INFORMATION TECHONOLOGY AND LIFELONG EDUCATION – IMPLICATIONS ON THE EU EMPLOYED POPULATION

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Abstract
The quality and the skills of human resources are important factors in the success of every organization wherever it act. Moreover this is really true in a very competitive market such as European Union. In the European Union the number of persons who are taking part in high education studies after the age of 25 years has seen an upward trend in recent years, increasing thus the share of employed graduates of tertiary education in total employment over 25 years. This increase is generated by the access to education forms adapted in terms of time and location of training. The appearance and development of these forms can be explained by the use of information technology (Internet access). Statistics show that in the EU, household access to the Internet and its frequency of use was also increasing, approximately 80% of all persons aged 16 to 74 years have ever used this information and communication tool.

Keywords
tertiary education; students; employed population; information technology; Internet access

JEL Classification
M30

Objectives

Today, the problem of employment of EU population is quite a debated subject. The most evident problems relate to youngest category of population, that of young people under 25, but equally to employees over this age.

In this quite problematic context of labor market, this article aims to take a picture of the evolution of the lifelong learning process of EU population, especially of those employed. We concentrate on the case of tertiary education in the context of the development and expansion of information technology. Accordingly, it is intended to highlight the extent to which the EU population, and especially the employed population aged 25 years followed a higher education degree as a consequence of the emergence and development of forms of part-time learning, which is much more suited to people who want flexibility in terms of time organization and choice of training location.

It has been also aimed to highlight any differences between EU member states in terms of the intensity with which the lifelong training phenomenon manifests among the employed population, namely the existence of association between the intensity of its manifestation and public access to the Internet.

Literature review

Since the early 70s, global academic promote the idea of the informal education approach, without proposing substantial changes in the formal process. New form of learning was perceived as an element of complementarity, which have the capacity to

provide those interested with the knowledge and skills to adapt to a changing environment (Sharples, 2000). It's essentially, as highlighted by Benteley in 1998, a long-term approach through which individuals become their own managers in an informal learning process.

The process of assimilation and integration of information technology in education has been the subject of numerous processes initiated at EU level.

European Union's interest toward the creation of a modern education environment has seen its peak in June 2002, while promoting eEurope initiative, announcing the transition to the knowledge economy. The use of information technology in formal educational processes aimed at achieving EU objectives as follows: improving curricula, educational sustainable development of educational resources in the online environment, creating and developing e-learning platforms, promoting formal continued education etc.

The approach initiated by the European Union in creating a knowledge-based economy continued in 2005 under the initiative “i2010 - A European Information Society for growth and employment'”, context in which it has been promoted as fundamental sustainable economic factors two key concepts: information and innovation.

The year 2009 brought to the forefront a new document - ET 2020 Strategic Framework for European Cooperation in Education and Professional Training (Council Of The European Union, 2009) - which promote the impact of education process on the basis of information technology over the economies of EU members. Particular attention was given in this document to promoting the access to adult education through concept of “lifelong learning”.

The concept of “lifelong learning” enjoys a wide interest among specialists in the field, both in academia and in practice. According to the EU, Life Long Learning is a continuous training approach involving action at three levels: initial training, ongoing training and continued education". Taking into consideration the target of the new concept, namely those over 25 years old, Knapper and Cropley mentioned individual dimension of the concept, namely “planning own learning methods depending on availability and personal motivations” (Knapper C. and Cropley, 2000)

According to the specialists the concept of “lifelong learning” can be operationalized through various methods, from traditional classroom “face to face” type to different forms incorporating information technology - distance learning, joint education and e-learning. As can be seen, distance learning, being directly correlated with the integration of the technology into the educational process, is a part of lifelong learning concept, this idea being supported by numerous specialists in the field (Bates, 1999; Garrison, 1999; Niper, 1989; Peters, 2001; Kose, 2010). It should be noted, however, that between distance education and e-learning there is a number of differences, which are extremely important in the context of the proposed analysis, as follows:

- distance learning, which appeared according to Bell and Tight in the mid-nineteenth century, involves the physical separation of the person trained to the trainer at certain stages of educational process (Bell and Tight, 1993]. On the other hand, e-learning is a concept of the twentieth century, involving the use of information technology to achieve a wide range of educational objectives, ranging from its integration in the traditional process training to one exclusively online environment.
- the target of distance education is the adults who have “family responsibilities and limited time” (Peters, 2001). On the other hand, the target in e-learning education is extensive, targeting formal process, from primary education up to the postgraduate education.
- global and European theory and practice shows much higher costs for e-learning education versus the distance learning (Bates, 2001; Ryan, 2002).

Major differences between the two forms of learning can be observed in the Member States of the European Union according to the level of economic development, the development of the education system, the acceptance shown by the population to new and so on. In Romania compared to other EU countries concentration can be observed in the form of distance learning at the expense of e-learning.
In other words, the analyzed concept - lifelong learning captures a society in which many levers are operationalized in the scope of learning for all ages. According to the opinions of various authors (Aspin and Chapman, 2000; Fischer, 2001) learning process is not limited to formal institutions, but it extends to all areas of activity of individuals (work, home, etc.).
Beyond the simple definition of the concept of lifelong learning, academic raises numerous questions to identify the results of this process, namely: What is the connection between this approach and formal learning process? What are its results and how can these be quantified? and so on.
It seems that although academia has no big problems in defining the concept, barriers arise when quantifying results generated by it. Even if the desired results have been identified - the assimilation of knowledge, skills and capabilities - it seems that it is more difficult to quantify the assimilation manner of lifelong learning. In this respect, two British authors (Jiusto and DiBiasio, 2006) noted that the process of lifelong lerning cannot be measured until the person has passed all stages of life that involves the acquisition of knowledge and skills. In the same direction of the identification of the results of lifelong learning may be mentioned the article proposed by Klamm et al. (2007), according to whom the concept captures "openness to learning opportunities, a process that involves initiative and independence in the acquisition of knowledge, responsibility, creativity, long term orientation and ability to use problem-solving skills.

Research methodology

The work is a study based on secondary data sources from Eurostat. We used in our analysis structure indicators and time series indicators which have revealed the evolution of tertiary education process throughout the life in the EU countries and the EU population access to information technologies, namely the frequency of Internet use.
According to the Eurostat methodology the people included in the lifelong training is those with age between 25 and 64 years. Not having data on tertiary education for this age group, we considered in highlighting the intensity of lifelong education the students over 25 years old and working population of 25-74 years.
According to ISCED - International Standard Classification of Education - UNESCO 1997, tertiary education includes level 5, namely higher education, and level 6, namely postgraduate education (taken after www.insse.ro). Regardless of the time of accession to the EU of different countries, the indicators used in this analysis were aggregated for all the years covered by the study for all 28 present states.

Research results

In EU countries there has been a rapid expansion of public access to the Internet, coupled with increased utilization of it. Thus, according to Eurostat data, at the EU countries (except Croatia) from 2005 to 2013, the share of households with Internet access increased from 48% to 79%, mainly due to strong increases registered in the new EU states. Closely related to access to the Internet, its usage has grown, so the share of persons with age between 16 and 74 years who have ever used the Internet

has gone from 60% to 79% in the indicated period. Bothe in the case of Internet access in households and in terms of the intensity of its use, the old EU countries stand largely above average throughout the considered period. On the other hand, the largest increases were recorded in the States belonging to the former communist bloc.

Table 1 Household access to the Internet and Internet use in the EU

Countries	Households with Internet access - Percentage of households			Individuals who have ever used the Internet - Percentage of individuals*		
	2005	**2010**	**2013**	**2005**	**2010**	**2013**
Belgium	50	73	80	61	81	84
Bulgaria	n.d.	33	54	n.d.	49	59
Czech Republic	19	61	73	37	72	80
Denmark	75	86	93	86	90	96
Germany	62	82	88	71	83	87
Estonia	39	68	80	64	78	84
Ireland	47	72	82	45	73	82
Greece	22	46	56	27	48	64
Spain	36	59	70	50	68	76
France	n.d.	74	82	n.d.	80	86
Croatia	n.d.	56	65	n.d.	58	71
Italy	39	59	69	n.d.	56	64
Cyprus	32	54	65	36	55	68
Latvia	31	60	72	49	71	78
Lithuania	16	61	65	39	65	71
Luxembourg	65	90	94	71	92	95
Hungary	22	60	71	40	68	76
Malta	41	70	79	43	64	72
Netherlands	78	91	95	82	92	95
Austria	47	73	81	60	77	84
Poland	30	63	72	42	65	68
Portugal	31	54	62	37	54	67
Romania	n.d.	42	58	n.d.	43	58
Slovenia	48	68	76	n.d.	72	77
Slovakia	23	67	78	58	83	85
Finland	54	81	89	77	89	94
Sweden	73	88	93	88	93	96
United Kingdom	60	80	88	72	87	92
European Union (28 countries)	n.d.	70	79	n.d.	73	79

n.d. – no data
* Refers to population between 16 and 74 years old
Source: Adapted from Eurostat

Regarding the lifelong learning, it has been a positive evolution in the European Union, the number of people between 25 and 64 years old who attended some form of training (last 4 weeks, prior to survey) increasing from 7.1% in 2002 to 10,4% in 2013. The highest values were recorded in Denmark (more than 31% of the

population between 25 and 64 years old following a training form in 2013), followed by Sweden and Finland (values around 28% and, respectively, 25 % in 2013), while the lowest values (until 2% in 2013) were registered in Bulgaria and Romania (according to Eurostat data).

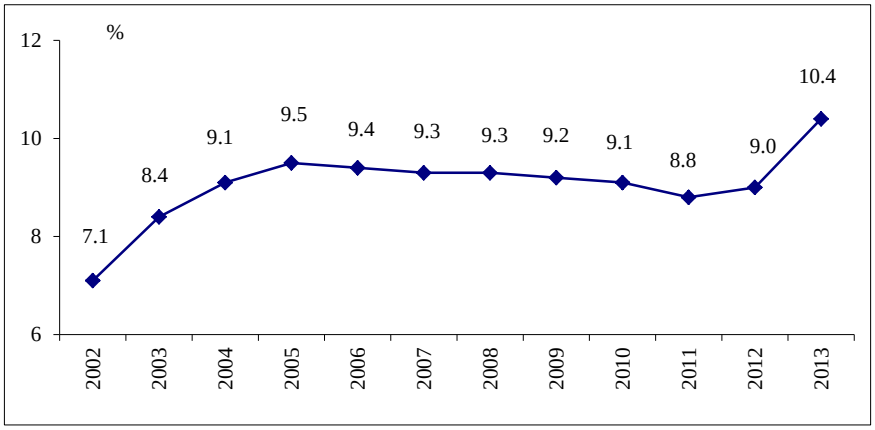

Figure 1 Participation rate in education and training (last 4 weeks) of total population between 25 and 64 years old in EU – 28 countries in 2002- 2013
Source: Adapted from Eurostat

Much more accelerated has been the evolution of higher education (levels 5 and 6 of education, ISCED classification), so from 2000 to 2012 there has been an increase in number of students over 25 years old who continue tertiary studies with more than 37,8% (at the EU, except Croatia) - a rate that exceeded the growth rate of the total number of students in tertiary education - levels 5 and 6 (respectively, 26,2%), thus increasing the share of this age group (over 25 years) in total students number (according to Eurostat data).
Ranked first in terms of share of are: Finland, Sweden, Denmark, Austria, and, on the other hand, in France, Croatia, Poland, Belgium, Lithuania, Malta and Bulgaria there is a lowest trend for further tertiary studies after the age of 25 years.
The largest increases in this indicator (share of students over 25 years old in total number of students) were recorded in Greece, Cyprus, Slovakia, Ireland, Romania, Czech Republic, Spain and in Luxembourg, United Kingdom, Germany, Latvia, Denmark, Italy and Sweden the share of students over 25 years old in total number of students has been declining, in 2000-2012 period.

Table 2 Evolution of the number of the students over 25 years old in tertiary education - levels 5 and 6, in the EU in the period 2000 to 2012

Countries	The number of students over 25 years old in 2012 (thousand)	The share of students over 25 years old in total number of students (%)			
		2000	2005	2010	2012
Belgium	113	18	23	23	24
Bulgaria	81	23	26	27	28
Czech Republic	144	20	33	33	33
Denmark	148	57	63	56	54
Germany	1310	52	46	42	45

Estonia	27	28	39	37	40
Ireland	61	18	21	31	32
Greece	328	5	27	47	49
Spain	764	26	35	40	39
France	429	18	21	19	19
Croatia	35		20	20	22
Italy	604	32	31	31	31
Cyprus	11	12	19	30	33
Latvia	33	39	44	36	34
Lithuania	47	22	34	29	27
Luxembourg	2	100			41
Hungary	133	29	40	35	35
Malta	3	24	28	25	28
Netherlands	264	28	28	26	33
Austria	196	51	40	51	52
Poland	450	22	21	21	22
Portugal	146	32	36	39	37
Romania	211	17	29	37	30
Slovenia	32	27	34	33	31
Slovakia	72	18	30	34	33
Finland	174	50	52	55	56
Sweden	248	56	58	56	55
United Kingdom	956	45	46	41	38
European Union (28 countries)	7024	*n.d.*	34	34	35

n.d. – no data
Source: Adapted from Eurostat

In total for full-time and part-time employed population over 25 years old, we can see that from 2000 to 2013 there is an increase in the share of employed persons with higher education. Accordingly, the number of employed people (all ISCED, 1997) increased during the period considered by 10,1% (at the EU except Croatia), while employment in of people with higher education degree by 59,1%, according to Eurostat data. This development shows that at least some of the employed population continued their studies along with running their own occupation, which is justified by the easy access of EU population to information technology and thus the possibility of following forms of education that not imply the presence in certain locations and certain time period.

It stands out the old Member States in terms of the share of people with higher education in total employment, the majority of these countries recording values above the EU average.

The first places are occupied by Malta, Poland, Portugal, Luxembourg, Romania and Ireland, this with the largest increases of noted indicator (share of employed persons with higher education in total employed population of 25-74 years) between 2000 and 2013.

Comparing the evolution of the employed population with higher education in total population, and changes in the share of households with Internet access in the countries analyzed (for the period 2005 to 2013), it appears that in most countries that have known values above the EU average of one of the indicators were recorded values above average for the second the indicator. Thus, Lithuania, Czech Republic,

Slovakia, Greece, Poland, Latvia, Portugal, Malta, Cyprus, Ireland and Italy showed values above the EU average in terms of both indicators. On the other hand, in Denmark, the Netherlands, Belgium and Germany both indicators were below the EU average.

Table 3 Evolution of Full-time and part-time employment for 25-74 year old population levels 5 and 6 graduate education in the EU between 2000 and 2013

Countries	Full-time and part-time employment for 25-74 year old population levels 5 and 6 graduate education in 2013 (thousands)	Share of full-time and part-time employment levels 5 and 6 graduate education in total employment (all ISCED 1997 levels) of 25-74 years (%)			
		2000	2005	2010	2013
Belgium	1,786.20	34.2	38.0	41.8	42.5
Bulgaria	866.1	24.0	27.2	28.7	31.3
Czech Republic	1,071.00	13.8	15.4	19.2	23.1
Denmark	872.1	28.4	36.6	35.8	37.8
Germany	11,546.90	27.1	29.0	30.5	31.9
Estonia	240.3	34.8	37.8	40.4	n.d.
Ireland	813	26.0	33.3	43.6	47.3
Greece	1,176.50	21.2	24.8	28.5	33.8
Spain	6,645.60	28.8	n.d.	37.8	41.5
France	8,870.8	25.8	29.3	33.9	n.d.
Croatia	336.9	n.d.	20.2	23.4	25.8
Italy	4,340.40	13.0	15.5	18.3	20.3
Cyprus	152.1	29.4	32.3	38.6	43.7
Latvia	301.8	22.5	24.3	32.1	36.7
Lithuania	505.3	48.6	30.9	41.1	42.4
Luxembourg	102.5	21.9	31.2	39.0	45.6
Hungary	1,017.50	18.6	22.0	25.1	27.4
Malta	38.6	8.7	17.1	20.6	25.4
Netherlands	2,673.40	28.1	34.0	n.d.	37.8
Austria	857.0	17.4	20.9	22.0	n.d.
Poland	4,675.90	15.1	22.6	n.d.	32.4
Portugal	920.6	10.3	14.4	17.5	22.0
Romania	1,647.30	9.7	13.4	16.7	19.1
Slovenia	280.7	18.9	23.7	28.3	33.3
Slovakia	503.7	13.6	17.6	20.9	23.1
Finland	991.8	37.0	38.9	42.8	45.3
Sweden	1,666.90	32.1	n.d.	36.7	39.7
United Kingdom	11,268.80	28.7	32.9	39.1	43.1
European Union (28 countries)	66,169.80	n.d.	26.8	30.5	33.4

n.d. – no data
(Source: Adapted from Eurostat)

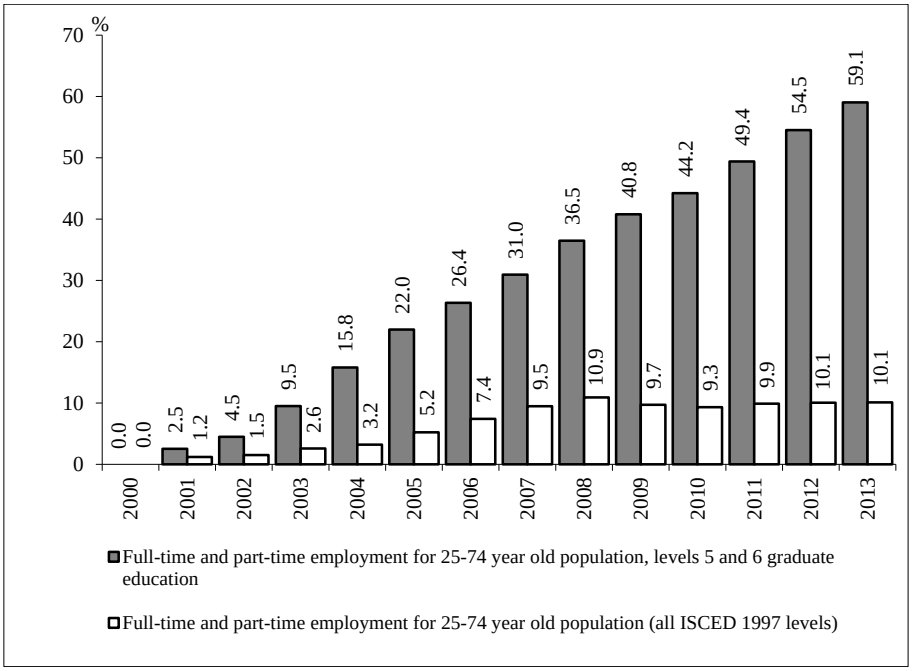

Figure 3 Relative change of the Full-time and part-time employment of 25-74 years old, total (all ISCED, 1997) **and for category 5 and 6 levels of education in the EU countries (without Croatia) in the period 2000 to 2013 (+ / - in% compared with 2000)**
(Source: Adapted from Eurostat)

So, for a total of 14 countries for which we have full data in 20 is detected the existence of a specific association between two indicators evolutions, thereby possibly confirming that the expansion technology was one factor among others that made possible the continuation of education for the category of employed people.

Table 4 Dynamics of share of households with Internet access and share of full-time and part-time employment with higher education in total employed population of 25-74 years old in 2013 compared with 2005 (%)

Countries	Dynamics of share of households with Internet access	Dynamics of share of employed population with higher education in total employed population of 25-74 years old
Belgium	160.0	111.7
Bulgaria	n.d.	115.2
Czech Republic	384.2	149.6
Denmark	124.0	103.2
Germany	141.9	110.2
Estonia	205.1	0.0
Ireland	174.5	142.1
Greece	254.5	136.1
Spain	194.4	n.d.
Croatia	n.d.	127.5
France	n.d.	n.d.

Italy	176.9	130.6
Cyprus	203.1	135.3
Latvia	232.3	150.7
Lithuania	406.3	137.2
Luxembourg	144.6	145.9
Hungary	322.7	124.5
Malta	192.7	148.7
Netherlands	121.8	111.0
Austria	172.3	0.0
Poland	240.0	143.4
Portugal	200.0	152.9
Romania	n.d.	142.2
Slovenia	158.3	140.6
Slovakia	339.1	131.1
Finland	164.8	116.2
Sweden	127.4	
United Kingdom	146.7	131.1
European Union (without Croatia)	164.5	124.6

n.d. – no data
(Source: Adapted from Eurostat)

After all the assessments, we can say that the impact of information technology on the educational system and the dynamics of absorption of the adult population in lifelong learning will see the same trend in the near future, resulting in changes in all associated activities: research, teaching and learning, organization, organization and operating framework, legislation etc.

Regarding the evolution of the number of employed adults in lifelong learning, we tend to think that we will see a relative stagnation in the developing states. For example, in Romania we expect a reduction in the number of adults that return to formal learning system, such as distance learning, as a result of strictly objective factors: the impact of economic crisis on living standards and the purchasing power, increased tuition taxes in distance learning programs, low labor demand in large and very large organizations etc.

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