

## THE IMPORTANCE OF EDUCATION AND THE THREAT OF UNEMPLOYMENT IN THE CONDITIONS OF THE DIGITAL ECONOMY

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### Abstract

*The current pace of progress raises widespread concerns about rising technological unemployment. One of the ways to face it will be to adapt the skills and abilities of workers to the new conditions. However, the development of digitalisation does not only place new requirements on traditional education systems, which are no longer able to train workers with adequate skills, but are also expected to lead to a change in the legal regulation of industrial relations. The aim of the article is to theoretically define what changes digital transformation brings to society, what is its essence and what impact it can have on the growth of unemployment. In addition, from the statistics available at Eurostat, to find out the situation in selected European countries in terms of internet accessibility and the digital skills of the population, as these are key indicators for the introduction of digitization elements, and to highlight how the last fifteen In recent years, the unemployment rate in the Slovak Republic developed depending on the level of education attained.*

### Key words

*digitization, digital skills, education system, Slovak Republic, unemployment*

**JEL Classification:** E24, I21, O30.

### Introduction

Digitization and the processes taking place in its background have significantly affected the system of functioning of the world economy. It has already been shown in the past that each new discovery has a significant impact on the overall operation of society. Whether it was the invention of the steam engine, the discovery and use of electricity or the development of information technology, the global economy has always seen a shift to a new level. The fastest progress was made by those countries that were able to implement current trends in a short time. A similar scenario is expected today. Leaders are those countries that create the best conditions for the digital transformation of economies. Competent world institutions have responded quickly to these new realities, and more and more indicators are emerging that assess countries' progress in this area, identify their shortcomings and seek to identify areas where investment is needed and their development to start. Outdated education systems, which are unable to produce graduates with the skills required by a constantly changing environment, often become a problem. A visible obstacle to digital transformation is, in particular, the absence of digital skills in a relatively large part of the population. Inadequate, outdated skills, together with declining jobs due to automation, make it more difficult for people to access

employment, leading to technological unemployment becoming a relevant threat. It does not affect all people in the same way, but it mainly affects low-skilled people or the older generation. Without an adequate level of education systems, it is difficult to ensure the required level of skills and abilities of employees, and in this context it becomes a great challenge to rework traditional education systems into the new conditions resulting from the digital transformation of society. The Slovak Republic will also have to deal with this difficult task and try to solve these problems as effectively as possible.

### Goal and Methodology

The main goal of the paper is to point out the changes brought by digitization processes in education systems, to evaluate the readiness of selected countries to implement these changes and to show that in recent years in Slovakia there is a positive relationship between education and employment opportunities. In order to achieve this goal, we studied several theoretical publications dealing with the issue, which we supplemented with statistical data available on the websites of the competent institutions. In working with these theoretical and statistical

sources, we used general scientific methods such as analysis, synthesis, deduction, induction or comparison.

## 1. Digital economy

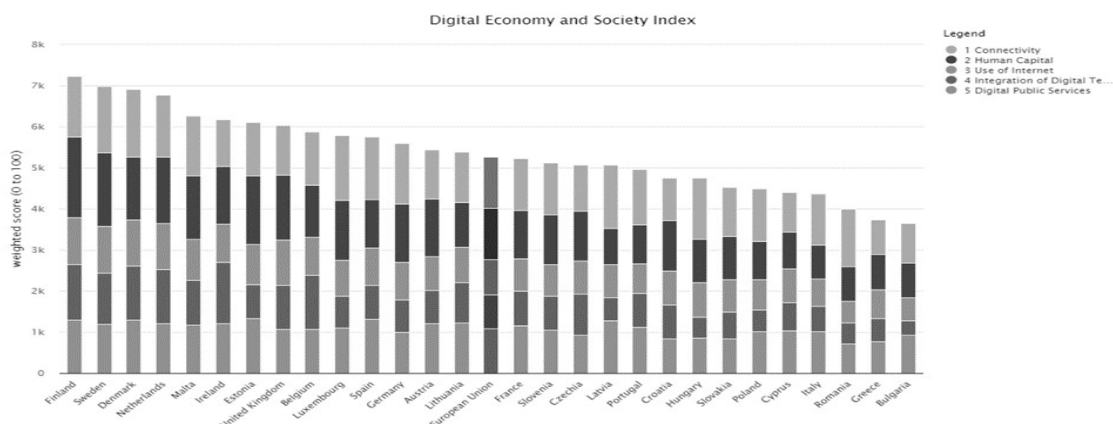
The digital economy is closely linked to the significant spread of information and communication technologies in all areas of human activity and is linked to other trends in the world economy, such as Industry 4.0 concept. On the one hand, it is a huge opportunity for the development and progress of individual economies, it leads to increased productivity due to the increasingly massive automation of production processes. On the other hand, it poses a threat to employees, as it gradually loses more and more jobs and brings with it new requirements for the qualifications of workers. All these facts also place new demands on the governments of the countries affected by the transition to the digital economy. It is mainly about the adaptation of laws, respectively. regulation of the new system of operation in conditions that are absolutely different from those to which we have been accustomed for decades. The digital transformation of the economy is expected to bring business

development, growth in competitiveness, added value, living standards and the well-being of society as a whole. However, this whole gradual transition will be accompanied by many issues, obstacles and problems that will require increased attention.

### 1.1 Expressing progress on digitization

In connection with the changes brought about by digitalisation, there is a tendency in the world to express the ability of individual countries to implement its elements. Within the European Union, the Digital Economy and Society Index (DESI) is compiled annually, which assesses the development of individual EU states in accordance with the effectiveness of their transition to the digital economy. The DESI index includes 34 indicators, which are divided into 5 groups and 3 levels. The overall index is calculated as a weighted average of the five main groups, each with its own weight: connectivity (25%), human capital (25%), internet use (15%), digital integration (20%) and digital public services (15%). Its aim is to identify, for each country, areas that are underdeveloped and require priority action and investment.

**Figure 1: Digital Economy and Society Index in 2020**



Source: European Commission

Among the 28 evaluated European countries, the Slovak Republic ranked 22nd below the EU

average in 2020. The best in this evaluation were the Scandinavian countries, the worst countries

in the area of South-Eastern Europe. The results of the countries are therefore similar to those shown in the indicator "households' access to the Internet", which we will deal with in the next part of the article.

The disadvantage of this index is that so far there are no studies and analyzes that would evaluate the relationship between the values of the index and economic development in individual countries (Stavytskyy, Kharlamova, Stoica, 2019). Even in this period, therefore, the answer to the question that seems clear at first sight, whether digitization is a source or a consequence of the economic boom of countries, remains unclear. On the one hand, digital technologies cannot be deployed without an adequate level of knowledge, skills and competences; on the other hand, opportunities for their deployment depend on economic development. Thus, the controversy that began in the second half of the 20th century continues, when Randall Collins deviates from the thesis of the interaction between economic growth and increasing the level of human capital. He argues that even a high level of education does not bring anything to the economy, but on the contrary, rapid economic development in recent decades has created sufficient resources to invest in education, and therefore the two categories are now mistakenly linked together (Collins, 1979). The increase in the number of educated is a consequence and not the cause of the economic growth of any country. He also argues that most professional experience can be gained by a worker directly in practical life and does not require unnecessarily long studies. However, Collins's theory deviates absolutely from many other economists who disagree with it. Most share the view that the higher a person's education, the higher his or her productivity and thus the more he or she contributes to growth. While Collins's view is partly accepted, especially the part where he emphasizes the need for practice, we believe that without lack of training, employees may not be able to handle the tasks assigned, they may be less reluctant to participate in further training that requires constantly changing conditions and rapid introduction of innovations, after losing a job they may have a bigger problem finding a job again, and so on.

## 1.2 New demands placed on education systems

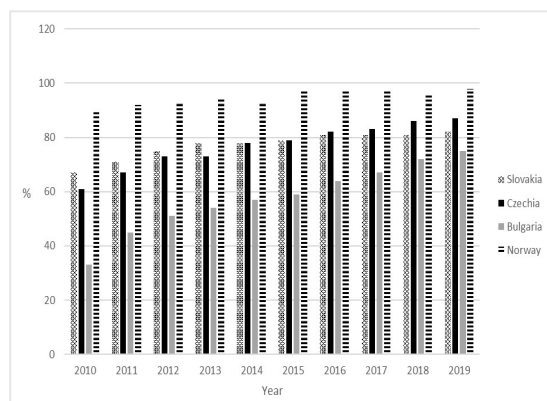
A visible radical shift towards other ways of organizing economic activity will be essential throughout the digitization process (Sundararajan, 2016). This will also require the modernization of education systems, which will need to be able to prepare people for emerging new positions. It will no longer be possible to keep them preserved in one form for several years or even decades. Permanent changes in technology and technologies will force the constant innovation of these systems, so that they are able to increase the competencies of future potential employees as effectively as possible in accordance with the requirements of the environment. For the time being, however, they are more aware of their inability to respond to these changes around the world. In the context of the digital economy and the closely related concept of Industry 4.0, there is increasing talk of education 4.0, which should be four-dimensional and include vocational education, business education, financial education and digital education (Sima, Gheorghe, Subic, Nancu, 2020). Digital education seems to be the most important, but only education in all key areas will lead to the expected results in the future. Employees will be required to understand the network system, become familiar with the technology of things, and be able to adapt to human-machine interactions in a new context.

## 1.3 Internet access - the basis for digitization

It is not necessary to focus only on what knowledge, skills or abilities new positions will require and thus in which direction the educational process should be oriented. Attention must also be paid to technologies that bring fundamental changes to the learning processes themselves. The personal presence of the lecturer at the training or similar teaching process is no longer necessary, but the whole procedure can be carried out online using the innumerable information and communication technologies that are currently available. And

here it is possible to meet with a close connection between two areas - in order to be able to implement education in this way, people must master the technologies used in it. Consequently, there is a need to invest adequately in digital infrastructure (Sundararajan, 2016). The basis of all ongoing processes here is a sufficient expansion of access to the Internet, because networking becomes a prerequisite for functioning in a digital environment. In addition, today his mastery is one of the skills of basic literacy, which includes the ability to read, write or count. In developed countries, Internet access is generally widespread, although in almost all of them, population groups that do not control it can be found. However, it remains a problem worldwide. Despite this fact, the growth in the number of people with access to the Internet has been slowing down in recent years.

**Figure 2: Level of internet access - % of household**



Source: <https://ec.europa.eu/eurostat>, own processing

The above chart evaluates the development of Internet access in the last ten years in the Slovak Republic and three other European countries, in order to assess how individual countries are trying to create conditions for the introduction of elements of digitization. In the Slovak Republic, as in many other European countries, more than 80% of households have access to the Internet (82% in 2019). Most countries are around this value, with a significantly higher share in the

Scandinavian countries, Luxembourg and Iceland. E.g. in Norway it was up to 98% of households in 2019. However, what is more interesting to observe is the pace at which this share has increased in the last ten years in the monitored countries. The most significant jump was recorded in Bulgaria (from 33% in 2010 to 75% in 2019). It can therefore be assumed that, like other countries, it is trying to create conditions for the implementation of elements of digitization and subsequent other processes. The need for progress in this area was also confirmed by the sudden change in the functioning of all institutions as a result of the Covid-19 pandemic. Personal contact became a thing of the past, handling most of the affairs was moved to the electronic environment, and many employees suddenly began working through the home office. For many, this transition was challenging, as they had to learn to work with ICT in a short time, which they had used only marginally before, or in many cases not at all. As it turned out during the first months, such a system of operation has proved its worth to institutions and companies. The pace at which they introduced elements of gradual electronization and digitization has accelerated considerably, which can be considered one of the few positives that the coronacrisis has brought.

#### 1.4 Digital skills

Digital skills represent a set of competencies on the basis of which an individual can evaluate in various situations whether and how to use available ICT (Kollár, Polakovič, Gasperová, 2015). At present, it is no longer possible to develop any further competences without developing digital skills, as digital technologies affect almost every area of our lives. However, despite certain technological progress, the level of these skills remains low for certain sections of the population. These are often people with a low standard of living or the older generation. This is a problem for the future, especially as regards their integration into the labor market. Although countries are gradually developing strategies to address this situation, it will be a lengthy process and the effects will be delayed. The situation in the Slovak Republic has changed only minimally in the last period.

Almost half of Slovaks do not have basic digital skills (46%). Compared to many other countries, this number remains relatively high. For 17% of Slovaks, it was not even possible to assess the level of these skills, as they had no access to the Internet in the last 3 months. Since 2015, this indicator has improved only slightly, which means that it will be problematic for the Slovak economy to quickly implement new trends, which are based mainly on digital technologies. As for the situation in other European countries, it is different. Significantly better is e.g. in Iceland, where only 15% of the population does not have basic digital skills, in Norway it is 17%. On the contrary, the worst situation within European countries is in Bulgaria, where 71% of the population does not have basic digital skills and in Romania 69% of the population. This result is not surprising, as access to the Internet was relatively rare in the two countries a few years ago and digital skills are closely linked to its use.

## 2 Digital transformation of economies and unemployment

Unemployment is a socio-economic phenomenon linked to the labor market, occurring in every economy. It negatively affects not only economic processes but also the personal lives of the people it affects. In connection with the development of digitization and automation, there are growing concerns about the increase in technological unemployment in individual countries. However, they are often exaggerated, as it turns out that even though many jobs are being lost, many new ones are being created at the same time. In addition, account must be taken of the fact that the mere possibility of automation does not mean that it will actually be introduced, as there are certain economic, social, legal and other regulatory constraints that cause long delays between the invention of new technologies and their adoption and diffusion throughout the world (Islam, 2018). Despite considerable uncertainty, there are still many estimates of the effects of the digital revolution on rising unemployment. Studies conducted in Finland, an economically viable economy, show that technological unemployment can be a threat, but

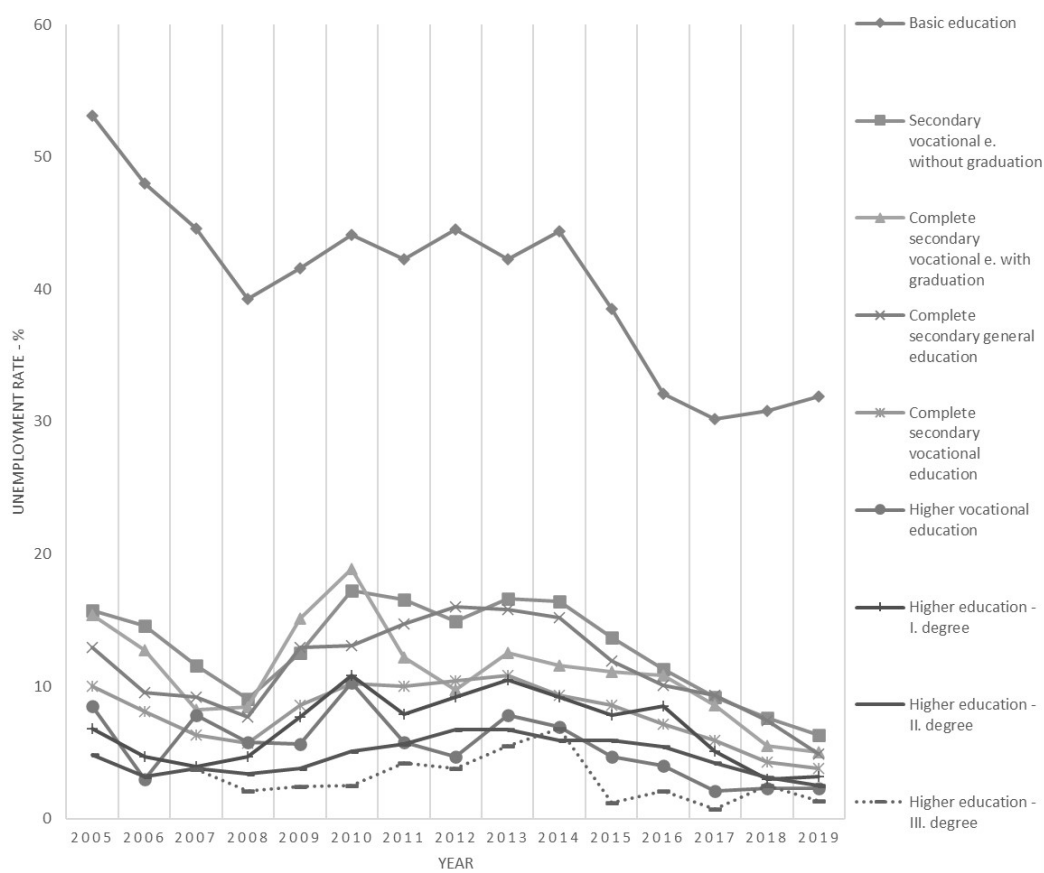
does not mean the "end" of work (Pulkka, 2019). New types of work will emerge, new jobs will be created, and even if the effects of the introduction of modern technologies in the growth of unemployment are felt, the whole problem can be solved through several measures. One of them is the concept of unconditional basic income or the possibility of reducing working hours. Thus, it will be necessary to change, supplement or create new laws that will regulate working conditions in this new way of functioning of economies. However, while the digital revolution does not seem to be such a major threat to developed countries, the position of developing countries on this issue is diametrically opposed. Their economies are mostly built on lower labor costs and many manufacturing companies are concentrated in them. These are, therefore, primarily jobs that are directly threatened by automation. However, some studies also refute this assumption, arguing that while the digital revolution will lead to the emergence of new professions, they may still be suitable for less skilled people (Ernst, Merola, Samaan, 2019). Of course, it will also be necessary for these people to go through training programs aimed at preparing them for the transfer to new jobs. Therefore, the goal for the future cannot just be to prepare new generations to work in a highly digitized environment. The aim must be for all citizens of each country, regardless of their level of education, age or current skills, to be able to acquire the necessary digital skills to enable them to find and keep a job in the new changed conditions. Governments around the world cannot ignore this fact, as the inadequate level of education of citizens is usually the reason for greater time delays in introducing the latest trends.

In addition, an inadequate level of education can trigger unemployment growth. Unemployment usually leads to a decline in economic activity and economic stagnation. As a result, the unemployment rate is popularly used as an indicator of whether a state's economy is doing well or not. The search for a dependence between the unemployment rate and the DESI index was also examined in a study which showed that European countries with higher unemployment rates generally show lower values of the index (Stavytskyy, Kharlamova, Stoica, 2019). Its conclusions show that in the

near future they could be able to increase the values of this index precisely due to falling unemployment, which is one of the basic macroeconomic goals for any economy. In this

context, it is necessary to point out the unemployment rate according to the highest level of education attained, even if education is not the only factor influencing it.

**Figure 3: Unemployment rate by educational attainment in Slovak republic**



Source: ŠÚSR, own processing

After evaluating the development of this unemployment rate in the Slovak Republic, we came to several conclusions. The above-mentioned graph draws particular attention to the high unemployment rate of the low-skilled workforce - people with basic education, which remains high in recent years, despite the positive development of the unemployment rate. Even while in 2005 it was only 3.28 times higher than the total unemployment rate in the Slovak Republic, in 2019 the unemployment rate of these persons was up to 4.67 times higher than

the total. The gap has clearly widened, proving that a workforce without any qualifications is becoming increasingly difficult to employ in the context of the rapid introduction of digital technologies. This group of people makes up a substantial part of the long-term unemployed, who are difficult to re-employ, as they have often lost their work habits. Not only in the Slovak Republic, but throughout the world, development trends in the market suggest that unskilled or low-skilled labor is increasingly being pushed out of the labor market.

Much lower unemployment was reported for people with any higher than basic education, but even here there are differences between different levels of education. It is interesting e.g. to monitor the difference between the unemployment rate of persons with upper secondary vocational education and upper secondary general education, from which it can be concluded that persons with vocational education are better placed on the labor market. The biggest difference can be seen in the post-crisis years, especially in 2014, when the unemployment rate of people with full secondary general education was 5.9 percentage points higher than the unemployment rate of people with full secondary vocational education.

Furthermore, the graph shows a difference in the employment of people with higher education I. and II. degree. For graduates of bachelor's degree programs who have decided not to continue their studies at II. degree, is often seen as less able (often assumed that they do not continue their studies because it was difficult for them, did not enjoy them, etc.) compared to graduates of master's and engineering programs, and therefore it is more difficult for them to find employment. Companies prefer people with completed II. degree of higher education, although a bachelor's degree is sufficient for a number of job positions. The long-term lowest unemployment rate is reported for persons with university education III. degree. However, there are significantly fewer such graduates each year compared to graduates at other levels of the education system.

It is also important to note in the graph that, regardless of the level of education attained, the unemployment rate in the last 15 years has also been linked to economic developments. After a period of relatively favorable development, the unemployment rate in the Slovak Republic increased as a result of the economic crisis that erupted in 2008. The increase in the number of unemployed occurred not only among the low-skilled workforce, but also among people with a university degree. Increase in the unemployment rate for people with university education II. and III. however, it was insignificant compared to the growth of unemployment in the other monitored categories. It can therefore be assumed that, although there are opinions that the digital transformation will create enough opportunities for less skilled workers, recent trends will

continue and people with higher education will have a better chance of getting a job.

However, at the time of digitization, the risk of further widening income inequality appears to be at a much higher risk than the risk of losing a job, as companies that are able to adapt to the changes resulting from the implementation of state-of-the-art technologies are expected to move towards to gain market dominance. However, dealing with this issue is not the subject of this paper.

## Conclusion

The effects of the digital transformation of the economy are being felt in all areas of human life. In addition to the functioning of manufacturing companies, where human labor under the influence of automation is pushed by machines or robots with artificial intelligence, and changes in the labor market, ongoing processes also significantly affect education systems. Until recently, the insufficient quality of education systems was pointed out, especially in the conditions of developing countries. At a time when the knowledge economy is gaining in importance, their modernization and improvement is beginning to pay more and more attention even among developed countries. It turns out that many countries have not been able to respond to the changes that are taking place in society. At first, it seemed that there would be enough time to introduce gradual changes, but recent years have shown that the speed with which they are introduced is crucial. It must not be forgotten that the results of the changes will take effect with a certain delay. Despite the fact that the ongoing processes of digitization have been talked about for several years, the level of digital skills of Slovaks does not change significantly. Intelligent robots are expected to replace people in performing certain routine activities, so less demanding jobs will be lost. And while new ones will emerge, they will require new competencies from workers. It will thus be necessary to prepare potential employees for new, but also more and more complex jobs, without a certain level of digital skills. Developments in the past show that how people are able to enter the labor market is related to the

level of education achieved. It is almost certain that this will continue to be the case, notwithstanding the changes that are taking place on a permanent basis, although in the second half of the 20th century there were views that the impact of education on employment and the contribution of education to economic growth is steadily declining. . Of course, it cannot be ruled out that a certain part of the skills will be acquired by the worker directly in practice, nor can it be assumed that the workers with the greatest abilities are always the best paid and hold the highest positions. We have often

witnessed a situation where acquaintances, political influence or belonging to a certain privileged group have a far greater influence on the position a worker holds than education itself. Nevertheless, in most cases, adequate education is the decisive factor on which a person's ability to get a job, stay in place, but also his ability to adapt to constant change. This often results in his willingness to participate in the process of lifelong learning, which is just one of the prerequisites for employment in the digital economy.

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