

SECTION VII
THE DIGITAL AGE. THE CRYPTOCURRENCY MARKET
ECONOMIC AND LEGAL IMPLICATIONS

ANALYSIS OF THE PARTICIPATION RATE IN DIGITAL SKILLS
DEVELOPMENT COURSES

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Abstract:

A strong digital economy, based on human resources with digital skills, is vital for European innovation, growth, jobs and competitiveness. The development of digital technologies has a massive impact on the labor market and on the type of skills needed in the economy and in the society, both now and in the future. In this work it was used the statistical method: grouping data on equal ranges of variation, to analyze the participation rate of human resources in the development or improvement of ICT skills, courses offered by employers, a comparative study at the level of Romania and the EU in the period 2015-2020. The results show low progress at the level of our country regarding the training courses in the digital field offered by employers.

Keywords: *digital skills, performance, innovation, training*

JEL Code: C40, O39

1. Introduction

Technology and implicitly digitization not only change the way of communication, but also the way people everywhere live and work, and the situation created by the COVID-19 pandemic has given the European Union and its member countries a strong impetus to make efforts in the direction of the transition accelerated towards digitization in the public and private sector. According to statistics from the European Council, at Union level, we are facing a growing demand from all sectors for workers with digital skills.

2. Theoretical approach

According to a survey conducted last year PwC's Upskilling Hopes and Fears, 77% of the 22,000 employees interviewed globally want to develop their skills and remain relevant in an increasingly digital labor market. In 2020 EU member states face an estimated deficit of 1 million digital experts needed on the market. Contrary to the fact that Romania boasts a respectable community of IT specialists and internet speeds that are hard to match, it ranks last in Europe in terms of the general level of digital literacy of the population, according to the latest report on the digitization index carried out by European Investment Bank.

Faced with an aging population and global competition, there are two options: to work harder or to work smarter. (Ross, 2020) We will probably have to do all two, but the second option is the only one that can guarantee the rise of Europeans' standard of living. To achieve this goal, the Digital Agenda includes proposals for actions that must be undertaken urgently

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to bring Europe back on the path of intelligent, sustainable and inclusive growth. These proposals will form a framework for the long-term transformations produced by an increasingly digitized society and economy. (Ceobanu et al., 2020)

Managing our collective transition to a digitally-driven business model is vital and crucial to our quest for a prosperous nation. And since digital touches so many parts of our lives, society and development, any significant reform program requires coordination of people, processes, and technologies.(Jacobs Edo, 2016)

The digital economy assumes three major characteristics: it is a global economy; favors intangible products: ideas, information, relationships; is intensely interconnected. These characteristics produce new market models, of societies that are based on the electronic network.(Ghenadie Ciobanu, 2015)

3. Statistical data analysis

The research method used in this paper for obtaining results was the statistical method: grouping data on equal ranges of variation. The preliminary data was taken from Eurostat statistics, between 2015 and 2020, values that refer to participation rate of human resources in the development or improvement of ICT skills, courses offered by employers. The analysis took into account the 27 EU Member States and United Kingdom. Processing of the data was done in the database created in the Excel program.

Analyzing the values taken from the Eurostat statistics(table 1) for Enterprises that provided training to develop/upgrade ICT skills of their personnel, we notice that the lowest rates of participation rate of human resources in the development or improvement of ICT skills, courses offered by employers are found for: Romania in 2017 about 4%.The highest rates of participation in the development or improvement of ICT skills are registered for: Finland (FI) in 2017 about 38%, Belgium in 2018 and 2019 about 36%, and Austria in 3026 about 37%.(table 1)

Table 1: Enterprises that provided training to develop/upgrade ICT skills of their personnel (%)

			2015	2016	2017	2018	2019	2020
No	COD	Country	Value%	Value%	Value%	Value%	Value%	Value%
1	BE	Belgium	32	34	35	36	36	33
2	BG	Bulgaria	8	8	9	9	10	7
3	CZ	Czech Republic	22	22	23	25	25	25
4	DK	Denmark	29	28	27	28	31	30
5	DE	Germany	30	29	28	30	32	24
6	EE	Estonia	14	13	13	13	17	17
7	IE	Ireland	30	30	30	30	21	27
8	EL	Greece	15	15	12	14	15	12
9	ES	Spain	22	23	23	21	22	20
10	FR	France	21	20	19	19	21	15
11	HR	Croatia	25	22	23	24	23	23
12	IT	Italy	12	12	13	17	19	15
13	CY	Cyprus	23	22	26	26	31	25
14	LV	Latvia	12	12	10	11	18	17
15	LT	Lithuania	11	10	11	9	11	14

			2015	2016	2017	2018	2019	2020
No	COD	Country	Value%	Value%	Value%	Value%	Value%	Value%
16	LU	Luxembourg	25	29	28	27	27	21
17	HU	Hungary	16	16	17	17	16	16
18	MT	Malta	25	23	26	26	26	28
19	NL	Netherlands	18	22	24	26	26	24
20	AT	Austria	33	37	31	27	18	18
21	PL	Poland	12	12	12	13	13	18
22	PT	Portugal	22	23	21	19	28	23
23	RO	Romania	5	5	4	5	6	6
24	SI	Slovenia	28	27	27	29	28	26
25	SK	Slovakia	19	20	17	18	18	16
26	FI	Finland	37	34	38	36	37	38
27	SE	Sweden	26	25	28	24	32	32
28	UK	United Kingdom	27	28	26	28	29	24

Source: data processed by the author after

https://ec.europa.eu/eurostat/databrowser/view/ISOC_SKE_ITTN2/default/table?lang=en&category=isoc.isoc_s.k.isoc_skt visited in 13.11.2022 at 9.20

The highest rates of participation in the development or improvement of ICT skills are registered for: Finland (FI) about 38% and Belgium (BE) about 36%, leaders in all analyzed years.(figure 1)

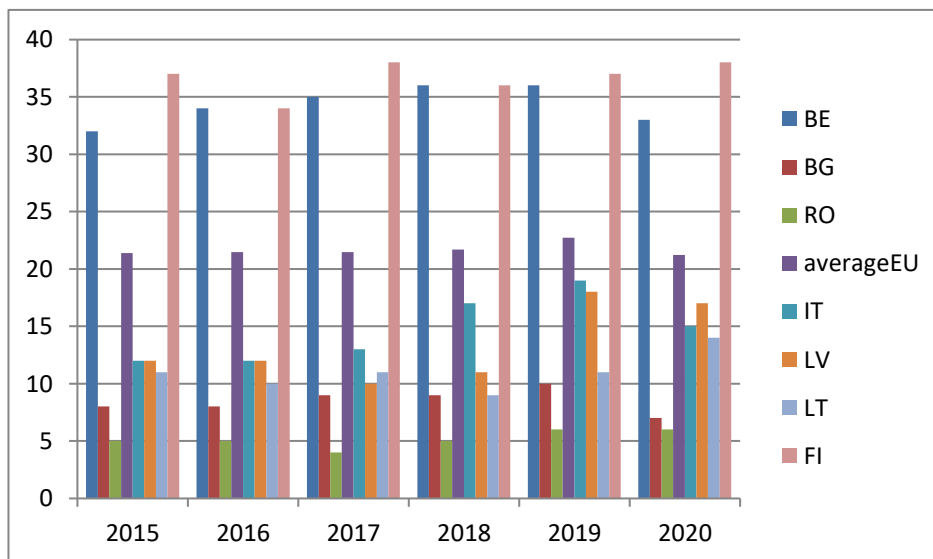


Figure 1: Comparison between the participation rate in the development or improvement of ICT skills in Romania and EU average level

Source: data processed by the author

To achieve grouping on equal ranges of variation, it is advisable to follow the next steps[11]:

- determine the amplitude (A) of the characteristic variation as the difference between the value maximum and minimum feature value, the red bold values in the table above 38% for Finland (FI) in 2017 and 4% for Romania (RO) in 2017:

$$A = x_{\max} - x_{\min} \Rightarrow A = 38 - 4 = 34 \quad (1)$$

- the number of groups is determined (r) after Sturges' relationship "r = 1 + 3.322 · lg n", where n is 168 the total number of values in the table :

$$r = 1 + 3.322 * \lg 168 \Rightarrow r = 8.39 \Rightarrow r \cong 8 \text{ groups} \quad (2)$$

c) the size of the grouping range (h) is determined as the ratio of the amplitude characteristics and number of groups:

$$h = A/r \Rightarrow h = 34/8 \Rightarrow h = 4.25 \quad (3)$$

d) grouping ranges are formed by specifying their exact boundaries as shown below[2]:

$$\begin{aligned} X_{\min} & \text{ --- } X_{\min} + h \\ X_{\min} + h & \text{ --- } X_{\min} + 2h \\ & \dots\dots\dots \\ X_{\min} + (r-1) * h & \text{ --- } X_{\min} + r * h \end{aligned}$$

Using equations (1), (2) and (3) the following grouping ranges are obtained for statistical data analysis. (table 2)

Table 2. The limits of the ranges

r	h	r*h	$X_{\min} + r * h$	the limits of the ranges
1	4.25	4.25	8.25	[4-8.25)
2	4.25	8.5	12.5	[8.25-12.5)
3	4.25	12.75	16.75	[12.5-16.75)
4	4.25	17	21	[16.75-21)
5	4.25	21.25	25.25	[21-25.25)
6	4.25	25.5	29.5	[25.25-29.5)
7	4.25	29.75	33.75	[29.5-33.75)
8	4.25	34	38	[33.75-38)

Source: data processed by the author

Regarding participation rate in lifelong learning in Romania, unfortunately the situation is unchanged during 2015-2020, Romania being at the bottom. In 2019, Romania's participation rate of human resources in the development or improvement of ICT skills, courses offered by employers reaches the highest value, nearly 6%, but not enough to advance into the upper group and and more importantly to achieve the objective proposed by the European Commission to increase participation rates in the development or improvement of ICT skills. After 2015, Romania's participation rate of human resources in the development or improvement of ICT skills, courses offered by employers, records decreasing values: 5% for 2016, and in 2017 the lowest value, 4% is recorded during the analyzed period.(table 3)

Table 3: Grouping data on equal ranges of variation

ranges	[4-8.25)	[8.25-12.5)	[12.5-16.75)	[16.75-21)	[21- 25.25)	[25.25- 29.5)	[29.5- 33.75)	[33.75-38)
2015	RO	BG,IT, LV,LT, PL	EE,EL, HU	NL,SK	CZ,ES, FR,HR, CY,LU, MT,PT	DK,SE,UK,SI	BE,DE,IE, AT,SI	FI
2016	RO	BG,IT, LV,LT, PL	EE, EL,HU	FR,SK	CZ,ES, HR,CY, MT,NL,PT	DK,LU,SI, SE,UK	DE,IE	BE,AT,FI
2017	RO	BG, EL,LV, LT,PL	EE,IT	FR,HU, SK	CZ,ES, HR,NL, PT	DK,DE,CY,LU ,MT,SI, SE,UK	IE,AT	BE,FI
2018	RO	BG,LV LT	EE,EL, PL	FR,IT, HU,PT, SK	CZ,ES, HR,SE	DK,CY,LU,M T,NL,AT,SI,U K	DE,IE	BE,FI

ranges	[4-8.25)	[8.25-12.5)	[12.5-16.75)	[16.75-21)	[21- 25.25)	[25.25- 29.5)	[29.5- 33.75)	[33.75-38)
2019	RO	BG,LT	EL,HU,PL	EE,FR,IT,LV,AT,SK	CZ,IE,ES,HR	LU,MT,NL,PT,SI,UK	DK,DE,CY,SE	BE,FI
2020	BG,RO	EL	FR,IT,LT,HU,SK	EE,ES,LV,AT,PL	CZ,DE,HR,CY,LU,NL,PT,UK	IE,MT,SI	BE, DK,SE	FI

Source: data processed by the author

4. Conclusions

Digitization is now part of our lives, regardless of whether we are employees or entrepreneurs, the type of company we work for and the field in which we operate. It is a trait that new generations are "born" with and that existing generations must "acquire". To take advantage of the full potential of developing additional skills, employees should not rely only on the company they work for regarding training opportunities, but should take individual initiatives. The demands of digital transformation and upskilling can push people out of their comfort zone, but this is to be expected and part of the necessary growth process. Digital solutions actively contribute both to job creation, to the stimulation of innovation, progress and competitiveness, and to a general improvement in the lives of citizens.

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