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Lifelong learning in organizations in the Czech Republic with regard to the Europe 2020 strategy

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Abstract

People are the main asset of the European Union (EU) and the key to the creation and transfer of knowledge, i.e. they constitute one of the factors determining the innovation potential of each society. Investment in education and training is a decisive factor in competitiveness, sustainable development and employment within the EU, which significantly affects the quality of life. The aim of this article is to assess the position of the Czech Republic (CZ) in an international comparison based on EU indicators in the field of education and to evaluate the involvement of Czech organizations in the process of lifelong learning. The evaluation of data has shown that the CZ is below the EU average in most of the indicators set out in the Europe 2020 strategy; however, in the CZ there is an ongoing change in the structure of education, the level of achieved education is gradually increasing. The results of the primary research indicate that the organizations that systematically plan educational activities and greatly exceed the expected rate are primarily large, international and state organizations.

Keywords

Czech Republic; education; European Union; lifelong learning; people, training

JEL Classification: I23, J24

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1. Introduction

Promoting lifelong learning and human resource development plays an important role not only in improving competitiveness and flexibility in labour markets, but also in solving the problems of individual personal development and knowledge sharing to gain experience (Alhanshi and Albraiki, 2015; Shahjahan and Morgan, 2016). Therefore, lifelong learning is the aim and concept of today's educational and human resources development policy, both at a national and transnational level (Europass, 2016). According to Weiss-Gal (2016) and Beneš (2014), it greatly affects social and economic policy.

The European Union (EU) member states have historically developed different approaches to the financing, management and evaluation of educational activities. The field of education therefore is not among the EU's common policies. Unlike the common monetary and customs policy, the education policy has the status of a so-called 'complementary' policy. This means that EU activity in this area does not directly affect national education policy, but is limited to supporting member states. The EU institutions can grant member states recommendations only (Cankaya, Kutlu and Cebeci, 2015). According to the Lifelong Learning Strategy of the Czech Republic (CZ) (MEYS, 2007), lifelong learning presents all possibilities for learning (whether in traditional educational institutions inside the education system or otherwise) as a single interconnected unit that facilitates diverse and numerous transitions between education and employment and which provides the same qualifications and competence in various ways and at any time during a person's lifetime (Cheng, 20013; Veteška and Tureckiová, 2008).

Based on the above, it can be concluded that the essence of the EU's efforts in education lies in its systematic and large-scale financial support given to individual countries and regions. Financial support is granted on the basis of commonly agreed objectives and through the Structural Funds and the Lifelong Learning Programme (Europass, 2016).

A proclaimed objective and subtitle of the Europe 2020 strategy (European Commission, 2010) is to achieve an economic growth that will be based on the principles of a knowledge-based economy, will be sustainable and will promote integration, both social and territorial (Panitsides, 2014). From the essence of Europe 2020 as the main economic strategy for the next ten years, it follows that it affects a significant part of sectoral policies and that its implementation will have a broad impact on the economic and social environment in individual member states (Dvořáková, 2012). On the basis of five main goals of the strategy, member states were invited to set analogous national objectives and, at their individual levels, implement policies and tools necessary to meet those objectives (European Commission, 2010). Education is one of the five pillars on which the Europe 2020 strategy is built. Two of the goals that have been used to monitor the EU's progress towards a smart, sustainable and inclusive economy concern education. These referential values are determined at an EU level, and state that:

- the percentage of students who leave school before completion of studies, i.e. dropouts, should be less than 10% by 2020;
- at least 40% of people between 30 and 34 years of age should have completed tertiary or equivalent education by 2020.

It should be noted that both these goals are set at an EU level and therefore do not apply individually to each territorial administration unit at a national or regional level. All referential values of the Europe 2020 strategy have been incorporated into the national (and sometimes regional) targets that reflect the different circumstances and conditions of each member state of the EU (Eurostat Statistics Explained, 2016). The Education and Training 2020 Strategic Framework (ET 2020) also defines the so-called European referential indicators – in short European benchmarks. These are the target values of average results of all EU countries in common priority areas that should be achieved by 2020 (MEYS, 2010):

- the percentage of early school or training leavers should be less than 10% (the CZ set the target value to 5.5%);
- at least 95% of children from age 4 till the beginning of compulsory school attendance should participate in early childhood education;
- the percentage of persons between 30 and 34 years of age with completed tertiary education should be at least 40% (the CZ set the target value to 32%);
- the percentage of 15-year-old pupils who have difficulties with reading, maths and natural sciences should be below 15%;
- the percentage of employed graduates (aged 20–34 years) who left school a maximum three years before the reference year should be at least 82%;
- at least 15% of adults should participate in various forms of lifelong learning.

Through its accession to the EU, the Czech Republic gained the opportunity to fully participate in all activities and initiatives in education, training, in community programmes aimed at supporting the development of education and training and cooperation between educational institutions, both between EU member states and with institutions from third countries (Antonescu, 2015). Since 2007, all education programmes financed by the European Union have been transferred to the Lifelong Learning Programme under the National Agency for European Educational Programmes (NAEP).

According to Hasanefendic, Heitor and Horta (2016), nearly two-thirds of the adult population in Europe still lack the skills needed to succeed in today's innovation environment. These skills consist of a range of technical skills and soft skills such as teamwork, leadership, and many others. It is therefore necessary for organizations to continue to educate employees as the main bearers of knowledge and experience while in their employment (Levy, 2011). Organizations are an important provider of lifelong learning, contributing to the development not only of the organization itself but also of individuals and society as a whole (Maurer and Gonon, 2014).

In light of the foregoing, the following section deals with quantifying the results of selected major indicators of lifelong education and training based on the strategic objectives of the Europe 2020 targets. Using these indicators, it is possible to evaluate the promotion of lifelong learning at the national level, to make a comparison of EU member states as well as identify trends in this area. Given that employers play

an irreplaceable role in lifelong learning, the approach of addressed organizations to lifelong learning in terms of the nature of the learning process is also evaluated.

2. Materials and Methods

The theoretical basis of the article was founded on the analysis of secondary sources, i.e. using the comparison of theoretical approaches of domestic and foreign authors of scientific articles on the issue of education and human resources development. In addition, for the theoretical background we also obtained data from available documents and the official websites of the Ministry of Education, Youth and Sports, the Government of the CZ, the Ministry for Regional Development and the sites of the EU and the Organization for Economic Co-operation and Development (OECD). Underlying data were obtained from the databases of the Czech Statistical Office and Eurostat database.

Throughout the article, logical methods were used involving analysis, synthesis, induction and deduction. To evaluate the formal and lifelong learning in the CZ selected indicators were used, such as the evolution of the structure of education in the CZ, the results of pupils and adults and expenditure on education with respect to the gross domestic product (GDP). Due to the different OECD and EU methodology in monitoring these indicators, the results are always in comparison with the OECD or EU average, so that the CZ's international status can be determined. The latest data published in the official documents that allow such comparison are from 2011.

Primary data were obtained from a questionnaire survey in which a total of 402 organizations participated. The organizations were approached in a random sample. The respondents were managers of human resources departments. The participating organizations were identified by the sector of their operation (public 14.5%, private 70.6%, and state 14.9%), size (1–9 employees, 16.7%; 10–49 employees, 24.3%; 50–249 employees, 24.9%; 250 and more employees, 34.1%) and by an organization's market (local, 12.2%; regional, 23.6%; national, 26.4%; international, 37.8%).

In the survey, the respondents characterized the educational activities of the organizations. To analyse the results, statistical tools such as tests of dependence (χ^2 test) and powers of dependence (Cramer's V) were applied. Within the research, whether there is a correlation between the implementation of educational activities in the

surveyed organizations and individual identifying variables was investigated.

Within the article three null hypotheses were tested:

- H_{01} : Characteristics of education in an organization do not depend on its size.
- H_{02} : Characteristics of education in an organization do not depend on its business sector.
- H_{03} : Characteristics of education in an organization do not depend on the organization's market.

For significant qualitative variables, the so-called 'sign diagram' was used, through which it was possible to determine which combination of characters most affects this dependence. For each box of a contingency table, an association table was formed and from it the χ^2 variable was expressed. The χ^2 value affects the number of signs in the table and is assigned based on the following distribution:

- if χ^2 is smaller than 3.84, then the field is without the indication.
- if χ^2 is higher than 3.84 but smaller than 6.62, then the field is marked with one sign.
- if χ^2 is higher than 6.62 but smaller than 10.83, then the field is marked with two signs.
- if χ^2 is higher than 10.83, then the field is marked with three signs.

Intervals for a decision on the number of signs were determined according to respective critical values in the tables of χ^2 distribution at a significance level $\alpha = 0.05$, $\alpha = 0.01$, $\alpha = 0.001$. The decision about whether the sign will be positive or negative was influenced by comparing actual and theoretical frequencies of a contingency table. A positive sign has been assigned where an actual frequency is higher than a theoretical one, and a negative sign has been assigned where an actual frequency is lower than a theoretical one. For the analysis of the results IBM Statistic 24 was used.

3. Results

The results of the main indicators in the priority areas of education and other indicators that significantly influence the level of lifelong education, such as the educational structure of the population or expenditures on education in the CZ, are further presented.

3.1 ET 2020 benchmarks

The ET 2020 strategic framework defines European benchmarks in common priority areas that should be achieved by 2020. Table 1 shows the achieved CZ and EU average values in the monitored period of 2012 - 2015, which reflect the ability of EU countries to meet the set commitments.

Table 1 ET 2020 benchmarks (Source: European Commission, 2016)

	CZ		EU average	
	2012	2015	2012	2015
ET 2020 benchmarks				
Early leavers from education and training (age 18-24)	5.5%	6.2%	12.7%	11.0%
Early childhood education and care (from age 4 to starting age of compulsory education)	87.8%	86.4%	93.2%	94.3%
Tertiary educational attainment (age 30-34)	25.6%	30.1%	36.0%	38.7%
Proportion of 15 year-olds with underachievement in:				
• Reading	16.9%	-	17.8%	-
• Maths	21.0%	-	22.1%	-
• Science	13.8%	-	16.6%	-
Employment rate of recent graduates by educational attainment (age 20-34, population with higher secondary education)	82.3%	82.2%	75.9%	76.9%
Adult participation in lifelong learning (age 25-64)	11.1%	8.5%	9.2%	10.7%

It can be seen from Table 1 that in the monitored period there was a deterioration in 4 out of 6 indicators in the CZ. In contrast, the EU countries have on average improved in all priority areas of education. The specific values for reading, mathematics and science literacy based on the PISA (Programme for International Student Assessment) are not yet known for 2015. However, according to Blažek and Přihodová (2016), in 2015 the pupils'

results in natural science and mathematical literacy were on the OECD countries' average, and slightly below the average in reading literacy. From 2000, when the CZ joined the survey for the first time, the pupils' results in reading literacy were below average until 2012, when the results became comparable with the OECD average. The results of pupils in reading literacy were below the average from 2000, when the CZ joined the survey for the first time, until 2012, when the results were comparable to the OECD average. In contrast, in mathematical literacy the Czech pupils were achieving above-average results up to 2009 when they matched the OECD average and since then, the results have not been statistically different. However, the CZ is among the seven countries where the students' above-average results in natural science literacy of 2006 significantly deteriorated to the current level of average results.

Based on the targets set for 2020, it is possible to say that the CZ is currently fulfilling its commitment to the *Employment rate of recent graduates by educational attainment* of more than 82% and is also approaching the fulfilment of the *Tertiary educational attainment* commitment. In the monitored period the CZ improved in this indicator only and approached the target level of 32%.

3.2 Development of the structure of education in the CZ

The level of education achieved creates differences in the labour market. Although the unemployment rate in the CZ is significantly lower than in other countries of the EU, it is significantly higher for those who have achieved a lower education only. For the workforce aged 25–64 the unemployment rate was 2.6% for persons with tertiary education and with a master's degree. For persons with lower secondary education it has grown to 21.4% (in EU21 these rates

were 5.1% and 15.2% in 2011). Adults who have attained tertiary education earn on average 75% more than those who have completed secondary education (OECD, 2013). From Table 2 it is clear how the educational structure changed between 2000 and 2011 in the CZ as well as in the EU and OECD. The placement in the OECD countries' list then indicates how the CZ is doing in an international comparison.

In 2011, the CZ had one of the highest percentages of adults with at least higher secondary education among OECD countries and the EU21 (92% compared with the OECD average of 75% and EU21 76%). This difference is due to the proportion of the population with higher secondary education (74%), which by far exceeds the OECD and EU21 (44% and 48%). The percentage of the population with less than higher secondary education is decreasing. The percentage of the population with higher secondary education in the countries surveyed between 2000 and 2011 remained relatively stable. Conversely, during the observed period there was a significant increase in the proportion of the population with tertiary education (CZ 7%, OECD 9%, EU21 8%). However, the CZ occupies one of the lowest positions in international comparison, where the proportion of the population is at 18%, compared to the OECD (31%) and the EU21 (28%) average. The latest OECD data (2016) show an increase in the CZ population with tertiary education to 22% in 2015. However, the OECD average was 35% that year. The development shows that there is a change in the educational structure of the Czech population towards higher educational attainment, which corresponds with an international policy to increase education. Nevertheless, the number still does not approach the OECD or EU average.

Table 2 The participation rate in education (Source: OECD, 2013)

Indicators	CZ		OECD average		EU21 average		Position of the CZ among OECD countries
	2011	2000	2011	2000	2011	2000	
Participation rate in education (aged 25–64)							
Percentage of population with less than higher secondary education	8%	14%	26%	34%	25%	34%	34 out of 35
Percentage of population with higher secondary education	74%	75%	44%	44%	48%	46%	1 out of 36
Percentage of population with tertiary education	18%	11%	31%	22%	28%	20%	31 out of 36

3.3 Financial investment in education

The most important financial indicator for education is the indicator *total expenditure on educational institutions as a % of GDP*, which presents the rate of spending on education in relation to the national wealth of the country. National wealth is estimated on the basis of GDP, expenditure on education consists of public spending, companies and expenditure by students and their families. Countries invest in education, especially in order to accelerate an economic growth, increase productivity and reduce social inequality. The share of expenditure on education relative to GDP depends mainly on the different preferences of various public and private expenditures. However, expenditures on education come mainly from public sources and are closely linked to the governments' budgets. The level of expenditure on education is influenced by the size of the population of school-age participation rates in education, teachers' pay, the organization of education and other factors (Eurostat Statistics Explained, 2016).

Table 3 Financial investment in education (source: OECD, 2014)

Indicators	CZE	OECD average	EU21 average	Position of the CZ among OECD countries
Financial Investment in Education	2011			
Annual expenditure per student (in PPPs*)				
- Pre-primary education	4302	7428	7933	28 of 36
- Primary education	4587	8296	8482	30 of 38
- Secondary education	7270	9280	9615	24 of 38
- Tertiary education	9392	13958	13572	26 of 37
Total expenditure on educational institutions as a % of GDP	5%	6%	6%	32 of 37
Total public expenditure on education as a % of total public expenditure	10%	13%	12%	30 of 34

* purchasing power parity

Table 3 shows that in 2011 the CZ held one of the last positions in the international comparison of expenditures spent on education. The structure of annual expenditure per student based on the level of education corresponds to the OECD and EU average but is significantly lower at all mentioned levels.

The CZ belongs to the below-average group of countries, having spent on primary to tertiary level of education 5% of GDP in 2011. However, since 2008, the CZ has seen a constant rise in expenditure on education as a proportion of the GDP. The latest European Commission report (2016) even points out in 2017 that the CZ in 2014 surpassed the EU average (4.9%) with a value of 5.2%.

3.4 The involvement of Czech organizations in lifelong learning

In the context of the current education system, it is not possible to provide the necessary knowledge and competence in individual countries. For the process of lifelong learning, it is therefore vital that employers in those countries become involved and systematically start planning educational activities such that their employees achieve the necessary skills. Therefore, the results of primary research are further evaluated on the sample of Czech organizations (n = 402).

By testing dependencies between selected features, it was found that the implementation of educational activities in the surveyed organizations depends on the market of the organization ($\chi^2 = 22.371$, p-value = 0.008 Cramer's $V = 0.136$, weak dependence) as well as on the sector of the organization ($\chi^2 = 30.080$, p-value = 0.000 Cramer's $V = 0.193$, weak dependence). The greatest dependence was found in the size of an organization based on the number of its employees. The value of χ^2 test criterion is 83.882 at 9 degrees of freedom (p-value = 0.000 Cramer's $V = 0.264$, moderate dependence). Therefore, all three null hypotheses have been rejected and alternative hypotheses, indicating the existence of dependence, have been accepted. For a more detailed analysis of dependence, the sign diagram was applied to determine which combinations of features best explain the dependence.

The sign diagram has shown that the addressed organizations with more than 250 employees (see Table 4 in the Appendix) are generally aware of the need to educate their employees and therefore choose planned educational activities that are always set for a certain time period. The method has also revealed that small organizations with up to 49 employees are not engaged in these activities at all, and if they are, it is only compulsory trainings or courses to meet

current needs. The difference between expected and actual frequencies showed that these organizations were not engaged in the systematic planning of education.

A significant difference between expected and actual frequencies was also found in organizations that operate within the international market (see Table 5 in the Appendix). These organizations are engaged in educational activities and, in general, the activities of the addressed organizations are characterized as planned.

Surprising results were found for the characteristics of education in relation to the sector of business in the interviewed organizations (see Table 6 in the Appendix). The sign diagram revealed the greatest difference in actual and expected frequency in organizations operating in both the private and state sector. While organizations doing business in the state sector educate their employees mainly on a planned basis, for organizations operating in the private sector, the opposite is true. Clearly, state organizations systematically educate their employees and follow the strategic direction of the CZ and are important providers of lifelong learning.

4. Discussion

Promoting education and upskilling the workforce is certainly a precondition for further economic growth, productivity growth and competitiveness of European countries, as demonstrated by the research performed by Shahjahan and Morgan (2016) or Uslu and Cubuk (2015). In the CZ there is an ongoing change in the structure of education, the level of achieved education is gradually increasing. In international comparisons in 2011, the CZ occupied a prominent position in the percentage of the population with higher secondary education (74%), which by far exceeds the average for the EU21 and the OECD (48% and 44%). Conversely, the CZ ranks among countries with the lowest percentage of persons with tertiary education (18%) compared to the average of the EU21 (28%) and OECD (31%) countries.

Although there is an increased percentage of persons with higher education, the CZ is still far below the EU average.

One of the main goals regarding education is to ensure that at least 40% people between 30 and 34 years of age have completed tertiary or the equivalent education. In this indicator the CZ has set a target value of 32%. According to the results of the European Commission (2016), the CZ reached 30.1% in 2015 and significantly shifted towards achieving this target. Dragomirescu-Gaina, Elia and Weber

(2015) predicted that Europe as a whole is likely to reach its target of 40% on tertiary education attainment by 2020, but the pace of improvement will be slower than in the past.

However, according to the results from 2015, the CZ is below the average in other indicators established under ET 2020, such as *Early leavers from education and training*, *Early childhood education and care* and *Adult participation in lifelong learning*. On the other hand, the CZ is significantly higher than the EU countries in the indicator *Employment rate of recent graduates*, and with a value of 82.2% in 2015 exceeded the target set for 2020. The last observed indicator is the *Proportion of 15-year-olds with underachievement in reading, maths and science*. According to Blažek and Příhodová (2016), the pupils' results in natural science and mathematical literacy met the OECD countries' average in 2015, and slightly below the average in reading literacy. However, there has been a statistically significant drop in natural literacy for Czech pupils since 2006. The results show an increasing annual expenditure per student as well as the growth of total expenditure in educational institutions as a % of GDP in the average of OECD countries, despite the economic downturn in 2008 (OECD, 2016). In 2011, however, the CZ was placed in the bottom third of the OECD countries even in financial indicators.

However, achieving the Europe 2020 targets is not the only guarantee of full success in education; the consistency between the supply of skills and needs of the labour market is also important. The Czech labour market is facing similar problems as most of the labour markets of EU member states, which are the consequences of globalization, international mobility and an aging population (Beloiu, Bostan and Iorgulescu, 2015). Dvořáková (2012) identifies the main causes of mismatches between skills and labour demand, which should be emphasized in the future: the formal education system is very slow to respond to the changing needs of labour markets; the absence of effective systems of lifelong learning and the existence of barriers that prevent a full realization of free movement of persons within the internal market. Graduates of a formal education system do not receive the skills and qualifications that match the nature of newly emerging jobs. Organizations in the CZ report labour shortages, especially in the fields of engineering, automotive industry and electronics. For firms, it is hard to find technically educated experts both among the vocational schools' trainees and graduates of secondary schools and universities (Government of the Czech Republic, 2014). This difficult situation with a shortage of technically educated people on the

labour market is already felt by more than half of the companies. Partially it is due to the population decline, but mainly it is a consequence of a long-term low number of university graduates in technical fields, as is clear from the research of the Ministry of Industry and Trade of the CZ (CzechInvest, 2012). Taking into account the results of the primary research, it can be stated that the organizations are aware of the need to educate and develop their employees. From a total of 402 organizations, 82.3% educate their employees in some form of employee training. Almost half (49.8%) characterized educational activities as planned for a predetermined period.

5. Conclusion

Changes in society and economy increase the importance of lifelong learning. The need for lifelong learning is steadily increasing and reflects a rapidly changing moral obsolescence of gained knowledge and a reduction in the shorter half-life of information. However, it is important to realize that the growing importance of lifelong learning is not only for individuals but also for the future of the whole EU, and it is necessary to continuously monitor the development of the educational structure of the population in the individual member states. On the basis of statistical testing ($n=402$ organizations in the Czech Republic), three null hypotheses were rejected (H_{01} , H_{02} , H_{03}) and the alternative hypotheses regarding the existence of a character were accepted. The nature of education in the surveyed organizations depends on the size, sector and market of operation of the organization. The application of a sign diagram has revealed a significantly exceeded value of actual frequencies over expected frequencies in all observed areas. It can be concluded that educational activities are systematically planned primarily by large international and national organizations. While organizations doing business in the state sector educate their employees mainly on a planned basis, for organizations operating in the private sector the opposite is true. This confirms that the CZ, as the founder of state organizations, is striving to increase the knowledge and skills of all employees, leading to increased competitiveness and greater flexibility in the labour market. The theoretical and practical contribution of the paper is the comparison of results in the field of education in the CZ and EU.

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Appendix

Table 4 Sign diagram of deviations – the size of the organization (source: own survey)

Question	Characteristics of training in an organization			
	Not involved in education	Unscheduled courses implemented as needed	Limited to compulsory training	Planned activities for a certain period
Organization size by number of employees	21	25	6	15
	++	+		---
1 – 9	27	29	10	32
10 – 49	++			---
50 – 249	18	21	14	47
250 and more	5	22	4	106
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Table 5 Sign diagram of deviations – the market of an organization (source: own survey)

Market of an organization	Characteristics of training in an organization			
	Not involved in education	Unscheduled courses implemented as needed	Limited to compulsory training	Planned activities for a certain period
local	13	14	5	17
regional	25	23	10	37
national	18	28	6	54
international	15	32	13	92
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Table 6 Sign diagram of deviations – the sector of organization's business (source: own survey)

Sector of organization's business	Characteristics of training in an organization			
	Not involved in education	Unscheduled courses implemented as needed	Limited to compulsory training	Planned activities for a certain period
public	6	17	7	28
private	60	75	25	124
state	5	5	2	48
	-	-		+++

