

## DIGITAL TALENT IN A LEARNING EUROPEAN UNION

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### **Abstract**

*In the current era of digital transformation, the European Union countries are facing challenges related to digitalization of businesses, attracting digital talents, digital divide, digital skills, low number of digital champions, lack of cybersecurity readiness, trust in digital transformation, lack of investment. For the time being, we witness at international, European, national, regional, and local level the race for attracting digital talents as they are essential for a successful digital transformation in the EU. Digital talents are crucial for companies, local governments, universities, and countries as a whole for social and economic development and increasing competitiveness. The European countries should be able to attract, to invest, and to retain the most talented employees, thus to have competitive advantages. The idea of the paper is to explore how digital talents can better foster the development of countries and the way they could address the current worldwide challenges. The paper reveals the landscape of digital competences in the EU Member States as well as the main challenges of digital talent management. It also presents a comprehensive roadmap for enhancing successfully the digital competences in Romania. The empirical analysis of digital competencies emphasizes the necessity to develop digital competencies in all the EU countries and especially in Romania by modernizing the education and training systems. The current paper explores the statistical connection between digital competence and talent competitiveness. The research methodology comprises bibliographic syntheses, socio-innovative empirical researches, analyses of correlation, and regression.*

### **Keywords**

*Digital transformation; digital competences; correlations.*

### **Introduction**

For the time being, the coronavirus pandemic represents an outstanding challenge to the whole world. According to UNESCO (2020), “over 1.5 billion learners and 63 million teachers are affected by system-wide closures in 191 countries”. In this context, digital-based innovation is important both in healthcare and education and all governments have taken measures in view to ensure health protection and learning continuity by alternative tools, i.e. digital platforms, television, and radio.

The European Commission is providing a common European response to the outbreak of COVID-19, taking measures and actions in view to improve the healthcare, education and diminish the socio-economic impact in its Member States.

## The landscape of digital competences in the EU

In the EU countries, the benefits of digital transformation relate to enhancing productivity, fostering innovation, triggering the creation of new jobs related to artificial intelligence, data analytics, robotics, cybersecurity.

The European Union is committed to boosting the digital transformation, representing a key priority for its future economic growth. The White Paper on the Future of Europe highlights “the challenges of digital transformation that will influence all jobs, governments, and businesses” (European Commission, 2017). The European Commission is evaluating the impact of digital transformation on its labor market in view to develop relevant measures and actions. The Digital Europe program, the first EU program designated to digital transformation represents “a component of the 2021-2027 MFF proposals, with a proposed overall budget of €9.2 billion, in view to trigger investments mainly in supercomputing, artificial intelligence, cybersecurity, digital public services and advanced digital skills and to ensure the wide use of digital technologies” (European Commission, 2019).

Ferrari (2012) states that digital competence represents “the set of knowledge, skills, attitudes, abilities, strategies and awareness that are required when using information and communication technologies and digital media to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning and socializing”. According to Ilomäki et al. (2016), digital competence comprises “the skills and literacies needed for the average citizen to be able to learn and navigate in the digitalized knowledge society”.

Researchers as van Deursen and van Dijk (2014), Helsper and Eynon (2013) highlight that digital competences and the ability to make use of digital media autonomously and strategically are of increasing importance to ensure users’ full societal participation. Wastiau et al. (2013) emphasize “the comprehensive organization of policies, leadership and supportive organizational infrastructures when trying to achieve technology integration and development of the digital competencies needed”.

“Digital competence involves the confident, critical, and responsible use of, and engagement with digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, digital content creation (including programming), safety (including digital well-being and competencies related to cybersecurity), and problem-solving” (European Commission, 2017). The Council Recommendation on Key Competences for Lifelong Learning (European Commission, 2018) states that “digital skills are one of the top priorities for transversal/basic skills development in Europe” and “the Member States should pay special attention to increasing and improving the level of digital competences at all stages of education and across all segments of the population”. According to this Recommendation, the digital technologies develop “more flexible learning environments adapted to the needs of highly mobile societies”. It is acknowledged that digital transformation is at the same time creating opportunities both for the economy and society. But the European citizens should acquire and develop digital competences in view to valorize the above opportunities. The basic digital skills

are important to use health services, online educational programs, e-Government services as well as to protect against cyber threats.

According to EC Digital Skills for All Europeans, “83% Europeans use the internet regularly but 43% do not hold basic digital skills for searching information, sending e-mails, video calls, or paying online. Nine million Europeans are employed as ICT specialists, of which over a half are working in banking, healthcare, and production. 90% of jobs in all sectors of the economy require digital competencies but 35% of employees do not have basic digital skills. 53% of companies searching for ICT specialists report difficulties in recruitment, while Europe faces one million vacancies for ICT specialists” (European Commission, 2019). The increasing number of ICT vacancies in the EU reveals a gap between demand and supply of ICT specialists.

In the EU, the members of the Digital Skills and Jobs Coalition provided 7.4 million digital skills training courses, 1.9 million certifications, and 1.6 million persons were involved in awareness-raising campaigns.

The European Commission (2018) is highlighting “digitization, cybersecurity, media literacy and artificial intelligence, the need for a lifelong learning-based and innovation-driven approach to education and training”.

Strengthening European Identity through Education and Culture (European Commission, 2017) mentions “the existing shortcomings concerning teaching digital skills such as coding or cybersecurity skills, media literacy and entrepreneurship skills”. Therefore, the European Commission focuses on cooperation in view “to develop digital skills, digital learning strategies and exploit the potential of state-of-the-art technology, including learning analytics, accompanied by guidance on open education initiatives, as well as to strengthen Erasmus+ business consortia” (European Commission, 2017).

### **Digital talent management**

In a globally interconnected world, digital talent represents a crucial issue. According to Capgemini (2017), digital talent comprises “hard digital skills (such as data analytics), soft digital skills that constitute a ‘digital-first mindset’ and are necessary for a successful digital transformation”. The digital talent gap is widening. The talent gap in soft digital skills is more pronounced than in hard digital skills. The two soft digital skills most demanded on the labor market are customer-centricity and passion for learning while the two hard digital skills relate to cybersecurity and cloud computing.

Digital talent management refers to the activities and processes focused on selecting, attracting, developing, retaining talented human resources that bring added value to any organization, and create competitive advantages.

According to Dries (2013), talent is considered a “unique strategic resource”. “Sourcing and retaining the quality and quantity of talent has been a continual challenge for organizations” (Vaiman et al., 2017).

Around half of the labor force is represented by millennials and amazingly “they are perceived to be lacking analytical skills” (Capgemini, 2017). In the digital era, the demand for new technical skills is evolving exponentially. Mobile skills refer to “design

skills, e.g. platform-design, user-interface and gamification as well as technical skills such as app development, cloud services, mobile device management, and security”.

The main challenges for human resource management related to the fast development of information technology, artificial intelligence, remote working, community-thinking (PricewaterhouseCoopers, 2018). In this context, human resource management should focus on leadership in view to boost talent and develop an innovative culture. It should also focus on talent development by coaching, mentoring, on the job training, and community learning by sharing knowledge and experience as well as on creating a culture of innovation, by involving employees in innovative activities and stimulating their creativity, offering the opportunity to generate brilliant ideas. At the same time, human resource management should encourage open thinking, job crafting. The most talented employees should be compatibilized with the right roles and teams. The forthcoming skills gap that will influence all organizations “will disturb the global economic power and result in a shortage of 85.2 million skilled workers, 8.452 trillion in unrealized revenue” (Korn Ferry, 2019). Also by 2030, “the Technology, Media and Telecommunications sector will experience a labor skill-shortage of 4.3 million workers and unrealized revenues of \$449.70 billion. This deficit is problematic in such a sector that is currently booming with a supposedly promised growth in companies such as Apple, Google, and Amazon”.

The key to addressing the above challenge is an investment in talent development, in view to prepare for future complex jobs while the organizations should strengthen their learning and development activity.

At the same time, the organizations should concentrate on continuous improvement of staff personal development, on innovative means, on strengthening the organizational culture, so that their employees will be creative, will learn new skills, and acquire experience. The principles and values of an organization will foster the attraction and loyalty of employees.

Robots and robot process automation are playing an important role in supporting vital activities in all countries facing an aged population and lack of labor force.

Concluding, what can organizations do to decrease the digital talent gap?

Attracting digital talent, identifying and recruiting best talents, developing the digital talent pool, creating an environment that triggers learning, designing career development path, retaining digital talent, offering collaborative ways of working, developing cloud technologies, establishing key performance indicators could be success factors.

### **Roadmap for enhancing successfully the digital competences in Romania**

According to McKinsey (2017) analysis, “54% activities could be automated using the existent technology by 2030”.

Romania has a large STEM graduate talent pool that will transpose into an ICT specialist pool in the labor market, but the share of ICT specialists in the labor force is only 4.8%. The adult participation rate in training is 7% for people aged 25-64 while in the Nordic

countries is 54%. The brain drain is 6 times higher than the average of top IT country performers. In this context, attracting talents represents an outstanding challenge.

Taking into consideration the fast development of automation, artificial intelligence, and advanced robotics, the demand for skilled persons will increase, demand in terms of basic and advanced technological skills. Data analysts, IT specialists, programmers, IT engineers, IT designers, specialists in the interaction human being – robot, scientific researchers represent just a few occupations that need advanced technological skills. Especially for Romania, advanced technological skills are crucial in view to enhance the digital economy. Thus, it is imperative to promote lifelong learning for all the citizens as it represents a success factor for the digital transformation. It is well known that the digital readiness of the population in any country depends on the performance of education.

Romania should create its vision and identify the future needs in terms of digital competences, should accomplish an analysis on the skills gap, should identify the best methods and techniques in view to overcome this gap, should develop a performance-centered approach focused on key performance indicators and of course should invest in education, research and development, and innovation. It is important a network collaborating model, involving universities, research institutes, businesses, NGOs, and local governments to identify the needs for skills, competences and to provide consultancy and training programs. The universities should play an essential role in fostering the development and delivery of relevant training programs.

In Romania, the key enablers for digital transformation should focus on digital authentication of users, electronic signature, single databases for users, electronic correspondence between authorities and citizens.

Speeding up the digital services triggers improvement of competitiveness, an attractive environment for investments, optimization of the use of human resources. IT ensures transparency, increasing productivity, a decrease of fiscal evasion, a decrease of corruption, a decrease in costs in public administration, making more efficient the activity of central and local governments. The digital transformation is a long process involving several challenges that should take into consideration the voice of customers, the government should be more connected and responsive to citizens' needs, expectations. Also, it should be an agile approach for a gradual digital transformation by prioritizing the citizens' needs based on a mechanism of consultation. The leadership and innovative governance are essential for a common vision on digital transformation so that this would be continuous. Data interoperability and integration are crucial for decision making and improvement of efficiency, the effectiveness of central and local governments.

And of course, the government should demonstrate will and capability to accelerate digital transformation in Romania, by a focus on the development of the digital public sector, using more cloud services, collaborative working, strengthening cybersecurity. The enhancement of digital competences both for employees and citizens represent maybe the most important pillar for digital transformation. For Romania, the key success factors could be the following:

- Forecasting the set of competencies for the future.
- Analyzing the current and future skills necessary on the labor market taking into consideration IT dynamics.
- Encouraging all citizens to acquire and develop digital competencies and enhancing the digital competencies across the whole society by developing programs for lifelong learning, with a focus on reskilling and upskilling of the labor force.
- Adapting the best practices from successful countries.
- Endowing the pre-university schools with digital instruments and online resources (online courses, virtual reality).
- Developing the skills of teachers.
- Updating the curricula with a focus on programming, entrepreneurship, communication skills.
- Promoting STEM disciplines in view to create an ICT talent pool.
- Attracting students who study abroad by providing incentives and dedicated programs for starting a career in Romania.
- Encouraging the cooperation of universities with other European higher education institutions in the Erasmus+ program.
- Encouraging universities to cooperate with the private sector in view to develop joint applicative programs.
- Increasing the number of ICT specialists and attracting ICT specialists from all over the world.
- Promoting the start-ups in view to attract local digital talent.
- Attracting EU Funds by developing digital projects.
- Public-private partnerships for projects in artificial intelligence, cybersecurity, e-Government services, advanced digital skills.

### An empirical analysis of digital competences in the EU Member States

The empirical analysis of the digital competences of the EU population is based on the information retrieved from the Digital Agenda Scoreboard 2019. DESI Human Capital dimension is calculated as the weighted average of the two sub-dimensions: Internet User Skills (IUS) and Advanced Skills and Development (ASD).

**Table 1. Internet User Skills and Advanced Skills and Development in the EU**

Country	IUS	ASD	Country	IUS	ASD
<b>Austria</b>	32.24	23.41	Latvia	22.93	<b>17.52</b>
<b>Belgium</b>	28.42	21.20	Lithuania	26.69	<b>15.49</b>
<b>Bulgaria</b>	12.86	15.65	Luxembourg	42.67	<b>27.21</b>
<b>Croatia</b>	27.48	19.62	Malta	28.74	<b>26.31</b>
<b>Cyprus</b>	22.18	12.46	Netherlands	38.74	<b>23.04</b>
<b>Czech Rep</b>	26.46	18.35	Poland	21.21	<b>15.64</b>
<b>Denmark</b>	35.84	25.66	Portugal	25.25	<b>9.98</b>
<b>Estonia</b>	29.10	33.35	Romania	12.66	<b>18.43</b>
<b>Finland</b>	36.71	40.83	Slovakia	28.66	<b>15.53</b>
<b>France</b>	26.95	20.07	Slovenia	25.99	<b>20.34</b>

<b>Germany</b>	32.33	22.10	Spain	26.76	<b>17.74</b>
<b>Greece</b>	21.85	10.89	Sweden	37.63	<b>34.00</b>
<b>Hungary</b>	23.45	18.67	United Kingdom	35.53	<b>26.10</b>
<b>Ireland</b>	23.19	30.64	European Union	27.41	<b>20.60</b>
<b>Italy</b>	<b>20.76</b>	<b>11.88</b>			

Source: European Commission, Digital Agenda Scoreboard 2019

Luxembourg, Netherlands, Sweden, Finland, Denmark have the best scores for Internet User Skills while Finland, Sweden, Estonia, Ireland are top performers for Advanced Skills and Development. The Advanced Skills and Development “is calculated as the weighted average of the normalized indicators: ICT Specialists, Female ICT specialists and ICT graduates”.

**Table 2. Advanced Skills and Development in the EU**

Country	ICT Spec	ICT S F	ICT Grad	Country	ICT Spec	ICT S F	ICT Grad
<b>Austria</b>	20.95	12.20	13.67	Latvia	10.95	8.08	16.00
<b>Belgium</b>	21.90	15.15	5.33	Lithuania	12.86	11.45	6.67
<b>Bulgaria</b>	10.95	10.69	9.67	Luxembourg	23.81	11.27	19.33
<b>Croatia</b>	15.71	7.85	15.67	Malta	20.48	9.47	22.67
<b>Cyprus</b>	10.95	5.98	8.00	Netherlands	23.81	15.05	7.23
<b>Czech Rep.</b>	17.14	6.23	13.33	Poland	13.33	7.61	10.33
<b>Denmark</b>	20.95	15.36	15.00	Portugal	10.48	5.49	4.00
<b>Estonia</b>	26.67	18.70	21.33	Romania	10.00	10.52	16.33
<b>Finland</b>	32.38	25.61	23.67	Slovakia	13.33	7.06	10.67
<b>France</b>	17.62	12.51	10.00	Slovenia	18.10	10.93	11.67
<b>Germany</b>	18.10	11.11	15.00	Spain	13.81	8.67	13.00
<b>Greece</b>	7.62	3.50	10.67	Sweden	31.43	24.24	12.33
<b>Hungary</b>	17.14	5.86	14.33	United Kingdom	24.29	15.92	12.00
<b>Ireland</b>	20.95	16.99	23.33	European Union	17.62	11.53	12.05
<b>Italy</b>	12.38	8.04	3.33				

Source: European Commission, Digital Agenda Scoreboard 2019

We remark that for ICT specialists, the top countries are Finland, Sweden, Estonia while at the other extreme we find countries such as Latvia, Portugal, Romania, Greece. Why Romania is among the weak performers? A main reason refers to the whole education and training system. It is necessary to foster smart education and training system, based on critical thinking, computational thinking, and problem-solving, inspiring creativity and innovative ideas, on a reflective attitude. Concerning female ICT specialists, again Finland, Sweden, and Estonia are recording the best scores, Romania is in the 16<sup>th</sup> position. For ICT graduates, Finland, Ireland, Malta, Estonia, Luxembourg, and Romania are the best performers.

## Relationship between digital competence and talent competitiveness for the EU Member States

The current paper explores the statistical connection between digital competence (DC) and talent competitiveness (TC) in the EU Member States. It presents descriptively the relationship between the associated two indicators. The paper presents the analysis of correlation and regression concerning the digital competence indicator from Pillar 2 of the Global Competitiveness Index and talent competitiveness indicator of the Global Talent Competitiveness Index.

**Table 3. Digital competences in the EU**

Country	DC	Country	DC	Country	DC
Austria	4.8	Germany	5.1	Poland	4.3
Belgium	4.8	Greece	4.1	Portugal	4.5
Bulgaria	4.7	Hungary	4	Romania	4.5
Croatia	3.7	Ireland	5	Slovakia	4.6
Cyprus	4.9	Italy	4.2	Slovenia	4.8
Czech Republic	4.8	Latvia	4.8	Spain	4.3
Denmark	5.4	Lithuania	4.9	Sweden	5.7
Estonia	5.4	Luxembourg	5.2	United Kingdom	4.9
Finland	5.8	Malta	4.7	EU average	4.79
France	4.5	Netherlands	5.6		

Source: Schwab, K., 2019, World Economic Forum, Global Competitiveness Report

According to the data from Table 3, the Nordic countries are most successful, having innovative educational systems, embracing new digital methods: Finland, Sweden, the Netherlands, and Denmark. Estonia is also a top performer.

The Global Talent Competitiveness Index is based on an Input-Output model, comprising six pillars. “The Input sub-index presents four pillars concerning “policies, resources, and efforts that a particular country can harness to foster its talent competitiveness: Enable, Attract, Grow, Retain talent”. The Output sub-index aims “to describe and measure the quality of talent in a country that results from the above policies, resources, and efforts”, comprising Vocational and Technical Skills (VT) and Global Knowledge Skills (GTCI, 2020).

**Table 4. Global Talent Competitiveness, Vocational and Technical Skills in the EU, 2019**

Country	GTCI	VT	Country	GTCI	VT
Austria	68.87	69.95	Latvia	54.4	55.68
Belgium	68.87	65	Lithuania	53.32	46.15
Bulgaria	45.76	45.74	Luxembourg	73.94	65.68
Croatia	43.53	47.35	Malta	62.02	55.45
Cyprus	57.47	59.58	Netherlands	74.99	71.88
Czech Rep	60.91	63.49	Poland	49.48	54.31

Denmark	75.18	69.2	Portugal	57.8	52.31
Estonia	61.97	58.78	Romania	42.14	41.79
Finland	74.47	75.91	Slovakia	52.08	54.92
France	64.83	65.16	Slovenia	57.42	59.84
Germany	72.34	80.27	Spain	55.7	47.77
Greece	47.51	47.84	Sweden	75.82	71.77
Hungary	46.62	49.13	United Kingdom	72.27	62.8
Ireland	70.45	69.07	European Union	60.47	59.41
Italy	52.91	56.67			

Source: *Global Talent Competitiveness Index 2020*

According to Table 4, again the Nordic countries demonstrate a stronger power in attracting, developing talent at the same time with making remarkable investments in the education and training of their citizens as well as high vocational and technical skills. Table 5 presents the analysis of correlation, revealing a global image at the European Union level, a static one for 2019.

**Table 5. Analysis of correlation**

		DC	TC	VT
DC	Pearson Correlation	1	.686**	.665**
	Sig. (2-tailed)		.000	.000
	N	29	29	29
TC	Pearson Correlation	.686**	1	.907**
	Sig. (2-tailed)	.000		.000
	N	29	29	29
VT	Pearson Correlation	.665**	.907**	1
	Sig. (2-tailed)	.000	.000	
	N	29	29	29

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Taking into consideration the structure of the statistical database as well as how the indicators are measured, the correlations are powerful for a 0.01 level of significance. It is worth to note the powerful correlation between digital competence and talent competitiveness (0.686), as well as between digital competence and vocational and technical skills (0.665). The conclusion of the analysis of correlation is also confirmed by an analysis of regression.

**Table 6. Analysis of regression**

Variables Entered/Removed <sup>a</sup>			
Model	Variables Entered	Variables Removed	Method
1	VT, TC <sup>b</sup>	.	Enter

a. Dependent Variable: DC

b. All requested variables entered.

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.694 <sup>a</sup>	.481	.442	.4622660

a. Predictors: (Constant), VT, TC

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.158	2	2.579	12.070	.000 <sup>b</sup>
	Residual	5.556	26	.214		
	Total	10.714	28			

a. Dependent Variable: DC

b. Predictors: (Constant), VT, TC

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.240	.533		4.204	.000
	TC	.028	.020	.470	1.404	.172
	VT	.015	.021	.239	.714	.481

a. Dependent Variable: DC

Table 6 presents the analysis of regression for the indicators related to digital competence, talent competitiveness, vocational and technical skills in the EU Member States in 2019. The role of regression is to reveal the causality between variables. Obviously the value of regression is important as it shows how one variable influences the other. Within the analysis of regression, the dependency between digital competence and talent competitiveness, vocational and technical skills is moderate taking into consideration the coefficients from the equation of regression (0.028 for talent competitiveness and 0.015 for vocational and technical skills). The conclusion of this statistical analysis reveals the fact that there is a powerful relationship between digital competence, talent competitiveness, vocational and technical skills. This conclusion is valid for an overview of the two processes at the EU level, while analyzing them at each EU country level, sensitive differences could emerge.

**Conclusions**

Worldwide, the lack of digital competencies represents an outstanding challenge but there are huge differences between the countries. The smart and learning European Union is facing a growing need for digital competencies, new typologies of talent to meet the current and future challenges. In Europe, a successful digital transformation will be based on improving the organizational adaptability, a structured approach to digital services development, a holistic approach to analytics and ecosystem engagement, talent management, robot process automation. European digital citizens should also change their mindset and way of interaction. Digital transformation is triggering changes like work and labor markets, and for the time being, teleworking is the key. In view of addressing the gap of digital competencies, the EU Member States are joining their efforts in light to ensure a digital skilled labor force that will trigger the improvement of EU competitiveness. At the same time, the decrease of the digital

competence gap could be accomplished by sharing the best practices across the EU in areas of education, training, awareness increasing.

The current paper presents a comprehensive roadmap for enhancing successfully the digital competencies in Romania. At the same time, the paper emphasizes the necessity to develop digital competencies and digital talents in all the EU countries and especially in Romania by modernizing the education and training systems.

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