

## Ageing Workers and Digital Future

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### Abstract

The aim of this paper is to understand what the bottlenecks are for ageing workers in relation to technological innovation and how to help them in overcoming it.

The paper is structured as follows. After the introduction, the second paragraph is devoted to the state of the art of the topic of the criticalities older workers face in the labour market. The third section addresses the relationship between older workers and technological innovation with a focus on technological innovation as an opportunity and a challenge. The fourth paragraph explores the data selected from a EUROSTAT dataset in order to understand the level of digital qualifications of older workers and the difficulties they face in undertaking training and re-skilling. Finally, the author focusses on the analysis of active labor policy measures and interventions to enable older workers to remain in the labor market..

*Keywords:* older workers, Labour market, digitalisation, technological developments/innovation, active ageing

### Riassunto. *Lavoratori anziani e futuro digitale*

Questo contributo mira a esaminare la questione dei lavoratori anziani in un periodo in cui si affermano le nuove tecnologie e a suggerire strategie e interventi volti ad aiutare tali lavoratori a coltivare le competenze necessarie per il nuovo scenario digitale.

Dopo l'introduzione, il secondo paragrafo è dedicato allo stato dell'arte relativo alla questione dei lavoratori più anziani. Il tema è affrontato sotto il profilo teorico ed empirico. Il terzo paragrafo si concentra sulla relazione tra lavoratori anziani e innovazione tecnologica. Quest'ultima può essere tanto un'opportunità, quanto una sfida.

Il quarto paragrafo indaga, sulla base di dati EUROSTAT, il livello delle qualificazioni digitali dei lavoratori anziani e quali siano le difficoltà che essi incontrano nell'avviare percorsi di formazione e di riqualificazione professionale.

Infine, ci si concentra sulle misure e gli interventi di politica attiva del lavoro per consentire ai lavoratori anziani di rimanere sul mercato del lavoro.

*Parole chiave:* lavoratori anziani, mercato del lavoro, digitalizzazione, innovazione/sviluppo tecnologico, invecchiamento attivo

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## 1. Introduction

Work is undergoing a fundamental change, following technological and organisational innovations driven by digitisation (Hirsch-Kreinsen, Ittermann and Niehaus, 2018), the so-called Fourth Industrial Revolution. The technological advancement could make achieving skill upgrades and total factors productivity at least in some industries and implementing some of sustainable development goals possible (Osburg and Lohrmann, 2017). The issue is sensitive because of the coming impact of innovations on employment and the risks of social unrest (Frey and Osborne, 2013).

In Europe, and elsewhere, this technological and organisational revolution is likely to be realised with an army of grey-haired workers (OECD, 2019). It is therefore appropriate to

promote policies aimed at reskilling these workers and preparing the workforce for the coming digital society (Borghans and ter Weel, 2002; Goldin and Katz, 2010; Mitzer *et al.*, 2010; Athreya and Mouza, 2017). According to OECD (2017b, pp. 104-106), ca. 40 percent of the workers are not adequately equipped.

The aim of this paper is to understand what the bottlenecks are for ageing workers in relation to technological innovation and how to help them in overcoming it.

The paper is structured as follows. The first section is devoted to the topic of the state of the art concerning older workers and the labour market. The second one deals with the relationship between older workers and technological developments. A technologically changing environment is for older workers a definite challenge, but it can also be an opportunity. The third section deals with data selected from a Eurostat dataset in order to understand the older workers' digital skills levels and what their difficulties are across Europe in attending reskilling programs (OECD 2016a; 2017c). Lastly, I'm going to pay attention to the policy measures that enable older workers (though not exclusively them) to stay in the labour market.

## **2. The older worker and the labour market**

The ageing population affects many advanced countries – like Japan and among the European countries in particular Germany (Henseke and Tiving, 2009) and Italy (Golini and Rosina, 2011) – and some emerging economies like China (OECD, 2014, ch. 6; ILO, 2018, pp. 45-46. See also: Nyhan, 2006; Vettori, 2010; OECD, 2017a, p. 191). This process implies a structural change in competitive workforce as well as in social organisation.

Because of the socio-demographic change – due to the bettering life conditions in the advanced countries after the Second World War – and the consequent welfare restructuring process, an increasing part of the ageing population should remain active in the labour market (EU-OSHA *et al.*, 2017, p. 49). Life course according to the schema education-work-retirement should be considered in a different way (Mortimer and Lam, 2013, pp. 536-

538). The increasing life expectancy has had an impact on the economy and social policies with the result that retirement age has to be delayed (European Commission, 2015). This is the reason why a pivotal issue is facilitating older workers in actively participating in the labour market until retirement age (Dworschak, Buck and Schletz, 2006).

It is not particularly easy for many older workers to adapt themselves to a changing labour market and overcome their perceived declining abilities. The latter is a particularly sensitive issue. They need firstly to be helped in achieving good performance at work and being successful in their late career (Harper, 2009; Kuhn and Ochsens, 2009). Secondly, they need to be helped because the negative consequences of an ageing workforce are a reduction in available skills, an outdated human capital, and a consequent loss in productivity (Dixon, 2003; ILO, 2018, p. 48).

To withstand this trend and in spite of the perceived declining abilities affecting older workers, they should be involved in the labour market and encouraged to remain active (Barnes-Farrell and Matthews, 2007).

Before continuing, let's examine who is an "older worker". There is no universal definition for the term (Bohlinger and van Loo, 2010). According to the European Commission and the ILO, this term usually refers to workers between 55 and 64 years (European Commission, 2015).

But the "chronological age" may be insufficient. The literature (Baltes, Rudolph and Bal, 2012, Ch. 7) discusses age considering the functional or performance aspect, the psychosocial and subjective perception of age, and the organisational dimension (Kooij, 2010, Ch. 6; Truxillo, Cadiz and Hammer, 2015).

Since working encompasses not only skills and tasks but also psycho-physical wellness, mental health, identity, cognitive and social abilities should be taken into consideration (Marcaletti, 2014; Potocnik, 2017, p. 171ff.). For example, older workers in the healthcare sector, and among them many women, experience particularly heavy and stressful working conditions because of the night shifts (EASHW, 2009). In this context, the project carried out at the Minnesota State Operated Services aiming at developing the competence of health and social assistance workers is interesting. Their reactions to training and to a new

organisation of activities were positive (Fredericksen, 2008; see also Chin Chin, Czaja and Sharit, 2008).

Considering social relations, older workers are often a stigmatised group and the target of various forms of prejudice, mistreatment, and discrimination in the workplace (Desmette and Gaillard 2008; Truxillo *et al.*, 2017). They are often judged as weak productive workers, unable to upgrade their skills, and lacking flexibility compared to younger colleagues. This is the reason why older workers are at risk of being displaced or forced into early retirement (Paloniemi, 2006; Brownell and Kelly, 2013). There are cultural and pragmatic reasons that do not encourage workers older than 55 to undertake an upskilling program (Kite *et al.*, 2005; Tikkanen and Nyhan, 2008, p. 12), but these stereotyped arguments are often to justify not investing money in their training.

In order to improve the work attitudes of older workers – since implementing a set of measures mentioned in section 4 – empirical evidence shows that their motivation to continue to work is pivotal (Inceoglu, Segers and Bartam 2011, p. 301). As highlighted by Fredericksen (2006), in the US public service, the motivation to remain active is closely related to workplace satisfaction, a sense of being positively valued and psychological well-being.

Hansen and Nielsen (2006) in their research targeting unskilled men, aged over 50 and employed by two Danish companies (a refuse collection and a cleaning service) pointed out the workers' needs as the key element for successful active labour market policies. The starting point is based on a good working and training environment, an important way to overcome the lack of motivation among older workers regarding upskilling. Among the most successful cases in developing motivation in the workplace, Mai (2008) presents the Siemens' case. The company's purpose was to strengthen the willingness of the older workers and to improve their ability to take control of their self-efficacy in their jobs and private lives. The second positive outcome was developing Siemens' learning culture. A further case is reported by Gendron (2008) and concerns three situations aimed at involving older workers<sup>1</sup>. The results of these three experiences highlight that age management means

1 The first event took place at the France 3 television station, the second experience at a medium-sized enterprise, and the last one at a milk production factory. The action at the France 3 television station was structured as follows. In

new human resource policies in favour of older workers' and better working conditions (Barabasch, Dehmel and van Loo, 2012).

Summing up, ageing is a complex process involving biological and functional as well as psychological and social aspects (OECD, 2017c). This is the reason why flexible working conditions and supporting by the companies have a crucial impact in the decision to remain at work or to retire, as the literature has consistently highlighted (Loretto and White, 2006; Reeuwijk *et al.*, 2013; Thorsen, Jensen and Bjørner, 2016; Wahrendorf, Dragano and Sigriest, 2013; Eurofound, 2017; Anxo *et al.*, 2017).

### **3. Older workers and technological developments**

After explaining who is an older worker and which is his/her condition on the labour market, I'm going to analyse his/her relationship with technological developments. Many times, technologies have been implemented to overcome age-induced physical limitations and to improve their employability.

But this is double-sided. Technologies can facilitate older workers in overcoming their problems but at the same time create new barriers when not (older) user-friendly enough (Foster-Thompson and Mayhorn, 2012). In many cases, particularly in the manufacturing industries, the age of the workforce influences the possibility of introducing digital technologies. According to EU-OSHA *et al.* (2017, p. 52), small and medium enterprises have a lot of difficulty in implementing training measures and instruments, even though they employ older workers more frequently than bigger firms. Firms with a higher share of younger employees seem to be able to adopt technological and organisational innovations. In fact, according to de Koning and Gelderblom's research (2006) older workers use less frequently sophisticated devices and applications compared to their younger colleagues.

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the first phase a survey was conducted (mostly qualitative interviews) focusing on older workers' perceptions and prospects. In the second phase, an action plan was developed, taking into account the dissatisfaction of the workers. In the third phase, new mid-career meeting tools and new roles for older workers were planned and implemented. The meetings let the workers express their wishes and aims concerning working plans and career development.

On the other side, evidences show that older workers with good professional experience and good qualifications are ready to spend time in training and could benefit from digital technologies (Peacock, 2009; Meyer, 2009; Schleife, 2006). In so doing, they could thus represent a dynamic element in a working organisation. This means that experience and innovation are not to be seen as a dichotomy. According to the “subjectifying work action” approach (Böhle, 2017), experience means the capacity to cope with things, people, and situations in the work context.

The second aspect of the relationship between aged workforce and new technologies concerns skill imbalances, obsolescence and the way to manage them. One of the most significant challenges for our societies in the coming years will be to face a more knowledge- and skills-intensive labour demand, to invest in education and training, to increase human capital, and promote competence, development, and innovation (CEDEFOP, 2011). Skills mismatch and shortages imply costs for workers, employers, and the economy, but the skill depreciation has hit workers not in the same way (OECD, 2013, p. 74; CEDEFOP, 2018). The young people are considered more flexible and faster at learning, better at problem-solving, and are judged as being able to upgrade their skills and take advantage of new tasks.

Nonetheless, these negative effects may be partially offset by the positive impact that higher levels of work experience, socio-relational skills, and other soft qualities have on productivity. German cases show that middle-aged and older workers can increase their competence and capitalise on their experience more effectively than younger colleagues (World Bank, 2016, p. 32). As confirmed by Wilke (2008) in two case studies at the German companies Ruch Novaplast and Steinbach (a toolmaking and precision engineering company), older workers are more competent in “reflexive” abilities, such as verbal ones, and are able to interact more constructively (Lang and Carstensen, 2002). In sum, soft abilities are important as well as cognitive and physically based skills (Van Dalen, Henkens and Schippers, 2010).

Last but not least, to facilitate the relationship between older workers and new technologies, it is crucial to sustain them in reskilling programs, and also introducing new

forms of work organization, friendly working hours' patterns and flexible working conditions (Fuller and Unwin, 2006; Härmä, 2015).

#### **4. The older workers digital level in Europe and upskilling problems**

In order to analyse older workers' digital skills level across Europe, to understand their reskilling needs and what their difficulties are in attending training, I selected data from the Eurostat dataset, for the year 2016. I analysed firstly people aged 55 to 64 in Europe in order to examine their digital skills levels.

I selected from the Eurostat dataset (<https://ec.europa.eu/eurostat/data/database>) the following dimensions: a) no digital skills; b) low overall digital skills; c) basic overall digital skills; d) above basic overall digital skills.

In the case of those who have *no overall digital skills*, the EU28 average is 1 percent. Spain and Italy are at 3 percent, Ireland and Austria at 2 percent, and all others claim not to have anyone without digital skills.

Concerning those who have *low overall digital skills*, the EU28 average is 30 percent. France, UK, Sweden, Finland, Hungary, and Spain have between 30 and 40 percent of people in this situation. A few countries, very different to one other, are between 20 and 30 percent. This is the case of Denmark and Portugal, both at 26 percent, as well as Greece and Holland, both at 24 percent. I assume that in the most dynamic economies in Northern Europe, there are few unskilled people, while in the Mediterranean countries, the general level of digital skills is still low. In fact, the latter also show a similar percentage for *basic overall digital skills* and for *above basic overall digital skills* (between 10 and 20 percent).

Even when people have *basic overall digital skills*<sup>2</sup> or *above basic overall digital skills*, the Central and Northern European countries show higher values than the Mediterranean ones. Also, in the case of people who have *basic overall digital skills* or *above basic overall digital skills*, digital inequality across Europe is one of the issues to be dealt with, not only

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<sup>2</sup> Netherlands, 42 percent; Italy, 20 percent; Denmark, 36 percent; Greece, 13 percent; EU28 average, 24 percent.

in the workplace but more generally within society<sup>3</sup>. The analysis presented here demonstrates the significant and persistent divide between countries and the historical gap between Northern and Southern Europe with respect to education and skill levels. The results of the Active Ageing Index<sup>4</sup> in the EU show that the older workers in Northern Europe are more dynamic and have better living conditions than in Southern Europe<sup>5</sup>.

I'm going now to consider the obstacles to participation in reskilling training. In relation to the *distance*, the data show that particularly Sweden, Germany, and France tendentially help people<sup>6</sup>. With reference to the *costs*, the Scandinavian countries seem to be a particularly older-worker friendly ones<sup>7</sup>.

Also, *family reasons* play a role in discouraging participation in reskilling. Both middle-aged and older workers from the Mediterranean area are affected, and women are disproportionately disadvantaged (Table 1).

To sum up, in the most dynamic European economies, reskilling policies take into account the practical problems (distance, cost, and family) of the workers.

There are two other bottlenecks that discourage people from attending reskilling programs. The first one concerns a *no suitable offer for education or training*<sup>8</sup>. Workers aged 45–54 coming from countries very different to one other – such as Greece (40.3 percent), Latvia (34.1 percent), and Denmark (31.6) – complain about it. Concerning workers aged 54–65, it is quite surprising that those in the most economically dynamic and

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3 Scandinavian countries and the Netherlands are between 60 and 70 percent; Germany, the UK, and Finland, between 50 and 60 percent; France and Central Europe, between 30 and 40 percent; Italy, Croatia, Slovenia, and Ireland, between 20 and 30 percent; other Mediterranean countries, Bulgaria, and Romania, between 10 and 20 percent. EU28 average 39 percent.

4 The Active Ageing Index adopts a holistic perspective and employment is only a dimension of it (UNECE, 2019, p. 17; Kafková, 2018).

5 Active Ageing Index overall score: Sweden 47.2; Denmark 43.0; Netherlands 42.7; Germany 39.6; France 38.6; Greece 27.7; Spain 33.7; Italy 33.8, (UNECE, 2019, p. 19).

6 EU28 average (workers aged 45–54: 19.3 percent; workers aged 54–65: 19.7 percent); Sweden (workers aged 45–54: 15.6 percent; workers aged 54–65: 14.7 percent); Germany (workers aged 45–54: 12.8 percent; workers aged 54–65: 11.1 percent); France (workers aged 45–54: 11.9 percent; workers aged 54–65: 11.4 percent); Portugal (workers aged 45–54: 25.5 percent; workers aged 54–65: 22.6 percent); Italy (workers aged 45–54: 18.8 percent; workers aged 54–65: 17.1 percent).

7 EU28 average (workers aged 45–54: 33.3 percent; workers aged 54–65: 27.0 percent); Sweden (workers aged 45–54: 19.4 percent; workers aged 54–65: 19.8 percent); Denmark (workers aged 45–54: 15.2 percent; workers aged 54–65: 18.4 percent); Finland (workers aged 45–54: 19.4 percent; workers aged 54–65: 19.8 percent).

8 EU28 average (workers aged 45–54: 17.7 percent; workers aged 54–65: 18.9 percent).



technologically advanced countries are disappointed (Germany, 24.6 percent; Denmark, 31.9 percent; and France, 24.8 percent).

Country	Age: 45–54	Age: 54–65	Women
EU28	31.6	26.5	39.6
UK	36.8	27.1	45.7
Germany	33.8	27.7	45.6
Hungary	17.1	16.4	32.3
Greece	58.6	57.5	61.0
Portugal	31.3	23.6	40.2
Spain	40.3	36.9	46.4
Italy	49.9	46.4	52.4
Finland	12.8	13.1*	25.3
Sweden	24.5	16.8	34.1
Denmark	14.1	9.6	16.1
France	7.9	5.9	17.2

*Table 1 - Percentage of population wanting to participate in education and training but not participating because of family in 2016. Source: Eurostat, <https://ec.europa.eu/eurostat/data/database>*

The second obstacle in attending reskilling programs is the *lacking support from employer or public services*<sup>9</sup>. Middle-aged workers are more critical than their older colleagues<sup>10</sup>, particularly Germans (43.2 percent; workers aged 54–65: 29.2). On the contrary, Denmark (14.4 percent; workers aged 54–65: 13.5 percent)<sup>11</sup>. This dimension is, however, interesting because according to workers’ opinions, institutional support is crucial.

In conclusion, the workers across Europe are interested in training, particularly regarding digital skills. The data show also a gap within Europe concerning the policy measures to be implemented. In Northern and Central Europe, lacking support from employment services and problems such as family, costs, age commonly preventing access to training are solved most often. In the Mediterranean countries, the “traditional” obstacles remain, and often the active labour market policies are less advanced and widespread. As a result, workers don’t appear to experience a lack of effectiveness.

\* Year 2011.

9 EU28 average (workers aged 45–54: 28.2 percent; workers aged 54–65: 20.1 percent).

10 F.i. in France (workers aged 45–54: 36.9 percent; workers aged 54–65: 28.9 percent).

11 Denmark is close to Italy at 16.2 percent. It might seem that Italian workers are effectively and satisfactorily supported by employer or public services. On the contrary, I assume that it is more likely that in this case the Italian workers don’t realize the lack of effectiveness (Bianco, 2017).

## 5. Making the digital work: A policy agenda

Because of the demographic revolution we are experiencing particularly in the advanced countries, many scholars have stressed the importance to shift from a Welfare to a Workfare perspective and to improve the key competence of the human capital (OECD, 2016b). The EU has addressed the attention to adults with a low level of skills (European Union 2016), and the policy makers have formulated measures based on activation (Dingeldey 2006). Particularly older people have become the target to increase their social inclusion (Walker, 2002)<sup>12</sup>.

This section focuses on the measures and methods aiming to make workplaces more inclusive, to equip older workers to stay in the labour market, and to enable them to access the digital economy, implementing active ageing policies. According to WHO (2001) “active ageing” policies aim at promoting the residual potential of older people<sup>13</sup>. In so doing, they can benefit of social inclusion and are enabled to participate physically and psychologically in society in the best possible way.

Addressing the attention to the *measures*, lifelong learning is to mention. It's a well-known practice within active labour market policies (CEDEFOP, 2006). As pointed out by London (2011), after school, college, and university:

people will need continually to enhance their knowledge and skills in order to address immediate problems and to participate in a process of continuous vocational and professional development. The new educational imperative is to empower people to manage their own learning in a variety of contexts throughout their lifetimes (London, 2011, p. 4).

In a competitive economy, lifelong learning is a driver in building a skilled workforce and in increasing labour force participation rates also among older workers (Findsen and

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12 The emphasis on the participation of older people at the labour market aims also to recalibrate the numeric imbalance between the generations and to make the welfare system financially and socially sustainable.

13 In Europe the term “active ageing” appeared for the first time in EU documents in 1999 (Avramov and Maskova, 2003). The focus was on the employability of older workers. Later, the Lisbon strategy (2000) encouraged their participation to the 70% total employment target; 2012 has been designated as the “European Year for Active Ageing”.

Formosa, 2011; Withnall, 2012). In fact, to be a successful measure, lifelong learning should be drafted focusing on the background and needs of the involved workers, particularly the older ones, as emphasized by Knowles a long time ago (1973). According to him, the failure of this measure is generally due to a unilateral focus on the learning problem instead of considering also the (adult) learner. In fact, learning is a process involving the learners not only from the cognitive but also from the social and emotional point of view (Tikkanen, 1998)<sup>14</sup>.

Adult learning theories show that the aim is to transform the person through acquisition, participation, and knowledge creation. In this sense, more recently Tan (2018, pp. 934-935) points out that the role of technologies in the learning process does not mean sitting at the PC and digitising the learning material.

Many scholars stress that decreases in employment rates among older age groups depend on the institutional context (Vendramin and Valenduc, 2014) and on the measures supporting their participation in labour market. A quick look at the policies supporting active ageing shows that vocational education and training (VET) play a relevant role, particularly with reference to intergenerational cooperation (Neuweg, 2008, pp. 729-730). Originally based on the distinction of technical and vocational education, VET may be defined as a set of programs that help people to think critically, and manage and develop their capacities, competences, and interests.

Concerning the *methods* to train and develop digital skills, adult workers could access massive open online courses (MOOCs), virtual laboratories, and simulation games (Orr, Rimini and van Damme, 2015). MOOCs are courses from over 500 universities operating on major platforms around the globe (Downes, 2017, p. 18). The purpose of MOOCs is to make access possible for everyone interested in any topic. World Economic Forum (WEF) (2017, p. 6) in 2015 counted over 4200 operational MOOCs, involving 35 million learners.

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<sup>14</sup> Best practices are reported by some Northern European countries. A first example is described by Stuart and Perrett (2006) (see also Fuller and Unwinn, 2006). Starting from a restructured steel firm in the UK, they show that older redundant workers can change competences in their working lives when displaced. This is important for low-skilled and older workers. Stuart and Perrett suggest also that the workplace should be organised so that employees can develop their attitude to be flexible in skills throughout their entire working lives. A further empirical study has been carried out by Dworschak et al. in Germany (2006). The authors focused attention on work performance as influenced by the worker's age.

The MOOC model could develop into a personalised learning one (WEF, 2017, pp. 12-14). In spite of the promises of new technologies, evidence shows that learners accessing MOOCs and benefitting from them already have college and graduate degrees (Siemens, Gasevic and Dawson, 2015). Implementing such innovations in educational technology is therefore a challenge (Spector, 2018). The institutional responsibilities should protect the rights of learners (as users, as citizens) and be socially inclusive, considering the special needs of those with low or no education.

## **6. Conclusion**

Summing up the several issues of this paper, my starting point has been the two different social processes we are witnessing in the advanced countries: the ageing population and the technological innovation driven by digitalisation. Both of them are very complex transformation processes and complex to manage. In fact, older workers are asked to adapt themselves to a changing labour market. At the same time, the labour market should be shaped and organized to sustain and facilitate the impact of the greying of societies on labour.

After scrutinizing who is an older worker and which is his/her condition on the labour market (paragraph n. 2), I have analyzed the relationship between older workers and technological developments (paragraph n. 3). Technological innovation is sure a challenge for older workers, but it can also be an opportunity. In fact, for older workers with good professional experience and good qualifications, ageing seems to be not so relevant concerning their professional life. Particularly, the high-skilled older workers are ready to attend training programs. In so doing, they could develop their skills, avoid the risk to be fired or forced to retirement.

In order to understand the older workers' digital skill level across Europe and their difficulties in attending reskilling programs (OECD 2016a; 2017c), paragraph n. 4 deals with data selected from a Eurostat dataset. The resulting situation reflects the traditional regional differences across Europe. The Northern European countries are in digital skills among the

local population more advanced than the Mediterranean ones. The digital divides are then confirmed in Europe considering the following, traditional variables: gender, age and education level, i.e., women, older and low educated workers have got lower digital skills.

In the last paragraph, I focused the attention on the possible active labour market policies that enable older workers to stay in the labour market and to access the digital economy. I have distinguished into measures and methods. Among the measures, such as Lifelong Learning, these programs make people fit for the labour market. Among the methods, such as on-line courses, they aim at training people and updating their professionalism. In so doing, it is possible to develop the human capital of the older workers too and to enable them not only to remain active on the labour market but also to overcome the problems they face in relation to technological innovation.

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