy with 95.8%, Turkey 89.3% and Israel with 85.4%. Among the OECD partner countries of the Mediterranean area, the country that had the highest percentage of computers connected to the internet was Malta with 100% of computers connected to the internet, followed by Croatia with 97.5%, Cyprus with 94.3%, Montenegro with 87.3%, Algeria with 66.8%, Tunisia with 66.3%, Albania with 65.7%, and finally Lebanon with 53.8%.

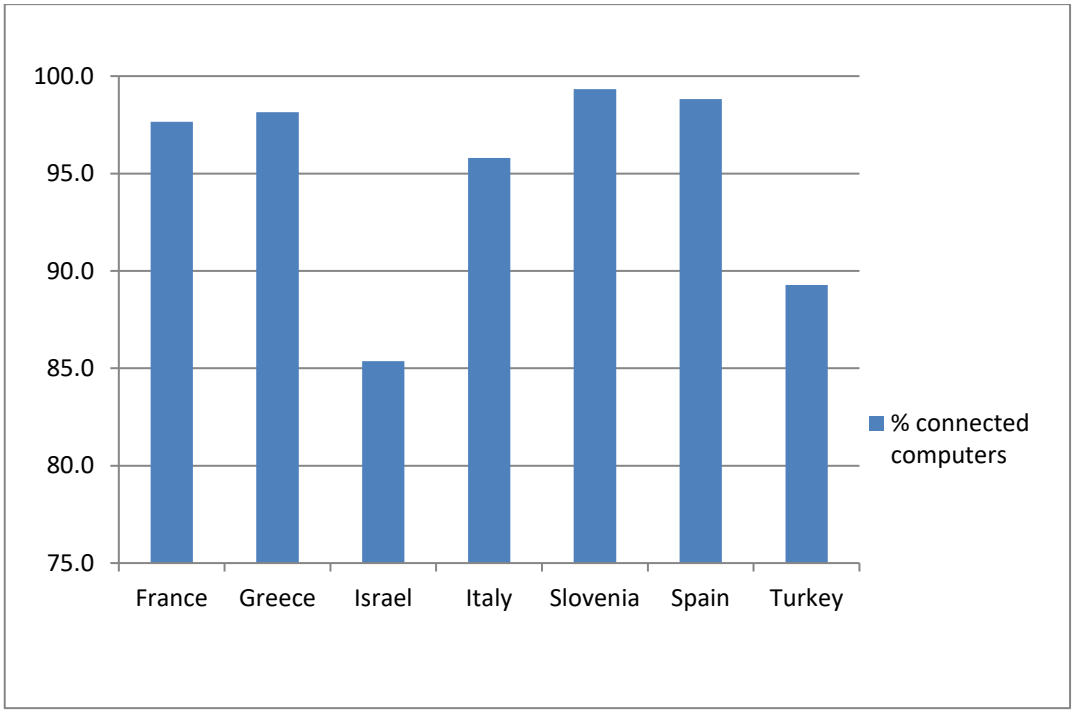

Figure 5 - Percentage of computers connected to the Internet in OECD countries of the Mediterranean area. Data source: OECD-PISA 2015 database.

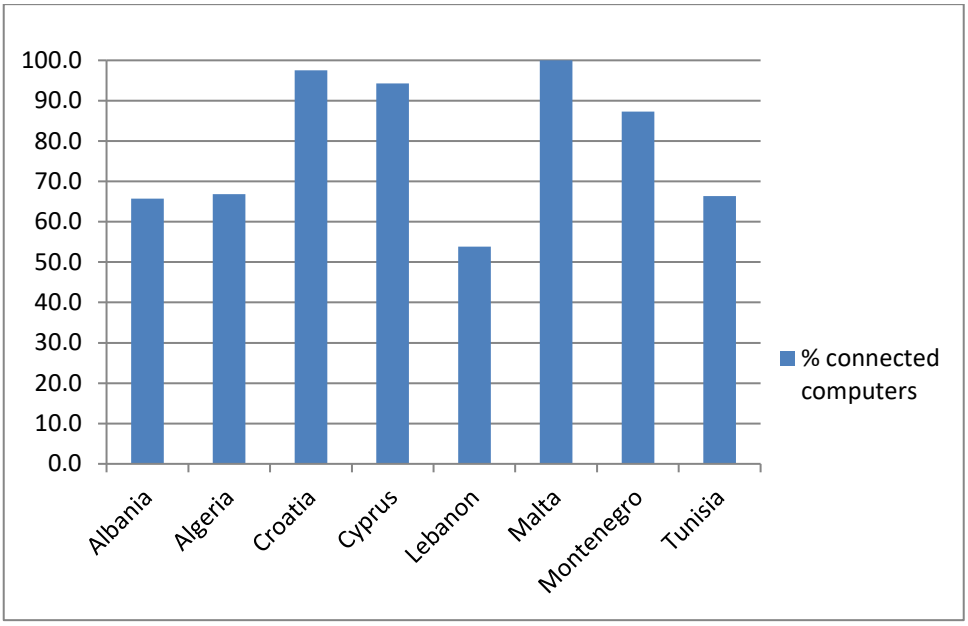

Figure 6 - Percentage of computers connected to the Internet in OECD countries partner of the Mediterranean area - Data source: OECD-PISA 2015 database.

Regarding access to digital technologies due to the economic status of students in the OECD countries of the Mediterranean area, there are no significant differences as can be seen from figure 7.

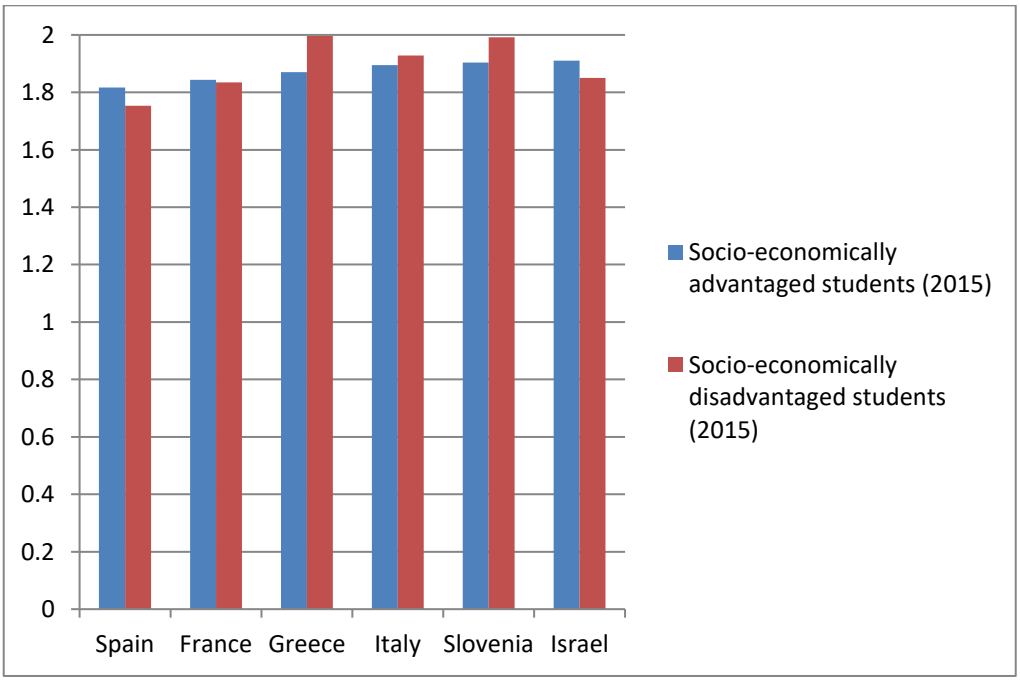

Figure 7 - Status socio-economically of students - Data source: OECD-PISA 2015 database.

Intensity at work of the ICT.

Digital transformation affects many workers in the OECD countries of the Mediterranean area. Digital technologies are profoundly changing the organization of the production system, more and more people will have to work using technology. Advances in Artificial Intelligence (AI) and in particular deep learning generate the possibility of automating much of the production process by creating "intelligent" machines that "work", "learn" and "react" like humans. The new Information and Communication Technologies (ICT) can replace many workers in routine tasks that are easy to automate and integrate workers into tasks that require problem solving. Workers in the "digital society" must be able to readjust. Workers will be facilitated for the transition to digitized work if they carry out continuous training, if they have a solid foundation in digital technologies, and if they have good coding skills. With digitization, workers trend to carry out non-routine activities.

The analysis hypothesizes that workers in the most digitalized work environments are those with an intensity with non-routine tasks and the use of Information and Communication Technologies at work, is superior to the median of the group of professions. Workers who perform routine activities and fewer activities related to the use of Information and Communication Technologies, with respect to the median of their group of professions are classified as workers active in less digitalized environments.

To identify the workers in countries exposed to digitization, we create an XY chart, where on the x-axis we insert the intensity with which we use the Information and Communication Technologies (ICT Intensity) and on the y-axis the non-routine work (Non-routine Intensity), the graph is then divided into four quadrants.

Looking at figure 8, we can see that no country is in the first quadrant (I), which would represent the most critical area, where workers would be strongly exposed to loss of employment.

The areas of the second quadrant (II) and the fourth quadrant (IV) represent partially critical areas. In the fourth quadrant (IV), no country is present, which means that from the point of view of non-routine work activity all the OECD countries of the Mediterranean area have overcome this risk.

The risk remains in the countries that are in the second quadrant (II), where workers in these countries are subject to a partial risk for the loss of work if no action is taken quickly to increase the skills and/or the use of Information and Communication Technologies. The countries at risk are Turkey, Greece, Italy, and Spain.

In the third quadrant (III), we find the workers of the countries France, Israel and Slovenia, which at the moment are excluded from the possibility of the loss of the work activity due to the introduction of Information and Communication Technologies.

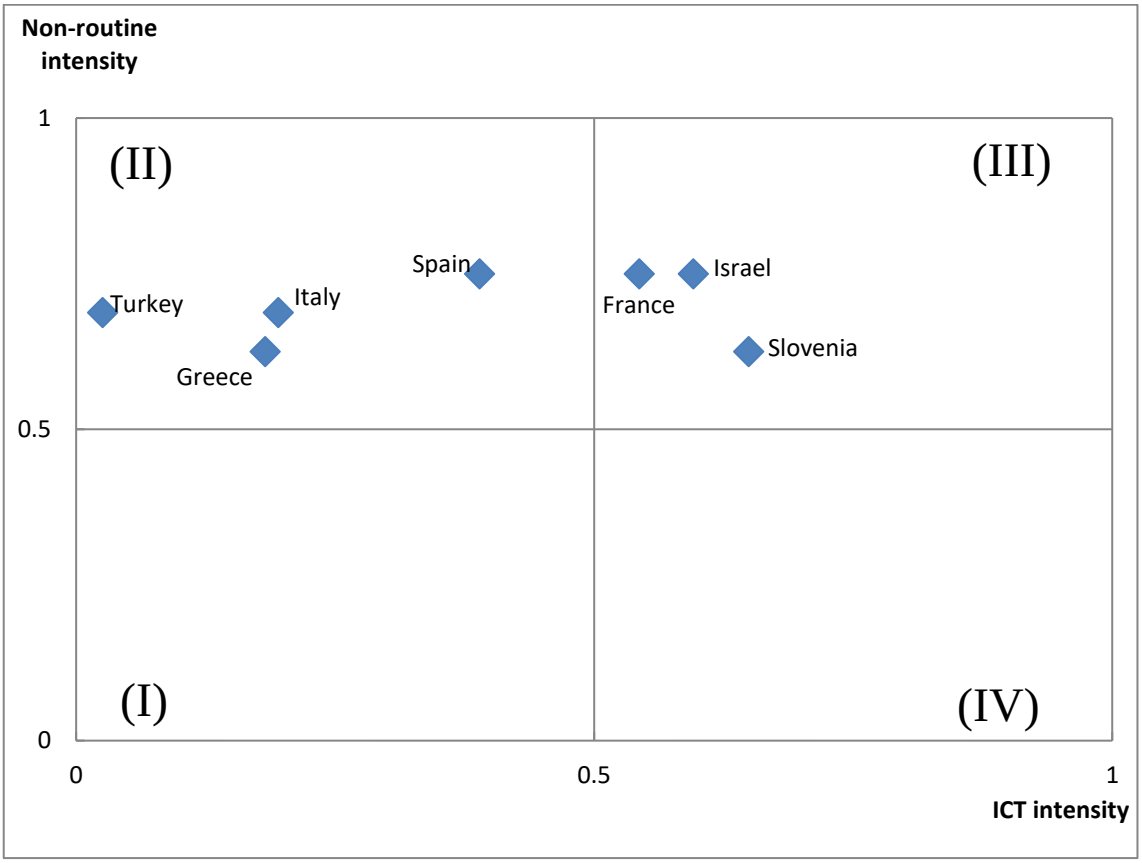

Figure 8 - countries exposed to digitization - Data source: OECD-PIAAC 2015 database.

Table I - Median of the non-routine and ICT intensity indicators across all workers, by OECD country.

Country	Non-routine intensity	ICT intensity
France	0,75	0,54
Greece	0,63	0,18
Israel	0,75	0,60
Italy	0,69	0,20
Slovenia	0,63	0,65
Spain	0,75	0,39
Turkey	0,69	0,03

As for the intensity of the use of Information and Communication Technologies, we can see (see figure 9) that in Italy there is a huge difference between teachers and graduate workers in other sectors. Just 48% of Italians teachers frequently use Information and Communication Technologies during their working activity, unlike graduate workers in other sectors where 81% use them frequently, with a difference of 33%. In the other countries, this difference is reduced starting from Turkey, where 60% of teachers frequently use Information and Communication Technologies during their working activity compared to 74% of graduated workers in other sectors, with a difference of 14%.

In Greece, 65% of teachers frequently use Information and Communication Technologies during their work, while graduate workers from other sectors frequently use it for 75%, with a difference of 10%. In Israel, 72% of teachers frequently use Information and Communication Technologies, while graduate workers in other sectors use it for 78%, with a difference of 6%. In Spain, 73% of teachers

frequently use Information and Communication Technologies, while graduate workers in other sectors use them for 77%, with a difference of 4%. In France, 76% of teachers frequently use Information and Communication Technologies, while graduate workers in other sectors use it for 80%, with a difference of 4%. In Slovenia, 79% of teachers frequently use Information and Communication Technologies, while graduate workers in other sectors use it for 83%, with a difference of 4%.

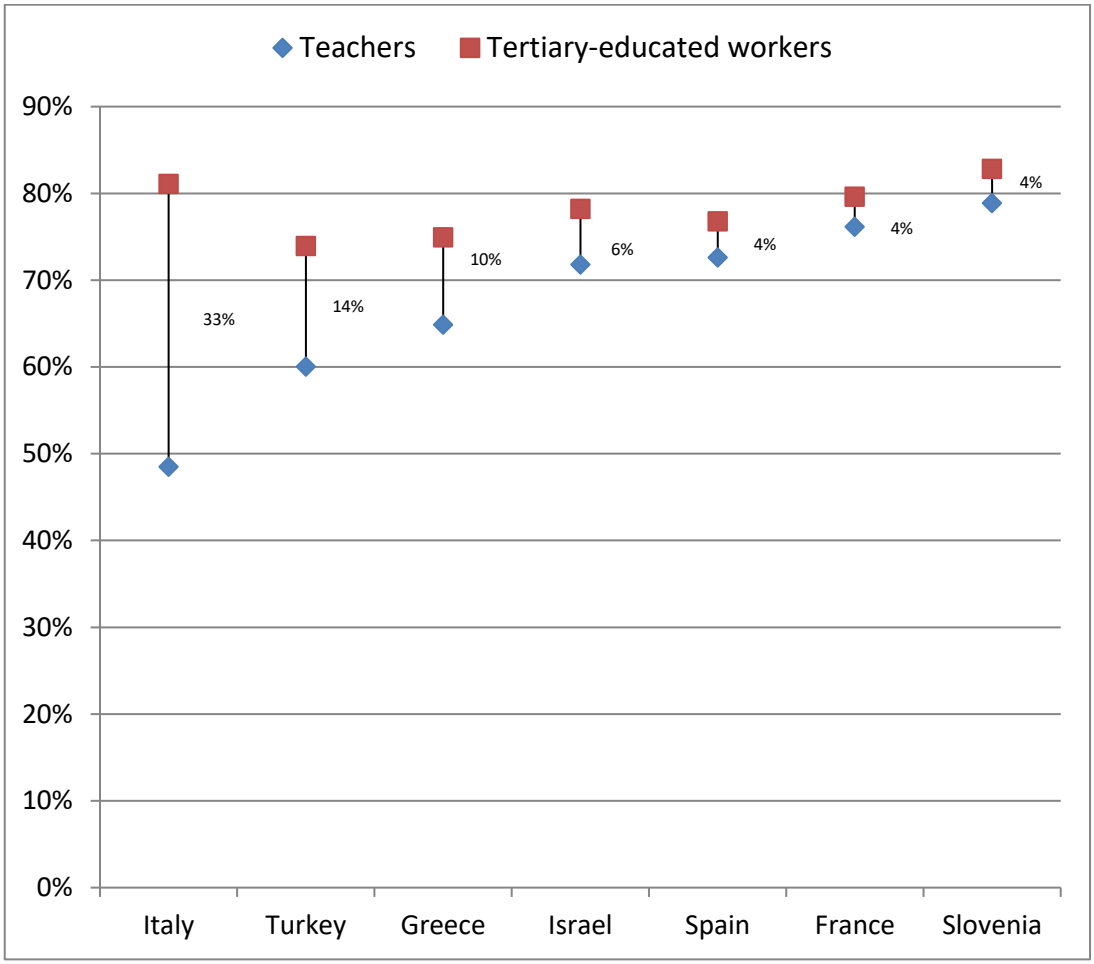

Figure 9 - Intensity at work of ICT, teachers Vs tertiary-educated workers -Data source: OECD-PIAAC 2015 database.

Type of activity through the use of ICT in the lessons by Italians teachers.

75% of the Italians teachers who answered the 2019 digital skills questionnaire stated that in their lessons, the activities proposed with digital technologies are easy activities. While 25% said that in their lessons, the activities proposed with digital technologies are complex activities.

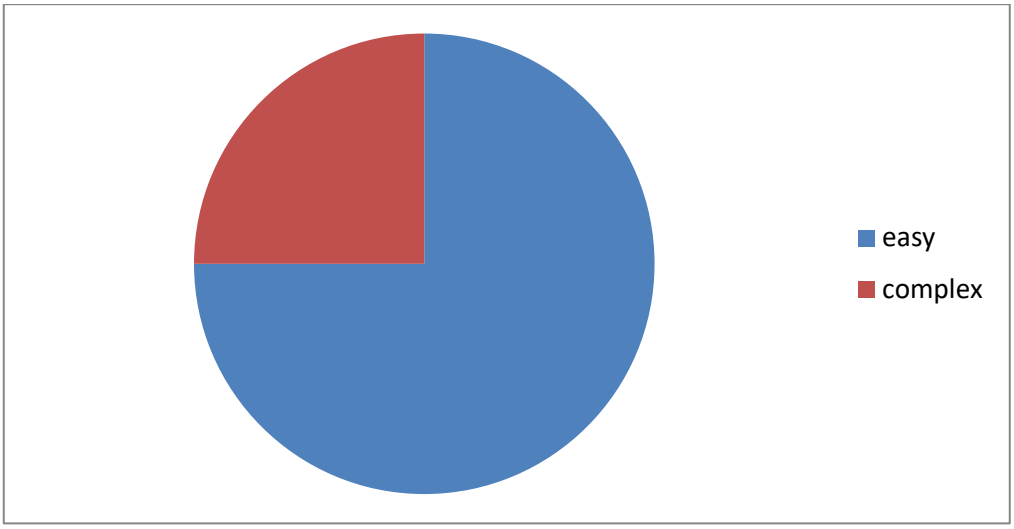

Figure 10 - Type of activity through the use ICT in the lesson. Data source: 2019 digital skills questionnaire.

Teachers needing training in ICT skills for development on their professions.

From the data of the TALIS 2013 survey, it emerged that 75% of Italians teachers need more training in the use of Information and Communication Technologies in order to adequately perform their teaching profession, while the average of other OECD countries of the Mediterranean area was 60%. Also, from the analysis of the TALIS 2013 survey, it emerged that 35% of Italians teachers needed a high level of training to use Information and Communication Technologies to adequately perform their profession, while the average of other OECD countries in the area Mediterranean was 19%.

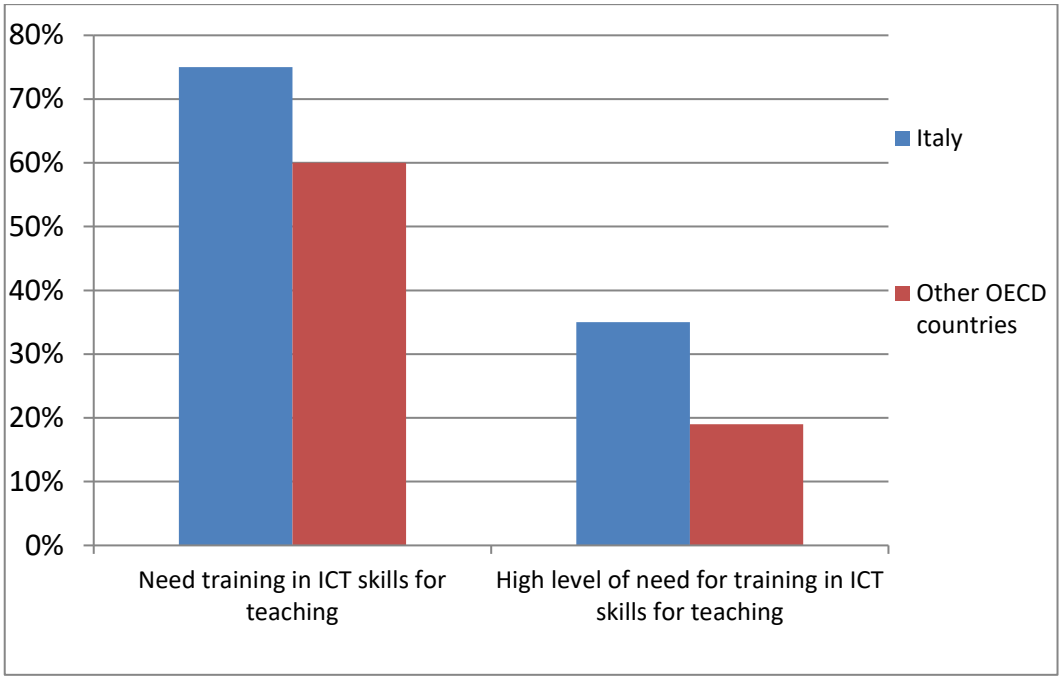

Figure 11 - Teachers who need training in ICT skills for the development of their professions. Data source: TALIS 2013 database.

From the analogous TALIS 2018 survey, it emerged that the teachers of the OECD countries of the Mediterranean area (note a) of the lower secondary school that need high levels of training for the use of the Information and Communication Technologies for their own professional activity are the 15.5%. While for the OECD partner countries of the Mediterranean area (note b), according to the TALIS 2018 survey data, the average is 22.1%. Among the OECD countries of the Mediterranean area, secondary school teachers who need high levels of training are 29.2% for Israel, 22.9% for France, 16.6% for Italy, 15.0% for Spain, 8.5% Slovenia and 7.5% Turkey. While for the OECD partner countries in the Mediterranean area teachers who need high levels of training for an adequate use of Information and Communication Technologies for the conduct of their profession, are for Croatia 26.2%, for Malta 14% and for Cyprus with 10.8%.

As far as the primary school is concerned, again from the data of the TALIS 2018 survey, we have data only for France 34.6%, Spain 22.1% and Turkey 7.7%.

Also, for the upper secondary school, from the TALIS 2018 database, only the data of a few countries are available, Croatia 20.8%, Slovenia 11.5% and Turkey with 7.4%.

With regard to lower secondary school teachers, who need training in the use of Information and Communication Technologies to adequately perform their profession from the TALIS 2018 survey data, it emerged that in OECD countries in the Mediterranean area (note a) the average is 32.1%, while in the Mediterranean OECD partner countries (note b) the average is 45.7%. The data for each country are France with 45.7%, Israel with 57.7%, Italy with 34.9%, Slovenia with 17.1%, Spain with 32.3%, Turkey with 16.3%. While for the OECD partner countries of the Mediterranean area (note b), we have, Croatia with 54.2%, Cyprus with 21.6% and Malta with 29.1%.

During their studies path from the TALIS 2018 data, it emerged that they carried out specific training to acquire skills for the use of Information and Communication Technologies in lower secondary school, 73.1% of teachers in Croatia, those of Israel for 68.7%, those of Italy and Spain for 68.1%, those of Turkey for 60.8%, those of Slovenia for 59.2, those of Cyprus for 55.2%, those of France 50.2%, those of Malta 47.7%.

Courses/seminars attended in person vs online courses/seminars for teacher training and principals.

The lower secondary school teachers from the analysis of the data from the TALIS 2018 database, in the OECD countries of the Mediterranean area (note a) followed courses in presence for own training and professional updating on average for 73.2%, while for the OECD partner countries of the Mediterranean area (note b) the 85.7%. While the lower secondary school teachers who followed online courses for their own training and professional development in the OECD countries of the Mediterranean area (note a) were on average 39.7%, and for the OECD partner countries in the Mediterranean area (note b) were 39.4%.

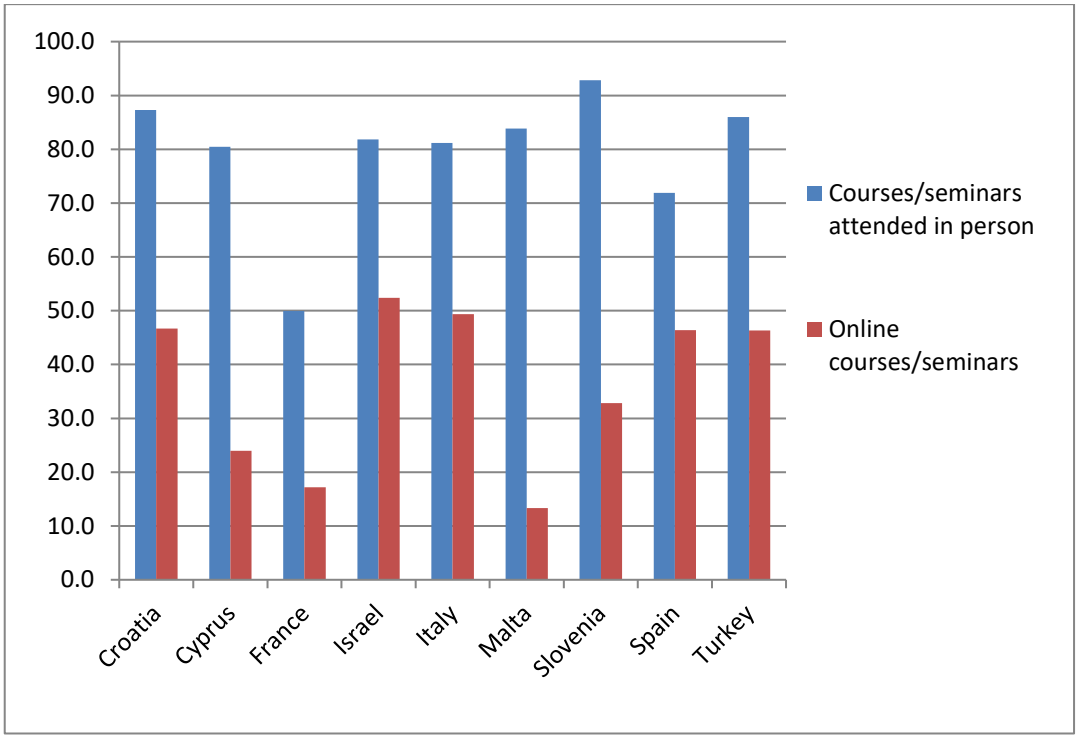

Figure 12 - Types of professional development undertaken by teachers, in lower secondary school.

Data source: TALIS 2018 database.

For primary schools, we have data only from France where 71.0% of teachers attended courses in presence and 55.0% of teachers followed online courses, from Spain where 83.5% of teachers followed Courses in presence and 45.1% of teachers followed online courses, and in Turkey where 88.1% of teachers attended courses in presence and 44.3% of teachers followed online courses.

For upper secondary school, there are data from Croatia where 82.7% of teachers attended courses in presence and 38.5% of teachers attended online courses, from Slovenia 90.8% attended courses in presence and 25.8% online courses, and in Turkey where 80.3% of teachers attended courses in presence and 41.1% of teachers attended online courses. The average of the OECD countries in the Mediterranean area and in the Mediterranean partner OECD countries is for courses in the presence of 73.2%, while for online courses it is 39.7%.

As for the principals for their training/update courses, they attended online courses in the OECD countries of the Mediterranean area (note a) on average 47.5%, while in the OECD partner countries of the Mediterranean area (note b) 42.1%.

Italy with the 68.4% is the first country where the principals of the lower secondary school follow their courses online for their own training activity, followed by the principals of Croatia with 50.7%, then Turkey with 50.0%, Spain with 43.9%, Slovenia with 34.3%, France with 31.6%, Israel with 24.6%, Malta with 23.0%, and finally Cyprus with 18.7%.

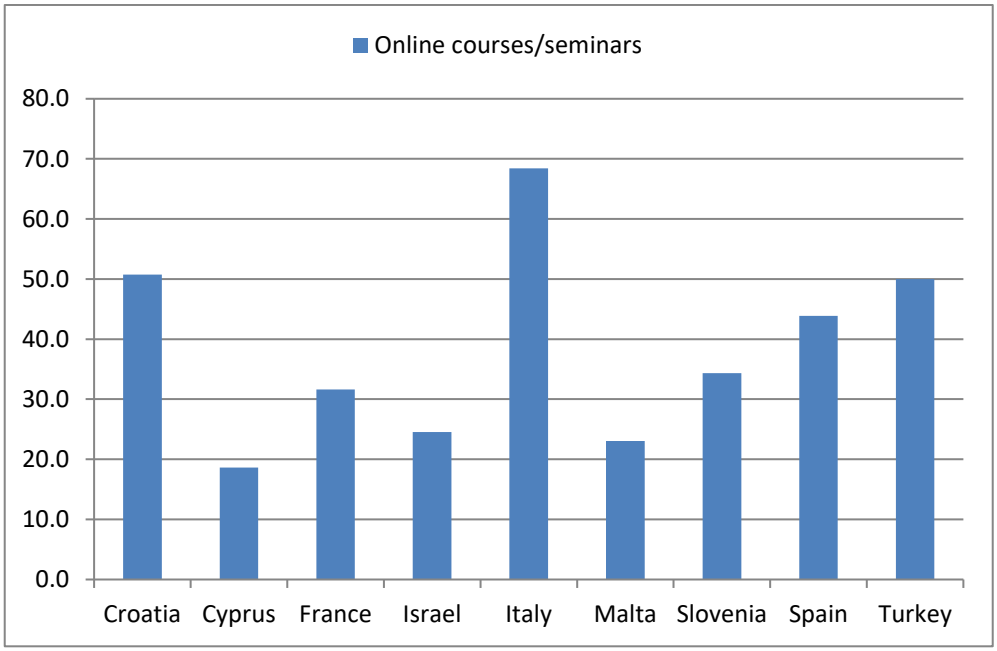

Figure 13 - Types of professional development undertaken by principals, in lower secondary school.

Data source: TALIS 2018 database.

In primary schools, the principals who attended online training/update courses are 19.1% in France, 45.2% in Spain and 33.4% in Turkey.

In upper secondary school, the principals who have attended online training/update courses are Croatia 52.2%, Slovenia 31.1%, Turkey 40.4%.

Open education for lifelong learning.

People must continually learn as the skills required by society change, a valid tool is open education and in particular MOOCs courses.

The workers of the OECD countries of the Mediterranean area who have followed open education courses, for their own training on the basis of data from the 2015 OECD-PIAAC survey are respectively, the 15.33% for Spain, 8.13% for Israel, 5.55% for Italy, 4.39% for Turkey, 3.72% for Greece, 3.67% for Slovenia and 1.89% for France. Workers in the OECD countries of the Mediterranean area who have attended open education courses on average are 6%, a result that is not reassuring and that puts workers in these countries at risk. To avoid this danger, it is necessary to intervene with specific policies so that more workers participate in open education courses.

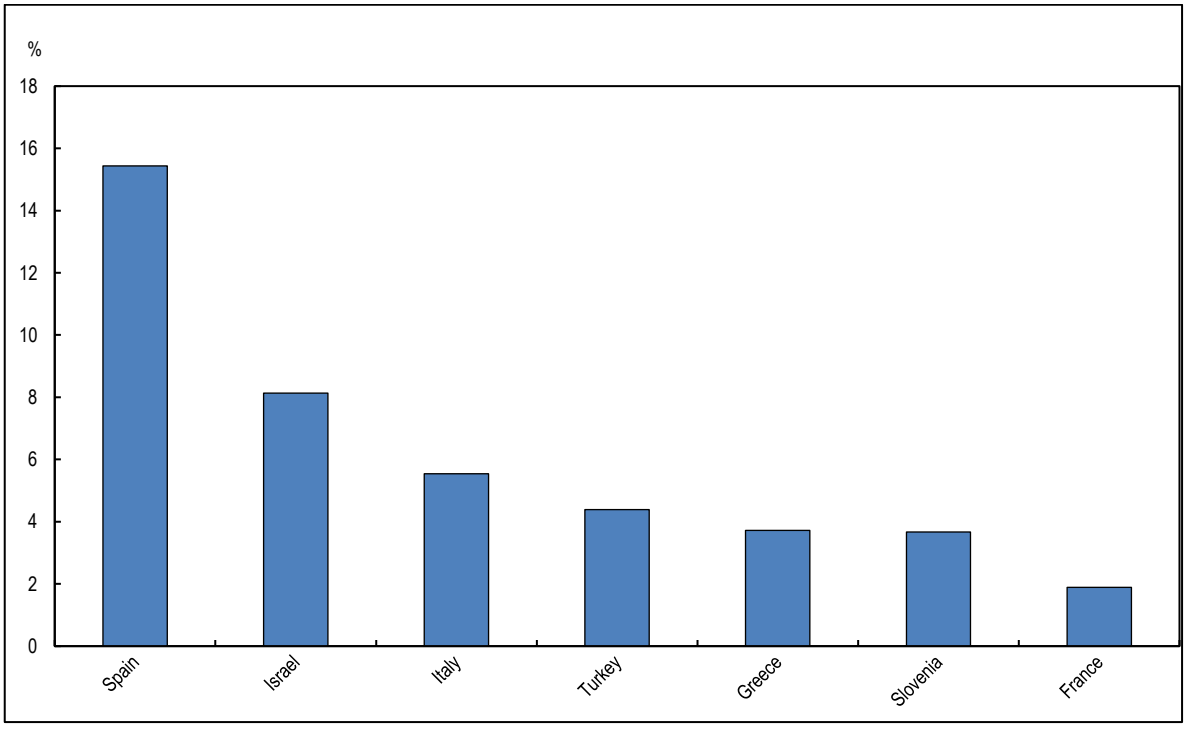

Figure 14 - Participation of workers in open education for lifelong learning. Data source: OECD-PIAAC 2015 database.

CONCLUSIONS.

This paper shows that Italians students had values very similar to the OECD average in the Mediterranean area as regards access and use of computers, the country that had the greatest access and made the greatest use of it was Greece, while Slovenian students were the ones who had the least access and made the least use of it.

The study shows that Italians students had values very similar to the average of the OECD countries of the Mediterranean area as regards the number of computers available per student, the country that had the highest number of computers available per student was France, while Turkey was country where his students had the lowest number of computers available per student. Considering also the OECD partner countries of the Mediterranean area, Italians students had values slightly above the average, the country with the highest number of computers available per student was always France, while Algeria was the country where the students had the lowest number of computers available per student.

The article shows that Italians students had values very similar to the average of the OECD countries of the Mediterranean area as regards the percentage of computers connected to the Internet. The country with the highest percentage of computers connected to the Internet was Slovenia, while the lowest percentage of computers connected to the Internet was registered in Israel. Also considering the OECD partner countries of the Mediterranean area, Italians students had above average values, the country with the highest number of computers connected to the Internet was Malta, while Lebanon was the country that had the lowest percentage of computers connected to the Internet.

The study shows that in the OECD countries of the Mediterranean area there are no differences in access and use of Information Technologies deriving from the economic status of students.

From the analysis of data from the OCSE-PIAAC 2015 survey, it emerged that workers in Turkey, Greece, Italy and Spain are subject to a moderate risk of loss of work, if in the short term, in working environments, no action is taken for increasing the use of digital equipment and ICT.

This research activity shows that in Italy teachers, unlike graduate workers employed in other work sectors, use Information and Communication Technologies with less intensity during the course of their profession. This difference in Italy is 33%, while in countries like Spain, France, and Slovenia it is only 4%.

Regarding the activities proposed by teachers who use digital technologies, through the 2019 digital skills questionnaire, it emerged that 75% make students do easy activities, while 25% carry out complex activities.

From the data of the TALIS 2013 survey, 35% of Italians teachers stated that they needed to acquire high levels of training for the use of digital skills, while the average of other teachers in the OECD countries of the Mediterranean area was 19%. In general, 75% of Italians teachers said they needed to acquire skills for the use of Information and Communication Technologies, while the average of other teachers in OECD countries is 60%. From the analogous TALIS 2018 survey it emerged, that, 15.0% Italians teachers, in lower secondary school, need high level of training for the use the Information and Communication Technologies for their own professional activity. The average of the OECD countries of the Mediterranean area is 15.0%, and the Italian value coincides with it.

The study, from the data of the TALIS 2018 database, shows us that Italians teachers lower secondary school follow 49.4% of online courses for their professional training, while, the average in OECD countries in the Mediterranean area (note a) and countries OECD partner of the Mediterranean area (note b) is 39.7%.

This paper shows us that the Italians principals of lower secondary school, with 68.4%, are those who follow more online courses for their professional training than their colleagues in the OECD countries of the Mediterranean area (note a) and OECD partner countries of the Mediterranean area (note b) that follow online courses for their professional training for 42.1%.

Workers in the OECD countries of the Mediterranean area do not follow sufficiently the open education courses, and one should intervene with policies also in the workplace to further encourage their participation.

In schools, digital technologies must be exploited to the full, as they help students develop the skills they need to fit properly into the digitized society, and not be part of those marginalized citizens because of the digital divide. Digital skills become essential to prosper in the new digitized society, helping citizens access and use digital devices, bridging the social gap.

The use of digital technologies can help students learn and thus reduce school failure, a useful support can be MOOCs courses, which offer new possibilities for acquiring knowledge.

New digital technologies, including Information and Communication Technologies (ICT), Artificial Intelligence (AI) and robotics, are transforming the way people live, work, and learn. Digitization offers immense potential to increase productivity and improve well-being. Furthermore, digitization can give individuals greater power (a greater decision-making capacity) for the choice of learning content, compared to when and where they work and how they engage in social life. However, this transformation can also accentuate inequalities if some people or regions were left behind. With an action aimed at improving the skills of their populations, countries can ensure that new technologies turn into better results for all. This orientation requires an action political, public, unified and coordinated.

The reference scientific literature increasingly emphasizes the need for teaching practices based on the interaction between strategies, contents, and technological devices.

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Note.

Note a: Greece data is missing.

Note b: data from Albania, Algeria, Montenegro and Tunisia are missing.

DATA OF THE AUTHOR.

1. Agostino Sorbara. PhD Pegaso International Malta. E-mail: agostinosorbara@libero.it

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