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Education as the Main Entry Point in a Digitally Transformed Future of Work

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ABSTRACT

In the upcoming future of work, due to the digital transformation of organisations, humans must learn to work alongside artificial intelligent systems and thus the working environment and society will evolve towards augmented intelligence and hybrid teams. This research paper will present both the benefit of working with artificially intelligent systems but also the potential risks that these systems represent for the employees. In order to mitigate these risks education will become the main entry point to a digitally transformed future of work. It will be highly required for humans to be engaged in continuous active learning after the end of their education years. For the digital transformed future both organizations and individuals will have to engage in a lifelong learning process. Even so, in the future there will still be humans and organizations that will produce goods, content, and art in the old ways without the help of artificial intelligence or advanced technologies, and these will be "human-made" products and services.

1. Introduction

The advancements in technology and automation which generated the successive industrial revolutions has produced waves that have impacted human society on a multitude of levels from the way humans live to the way humans work and learn. The history of the advancement in technologies proves that long -term positive effects have offset the negative short-term consequences at global economy level and the general level of well-being of people. The current digital technologies have opened the door to a continuous digital transformation of every aspect of society from the way companies are running their business, to the future of work to including the way the educational system needs to change and adapt by digitally transforming the process of education.

According to Saarikko, Westergren, and Blomquist (2020) digital transformation refers to a process in which organizations and individuals must adapt to new technologies by using different skills and competencies. This will result in the new generation of workers having to be prepared for a lifelong learning in order to use technologies and skills to their advantage, while not attempting to compete with systems based on digital technologies. Artificial intelligence-based systems are much better than humans at doing repetitive tasks, and therefore the most likely outcome of such a competition with humans is that workers will be replaced quickly by such systems.

The Price's law Price's Law is stating that "the square root of the number of people in a domain do 50% of the work" and therefore, the other 50% of work is done by the others. It was formulated by the famous scientist Derek J. de Solla Price in 1963 (Peterson, 2018). It points out that if a company has 1000 employees only about 100 of them are doing half of the work while the other half is done by 900 employees. Consequently, the individual productivity of an employee belonging to the first group of 100 employees is 5 and the productivity of the second group is only 0,055, so one employee from the first group has a 90 times higher productivity than one employee from the other group. The law indicates that when a company grows as number of employees, incompetence grows in an exponential manner and that competence grows only linearly.

On the other hand, Peterson (2018) has explained this principle as the distribution of success and wealth in human society because just like in the animal kingdom the "winner takes it all". Peterson (2018) also provides a good example for this by explaining that only the music that was written by Beethoven, Bach, Tchaikovsky, and Mozart is played today by the modern orchestras and from their composition, and that only

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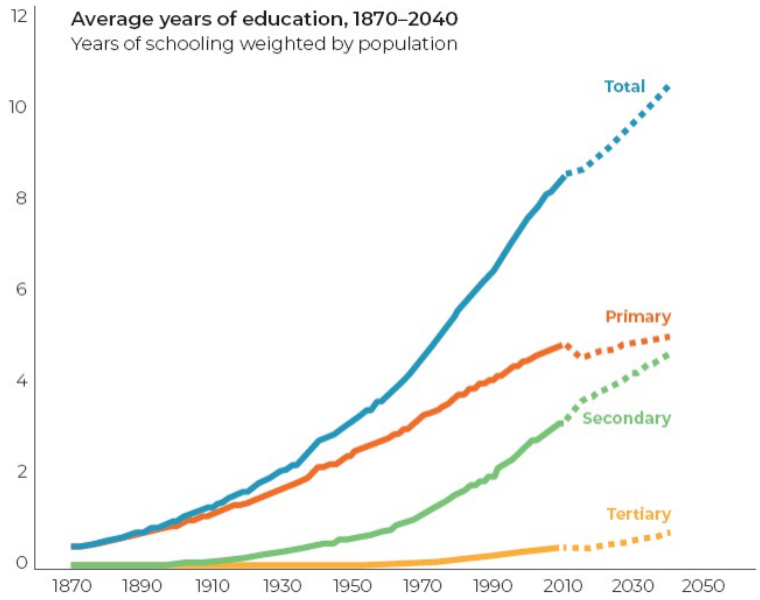
a small number of their music compositions are still played. If this principle is applied with technologies and especially with artificial intelligence it is clearly seen that it outperforms humans even if it is doing just one task for example cancer detection in the lungs, because the winner takes it all. In our opinion it is also clarifying why humanity must learn to adapt to the current technology environment and why this is valid for all categories of professions. This principle can be also applied in creativity, by training a neural network with hundreds of different furniture designs it will be able to generate new different designs as is the case of OpenAI algorithms. And as it never gets tired, it will outperform human creators at a certain moment in time, and in "a winner takes all" world, the AI systems will eventually win and replace humans in creative activities. Artificial intelligence is the technology that tries to mimic the functioning of the human brain with the help of mathematics. By processing large quantities of data, it is able to learn from past experience, analyze and recognize patterns in the data, make predictions, prescriptions and descriptions (Kreutzer and Sirrenberg, 2020). In conclusion, if humans want to remain relevant in a digitalized world and organizations, it is mandatory to become lifelong learners and able to adapt to different and changing working environments by continuously learning and developing their competencies, skills related to the use of digital technologies to their advantage in order to stay on the winning side.

From Figure 1, below, it can be clearly seen that since the technologies evolvement has started also the level of education has risen (Bailey and Tupy, 2020, apud Barro and Lee). This is also a result of the fact that economic growth and the life expectancy of the population have also risen. This economic and technological growth is also a result of extended peace time in the world since the second world war. The number of conflicts around the world have also dropped.



Source: Robert Barro and Jong-Wha Lee, "Educational Attainment for Total Population, 1950–2010," June 2018 update.

Figure 1. Average years in education taken from "Ten Global Trends That Every Smart Person Needs to Know: And Many Other Trends You Will Find Interesting " (Bailey and Tupy, 2020, p. 55)

2. The main technologies making a big impact on the future of work

Starting with the development of the Internet new knowledge has been produced at a rapid pace since and it enabled humans to access various information resources from anywhere around the world. While it is true that the world wide web contains more information than a single human can ever read in its lifetime, it is also true that it also contains misinformation. And humans must learn to distinguish the correct information from the misinformation which is becoming more difficult to do. It is important to point out that there are artificial intelligence algorithms that are capable of generating misinformation, such as text generation, image and video manipulation. Therefore, humans have also developed artificial intelligence systems that are able to assist humans in identifying and removing misinformation from different online platforms. Artificial intelligence has become more powerful over the years as new algorithms are developed at a high pace. There is also a lot more data generated by humans to train these algorithms. These facts are enhancing humans and organizations to get a better understanding of human society and behavior. Artificial intelligence will play a major role in the future of humans at society and organizational levels because it will influence the choices humans make from the supply chain, production process to customer relationships, to

online influencers. There are now artificial intelligence algorithms that can analyze large quantities of data and discover new patterns and make future predictions helping organizations gain better insight into their customers and competitors.

Artificial intelligence has also shown breakthroughs in creativity. For example, OpenAI creative algorithms are able to generate music, paintings, images from text and content that are almost able to pass as done by humans (Ramesh, et al., 2021, Chen, Radford, and Sutskever, 2020, Dhariwal, et al., 2020, Voss, et al., 2020, Brown, et, al., 2020, Payne, 2019). In the future, humans working in creative industries will have to learn and develop their digital and social skills in order to sell what they have created in collaboration with their artificial intelligence "partner". It can be said that artificial intelligence will have a major impact on the creative industry. A good example of this has happened in 2018 when an art piece called "Edmond de Belamy" was sold at an auction for US$432,500 (Cohn, 2019). The portrait was generated using Generative Adversarial Networks (GAN) and was trained on a data set of 15000 paintings from artists between the 14th and 20th centuries (BBC, 2018). This artificial intelligent algorithm was developed by Ian Goodfellow and it consists of a destructor and a generator with the help of which in time it can improve the artistic output. The generator generates new output and the destructor discriminates between the real item and the generated output (Brown, 2020a).

Another emerging technology that is going to become mainstream is the rise of virtual influencers. These influencers are created by CG artists and have the voices of different actors (Mosley, 2021). These types of virtual influencers offer a lot of potential for businesses and are more secure since a business has no control over a human influencer or actor, compared to a digital one (Bradley, 2020). As it can be seen some of these influencers are very popular and have a large fan base like Lil Miquela, Hatsune Miku, Shudu, and Bermuda (Poppi, 2020, Mosley, 2021). In the future, more businesses will use virtual influencers as their representatives in online communities. Given this we can imagine a future where companies will have digital avatars with artificial intelligence as their brain in order to interact and engage with human customers.

Artificial intelligence is impacting other industries like the medical and pharmaceutical industries, and the agricultural industry. For example, organizations are starting to use artificial intelligence systems to read and predict patients' diagnoses and develop new drugs for existing diseases. Also, the agricultural industry is using artificial intelligent systems together with Internet of Things (IoT) and robotics to manage crops and improve crop production. IoT based on using various sensory devices and cloud storage manages to connect and extract information from the real world into the machines (Brown, 2020b). Agricultural businesses that adopt such technologies will also improve their crop quality. Such a combination of systems is also used in the manufacturing process as machines take over the repetitive task done by humans enabling humans to engage in tasks that require more critical and creative thinking and also social skills.

By using a wide range of digital technologies, organizations will do one of the following three alternatives to further digitalize their processes. First, they will "replace and destroy tasks and jobs" for example manufacturers are reorganizing the production line and adding robots that will boost the production of goods but also will replace the human workers. Second, they will "hybridize tasks and jobs" by modifying old tasks and jobs with the help of digital technology by adding new competencies and retrain their employees in the new competencies. Third, they will "create new tasks and jobs", for example advisors in virtual worlds (Vartiainen, 2020, p.237).

Even educational activities are also affected by digital transformation and new digital technologies. Education is an entry point in the future of work, and also represents humanity's hope for a better future. In time, education will become more hybrid as humans still need to learn from humans' empathy and communication, and because education relies a lot on communicating the information to students it will be hard to fully automate. In education, there are applications and platforms that use augmented and virtual reality for students to better understand the concept and informational material offered by the professor. Virtual reality (VR) fully immerses the student or the employee in a virtual training environment in which the user loses contact with the real world (Lavingia and Tanwar, 2020, Azuma, 1997). While augmented reality (AR) overlays the virtual and 3D objects over the real world this will allow the user to keep in touch with the real environment (Lavingia and Tanwar, 2020, Azuma, 1997). Augmented reality and virtual reality are very powerful and in the future they will be more present in humans' lives (Cristache et al., 2019). These two technologies in combination with artificial intelligence and IoT will allow humans to connect the real environment and the digital world in an immersive experience. In the future, the teacher will be focusing on providing more guidance to their students and help them to acquire and improve various skills in order to prepare them for the future of work.

3. Competencies and skills for the future of work

Digital transformation has a major impact on the future of work and in order to face the challenge of unemployment, humanity must adapt by entering a continuous education era. Organizations and employees must learn to use new technologies and acquire new skills for the new jobs that will emerge as a result of their digital transformation.

According to Vartiainen (2020) "The European Commission prepared a European reference framework Key competence for lifelong learning considering competencies a combination of knowledge, skills, and attitudes" (Vartiainen, 2020, p. 248). This framework was prepared to identify key competencies and help societies and individuals develop necessary skills for the digital future. According to Vartiainen (2020) in this framework the following competencies were listed as important: "literacy, languages, science, technological, engineering, and mathematical, digital, personal, social, and learning, civic, entrepreneurship, and cultural awareness and expression competencies."Vartiainen (2020, p. 248).

In order to survive the coming future of work, humans will need to learn new skills sets and competencies. In the future of digital work, humans will learn different competencies such as:

- individual competencies which are a set of skills and learning abilities that a human requires in order to perform a certain task or job.
- teamwork is another important competency that an individual will need various to learn in order to adapt to different working environments and teams;
- to use strategic core competencies at organizational level, for organizations that aim to maintain and achieve competitive advantage;
- societal competencies that are required for society as a whole in order to survive the future of digital everything because these are the digital competencies that any developed society must learn and possess (Vartiainen, 2020, p.245).

In other words, individuals and organizations must learn to use both digital skills and social skills to prepare for the future of work and the future society. In future, learning and education will be part of daily human life because technology and digitization will continue to evolve. Also, the degree of interconnected technologies and the blending between digital and real-world will continue to grow, because digitalization is eliminating barriers in time and space between them (Roja, 2019). According to Merisotis (2020a), human work can be defined into three sets of skills as follows:

- People skills: given the advancement in digital technologies the collaboration between humans and creating social networks will increase. Engagement and interaction between people will become vital for every profession in the upcoming future of works since most of the repetitive tasks will become automated and consequently, fewer people will work in organizations;
- Problem-solving skills: this is a very complex set of multiple skills like identifying a problem, diagnosing the problem by analyzing all the data available involving dealing with risk and uncertainty and developing alternative solutions to solve the problem and taking the decision. In addition, in performant organisations this involves using also people skills due to actively involving various people from various groups of internal and external stakeholders into the whole decision making process;
- Integrative skills: refers to the way humans must learn to combine both knowledge and technical skills in order to adapt to different working environments.

Furthermore, Merisotis (2020b) has defined the notions of "wide learning" which is another important term to understand for the upcoming future of education. According to Merisotis (2020b), wide learning "includes broad, integrative thinking skills such as problem solving and abstract reasoning, and it also includes advanced technical skills that are constantly changing and evolving". In addition, wide learning includes attributes such as caring and empathy that also are learned, but through experiences that we need to assure people can have" (Merisotis, 2020b). Given the definition of wide learning it can be clearly seen that for the future of work humans must learn to integrate and use their social skills combined with different knowledge and technical skills (Micu A et al, 2018). Consequently, education systems must adapt to the requirements of wide learning coming from the work market and make changes into their curriculum according to the market needs. With the help of education humans will learn to combine skills and ensure that even if their job would become a repetitive task they will become able to provide better services using their people skills, problem-solving skills and integrative skills.

Given the above we recommend making humans aware of the fact that if their current job is a repetitive task it will be for sure automated in the future in the sense that some machine or an artificially intelligent system will take over that task and perform it much faster, better and more efficiently. According to Rosse (2021) if the job is a repetitive task and the human employee is just an endpoint for data that job will become automated. The more a job is connected to the outside network where the use of social skills is more important the less likely it will to be automated.

4. "Homo zappiens" and the future of education

Because of the rapid pace in digital technologies development and the subsequent digital transformation of organizations, a new term "Homo zappiens" to describe the human race has emerged, according to Henning (2021, apud. Veen and Vrakking, 2006). This term is used as a way to explain what has happened to the new generation of humans due to the development of technology, its impact on human life and to being constantly connected to digital technology. The term Homo zappiens is a complement to Homo sapiens and it refers to "learn in both highly parallel and non-linear ways" (Henning, 2021, p.45). Also, Homo

zappiens has become ”accustomed to making decisions at high speed and are permanently multitasking-doing several things at the same time” (Henning, 2021, p.45). Because of this, the educational process must change the way it teaches new knowledge, school children have already lost the ability to focus on one task for a longer period. School children and preschool children are already navigating the digital world with the help of icons and pictures even if they did not learn how to read or write. By the time they go to school children have already learned to use “non-linear approaches and connect everything before they look at individual elements” and this is a perfect skill for the future of work since it is “perfectly suited for mastering complex tasks” (Henning, 2021, p.45). The educational system must create a new curriculum in order to further enhance the development of this skill in pupils because in the complex and dynamic technological digital world humans must learn to navigate and make the right decisions from the multiple variants of possibilities and choices. Homo zappiens is the result of “the expansion and change of human learning and behavioral processes in the digital transformation” Henning (2021, p.52). In order words, the skills to navigate the complex word and multitasking are essential for being successful in the future workplace. that will require human beings to constantly learn and adopt new skills (Lovin, 2020).

5. The future of work and the need for education inside organizations

In order to prepare for the future of work, organizations will have to design their organizational learning processes and systems to provide support for their employees. Learning inside the organizations often fails to align with business needs, and organizations fail to address this given the uncertainty of new jobs emerging due to rapid changes in technologies. Also, when implementing learning inside organizations it is important to use in combination different learning models and more personalized learning experiences. According to Caporarello, Manzoni, and Trabelsi (2020) traditional learning or face-to-face learning is represented by students and professors being in the classroom at the same time. The online learning experience is the use of different platforms like Udemy or Coursera where the student and professor are not present at the same time, and students can navigate their lecture at their own pace. And blended learning is a model that combines traditional and online learning models.

According to Caporarello (et al. 2020) in order for learning to occur inside organizations, both organizations and employees must understand the “WHY” to learn (the motives), the ”WHAT” to do (the various ways to do it), and the “HOW” (the activities needed to do the chosen way to do it). The “why” refers to the benefits that are achieved through the educational process for both the organizations and its employees, such as increased job performance, or products and services enhancement. The “what” refers to the way in which learning can take place at an “individual level or team level”, and also at the organization’s level, the “organizational learning”. Regarding the “how” it is about categorizing the learning process in models (online, traditional, or hybrid as blending between online and traditional learning), in modes (learning can occur in teams or individual, face to face or distance learning, it can be standardized or a more personalized according to student needs) and methods (they can be game-based learning, lecture-based learning, project-based learning and so on). The research conducted by Caporarello (et al. 2020) has shown that while most of the learning occurs today at the job (about 67%) and about 33% occurs in the class, in future (in the year 2025) 77% of the learning will happen in schools “and it will become digitally-enhanced” (about 45%) as it shows in the data from Figure 2, below. in the future learning will be more personalized to students' needs and will take place in class.

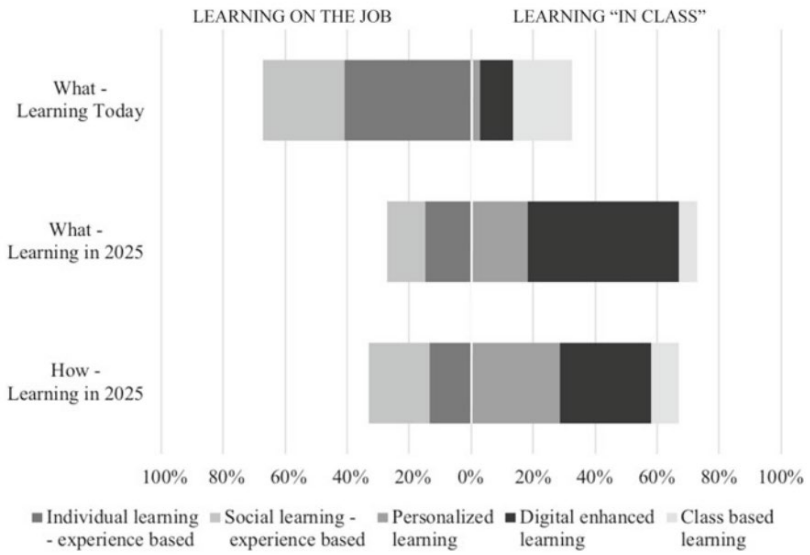


Figure 2: The future of education according to a survey done in Italy on people with working experience (Caporarello, et al. 2020, p.140).

The data from Figure 2 is representative for Italy and it displays the opinion from working people inside SMEs or large firms with ages over 35 years old. However, its results are consistent with the global trends in education identified by Bailey and Tupy in their book "Ten Global Trends That Every Smart Person Needs to Know: And Many Other Trends You Will Find Interesting".

The data shown by Caporarello can be further correlated with organizations having difficulties in finding the right staff and dealing with long periods of skills shortage. A survey, conducted in 2019 on business innovation and strategies by Statistics Canada together with other institutions, is showing, in Figure 3 , below, that Canadian businesses have issues with long-term skills shortages. By analyzing this data, using "Tableau" software for data science and analysis, it can be seen the high importance of training activities for organizations.

	Large enterprises (250 and more employees)	Medium-sized enterprises (100 to 249 employees)	Small enterprises (20 to 99 employees)
Job specific training	86.45%	85.15%	75.90%
Managerial training	59.90%	48.85%	27.20%
Training in new technology	52.75%	42.75%	29.40%
Training in new business practices	38.55%	28.35%	22.90%
Other training or development	35.20%	30.30%	21.65%
Digital skills training	27.95%	18.60%	13.90%
Data literacy skills training	17.15%	8.20%	6.20%
No training or development activities	4.50%	6.35%	13.70%

Figure 3: Training or development programs offered by enterprises in Canada

Source: Researchers' Computation

By calculating the median value in percentage across industries using data provided by Statistics Canada, large enterprises lead when it comes to training and development of their staff, with 86.45% in Job specific training, 59.90% in managerial training, and 52.75% in New technologies training. This type of programs done by organizations in Canada are actions they took in order to retain their employees. As it can be seen in Figure 4, below, businesses in Canada have taken various measures in order to retain their employees and to recruit new staff.

	Large enterprises (250 and more employees)	Medium-sized enterprises (100 to 249 employees)	Small enterprises (20 to 99 employees)
Targeted recruitment process	70.40%	61.10%	46.90%
Additional financial incentives involved in the retention strategy	70.25%	76.20%	79.30%
Additional financial incentives involved in the targeted recruitment process	61.50%	60.80%	55.10%
Training staff	55.10%	51.60%	51.70%
Additional non-financial incentives involved in the retention strategy	51.85%	52.45%	50.85%
Retention strategy	46.40%	41.35%	34.60%
Outsourcing work	43.00%	45.85%	42.30%
Student hiring	38.40%	32.20%	23.30%
Additional non-financial incentives involved in the targeted recruitment process	30.45%	34.15%	25.75%
No additional incentives were involved in the targeted recruitment process	19.50%	22.80%	22.30%
Don't know the incentives involved in the targeted recruitment process	10.80%	0.40%	0.00%
Temporary foreign worker programs	10.50%	11.60%	10.20%
Other measures	9.05%	6.70%	9.15%
Government programs	8.60%	7.70%	7.55%
No additional incentives were involved in the retention strategy	7.60%	0.00%	0.00%
Don't know incentives involved in the targeted retention strategy	4.85%	0.00%	0.00%
No measures taken	0.00%	0.60%	2.40%

Figure 4: Measures taken by enterprises in Canada to overcome skills shortages

Source: Researchers' Computation

By calculating the median value in percentages across industries, providing training/education for their employees is almost the same value across different enterprise sizes (i.e. 55.10% for large enterprises, 51.60% for medium-sized and 51,7-5 for small enterprises). It is also important to point out that no matter the size of enterprises the efforts to keep the existing workforce were focused on providing additional financial incentives and non-financial incentives, training existing staff, and applying a retention strategy. Another important aspect in the data set is businesses' involvement in the targeted recruitment process and this can be correlated to the skill shortage that businesses experienced over a long period of time and it can be seen in Figure 5, below.

	0 to 3 months, duration of skill shortage	4 to 6 months, duration of skill shortage	7 to 12 months, duration of skill shortage	13 or more months, duration of skill shortage	Skill shortage	Don't know, duration of skill shortage
Basic digital	0.00%	0.00%	0.00%	35.15%	3.00%	0.00%
Business	9.20%	14.20%	15.60%	17.70%	11.70%	0.00%
Computer science	0.60%	12.35%	13.85%	30.95%	17.60%	0.00%
Design	0.00%	6.20%	3.60%	27.30%	10.00%	0.00%
General data science and analytics	0.00%	0.00%	11.30%	24.55%	14.00%	0.00%
Information Technology (IT)	3.40%	10.05%	13.60%	34.70%	12.30%	0.00%
International business	0.00%	0.00%	0.00%	24.00%	2.30%	0.00%
Management	7.45%	9.75%	16.25%	24.55%	11.00%	0.00%
Skilled trades	4.90%	9.80%	13.95%	59.55%	51.70%	0.00%

Figure 5: Duration of skills shortage inside enterprises in Canada

Source: Researchers' Computation

As Figure 5 shows businesses in Canada have to deal with long-term skill shortage (longer than 13 months), and that the most affected types of skills, as median value in percentage, are first, skilled trades 59.55%, basic digital skills 35.15%, Information Technologies (IT) skills 34.70%, followed by Computer science skills 30.95%.

Skills shortage also affect many other countries, as indicated by the results of a survey across 100 countries conducted by Facebook in collaboration with OECD and World Bank in 2021. The survey is called "Future of Business Survey" and is run bi-annually on business with different questions. We have used an aggregated dataset related to the question "In your opinion, what are the 3 most prominent problems faced by business leaders like yourself? (Select up to 3)" and has the following two answers "Finding the right staff" and "Access to proper education and training to get the right skills", because we considered them relevant for our study. The analysis of this data set was conducted using IBM SPSS Statistics Version 26. Before the analysis, the dataset was prepared by selecting only the two variables by country. Before starting the analysis, we have defined "Finding the right staff" to be treated as the dependent variable and "Access to proper education and training to get the right skills" to be treated as an independent variable. Because we want to find out if finding the right staff is dependent on the variable access to proper education and training as it can be seen in the visual relationship of the two in Figure 6.

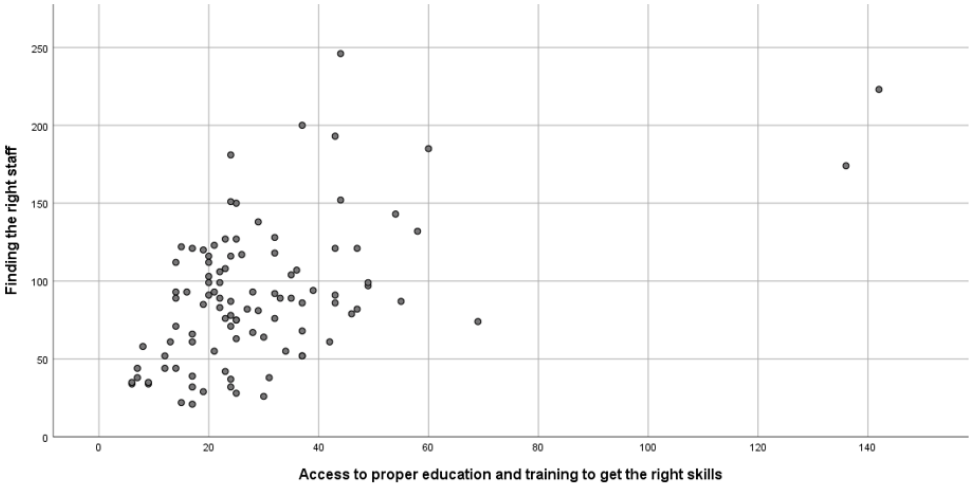


Figure 6: Simple scatter plot of access to proper education and training to get the right skills by finding the right staff

Source: Researchers' Computation

By considering the distribution of dots in the scatter plot chart from Figure 6, above, it can be seen that the relationship between the two variables can be described using nonlinear regression with a logistic relationship. The following logistic function with three coefficients has been used:

$$y = \frac{a}{b + e^{cx}} \quad (1)$$

where:

y = is the dependent variable "Finding the right staff"

a = this coefficient was defined with the starting value of 1
b = this coefficient was defined with the starting value of 1
c = this coefficient was defined with the starting value of 0 because is the coefficient of the exponent "Access to proper education and training to get the right skills"
e = is the exponential function
x = is the independent variable "Access to proper education and training to get the right skills"
After running the analysis in SPSS the results are in the following:

Table 1. Iteration History [b]

Iteration Number[a]	Residual Sum of Squares	Parameter a	b	C
1.0	1000759.000	1.000	1.000	.000
1.1	1034300.382	82.107	-60.704	-4.565
1.2	1019215.573	32.633	-62.266	-1.775
1.3	1019680.144	16.585	-30.171	-.856
1.4	1020732.573	8.466	-13.933	-.407
1.5	1023181.736	4.621	-6.241	-.197
1.6	1036953.742	2.374	-1.748	-.075
1.7	980234.929	1.349	.301	-.019
2.0	980234.929	1.349	.301	-.019
2.1	953025.664	1.649	.156	-.029
3.0	953025.664	1.649	.156	-.029
3.1	908368.884	2.033	.097	-.039
4.0	908368.884	2.033	.097	-.039
4.1	833881.817	2.534	.067	-.049
5.0	833881.817	2.534	.067	-.049
5.1	715689.416	3.164	.048	-.060
6.0	715689.416	3.164	.048	-.060
6.1	524575.527	4.038	.035	-.073
7.0	524575.527	4.038	.035	-.073
7.1	324343.188	5.237	.029	-.089
8.0	324343.188	5.237	.029	-.089
8.1	240761.638	6.764	.043	-.104
9.0	240761.638	6.764	.043	-.104
9.1	188050.613	10.271	.073	-.111
10.0	188050.613	10.271	.073	-.111
10.1	165116.730	17.733	.134	-.102
11.0	165116.730	17.733	.134	-.102
11.1	156835.463	33.119	.250	-.073
12.0	156835.463	33.119	.250	-.073
12.1	151371.939	50.165	.351	-.052
13.0	151371.939	50.165	.351	-.052
13.1	149712.388	69.714	.416	-.031
14.0	149712.388	69.714	.416	-.031
14.1	143973.768	71.246	.350	-.029
15.0	143973.768	71.246	.350	-.029
15.1	143938.070	72.224	.358	-.028
16.0	143938.070	72.224	.358	-.028
16.1	143938.045	72.182	.357	-.028
17.0	143938.045	72.182	.357	-.028
17.1	143938.045	72.186	.357	-.028

Source: Researchers' Computation

Derivatives are calculated numerically.

a. Major iteration number is displayed to the left of the decimal, and minor iteration number is to the right of the decimal.

b. Run stopped after 40 model evaluations and 17 derivative evaluations because the relative reduction between successive residual sums of squares is at most SSCON = 1.000E-8.

Table 2. Parameters estimates

Parameter	Estimate	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
a	72.186	14.016	44.369	100.003
b	.357	.092	.176	.539
c	-.028	.009	-.047	-.010

Source: Researchers' Computation

As it can be seen the estimate of parameter c is not 0 and has a negative value of -.028 because the growth of the dependent variable tends to get lower. This is statistically significant because the Lower bound is negative and lower than 0 at -0.47 and the Upper bound is -.010 and so the confidence interval does not contain the null value. In conclusion, the parameter c the coefficient of the exponent is statistically significant because is different from 0 in the total population

Table 3. Correlations of parameter estimates

	a	b	c
a	1.000	.664	.704
b	.664	1.000	-.019
c	.704	-.019	1.000

Source: Researchers' Computation

Table 4. ANOVA[a]

Source	Sum of Squares	df	Mean Squares
Regression	865805.955	3	288601.985
Residual	143938.045	97	1483.897
Uncorrected Total	1009744.000	100	
Corrected Total	197943.000	99	

Source: Researchers' Computation

Dependent variable: Finding the right staff [a]

a. R squared = 1 - (Residual Sum of Squares) / (Corrected Sum of Squares) = .273.

According to the analysis, the R squared is 0.273, and so the independent variable "Access to proper education and training to get the right skills" expresses 27,3% of the variation in the dependent variable "Finding the right staff".

Given the above results, we can conclude that the model is a valid model and the two values are correlated and indeed organizations are in need to find employees that possess the necessary skills and are willing to adopt continuous learning is becoming a necessity. Also, it is important to mention that this survey was run in 100 countries by Facebook and the correlation in the data must be different depending on the situation that businesses face in the country in which they operate. The results of this analysis can be considered because digital transformation does not affect only a limited geographical area, it affects every area of human activity and all businesses across the world Since digital transformation is related to innovation, and once innovations and changes develop more also the need for new skills and education increases.

According to Gromova (2021), the digital transformation of business organisations relates to the digital transformation of higher education. It is a strong relationship between business and education because a lot of employees and organizations will access different universities programs or online lectures in order to prepare for the future of work. These education programs will be done in-person, face-to-face or online using distance learning.

Organizations can provide distance learning in order to assist and help their employees with the challenges that arise from digital transformation. Given the fact that digital transformation is such a complex process, it is difficult for organizations to find the right teachers in their own geographical area. Consequently, organizations should access remote, knowledgeable, and skilled professors in different domains by using distance learning. Gromova (2021) describes distance learning as a process that can occur in five stages and are important for both professor and student:

- The first stage is "acquaintanceship, interaction, and incentive". This stage is very important for the students, and they must learn to use the new tools provided by the digital platform used in the process (Gromova, 2021). In this stage it is very important that the professor (or educational

organization) provides their students with the support needed in order to accommodate within the platform.

- The second stage is "information exchange". It happens after the students have learned to master online communication provided by the digital platform using various channels like video conferences, group messages in order to be able to work as a team on various tasks (Gromova, 2021). In this stage, communication between the professor and his/ her students and between students themselves is happening. The professor must make sure that the students desire and are able to engage in group communication on various topics related to the field of study. This stage is important because in the digital era cognitive skills that enable humans to work in collaboration with other humans or artificial intelligent systems represent one of the main advantages of humans. Therefore, they must develop them through education, too.
- The third stage is the "understanding" stage. In this stage the professor must create a learning environment where the students are able to engage in different role-playing games and tutorials in order to solve various problems (Gromova, 2021). The professor will assist students in order to analyze their activities and explain where they need to improve their skills.
- The fourth stage is "application": the student will work in groups in order to solve different problems using the newly acquired knowledge (Gromova, 2021). The professor could be a part of the process together with his students or could supervise the students' work in order to achieve the desired outcome for the problem.
- The fifth stage is "knowledge building and improvement". In this final stage, the students should be able to critically think and analyze their performance in order to further improve their skills and prepare for the constantly changing future of work (Gromova, 2021).

According to Gromova (2021), in the last stages of distance learning, there are no lecturing lessons, because in the distance learning process the student must learn to build their knowledge independently and apply it during different group tasks in class. As it can be seen, distance learning has its advantages when it comes to acquiring the expertise of professors that are not in the same geographical area with the organization. And so, distance learning can be used as a method for organizations to succeed in their digital transformation journey by providing better and focused education to their employees.

In conclusion, the process of the digital transformation of organizations is enabling the era of lifelong learning for employees. Managers of these organizations should understand that educational organizations must be the provider of educational services for their employees in order to achieve and maintain competitive advantages in the long term.

6. Augmented intelligence: The enhanced human worker

Digital transformation is fast changing the future of work, so humans must learn to adapt to new technologies and constantly educate themselves to use these new technologies. According to Hurwitz et al. (2020a), the future of work will be one that uses augmented intelligence meaning that human workers will be collaborating with intelligent systems. In this type of collaboration, human workers will need to be able to evaluate the data provided by the systems that use artificial intelligence in order to make better decisions. There is a very important distinction between artificial intelligence and augmented intelligence: the last tries to enhance humans' capabilities while the first tries to mimic human capabilities (Hurwitz, et al. 2020a).

Augmented intelligence is designed to extend the capabilities and intelligence of the human worker. There are two types of collaborations between humans and machines. The first type is "weak augmentation" where the process or task becomes fully automated because is cost-effective and more efficient (Hurwitz, et al. 2020a). The second type is "strong augmentation" where the workers collaborate with artificially intelligent systems and by doing so they are able to change the entire business process (Hurwitz, et al. 2020a). There are tasks where humans outperform machines and tasks where machines outperform humans. For example, it will never be possible for a single human to analyze a huge quantity of data and to recognize its patterns, as it is impossible for machines to explain different outcomes. Therefore, in the future of work, people must learn to collaborate with machines and to take advantage of this collaboration, in order to extend their capabilities and strategic thinking. Thus, it will become mandatory to continue learning and adapting to the different working environments and acquiring new capabilities.

Hurwitz (et al. 2020a) defines some key elements for organizations in order to develop humans-machine collaborations that lead to augmented intelligence. First, organizations must decide what they need to automate in order to drive better outcomes and create and enhance human-machine collaboration by changing the task flow or the business process. During this process, large quantities of data are required in order to train the artificial intelligence algorithms. When doing it organizations must design this system in order to combine artificial intelligence with human intelligence and achieve augmented intelligence. In the end, humans must learn to work using augmented intelligence and this will become a tool that will assist humans with their work, given the fact that humans intelligence has its limits (Hurwitz, et al. 2020). According to Hurwitz (et al. 2020b), special artificial intelligence systems will assist humans in learning at work inside their organization in the future. This type of system will be able to evaluate the human worker

based on past data and make suggestions to improve its work process. It is important to point out that organizations must consider all ethical considerations in order to ensure a safe working environment for their employees when implementing such a system. Augmented intelligence provides a huge opportunity for human-machine hybrid collaboration by freeing up workers' time from executing repetitive tasks and enabling them to become better at decision making with team members and networking with different clients for better outcomes. (Hurwitz, et al. 2020b)

7. Unemployment as the risk generated by technologies

Future is defined by uncertainty making it difficult to predict what lies ahead. Therefore, it is important to understand that humans and organizations will continue developing and adopting new technologies and that the process of digital transformation of organizations will continue. Likewise can be said about the future of jobs because there are no robot-proof jobs and that sooner or later all jobs could become automated and digital. We consider that it is the task of humans to manage their jobs in order to prevent the dehumanization of jobs.

As Roose (2021a) in his book "Futureproof: 9 Rules for Humans in the Age of Automation" argues that automation is also coming for white-collar professions like lawyers, doctors, even programmers because of the development of no-code platforms. Even jobs that were considered safe and use creativity and compassion are no longer safe (Roose, 2021a). As explained before, there are already artificial intelligent systems that are generating creative content that will have a huge impact on content creators like journalism, movie writers, and fashion artist because in fashion there are a lot of repetitive patterns when creating new clothes (Roose, 2021a).

For compassion, there are already robots that take care of the elderly and replacing human caretakers in Japan (Roose, 2021a). It is true that they lack human emotions but in time as technologies advance, they will become able to emulate emotions as they are already getting better at reading human faces in order to detect emotions (Roose, 2021a). Another trap for humans is the thought of programming robots to have sensory feelings and show feelings. For example, if humans thought that a robot could feel pain, it would not be too difficult for humans to feel empathy and compassion for that robot given the fact that humans feel empathy and compassion for animals. Given this, it is important to understand that in the future humans need to learn and utilize their skills more for interactions with other humans and humanize their job. For example, in medicine, there are already programs that analyze the patient data and generate results for doctors so doctors will use their time to interact with and offer comfort and empathy to their patients.

In future, jobs will be divided into two categories according to Roose (2021b), the first, "machine-as-assisted" jobs and the second, "machine-managed" jobs. In the machine-as-assisted job, the human worker has the purpose of using automation as a means of help in order to improve the outcome (Roose, 2021b). This type of job requires "human-centered automation" based on digital systems complementing the human worker by augmenting and extending his/ her capabilities and intelligence. The "machine-managed" job refers to the type of job where the human workers are endpoints or gap fillers. In this type of job, the human workers are not collaborating with the machine because they are more on serving the machine by doing tasks that machines are not able to do on their own (Roose, 2021b). Likewise, a good indicator that a job will be fully automated is if the human worker is carrying out instructions generated by smart machines, so they are actually managed by the machine.

8. Digital transformation and the rise of human-made products and services

Based on the above considerations, it is safe to state that by promoting human work and human creativity there is also a third way for humans to coexist in this digitally transformed future. This assumption is based on the fact that there are currently several products created by using ancient or traditional ways and they are called "handmade". In the future, human-made creations will exist that will be done without the use of artificial intelligence or different machines. These products will be labelled "human-made" since it will be created only by using human creativity and work and will not be generated by different algorithms.

Also, it is correct to assume that in future there will be small businesses run by humans for humans' needs and which will emphasize the human nature of work they are providing. This will be the age of human-made in the age of artificial intelligence (Gruia, Bibu, and Roja, 2020) as it is for the hand-made products that are of great value on the market compared to the industrial products. This conclusion is based on history, for example artisanal and traditional items have a higher value on the market now as they had in the past when they were considered everyday items. For example, in Romanian traditional clothes have a higher value on the market compared to modern clothes. Also, the way in which these items are created has risen to the state of art in some countries like Japan, where the making of old products in the traditional ways is considered an art. And this type of art, creativity, and human collaboration will never become automated. Also, this type of work will be done by small businesses and individuals that want to prevent the loss of traditional crafting.

We consider that the learning methods used to acquire the skills needed to create different products or art will remain the same. However, small entrepreneurs will need to develop digital skills useful for advertising, selling and keeping in close touch with their customers, in the digitalized world of tomorrow.

9. Conclusions

This paper examined the extent and impact that digital transformations bring to education and to the future of work. The main conclusion is that in order to succeed in the future of work humans need lifelong learning. In other words, the road to a digitally transformed future of work is paved with education and learning. Not only individuals but also organizations will have to embark on a continuous learning process in order to improve their business models and achieve success in their digital transformation process.

Given this, new questions will emerge as to how future digital society will work? And how will human beings be able to adapt to a lifetime of constant learning to keep pace with the fast-changing world and work? And what will be the physical and psychological consequences of this process when humans are getting older? And what will happen with those who cannot learn as fast and lose their jobs to other humans? What will happen with those humans who will not find a job since many jobs will be performed by machines using artificial intelligence? These are some of the questions that need future research in order to identify the best answers and solutions.

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