

## THE CHALLENGES AND TRENDS IN HIGHER EDUCATION

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**Abstract:** The aim of this paper is to study the developments and trends in higher education. The mission of universities is to develop harmonious personality, knowledge, wisdom, goodness, and creativity in a person and to contribute to the development of education, science, culture and health for the welfare of the whole society. It is necessary to pay attention to changing trends in the labor market in connection with the introduction of new technologies and the creation of new jobs as well as the changing requirements of employers in order to fulfill this mission. Despite falling unemployment, it is still necessary to pay significant attention to the preparation of the new workforce which enters the labor market and mainly to the education of a highly qualified workforce that is required by the labor market. The authors are dedicated to education itself as well as educational trends, they sought to underpin the theoretical background of education through statistical indicators. The authors used a time series analysis for the identification of trends and changes of the monitored parameters. They used a regression analysis for the prognosis of trends and have been using the index of correlation and determination for the choice of the most probable future development.

It is essential that the training of the workforce for the labor market and the education sector respond to the changes in a flexible manner. The conventional way of education will become substandard over several years, not only the content but also a technological transformation will be required.

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### Introduction

Globalization processes associated with the development of new communication technologies significantly impact the national labor markets and can result in an even greater problem with employment. In this context, the education system which prepares the workforce for the labor market is changing. The ability of the workforce to adapt to the changing labor market requirements becomes important. The basic structural features of the labor market of the EU countries, as well as the Slovak Republic is the aging population, high levels of long-term unemployment, high unemployment of people with low education, high youth unemployment, and large regional disparities (Fusch, 2016). Employment and productive work are one of the most important factors for economic and social development of society. Employment increases development of a society and the living standards of every citizen. That is the reason why the growth of employment is the most important goal in the majority of countries. A characteristic feature of most developed societies is their high degree of sensitivity to the level of employment. Many societies are based on the fact that the majority of their population that is able to work consists of employees who earn wages. This implies a dependency ratio on the stability of employment, which ensures a regular flow of income.

Employment represents the involvement of the population in the work process. It can be measured by the number of employed and the employment rate. Full employment reflects a level of employment, which corresponds to the natural rate of unemployment and the economy at the level of potential output. (Habánik, 2012). It is necessary to be aware of the preparation of the new workforce which enters into the labor market and in particular the preparation of a highly skilled workforce that is on demand. Such a workforce is prepared especially in higher education. The need for qualified labor force growth in the fourth scientific and technological revolution, particularly the workforce in specific industrial sectors, which are necessary for the growth of new sectors of production. However, unskilled labor or the workforce skills that can not find employment in new sectors are constantly appearing in the labor market. (Krajňáková&Vojtovič, 2012, p. 69). State intervention in the form of measures of active labor market policies but also in measures for more effective education systems helps facilitate the entry of young people into the labor market. The existence of targeted instruments

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to support and provide help to young people can make a significant contribution to enhancing their competitiveness and integration into working life. Tools eliminating their main handicap, such as a lack of professional experience and practical experiences, generally are standard tools of the active labor market measures which are explicitly targeted towards young people. These schemes provide incorporation, training, and professional experience directly in the workplace by the employer in order to obtain professional competencies. Graduate practice, is for these purposes, in the active labor market measures of Slovakia. This practice gives the opportunity for graduates to acquire vocational skills and practical experience through work placements at the employers.

The issue of higher education is now rightly in the center of attention of experts and the general public due to the fact that many graduates leave Slovak universities every year and they do not have the required skills for the labor market needs. Education is a process that is difficult because of the changing conditions and rapid obsolescence of knowledge nowadays. Knowledge of the graduates can be obsolete already at the end of their study; therefore, the ability to learn and orientate one's self in the search and acquisition of new knowledge is an important feature of graduates.

### **Purpose and methods**

We used the following research methods:

- Quantitative methods, particularly mathematical - statistical methods (time series, relative values, indexes, regression and correlation analysis, the correlation coefficient and determination, prognostication etc.)
- Qualitative methods such as a secondary analysis of documents, laws, research materials, and other factually relevant domestic and foreign documents, etc.

The information sources from the Statistical Office of the Slovak Republic, Ministry of Labour, Social Affairs and Family, Ministry of Education, Science, Research and Sport of the Slovak Republic, Central Office of Labour, Social Affairs and Family have been used to analyze these. Internal materials of relevant institutions and organizations dealing with given issues and other available literature mentioned in the bibliography have been incorporated in the analysis.

Time series analysis for the identification of trends and changes in the examined indicators have also been employed.

Regression analysis for the prognosis of trends have been used and the most probable future development of this indicator and the index of correlation and determination have been chosen. Price index of determination could take values from 0 to 1, the more the value of the index approaches 1, the greater part of the total variability approaches zero, the smaller part of the total variability is explained by the model. described by the model and vice versa, if the determination index

### **Impacts on the market of higher education in the Slovak Republic**

The decline of a population significantly affects the whole European market of education. The capacity of universities is set to a greater number of students. This means that higher education is becoming more accessible to a greater number of individuals from the population each year. Therefore, training for future employment is extended significantly and the average age of the workforce which enters into the labor market in the European area is the highest in history. The following graph shows the situation of the development of the number of applicants for university study in the Slovak Republic.

Interest of students is focused mainly on social sciences and natural sciences in the Slovak Republic in recent years. In comparison with technical sciences, where interest of students is significantly lower for this type of study. This situation also impacted the labor market and the Most Desirable graduates become graduates with engineering degrees.

Due to the fact that boomers are falling, the employers are more often looking for graduates of technical fields, this results in an unharmonic labor market. Technical studies are generally considered to be very difficult; therefore, only the best students achieve success. The classic form of teaching and subjects that have not changed for at least two decades discourage potential candidates. Many of the subjects seem unnecessary. In Slovakia, there is no possibility for students to choose subjects that are considered more appropriate and that are prescribed as compulsory subjects in the group, from the range of prescribed credits. Flexible learning pathways and the use of more ICT in education will

change routines of higher education differently opposed to those being practiced now. (Jirasko, Hynek, 2016)

Technically and economically oriented faculties clearly dominate in comparison to individual faculties. Conversely, faculty focused on law, education, and agriculture are least in demand.

Despite the mentioned facts, university graduates create a negligible group in the overall unemployment rate in Slovakia. Other circumstances can lead them being registered as unemployed due to the lack of job opportunities. The following table presents an overview of unemployment in the Slovak Republic by educational attainment.

Table 1: Population structure by education

	2008	2009	2010	2011	2012	2013	2014	2015
<b>Primary education</b>	39.3	41.6	40.2	42.1	44.5	42.3	44.4	38.5
<b>Secondary (vocational) education without GCE *</b>	18.1	25.1	32.6	32.9	29.8	33.2	16.4	13.7
<b>Secondary specialized (vocational) education with GCE</b>	8.4	15.1	19.6	12.2	9.7	12.5	11.6	11.1
<b>Completed secondary general education</b>	7.7	12.9	13.5	14.6	16	15.8	15.2	11.9
<b>Completed secondary technical education</b>	5.7	8.6	10.3	10.0	10.4	10.8	9.3	8.6
<b>Higher vocational education</b>	5.8	5.6	9.2	5.7	4.7	7.8	6.9	4.7
<b>University education</b>	3.5	4.2	6.5	5.8	6.9	7.2	6.4	6
<b>No education</b>							17.4	

Source: ŠÚ SR, VZPS  
 \* Vocational education is included in this number to 2013

The increasing trend of an economically active population (EAP) in the Slovak Republic and also the increasing trend in the share of university educated people from EAP during the period of 2008 to 2015 is being shown in Table 2. EAP growth index is 1,018 that represents an increase of 1.8%, and the university educated component of this population increased by 46.7%.

Table 2: The economically active population in the Slovak Republic and the share of university educated people in the years 2008 - 2015 (in thousands)

	2008	2009	2010	2011	2012	2013	2014	2015	Index 2015/2008
EAP	2691.2	2690.0	2706.5	2680.0	2706.5	2715.3	2721.8	2738.3	1.018
University educated	401.4	425.0	476.7	488.4	500.2	528.8	562.5	589.0	1.467
Share in %	14.9	15.8	17.6	18.2	18.5	19.5	19.3	21.5	-

Source: ŠÚ SR, own processing

Following on the statistics above, the university educated component of economically active population of Slovakia has increased. It has been noticed that the highest share of population with university education on the EAP is in the Bratislava Region (share was 37.3% in the year. 2015), then in the Trenčín and Košice regions (share was 20.6% in the year. 2015). The lowest share was 5.9% in the Trnava Region in the year 2015 from the regional perspective.

It is expected that further development of the university educated component of the economically active population in Slovakia will continue until 2020 if we take into regard a linear model with the equation  $y = 25,819x - 51439$ , which has an index of reliability of 97.95% for this time period. Development prognosis are illustrated in Table 3.

Table 3: Prognosis of university educated component of economically active population in the Slovak Republic for the years 2016 - 2020 (in thousands)

	2016	2017	2018	2019	2020
<b>University educated component of EAP</b>	612.1	637.9	663.7	689.6	715.4

Source: own processing

In summary, given the analysis of the employed in Slovakia by education, the number and thus the share of university educated people have an increasing trend in the monitored period. This group makes up more than one fifth of workers in recent years. The share of university educated workers on the overall number of all workers in the Slovak Republic was approximately 22.8% in 2015. The Bratislava region is for the entire period higher than this value, which can be justified by the concentration of state and private enterprises, companies, organizations and councils, which require highly qualified workforce. Trnava and Nitra regions have long been below the national share of university educated workers on the overall number of all workers, which is likely related to the migration of the highly qualified workforce to the Bratislava Region; for instance, due to the closer proximity to and higher number of better career prospects, higher remuneration, etc.

The analysis about the proportion of the unemployed with university education in the Slovak Republic indicates an increasing trend as seen in Table 4. For example, it was only one person with a university education in twenty unemployed in 2008, but it was approximately one in ten of unemployed in 2015.

Table 4: Development of unemployment in total and unemployed people with a university education in the Slovak Republic in the years 2008 - 2015 (in thousands)

	2008	2009	2010	2011	2012	2013	2014	2015
<b>Together</b>	257.5	324.2	389.0	364.6	377.5	386.0	358.7	314.3
<b>University</b>	14.0	17.7	26.9	28.6	34.8	38.0	36.1	35.6
<b>Share in %</b>	5.4	5.5	6.9	7.8	9.2	9.8	10.1	11.3

Source: ŠÚ SR, own processing

The lowest share of unemployed with university education was found in Banska Bystrica, Trnava and Prešov regions throughout the period. This situation may be caused by the outflow of educated workforce to other regions and also shows that education has a positive impact on success in the labor market in these regions.

Table 5: Development of EAP and unemployed people with a university education in the Slovak Republic in the years 2008 - 2015 (in thousands)

	2008	2009	2010	2011	2012	2013	2014	2015
<b>EAP</b>	401.4	425.0	476.7	488.4	500.2	528.8	562.5	589.0
<b>Unemployed people with UNI</b>	14.0	17.7	26.9	28.6	34.8	38.0	36.1	35.6
<b>Share in %</b>	3.5	4.2	5.6	5.9	7.0	7.2	6.4	6.0

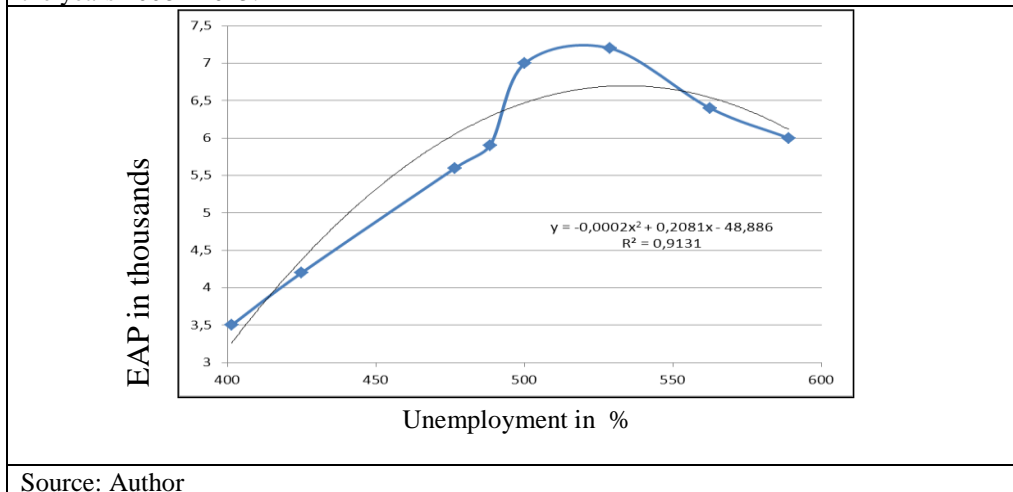
Source: ŠÚ SR, own processing

It is assumed that there is a correlation between the development of the university educated economically active population and the development of university students in the total number of unemployed. Based on the above further reduction of the share of highly qualified unemployed can be expected in the total number of EAP with university education. Index of correlation of these indicators is the highest in the quadratic model and has a value  $r = 0.96$  (statistically very high interdependence of the examined parameters).

To summarise, the share of university educated people could fall below 2-3% till 2020, it is based on the quadratic model  $y = - 0,0002x^2 + 0,2081x - 48,886$  with determination index 91.3% and the expected development of EAP with university education (Table 1). Of course, other factors that may affect future development have to be taken into account.

Availability of university education depends on the financial possibilities of families and students. Therefore, the choice of this type of education is particularly influenced by the possibility of studying in the region from which the student comes from, and it is usually associated with the lowest financial burden for the family. The graduates often remain at work in the regions in which they studied, and it is very important in the balancing of disparities in the labor market, which have been mentioned previously.

Figure 1 Quadratic model – dependence on share of university educated unemployed population in the economically active population with a university education in Slovakia in the years 2008 - 2015.



## Conclusion

The Industry 4.0 Initiative, introduced in Germany, brings an entirely new model that will connect the production and non-production components of the organization (Lom, Pribyl, Svitek, 2016; Liu, Xu, 2017). This model will put very different requirements for existing employees in place. The creation of new jobs will be accepted with important changes. It will have a major impact on the required qualifications of the labor market in general; and will create a need to think about the social aspects of these impacts to (Pfeiffer, S. 2016). These impacts will not only lead to a new organizing work principle but will also require new skills and knowledge of employees and employers. Even in the 1980s, it was assumed that each vacancy would be replaced by a new one where the higher qualification and the higher salary would be required. However, at present, this looks different. Reproduction of work leads to another level. There is a small group of jobs that are highly specialized with a higher salary, bonuses and all others, and the vast majority of jobs with low intensity of qualification and lower salaries. On the other hand, it is necessary to take into account the low population growth in the EU. In this context, there is a need to change the training of the workforce for the labor market, and hence huge changes are waiting for the education sector. The conventional way of education will become unsatisfactory in a few years. University education will require huge changes in the content of the curriculum as well as technological changes. (Brigui-Chtioui, Caillou, 2016).

New communications technologies will have to be incorporated into the educational process inevitably (Begum, Aruna, Vetrivelan, 2016, Hutto, 2017). Growth in the use of mobile applications is expected and university teachers will work more as mentors of education, differently from what it is now. Requirements for their skills will inevitably change as well. As factories create smart places or smart factories, this trend will also affect higher education. The teacher will communicate more with students through the new communication technologies and applications than its traditional way, face to face. The considerable emphasis will be put on acquiring new knowledge and passing that new knowledge onto other students. It is important to realize how quickly the knowledge becomes outdated. This process will be more dynamic than it is nowadays, and it will affect all areas including scientific fields. It clearly shows that knowledge of ICT will become the foundation of skills for every individual within the society which also means that education in the humanities will require some level of technical knowledge. The question is raised around the student's role in the new model. Their task is to study in a traditional school. This basic task of a student may change significantly, and the process of gathering and sorting information and knowledge will put significant focus on creativity. A student will become more of a partner to their teacher. The students themselves will be the bearers of new creative ideas. A teacher will lead the students to the implementation and verification of knowledge especially in practice in the role of a coach. It will encourage greater integration between new knowledge of science and education and the transformation of knowledge (Ližbetinová, Hitka, 2016).

On the other hand, we must not forget the group of people who will need to be educated as communication experts [SMEs – Subject Matter Experts], whether as traditional or virtual ones. Communication will become the basis for Industry 4.0, but on the platform of elements that are at the same level, it means that even a person finds himself in an interaction with the machine, he becomes an equal partner. Specialists in social communication between people will be required as a result of these changes because this vision will have a negative impact on this sphere of communication. Today, the millennial generation use a large number of communication applications. It has been seen that the deterioration in their communication with the surrounding world outside of virtual reality. University education will be much more important for society than it is today. These questions have to be addressed, and an action plan has to be produced in order to prepare for these changes. The government will have, as a founder of the educational process, an important role in this process. The measures adopted at the strategic level will affect the next generation of employees, their skill sets and abilities. For this reason, these measures must be very flexible. Measures will have to be changed more frequently than at present. On the other hand, measures will need to be reflected upon and must take into account the impact on the generation. Attention has to be paid to lifelong learning, in which universities should have a primary role in the education market.

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