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## The Skills and Competencies Needed in the Labor Market in the Time of the COVID-19 Pandemic in Poland

## Umiejętności i kompetencje pożądane na rynku pracy w czasie pandemii COVID-19 w Polsce

Almost four years ago some futurists were predicting that over onethird of skills (35%) that are considered important in today's workforce will have changed (Grey, 2016). The Fourth Industrial Revolution of which we are living in have brought us advanced robotics and autonomous transport, artificial intelligence and e-learning, advanced materials, biotechnology and genomics. But beside AI, Web 4.0, 5 and 6G,...etc. Unfortunately nobody expected in 2020 the next so called a phenomenon of Black Swan (Taleb, 2020), which became the eruption of the COVID-19 over the world and the post-Covid crisis situation in economy and labor market. In the context of economic forecasts, the SAARS COVID-19 pandemic can be presented in the phenomenon and term of "Black Swan", a theory described in 2007 by Nassim Nicholas Taleb (Taleb, 2020), who just tried to describe such a type of impact of highly unpredictable events and even unbelievable, such as the attack on the World Trade Center on September 11, 2001 or the election of Karol Wojtyła as pope. Unfortunately in contrary to the last typical economic crisis the Coronavirus pandemic does not have an economic etiology, as it had caused the economic crises – in the 1920s or the last crisis in 2008 – the collapse of the financial system. Now it is uncertain how similar or distant repercussions of the suspension of all major national economies, because of the Covid lockdowns, will be effecting a globalist network of connections and supply flows. It is also uncertain of what the far-reaching effects of the protectionist actions of individual governments (in Poland so called *Anti-crisis Shield*) in saving local economies will be.

The developments of technology and either the SAARS COVID-19 have transformed the way we live, and the way we work. Some jobs will disappear, others will grow and jobs that do not even exist today will become the needed. What is more predictable, the future workforce will need to align its skill set to keep pace.

# Last changes in the Polish labor market based on the SAARS COVID-19 pandemic

Let us look at the last main sources of changes in the local labor market, especially in the context of lockdown of Polish economy and the majority of brands of the Polish labour market.

From the experience of last crisis, and especially from the stages of the postcrisis period, it can be stated with some regularity that properly managed free market economies return to full prosperity and state of economic activity for at least 10–15 years. There is no doubt, however, that the post-crisis period that awaits globalized economies after the pandemic will focus on labor, the labor market and the repercussions associated with it. In the global context, so far the first remedial steps taken by national governments where the tendency of a significant increase in unemployment was real, worked positively. They mostly consisted in a protectionist transfer of large sums of money funds (in the US – the first tranche was 2 trillion dollars, and in Poland 70 billion PLN, the so-called first "Anti-Crisis Shield") to local economies, primarily to relieve labor costs and neutralize mass layoffs. Such active programs involved mostly in Europe and USA helped to suspend at least for some time peaking unemployment. The Skills and Competencies Needed...

In Poland, the first two-months (March–April) freezing of the Polish economy due to the introduction of the state of epidemic threat in Poland resulted in crisis tendencies in the labor market; more specifically, it cost the Polish debt an additional PLN 40 billion (so far, on average, the Polish economy was in debt over an interval of 3 years). Already at the beginning of the epidemic in Poland, some mass layoffs took place in March, which was in that time an upward trend:

According to the data we have collected, in March 2020, nearly 7,757 people are threatened as part of the reported collective redundancies. The greatest number was indicated in the voivodships of Lublin (1,907 people), Śląskie (1,075), and also Wielkopolskie (1,072) (Krawiec, Bednorz 2020).

Pro-employment instruments (e.g. the so-called "waiting out" benefits for entrepreneurs, so that they do not have to lay off employees in large number) included in Polish so called "Anti-crisis Shield" were slowly implemented since April and May 2020 to prevent the wave of unemployment that might pass through the Polish economy after the second quarter of 2020. Although at the end of March 2020, the registered unemployment in Poland was shaping above 5 percentage points (according to GUS, The Main Office of Statistics in Poland), it was then predicted that the crisis would have hit employees of the service sector on the basis of civil law contracts in the first moment (experts from Personnel Service were indicating that trade workers are most at risk, because even a million would lose their jobs; pessimistic attitudes were also among the automotive industry as well as in gastronomy, tourism, hospitality, entertainment... (Personnel Service, 2020). Therefore the number of unemployed increased in June by 15.4 thousand to over a million (1,027.1) of unemployment workers. Although the level of registered unemployment has been slightly increasing since April, the highest growth dynamics in relation to the previous month was recorded in April. In May and June, the growth rate was slowing down by months because of mentioned supporting governmental programs and slow semi opens of some businesses. From the comparative perspective it may be observed that:

In April this year the number of unemployed compared to March this year. It increased by 6.2 percent, in May by 4.8 percent, and in June already by 1.5 percent. – said the Minister of Family, Labor and Social Policy, Marlena Maląg (Wprost Biznes, 2020).

In June we could observe a stabilization of the situation on the labor market. The unemployment in June was stabilized on the level of 6.1 percent probably because of slowly opening economy and a sort of "re-bounce" of market; there were also still very helpful the subsidizing programs issued by the Polish government and EU sources. Number of vacancies and places for professional activation reported by employers to labor offices in June 2020 amounted to 91 thousand and was by 15.4 thousand, or 20.4 percent higher than in May this year, which was also reported. At the end of July the Ministry of Family, Labor and Social Policy indicated that in July there was almost no changes regarding the level of unemployment in Poland which means that too pessimistic predictions referring to economical situation about second quarter were exaggerated, although between July and August of 2020 there was a second wave of Coronavirus infections (in some days of August there were around 600–800 new cases) (Business Insider, August 2020). It was probably a result of opening businesses and holiday season. But it should be remembered also that in addition to reducing employment, enterprises are also announcing to decrease wages.

On the other side it is optimistic that the economic situation of the Polish economy before the period of the epidemic might act as a sort of cushion neutralizing the impact of the unemployment wave. If we compare this still relatively low unemployment (around 6 %) to the most pessimistic forecasts from March 2020, the ratio should not exceed a two digit number in next quarters of 2020 depending on the next waves of Coronavirus or some part-lockdowns in particular regions of Poland with the highest ratio of the SAARS COVID-19 infections. Structure of unemployment in Poland is still highly depended on the conditions of particular region or even county and part of the country: for instance it will be different in the Wielkopolska Province than in the Świętokrzyskie Province.

Unfortunately, during a short period of prosperity in Poland before the burst of COVID-19, it was still not possible to balance the development of the internal labor market and to eliminate the constantly deep regional differences: at the end of March 2020, the unemployment rate in the Wielkopolskie voivodeship was at the level of 3.1%, and in the Świętokrzyskie voivodeship – 8%.<sup>1</sup>

The situation of the COVID-19 epidemic in Poland also has shown how important are in the labor market skills and competences related to new technologies; switching to online or remote work has verified not only the knowledge and skills of actual use of new technologies, but also confirmed that digitalization and technologies such as Web 4.0, and soon G5, are the future and guarantee the development of not only the economy, but the future of the labor

<sup>&</sup>lt;sup>1</sup> The number of registered unemployed and the unemployment rate by voivodships and counties. Data obtained from the District Labor Office in Opole on April 30, 2020.

market. Hence, it seems necessary that employees in a every group of workers sooner or later must acquire this type of skills in order to remain competitive and effective employee.

#### Communication in the context of crisis - COVID 19

Situation of COVID-19 required in almost the same measure a distance working from employees as e-learning from the students and teachers. In Poland in fact by March 2020 of first pandemic regulations issued by the government there almost had been no a particular law to regulate procedures of distance working in Poland. Unfortunately, in Poland the results of Antal's research show (from February 2020), about 2.5 million professionally active Poles carry out tasks that can be performed remotely (in whole or in part). Therefore since a mid of March 2020 a Polish labor market had to come to grips with a new situation.

According to a study conducted by Digital Workforce' research, workers whose employers care about universal and easy access to the application spend almost 20 percent less time to manually execute processes, as well as better collaborate with others and make decisions faster. Moreover, providing employees with work comfort comparable to that offered by consumer devices brings a number of other benefits positively influencing the company's work (Forbes Insights, 2017). This rise in apps has a profound impact on the performance of employees and, especially on a company's bottom line. As the survey found, companies providing ready access to the apps:

More than three-quarters of end-users in Digital Workspace companies say apps accelerate their decision making (compared with just 39% of end-users in Traditional Workspace companies) and increase personal productivity (Forbes Insights, 2017, p. 3).

Beside some shortcomings of distance working especially for employers, who maybe are not able to monitor too precisely of workers behind their computers or distance devices, there are more strengths useful for the situation of pandemic and post-pandemic we are facing now. Some people are more effective as remote workers, others are completely unfit to this way of work. There are psychological factors, a range of predispositions that guarantee the remote worker high efficiency and effectiveness in action. Let us make a brief review of these following manager Alicja Detlaff's remarks:

• one of the key success factors of a distant employee is strong internal motivation, self-discipline and the ability to manage oneself in time,

including organizing work on one's own, as the ties between the employer and employee are loose.

- a positive attitude to change and innovation is another important element that characterizes employees capable of working in the home office. Employees with a flexible nature easily adapt to new situations and have no major problems with accepting non-standard working conditions.
- a next challenge in remote work is to cope with limited social contact and sort of isolation. The human need for affiliation, i.e. social contacts and group affiliation, is one of the basic human needs, which plays important role in effectiveness of workers. Therefore such an employee working more individually must be more self-dependent than others and holds some special predispositions. Some of these are independent control of own work, responsibility for the organization of time, autonomy and independence in making decisions (Detlaff, 2020).

It is truism to claim today that an employee sitting only at the office does not guarantee the highest labor efficiency and effectiveness in action. It is hard not to agree with the labour tendency that:

More and more companies are beginning to understand that work is an activity, not a place to work. There are some pretty hard numbers behind this. 63 percent Status of Telework respondents believe remote working increases productivity. 65 percent teleworkers are more likely to stay in their institution thanks to the possibility of remote work. The US Patent and Trademark Office cut annual property costs (Gajewski, 2020).

How important and helpful e-technology plays key role in such unexpected situation as COVID-19 pandemic proves an example from Rome which was enormously affected by coronavirus. In Rome the city government maintained business continuity mainly thanks to digital workplace technologies. The city authorities and agencies offices as *Città metropolitana di Roma Capitale* oversees an area of 121 local municipalities and 4.5 million inhabitants. Like other Italian public sectors, *the Città metropolitana di Roma Capitale* started its digital transformation already in 2018 and in 2020 it turned out to be very fruitful. An important part of it was also the implementation of VMware Horizon 7, i.e. IT solution that was a key in ensuring remote work. When social isolation was ordered in Italy in March, because of the most infected European country, in Rome there were employed almost 900 workers capable of working from home. According to a survey conducted by SHRM in April last year, as many as 69

percent of enterprises around the world offered employees the possibility of remote work (Gajewski, 2020).

The situation of currently required skills in labour market under conditions of COVID-19 to some extent is similar to circumstances in education, where one of the most needed skills has become communication competences and dealing with IT, ICT, new media and internet technologies. In the current situation of Coronavirus the communication skills are important for many professions but are crucial for teachers/educators or counselors. Teachers communicate with students, parents, colleagues and administrators almost every day. Instead communicating face-to-face, they may be in touch through the internet, smart communicators, on the phone, in print, electronically or through the public address system. Beside the current situation the message always must be constructed carefully and delivered clearly to be properly received. Educators, teachers or lecturers belong to key labor groups of workers who have been affected significantly by COVID-19 and conditions of lockdown.

Since April 2020 of the beginning of lockdown in Poland not only young people, but majority of employed active educators and professionals had to use technology to facilitate the kind of social interactions in order to complete the particular curriculum. There is always smaller group of digital pioneers in focus group that is pushing at the boundaries of conventional practice. For every focus group there should be a 'leader of the pack' who used to be one step ahead of the rest. Such individuals used to have strong digital identities and are making the shift from consumption to creation. A range of characteristics is common to this type of activity – self-motivation, ownership, purposeful creativity and peer-to-peer learning.

Communication is both receptive and expressive, especially in the time of isolation as the COVID-19 lockdowns. Therefore teachers/educators must be skilled at listening to their students as well as explaining things clearly. Teachers need clarity of thought to present their ideas and instructions. They must be able to break down complex ideas into simpler parts and smaller steps to transmit to their students as well as adapt their methods of communication to all students regardless of ability or learning style. They are able to "read" their students and adapt to the needs of the individual. Effective communication includes transforming the boring into the interesting and having good presentation skills.

According to the latest report of the Polish students for instance from the Opolskie Region (Poland) high school in Poland there are some suggestion of improvement in communication process in such unusual and difficult context.

Comprehensive examination of needs, problems and opinions students who, in the face of the ongoing Coronavirus pandemic, are facing a great new challenge which is a remote education (*Edukacja zdalna..*, 2020).

Most of Polish educators/teachers on almost all levels of education used forms of distance learning in the time of quarantine. The forms of conduct distance learning which have been chosen by educators and teachers are:

- sending tests, work cards or homework assignments;
- online lessons (video conferencing);
- using e-learning platforms e.g. Epodręczniki.pl (website of textbooks);
- using dedicated platforms by publishers.

Definitely the dominant forms of distance learning were sending tests, work cards, homework or other forms that require the student to work individually at home and then to send back the completed materials to the teacher for checking. As many as 92.6% of the surveyed students declared that they had been using this form of remote education. Using e-learning platforms is not a popular solution, but 39.1% of respondents declared using this form of distance learning *Edukacja zdalna..*, 2020). A solution that was hardly applied in the city schools was to use platforms dedicated to school textbooks. Only 6.6% of the surveyed students chose this form of distance learning. Despite low popularity, this solution offered interesting interactive materials, of which students were satisfied. There were also other popular means and tools:

- recommended links of multimedia helpful materials;
- using popular social media and messenger platform
- sharing movies on You Tube web;
- recording lectures, classes, speeches and sharing with on the social media;

Recording lectures or lessons, which were then put on the platforms such as YouTube in the form of a film or content in communicating platform as "Teams" was also a form of distance learning that some educators/teachers took on. Students in the report also indicated that the ability to re-play a lecture or lesson was useful in that solution. External sources were also increasingly chosen, to which students got access via teacher's internet links (films, radio programs, press articles).

There was recommendation to unify the remote education system within tools to one platform common for all students. In particular, it was pointed – "Microsoft Teams" platform, which offers extensive opportunities for communication, work organization and interactive work with students during online lessons. Appropriate system configuration should be on the school management's side in order to provide all students with comfortable access to lesson materials provided by teachers (*Edukacja zdalna*.., 2020). From this local research and students and educators' experience the result which worries is a low popularity and take on e-learning platforms.

In such context of exploiting strongly ICT, ITI and digital platforms of distance learning, we might ask at this point if finally ICTs would replace the teacher or student in the time of pandemic? The answer supposed to be a negative because in fact, with the introduction of ICTs in the classroom, the teacher's role for example in the learning process becomes even more pivotal. A learning process in these days shifts from the "teacher-centered model" to a "learnercentered model", the teacher becomes less the sole voice of authority and more the facilitator, mentor and coach-from "sage on stage" to "guide on the side". The teacher's primary task becomes to teach the students how to ask questions and pose problems, formulate hypotheses, locate information and then critically assess the information found in relation to the problems posed. And since ICTenhanced learning is a new experience even for the teachers, the teachers become co-learners and discover new things along with their students. Such experience will be so needed in dramatically changing requirements of labour market also in Poland. Some years earlier such diagnosis of changes in labor market over other countries were already reported such as a finding by the National Academies of Sciences, Engineering, and Medicine (2017):

As IT continues to complement or substitute for many work tasks, workers will require skills that increasingly emphasize creativity, adaptability, and interpersonal skills over routine information processing and manual tasks. The education system will need to adapt to prepare individuals for the changing labor market. At the same time, recent IT advances offer new and potentially more widely accessible ways to access education (National Academies of Sciences, Engineering, and Medicine, 2017, 140).

#### New educational and skills-building programs

A few years ago, the OECD presented a bleak picture of adults with poor literacy skills (Figure 1), and reported that, on average, one in five adults have poor reading and numeracy skills (OECD, 2016), where unfortunately Poland was still in high percentage of lacking these basic skills. In Europe, the Cedefop-European Centre for the Development of Vocational Training calculated that adults with low or no qualifications comprise 30% of the unemployed (Dehmel, 2013).



Figure 1. Adults with poor literacy skills, as a percentage of all adults (aged 16 to 65 years)<sup>2</sup>

Regarding education, it is useful to summarize some crucial questions related to the new job skills:

- What are the most important skills needed to succeed in the workforce of the future?
- Which of these skills can be taught effectively via online systems through a self-learning and social learning approach?
- Which skills present teaching challenges?
- What new types of credentialing systems should support non-formal and informal learning programs?

Experts indicate that critical thinking and creative thinking are crucial factors for the success of the future workforce. However, this is true only in the medium-long term. In reality, at present, workers who are really creative and innovative often encounter various difficulties. In countries where corruption and political and patronage relationships dominate the working environment, a creative capacity is not considered to be a value, therefore we could observe partially so large numbers of labor immigration of Polish students in last two decades. Indeed, the new technologies will contribute to the elimination of many parasitical levels in elevated workplace hierarchies, particularly in public organizations. At the moment, the problem is that many top managers are not skilled to compete in challenging world, and restrain innovative initiatives that

 $<sup>^{2}\,</sup>http://www.oecd.org/employment/ministerial/How-does-your-country-compare.pdf; last accessed on 04.09.2020.$ 

they do not understand. This situation is complicated by information systems that are ineffective since their design has not evolved with the times in terms of new emerging needs such as pandemic lockdowns.

From this perspective, acquiring skills in computational thinking could be more fruitful. Computational thinking is a method of thought that is used in computer sciences (Grover & Pea, 2013), but experts argue that it can also influence the way people solve any type of problem. Computational thinking can be understood as the mental activity of formulating a problem in such a way as to admit a computational solution (Wing, 2014).

In this regard, learning coding may help to improve the way in which any kind of problem is tackled in an increasingly digitalized world. In the near future, computational thinking will provide the skills necessary in the sphere of work, but will also bring great social benefits since it can help design innovative solutions for people's livability. Computational thinking enables complex problems to be tackled in efficient ways as well as the up scaling of good solutions. In such context of mechanization also in thinking there cannot be forgotten more and more important also during a time of pandemic so called "emotional intelligence". Therefore the social skills, such as persuasion, emotional intelligence, and teaching others, will be in higher demand in near future across industries. Content skills (which include ICT literacy and active learning), cognitive abilities (such as creativity and mathematical reasoning), and process skills (such as active listening and critical thinking), will all increasingly become part of the core skills requirements for many industries (World Economic Forum, 2016, p. 24)<sup>3</sup> also for educators and professionals who must implement them into process of education.

Figure 2 synthesizes the future of work and skills, offering some propositions of skills' matrices for 2020, but they of course did not predict a pandemic time of Corona virus.

Tony Wagner, an innovative educator evolves a proposal of important future educational skills. According to Tony Wagner skills & qualifications surrounded by helpful technological circumstances may support the holistic students' development (Wagner, 2008; Davis, 2008). In circumstances of future pedagogy, Wagner proposes more in holistic way achieving these skills&competences in relation to human work, life-long learning and fulfilling citizen tasks. He called them "survival skills". According to him following and fulfilling those skills may

<sup>&</sup>lt;sup>3</sup> More than half (52%) of all jobs expected to require these cognitive abilities as part of their core skill set in the 2020s either do not do so today, or do so to a much smaller extent.

guarantee more or less succeeding not only education but in business as well (Wagner, 2008). Very important group of skills in his proposal there is a group of communication skills. In his "21st Century Skills as defined by Partnership for 21st Century Skills", which is enlarged sets of needed and useful skills, there may be found a important indication: "Communicating and collaborating with teams of people across cultural, geographic and language boundaries" (Wagner, 2008). Especially the stress should be put on a communicating across geographic borders after returning back to country borders and closing them because of the COVID-19.

Figure 2. Ten skills for the future (source: Tracey Wilen-Daugenti)<sup>4</sup>



How much important not only in development process of education but also in holistic progress of a human being there are communication skills, especially in the field of professionalization and even business are others propositions of evolving the communication competences for example among professionals. One of such propositions is "The Effective Oral and Written Communication" of Annmarie Neal, Vice President for Talent Management at Cisco Systems, who understands and puts such competences very high in hierarchy of skills: "The

<sup>&</sup>lt;sup>4</sup> Careers 3.0 Future Skills Future Work, slide presentation; available at https://www.oecd.org/ site/eduimhe12/Tracey%20Wilen-Daugenti.pdf; last accessed on 11.08.2020.

biggest skill people are missing is the ability to communicate: both written and oral presentations. It's a huge problem for us." Wagner adds more as a clear and concise writing, speaking, and presenting with focus, energy, and passion; ability to persuade others; know how and when to use different levels of communication; ability to provide "elevator speeches"; presentation skills. There is no coincidence that Wagner sets a group of communication competences just with collaboration skills. Communication and collaboration mean that students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. They also:

- a. interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.
- b. communicate information and ideas effectively to multiple audiences using a variety of media and formats.
- c. develop cultural understanding and global awareness by engaging with learners of other cultures.
- d. contribute to project teams to produce original works or solve problems.

Another proposition of future skills set comes from the diagnosis for young people who will be applying for job. These core employability skills have been grouped under four broad skill categories: learning to learn; communication; teamwork; problem-solving. But so many pro-future skills and competences which are treated in many educational proposals as needed and necessary consist of communication skills such as: competent in reading, write to the needs of an audience, write effectively in the languages in which the business is conducted, listen and communicate effectively, listen to understand and learn, read independently, read, comprehend and use materials, including graphs, charts, displays, understand and speak the language which the business is conducted, use numeracy effectively, articulate own ideas and vision (Brewer, 2013, pp. 10–11).

#### The future of jobs and skills

Generally speaking, manual working tasks and repetitive intellectual activities will continue to be drastically reduced. This trend is already evident in industrial production and office work. Indeed, since the beginning, the goal of automation was to eliminate physical work and routine low-level intellectual activities, such as ordering data, checking for formal correspondences, performing calculations, etc. The first aim of Artificial Intelligence was to make machines that were able to make things in a way that would be considered intelligent if the work were done by humans.

Currently, most administrative tasks consist of entering data/documents received from users into electronic systems and checking their consistency. Administrative work can be drastically cut if users enter data directly and intelligent programs check it. The advent of home banking has greatly decreased the interactions of a bank's customers with its employees, since customers can arrange many of their transactions by themselves.

Figure 3 presents the seven key principles of future work indicated by the futurist and keynote speaker Jacob Morgan. The development of intelligent software will not only make employees redundant but also computer engineers who, today, provide for the maintenance and management of traditional electronic programs. The availability of more advanced and sophisticated tools will allow normal users to develop applications without coding but simply by assembling ready-made functions and using wizards.

The development of intelligent software will not only make employees redundant but also computer engineers who, today, provide for the maintenance and management of traditional electronic programs. The availability of more advanced and sophisticated tools will allow normal users to develop applications without coding but simply by assembling readymade functions and using wizards.





However, if new office applications lead to a decrease in administrative staff and a simplification of bureaucratic procedures, their implementation will require new professional figures. To build intelligent applications, machines must be fed with knowledge in machine readable format. Ontologies should be created and knowledge bases should be implemented by knowledge specialists. The building of multilingual knowledge bases and the training of machines will be one of the future jobs that will replace routine office work. Of course, in a far future, this job could itself also be automated.

We can argue that the digital revolution will bring people to spend their time isolated, additionally backed by situation of pandemic lockdowns, working alone with information and knowledge as well as in performing cognitive tasks and communicating with others (both humans and machines).

A few years ago, for instance the Foundation for Young Australians' (FYA) and the AlphaBeta Corporation Ltd (2017) have explored how automation, globalization, and flexibility are changing the future of work, highlighting what the main implications will be for young Australians. Some interesting indications contained in this analysis are the following:

- Future pharmacy assistant the time spent on store admin tasks (such as stocktaking and ordering) will be reduced from 22 hours per week in 2006 to 6 hours in 2030.
- Future electronics technician the time spent inspecting equipment will decrease from 9 hours per week in 2006 to 3 hours per week in 2030, whilst scheduling will also be cut (down from 11 hours to 1 hour); on the contrary, time spent interacting with customers or colleagues will increase from less than 1 hour to 4 hours, and time spent analyzing product data will increase from 0 hours to 2 hours.
- Future teaching/learning by 2030, teachers will routinely use digital technology for lessons and to support students' self-learning. People will spend many hours learning on the job, and continuous learning will be a relevant part of everyday engagement in work.

There is a broad consensus that smart thinking will be a crucial future skill (Vaughan, 2013; Buzan, & Dottino, 2016). Since many administrative tasks will been automated, workers will need strong skills in problem solving, communication, and the use of digital platforms. Moreover, it is expected that non-permanent and remote workers will make up the majority of workers, and consequently the need to collaborate across networks and lead by influence will increase. Finally, future work in the time of post-pandemic will be more

flexible and independent and, accordingly, workers will also need to have an entrepreneurial mindset.

A recent study, conducted using original survey data gathered from a sample of 10,000 individuals, analyzed the possible impacts of artificial intelligence and robotics on employment (Morikawa, 2017). The results of this investigation suggest that:

[...] malleable/adaptable high skills acquired through higher education, particularly in science and engineering, are complementary with new technologies such as AI and robotics. At the same time, occupation-specific skills acquired by attending professional schools or holding occupational licenses, particularly those related to human-intensive personal services, are not easily replaced by AI and robots (Morikawa, 2017, p.10).

What emerges from the diagnosis is the importance of developing malleable high-level skills through postgraduate education and the development of personal skills specific to human-intensive services. In fact, skill shortages can compromise the ability of firms to innovate and adopt new technologies, whilst skill mismatches reduce labor productivity due to the misallocation of workers to jobs McGowan & Andrews, 2015). As a consequence, anticipating emerging skills is crucial to harmonizing the impact of technology in the labor world.

It has been observed that the ability to assess and anticipate skill shortages and mismatches should become a major policy concern (OECD, ILO, IBRD, & IMF, 2016), whilst the importance of understanding changing skill needs, especially in the context of pandemic and post-pandemic world in order to ensure a better alignment between skill demand and supply is widely recognized.

#### Conclusion

It seems obvious in these days that technology will change the way in which humans produce goods and run services. Some types of human labor, both physical and intellectual, will be replaced by intelligent programs and robots. Many jobs will be eliminated whilst others will be created. This means that future workers should be prepared to change their jobs and, perhaps, to work for more than one employer at the same time.

Continuous advances in computing and communication technologies are having almost similar profound impact on our society as the pandemic of COVID-19. Technology will, on a global level, affect every sector of human life, creating big opportunities for economic growth but also leading to significant changes. The world of labor and the workforce will be still undergoing radical transformations despite crisis and depression after lockdowns of the pandemic of COVID-19. Even though the latter may more accelerate the changes in labor markets, also in Poland as we can observe. Beside these influential changes still the application of potential and pro-employment activation and integration programs will be also adjusted to the situation of the unemployment level and the labor force's share in the market, because a direction and structure of unemployment in post-pandemic period seem be still quite decisive as well.

In its destructive effects, the COVID-19 pandemic broke the second stage of globalization, which for example consisted of the tight connections of supply chains with Asian markets because of cheap labor. Moreover, as it could be observed in the case of a temporary shortage of protective products during the Coronavirus pandemic, addiction to Chinese producers in many sectors of the EU and US markets has shown many negative influence also on a Polish market – especially all of the sudden there came out shortages of medical supplies in European and Polish markets. As a part of the probably propaganda war and the real economic conflict between the USA and China, new labor markets will be sought, still cheaper, but above all safe and equally efficient - hence the Polish labor market can remain competitive and attract migrants from Asia in this context of global western corporations and enterprises. The current protectionist measures in majority of well developed markets confirm a trend of coming back to self-sufficient and anti-globalist economical models.

In this regard of required and useful skills and competences in the Polish labor market there is a necessary an effort to understand the future technology trends and develop strategies to support the changes in the labor market. Therefore, experts suggest investing in education to exploit the opportunities offered by the technological revolution. However, ongoing transformations will not wait for the reform of the current educational system, it is therefore urgent and critical to prepare educational programs in order to re-train the current workforce. Governments should develop effective policies to sustain the educational effort and favor innovations like in distance learning, communication models, emotional intelligence, or social innovation, making people aware of the challenges awaiting them. Abstract: The paper examines an importance of e-technologies and their key roles in such unexpected situation as COVID-19. The authors propose diagnosis of Polish labor market which had to answer to both challenges in quite short time of year 2020 - technological and civilizations changes as well as COVID-19 pandemic and post-pandemic time. The situation of currently required skills in Polish labor market under conditions of COVID-19 to some extent is treated as similar to circumstances in education, where one of the most needed skills became communication competences and dealing with IT, ICT, new media and internet technologies. The authors also raise a pivotal issue of new required skills and competences because of these last main changes: for instance in the context of Coronavirus the communication skills and coping with e-technologies became quite important for many professions and labor fields. In similar way the social skills, such as persuasion, emotional intelligence, and teaching others, are going to be in higher demand in near future across industries. According to authors such skills as the content skills (which include ICT literacy and active learning), cognitive abilities (such as creativity and mathematical reasoning), and process skills (such as active listening and critical thinking), will all increasingly become part of the core skills requirements for many industries.

**Key words:** Polish labor market, COVID-19, pandemic, skills, competences, new technologies, remote and distance work.

Streszczenie: W pracy poddano analizie znaczenie e-technologii i ich kluczowej roli w tak nieoczekiwanej sytuacji, jaka jest COVID-19. Autorzy proponują diagnozę polskiego rynku pracy, który musiał odpowiedzieć na dwa wyzwania, które pojawiły się w dość krótkim czasie na przestrzeni roku 2020, to jest zmian technologicznych i cywilizacyjnych oraz czasu pandemii i postpandemii COVID-19. Obecna sytuacja związana z wymaganymi umiejętnościami na polskim rynku pracy w warunkach COVID-19 jest w pewnym stopniu zbliżona do sytuacji w edukacji, gdzie jedną z najbardziej potrzebnych umiejętności stały się kompetencje komunikacyjne i radzenie sobie w środowisku informatycznym, posługiwanie się technologiami informacyjno-komunikacyjnymi, nowymi mediami i technologiami internetowymi. Autorzy poruszają również zasadniczą kwestię wymaganych umiejętności i kompetencji, które pojawiły się w związku z ostatnimi, ważnymi zmianami: np. w kontekście koronawirusa. Chodzi o umiejętności komunikacyjne i radzenie sobie z e-technologiami, co stało się dość istotne dla wielu zawodów i dziedzin pracy. Podobnie w najbliższej przyszłości, w różnych branżach, umiejętności społeczne, takie jak perswazja, inteligencja emocjonalna i uczenie innych będą bardziej pożądane. Zdaniem autorów takie umiejętności jak te w zakresie treści (które obejmują umiejętności posługiwania się technologiami informacyjno-komunikacyjnymi i aktywnego uczenia się), zdolności kognitywne (takie jak kreatywność i rozumowanie matematyczne) oraz umiejętności procesowe (takie jak aktywne słuchanie i krytyczne myślenie) w coraz większym stopniu staną się częścią podstawowych kryteriów w wielu branżach.

**Słowa kluczowe:** polski rynek pracy, COVID-19, pandemia, umiejętności, kompetencje, nowe technologie, praca zdalna i na odległość

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