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CHANGES IN THE SKILLS OF THE WORKFORCE FOR FUTURE DEVELOPMENT OF THE LABOR MARKET IN THE SLOVAK REPUBLIC*

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Abstract. A deep knowledge of the changes that are important for the link between the labor market and human resources is a prerequisite for the right link between education and the labor market. Undoubtedly, the most important element for the coming period are innovative changes that significantly change the nature of employees' work. For employers to remain competitive, they need a skilled workforce. The presented paper has a theoretical-empirical character. In the article, we used research methods such as synthesis of available bibliographic references, induction, and deduction as a theoretical general method of scientific knowledge. The questionnaire method was used in the creation of the paper, through which the selected results of the questionnaire survey were evaluated, within which we determined the importance of individual skills for the future labor market. In Part 1, the paper focuses on the theoretical basis of business education with an emphasis on highlighting innovation trends and new demands on the workforce. In the 2nd Part of the paper, through the analysis of the results of the survey, the future key skills that the workforce will have to have by 2030 are identified. As well as in the labor market comprehensively. The results of the survey showed the importance of digital, interpersonal, and cognitive skills. In addition, the survey found that the workforce in the Slovak Republic will have to use a higher level of skills by 2030, such as effective teamwork, the ability to achieve goals or self-control. The main goal of this paper is to examine two areas that will face significant changes in the coming period - the labor market and employee training. The aim of the paper is based on the analysis of domestic and foreign literature, and processing of research findings from the questionnaire survey to provide insight into what the system of formal and non-formal education we will have to pay the highest attention in the next 10 years, especially in preparing future graduates. In addition, it is important information for companies that need to train employees.

Keywords: education; labor market; human resources; innovation; soft skills

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1. Introduction

The labor market in Slovakia has changed over the last 20 years. Employment is growing slightly and a change in the structure of employment can be seen. Even though until 2019 we witnessed the most significant economic expansion in the labor market in the history of the independence of the Slovak Republic, from a long-term perspective, only a slight increase in the number of employed persons can be observed. In 2016, the magic limit of 2 million employed inhabitants was exceeded in the conditions of the Slovak Republic, which happened for the first time in the last 20 years. On the other hand, many foreign studies evaluate the countries of Eastern and Southern Europe, and others as being significantly threatened by job automation (Nedelkoska, Quintini, 2018; Snieska et al., 2020; Fakunle, Ajani, 2021). Human progress inevitably brings about changes that are largely reflected in the labor market. Globalization, automation, digitization, and dozens of other innovative trends are changing the demands of employers for their potential employees. Companies expect technologies such as cloud computing, Big Data Analysis, and the Internet of Things to be a high priority by 2025 (World Economic Forum, 2020). Big data analytics has become an important topic among policy makers and practitioners in relation to the large volumes of diverse data and associated new data information practices which have become available to firms (Niebel, 2019). Other element of innovation is communications technology development that create and enable communications networks between machines and the wider internet, i.e., Internet of Things (Edquist, 2021).

Due to changes in the business environment, i.e. the growing importance of creativity, services, knowledge, the information technology development, digitalization, globalization, and the surge of intellectual property, a new approach of companies has been created; therefore, the value creation ability has shifted from tangible resources to intangible resources, i.e. creativity, knowledge, unique organizational culture, corporate reputation, innovation (Kamasak, 2015). Indeed, structural changes in the labor market are becoming more and more dynamic, which is growing and the importance of anticipating them will grow. Technological progress and process automation increasingly changing the labor market. Therefore, technological innovations can have an impact on labor markets, wherein technological change can either substitute for or complement various types of labor. This can lead in changes in demand, and hence wages for certain types of labor (Naudé, 2021). The rate of replacement of labor by capital is thus constantly increasing and is not an issue “if”, but the question “when” there will be an industrial revolution that will reduce the need for human labor in several sectors to a minimum. However, such a revolution may not have negative consequences for the labor market, employment and unemployment, as it will develop other areas of economic life. There is a place for innovative changes in the labor market through the use of new trends in education, which companies will develop and adapt to the current situation. It is important to know the development in the field of innovation trends and thus prepare the workforce adequately for changes in the necessary skills. OECD estimates suggest that almost two thirds of jobs in the Slovak Republic are at risk, with up to 34.6% of all jobs in Slovakia being highly automated and a further 31% at risk from a substantial change in the way they are carried out (Georgieff, Milanez, 2021). In addition, labor market disparities are a significant problem in the Slovak Republic. Almost two thirds of high school and university graduates work in positions that do not correspond to the field of study (Trexima Bratislava, 2019). The skills of school graduates and those in the labor market are not in line with the needs of a rapidly changing labor market, which poses a long-standing challenge for education and training, including lifelong learning. Only 33% of Slovaks currently have basic digital skills (Európska komisia, 2019). Recommendations of the European Commission's in relation to Slovakia's National Reform Program highlight the importance of lifelong learning, intensified cooperation between business and the education system at all levels and better linking training and retraining programs to current and future labor market needs, strengthening digital skills and ensuring equal access to quality education. The change in the educational and age structure of the population will affect unemployment. The reason is that different age and educational groups are characterized by different unemployment rates. In general, unemployment is higher among young people, people with low education and many times near people of

retirement age. The aim of this paper is therefore in the first part to theoretically analyze current trends in education in relation to innovative changes and in the second empirical part to point out the expected trends in changes in skills from the perspective of employers in the future. These are evaluated on the basis of the results of a questionnaire survey, which was prepared by the author of the paper for the National Union of Employers.

Note: Author of the paper Ing. Michal Hrnčiar participated in the author's team in creating an analysis called "SKILLS FOR THE FUTURE OF THE COMPETITIVE LABOR MARKET IN SLOVAKIA", which was carried out for the National Union of Employers in 2021. Data on the results of the questionnaire survey were drawn from the analysis in question for the purposes of the submitted contribution.

2. Literature Review

2.1 Aspects of examining trends in education in labor market conditions

One of the key tasks of active labor market policy is to reduce the mismatch between labor supply and demand. Such a disparity tip arises even if the employee does not have sufficient skills and qualifications to be able to perform his work as the employer expects. In the future, we can expect a growing need for retraining, which can provide the current workforce with the opportunity not to end up without work. Employers can react to upcoming innovation trends in advance and thus secure a skilled workforce already today. Supporting employee training brings a large number of benefits. Trained employees provide better services, better communication with co-workers and customers, i.e. customers get a much more professional service.

For the company, employee training should ensure a better position in the competitive environment and better company performance. The burden of developing the required qualified group lies on individuals in the field of learning management, to develop knowledge, skills and abilities related to the area in accordance with the needs of society (Vojtovič, 2016; Sinlarat, 2016). However, the fact that not all tasks and competencies can be replaced by automation and other innovative elements remains an important element. According to the author David (2015), there are less endangered positions that require creativity and intuitive judgment. According to authors Šárka, Petříková (2015) the companies which are able to represent potential of its employees in terms of creativity, knowledge and ability to implemen innovations are the highest price. The author of Kutrzeba (2018), in turn, describes critical thinking, ingenuity, and complex cognitive and social skills as those in which people continue to overcome intelligent machines. In addition, it is necessary to build on historical experience, when the introduction of new technologies has also created new jobs. An example is the period from 1999 to 2010, when computerization created more than 11 million jobs (Gregory et al., 2021).

The aim of the paper is to provide insight into what the system of formal and non-formal education we will have to pay the highest attention in the next 10 years, especially in preparing future graduates.

2.2 Areas of education and their trends for the future

The digital transformation that is taking place around the world, for which new positions are constantly being created and for which jobs in the services sector are being lost, is replacing human resources to a certain extent with technology. Human society is currently facing various challenges that have not been solved by any sector. New trends and technologies are emerging to help meet the challenges. Among the new technologies are, for example, cooperative systems, new forms of massive data processing, so-called "big data", robots for the maintenance of transport infrastructure and vehicles, nanotechnologies or new materials that can regenerate themselves. The new services will be, for example, vehicle sharing, personalization of the service or transport on demand according to the order. These innovations will also affect business and working conditions in the sector. Employees will often not be physically tied to a specific job, their work will be more flexible, e-commerce services or collective financing schemes will be used. In the future, not only new knowledge will be important,

but also the way it will reach students or staff. Traditional forms of teaching, where the teacher is at the center, should replace new ones, where the learner gets more opportunities. These include brainstorming, cooperative learning, developing critical thinking, using virtual reality, gamification, personalized training, etc. However, the author Axryd (2019) points out that technology is not everything. According to the analysis, most large data projects fail due to a lack of expertise - employees do not have data and management skills that lack big data leadership and skills.

If companies realize the importance of training their employees even in soft skills, success will ultimately be realized for both the company and the employees. The allocation of soft skills forms an important basis for the interaction of business and education (Gruzdev et al., 2018). In contrast “non-cognitive skills“ or personality traits, i.e. “soft skills“ are usually combined through many experiential abilities and skills, including motivation, social skills and work habits (Laskey, 2010). The bridge between work and personal life in connection with soft skills is offered by the author Prince (2016). She understands “soft skills“ as the advantage that allows a person to be more successful in the workplace and beyond. She defines soft skills as personal competencies which, unlike hard skills, are the driving force on the way to the realization of their potential. Thanks to them, we can face challenges and work for change. Improving skills “upskilling“, and adult retraining “reskilling” is an urgent priority for European policy makers and stakeholders.

Rapidly changing labor markets and multiple challenges, such as digitalisation and its implications for the future of work, technological change, the environment, aging societies and social inclusion, require a solid skills base and the constant renewal and acquisition of new skills, knowledge and competences. The term education is currently used in the field of education “upskilling” – it is not retraining, but increasing your existing skills, abilities and competencies; also the acquisition of new ones, while performing work. “Reskilling“ is gaining a new useful ability, a new qualification. Investments in upskilling and retraining low-skilled adults are even more urgent as our societies and economies face the unprecedented consequences of the Covid-19 pandemic. If the use of information and communication technologies for education is to be beneficial, it is necessary that teachers and future teachers have professional skills that would be able to evaluate the use of information and communication technologies in the psyche of its user. The aim is to focus on developing coherent and coordinated approaches to skills development for low-skilled adults. It is becoming a priority to develop an analytical framework for skills development for low-skilled adults that can support policy makers and stakeholders in designing and implementing coordinated and coherent approaches for comprehensive, sustainable, inclusive and flexible pathways, tailored to individual needs (Cedefop, 2020).

Some contours of the new educational concept are presented in the study of Wu et al. (2013). These include, for example:

- E-Learning: learning with the help of electronic teaching devices;
- Mobile learning: teaching through mobile devices;
- Combined learning: a learning model combining full-time education and online learning;
- Contextual learning: learning by context, through localization devices;
- Collaborative environments: learn in highly interactive environments;
- Cloud computing (storage): using cloud computing technology.

Digital technologies make it possible to simplify teamwork in workplaces in different sectors, where soft skills need to be used for better collaboration and communication. To implement the digital transformation of education, it is necessary to develop an action plan - setting systemic measures, goals, their implementation in the short and long term, a system of criteria and a mechanism for assessing their fulfillment. It is important not to put pressure on people's performance and to communicate with employees clearly, sensitively, directly and in detail. In the hybrid world of work and education that is currently underway, this is a necessity. The inner motivation of each person will depend on whether they want to manage the task or take a different attitude. It is important for

companies to be able to anticipate the direction of development of their business area and to prepare their employees in a targeted manner, and not just to respond to emerging skills. Not every organization can define it.

There are several agencies on offer that companies can help. However, the company must have clearly defined what it wants to achieve. The main trend in education is to move away from the classical classroom. Increasing emphasis will be placed on online managers, as they are in direct contact with employees, affecting the productivity and success of the individual or team. There is room for companies to give employees the opportunity to develop their competencies and support their efforts to learn. As in other areas of human life, responsibility for professional and personal growth is transferred to the individual in education.

3. Results and discussion

An important challenge for the training of the current and future workforce is its preparation in accordance with the requirements of employers on the labor market and in connection with current innovation trends. It is the employers who work with innovations, new trends in practice and who introduce new technologies into their production processes in order to streamline production, save time and minimize their costs. Global trends show us which innovations will be most important in the future. But do employers operating in the Slovak Republic perceive these trends as importantly? Will the threat that a significant part of jobs are threatened by informatization materialize? (Frey, Osborne, 2013). This answer is offered by the results of a questionnaire survey conducted by one of the authors of the submitted contribution for the National Union of Employers.

The starting point for creating the questionnaire survey was the study “Defining the skills citizens will need in the future world of work“ implemented by McKinsey & Company in 2021 (Dondi et al. 2021). This study defined 13 categories of future skills. These were expanded by the author of the paper to a final number of 19. In December 2021, a nationwide questionnaire survey was conducted, which was attended by more than 500 respondents. Employers with an account created on the job portal were contacted “Online job market guide “ www.istp.sk, who have given their consent to the sending of marketing messages. In addition, the experts represented within the national project Sector-Driven Innovations for an Effective Labor Market (Ústredie práce, sociálnych vecí a rodiny, 2021) and, last but not least, members of the National Employers' Union were addressed.

The results of the questionnaire survey pointed to interesting trends in the importance of individual skills in the future (2030). In this survey, the respondent was to assess the current need for 19 monitored skills and then assess the future expected importance of these skills. The slider bar function was used for evaluation, which contained numeric values from 0 to 100 (with 0 expressing the lowest level of importance and a value of 100 expressing the highest value of importance). When filling in the questionnaire, the respondent could enter his ID number, which was then possible for the author's team to analyze the results from different perspectives - e.g., size category of the organization, branch according to the Statistical Classification of Branches SK NACE Rev. 2 etc.

Selected survey results are summarized in the following section. All 19 skills examined were grouped into 5 main categories. The aim was to offer the respondent the opportunity to assess the future importance of large categories and then individually evaluate the expected trends in 19 skills. Graph no. 1 shows the results of the assessment of the expected importance of skills categories. The results show a clear dominance of the first two categories - digital and surprisingly interpersonal skills. In the general assessment, however, it can be argued that all five examined categories of skills will be important from the point of view of employers in the Slovak Republic in the future (2030). The respondent rated the skill categories in question on a scale of 0 to 100, with a value of 0 representing the lowest level of importance and a value of 100 representing the highest level of importance.

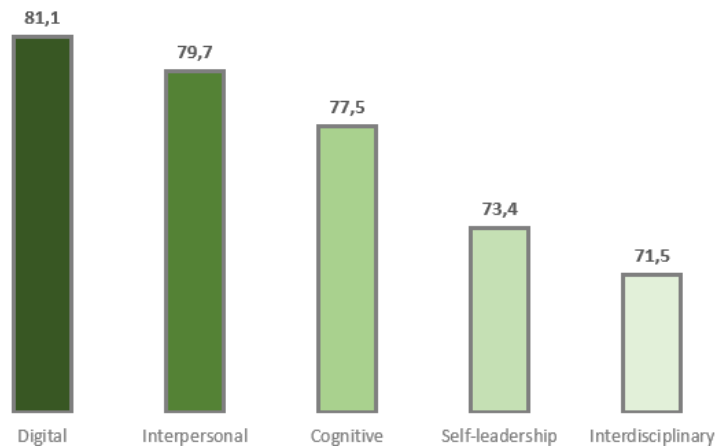


Figure 1. Expected level of importance of skills categories by 2030 (maximum number of points 100)
 Source: Skills analysis for the future of a competitive labor market in Slovakia (2021)

Based on a study by Dondi et al. (2021) provided by McKinsey, our questionnaire survey confirmed that Digital skills are perceived by employers in the Slovak Republic as the most important part of the competency model of their employees in the future (2030). This is proof that the growing trend of digital transformation and digitization will be more pronounced in the national economy in the coming years, which is in line with the expectations of the advanced world economies. It is interesting to see how respondents perceive the importance of individual skills now and in the future. For all monitored skills, an expected increase in importance was recorded by 2030. The table 1 below shows in which skills respondents expect the highest increase in importance in the future and in which, on the contrary, the lowest.

Table 1. Expected change in the importance of the skills examined (comparison of components and future - year 2030)

NAME OF SKILL	DIFFERENCE BETWEEN CURRENT AND FUTURE LEVEL OF IMPORTANCE	Level of importance	Level of importance
		<i>present</i>	<i>future</i>
Environmental literacy	18,4	56,5	74,9
Knowledge of a foreign language	17,0	47	64
Understanding the digital system	16,1	49,3	65,4
Digital skills	15,6	60,5	76,1
Technical literacy	13,1	59,3	72,4
Use and development of software	12,9	45,2	58
Economic and financial literacy	12,7	57,6	70,3
Entrepreneurship	12,5	53,7	66,2
Mobilization	11,6	57,1	68,7
Mathematical literacy	11,5	53,8	65,4
Achieving goals	11,5	64,9	76,4
Self-awareness and self-management	11,5	64,7	76,2
Effective teamwork	11,0	66,5	77,5
Mental flexibility	10,6	64,4	74,9
Planning and ways of working	8,5	66,8	75,3
Critical thinking	8,5	65,5	74
Developing relationships	8,3	66,6	74,9
Analytical thinking	7,6	66,4	74
Communication	6,8	67,7	74,5

Source: Skills analysis for the future of a competitive labor market in Slovakia (2021)

From the above, it is possible to observe the highest expected increase in the importance of environmental literacy. Respondents expect an increase in importance from the current value of 56.5 points to the level of 74.9 points (the maximum number of points in the evaluation of importance was 100). In addition, respondents expect a significant increase in the importance of skills such as: knowledge of a foreign language; digital system understanding; digital capabilities, etc. In addition, the 19 skills in question were evaluated in terms of expected importance in 2030. This ranking highlights important information on which skills will be most important to employees in the future (see table 2 below).

Table 2. Ranking the skills examined according to the highest expected importance in the future

NAME OF SKILL	Level of importance	Level of importance
	<i>present</i>	<i>future</i>
Effective teamwork	66,5	77,5
Achieving goals	64,9	76,4
Self-awareness and self-management	64,7	76,2
Digital skills	60,5	76,1
Planning and ways of working	66,8	75,3
Environmental literacy	56,5	74,9
Mental flexibility	64,4	74,9
Developing relationships	66,6	74,9
Communication	67,7	74,5
Critical thinking	65,5	74,0
Analytical thinking	66,4	74,0
Technical literacy	59,3	72,4
Economic and financial literacy	57,6	70,3
Mobilization	57,1	68,7
Entrepreneurship	53,7	66,2
Understanding the digital system	49,3	65,4
Mathematical literacy	53,8	65,4
Knowledge of a foreign language	47,0	64,0
Use and development of software	45,2	58,0

Source: Skills analysis for the future of a competitive labor market in Slovakia (2021)

Although digital competences gained the highest points in 2030 in terms of importance in the evaluation of large categories of skills (Chart 1), the evaluation of 19 sub-skills shows that the first digital skills (Digital Competences) finished in fourth place in terms of future importance. However, the difference compared to the most important partial skill is minimal, so the digital capability must be considered as one of the key future skills of employees.

According to the respondents, effective teamwork appears to be the most important skill in 2030. This fact is also reflected by Graczyk-Kucharska et al. (2020), who consider skills such as: entrepreneurship, teamwork, creativity and communication to be key to future labor market requirements. On the contrary, respondents expect the lowest level of importance in the skill of using and developing software, which is probably related to the fact that it is a specific skill that is not used in all types of employment.

In the survey, all 19 skills were examined in depth, the authors focused on the current and future expected level of importance of the skills. In addition, these results of individual skills were analyzed in terms of the type of work performed, industry, type of ownership (domestic or foreign) and size category of the organization that the respondent represents. For the purposes of this paper, we present one of the most important skills of the future - **Digital skills**. Respondents rated digital skill in terms of its importance in performing work now and in the future. At present, respondents perceive the importance of digital skills at the level of 60.5 points out of a possible 100. By 2030, they perceive an increase in importance to the level of 76.1 points. These results confirm the European

Commission's priorities (2019), according to which the improvement of ICT skills and basic digital competences should be in line with the European Digital Learning Action Plan, as well as the focus on artificial intelligence. In addition, the World Economic Forum (2020) has identified a high rate of acceleration of digitization into work processes (for example, a significantly higher need for control of digital tools is expected, etc.)

THE IMPORTANCE OF DIGITAL SKILLS TODAY



THE IMPORTANCE OF DIGITAL SKILLS IN THE FUTURE

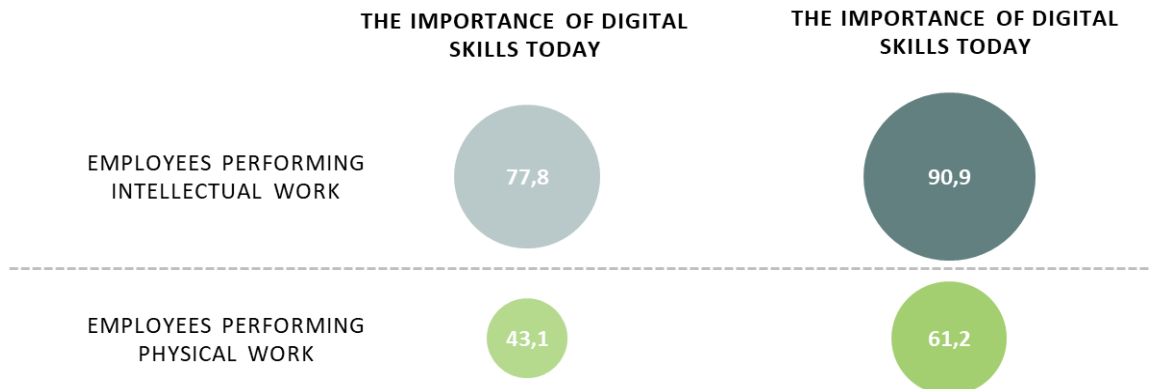


Source: Skills analysis for the future of a competitive labor market in Slovakia (2021)

As part of the evaluation of the questionnaire survey, the author also focused on the division of employees. The starting point for dividing employees into two groups is the common English term „White and Blue collar“ – division of employees into those who perform physical and mental work. Some companies, and perhaps most of them, are completely dependent on recognizing, developing and retaining talented people in terms of their survival. Long-term success in acquiring, retaining, developing, motivating and using the best talents in a given field will probably become the most important factor determining the long-term viability of a company. Part of the traditional mistrust of human resource management has been the fact that talent and knowledge are extremely difficult to measure. Organizations prefer cost measurability and productivity that are easier to measure.

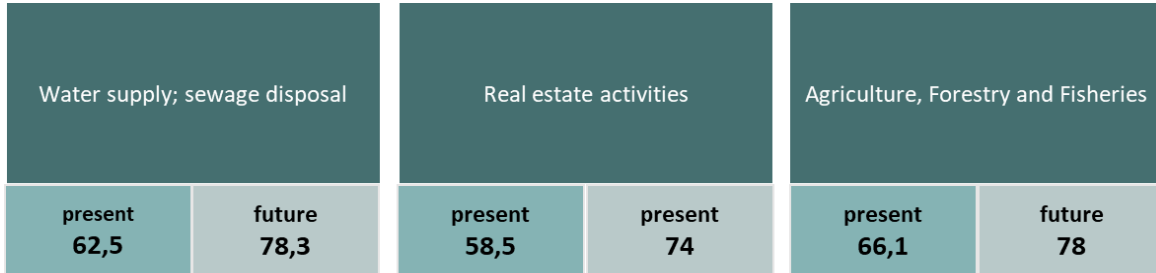
Note: Workers with a predominance MENTAL WORK perform specialized, technical, managerial and administrative tasks mainly in the office or in other administrative premises. Workers with a predominance PHYSICAL WORK perform manual, craft work in the workshop, in the field, on the construction site, in the hall, means of transport, in catering and hotel operations outside the office premises.

When dividing employees into these two groups, significant differences can be observed within the importance of the skills examined. While for employees performing mental work, respondents expect the importance of this skill at the level of 90.9 points out of a maximum of 100, for employees performing physical work it is only 61.2 points.



Source: Skills analysis for the future of a competitive labor market in Slovakia (2021)

In terms of the highest expected increase in importance (comparison of current value and future value), the authors evaluated the sectors of the national economy. The graphics below show the TOP three industries with the highest expected increase in the importance of digital capabilities by 2030.



Source: Skills analysis for the future of a competitive labor market in Slovakia (2021)

The importance of skills Digital skills are similarly perceived by respondents representing both domestic and foreign organizations. A slightly higher degree of expected importance in the future (until 2030) was recorded in the case of domestic organizations.



Source: Skills analysis for the future of a competitive labor market in Slovakia (2021)

Conclusion

Based on the evaluation of current trends and key competencies, we analyzed the global trends within the theoretical basis, which will significantly change the labor market in the coming period. These trends were subsequently examined in a questionnaire survey, the aim of which was to monitor and evaluate the importance of selected skills in employees until 2030. By 2030, all the skills examined for employees are expected to be at a higher level, compared to the current level of importance. These valuable data from employers operating in the Slovak Republic are an important basis for setting the policy of employee training in companies and also for the preparation of the future workforce. The current and future workforce will have to master skills that will meet the requirements of employers for employment in the labor market, where soft skills in particular come to the fore. From the results of the questionnaire survey, digital and interpersonal skills can be characterized as those that will be significantly needed in the future in the performance of employees' work. In addition, the following skills will be important: Environmental literacy; Knowledge of a foreign language; Understanding digital systems; Digital skills - with these skills, employers' representatives in the Slovak Republic expect the highest increase in the level of importance of a given skill in the future (2030), compared to the current situation. In the conditions of the Slovak Republic, the expectation that the demand for technological, social, emotional and higher cognitive abilities will be to grow. Following a study by McKinsey, our questionnaire survey confirmed that Digital Skills is perceived by employers in the Slovak Republic as the most important part of their employees' competency model in the future (2030). This is proof that the growing trend of digital transformation and digitization will be

more pronounced in the national economy in the coming years, which is in line with the expectations of the advanced world economies.

The author of the paper, as a co-author of the analysis Lednárová-Dítětová et al. (2021), in collaboration with other authors has developed a unique evaluation of future skills broken down according to their importance until 2030. A selected part of these results was used in the present paper. The results of the questionnaire survey provided an interesting view of which skills / competencies will be most important in the conditions of the Slovak Republic by 2030. The findings are important for stakeholders such as employers, educational institutions preparing future graduates, social partners operating in the Slovak Republic, trade unions representing employers, employers' and professional organizations, the Ministry of Education, etc.

For employers, the most important goal remains to be competitive even in the global market, where innovation trends are gradually being introduced in all areas of production and service provision. Until now, the usual working system has consisted of the following steps like skills development in primary, secondary and tertiary education, the use of these skills in only one sector. Due to technological changes and changes in the company, this structure changes as follows: skills development takes place not only during the first part of life (at school), but also throughout life, education is complemented by "Early Childhood education" and care, effective use of skills not only in one sector in one job, but during the working life to use your skills in several jobs and sectors, i.e. "Multiple jobs, multiple sectors" (Hrnčiar, Rievajová, 2019). If an employer wants to keep up with these changes, he must have a workforce that is adequately prepared to work with innovation trends and able to communicate his requirements. That is why it is essential that the skills examined, in view of their expected importance, be translated into the education system as part of the training of the future workforce and at the same time into the training programs of individual employers. This research is not definitive and we see room for further research that will further determine the priorities of employers in education, where they will seek access to employees through key competencies so that both parties can benefit from it. It will be crucial for the employer to set the priorities for which he will want to train employees. On the employee's side, there will be an opportunity to move up the career ladder and thus improve one's conditions. We anticipate that teamwork, creativity and communicativeness as tools for the future will benefit society and can keep it coherent and goal-oriented. In addition, it is a challenge for national governments to work with employers. According to the Deloitte study, governments and employers should identify the main drivers that motivate workers to engage in training to provide the right guidelines for retraining and training. According to the authors Baláž, et al. (2017) a sustainable economy will require improving the quality and providing inclusive education for all for the needs of the labor market, as well as for the needs of the modern digital economy and society. In this regard, multinational companies play an important role in the current global economic turbulent processes in ensuring sustainable economic growth in the world economy and increasing competitiveness in the global economy (Kordos, Vojtovic, 2016). Our research supports these authors' views and provides important information and findings for the education system and employers. If the Slovak Republic is to remain competitive, it must develop its education system in the same direction as new technologies and innovations. Without knowledge of future labor market needs, we will not be able to secure a skilled workforce.

The limit of our research was the conditions in which the questionnaires were created and applied. The reason is the pandemic situation, which did not allow structured interviews to be conducted directly with the respondents. In addition, we consider the fact that respondents' answers about future skills may change in a short time to be a limitation. Ensuring inclusive education is not that simple and labor market needs are dynamic and growing.

References

- Axryd, S. (2019). Why 85% of big data projects fail, available at: <https://www.digitalnewsasia.com/insights/why-85-big-data-projects-fail>
- Baláž, V. et al. (2017) Východiská prípravy národných priorít implementácie Agendy 2030 [online]. Prognostický ústav SAV, 2017, online. 43 s. [cit. 2022-01-08]. Available at: https://www.researchgate.net/publication/322490851_Vychodiska_pripravy_narodnych_priorit_implementationi_e_Agendy_2030
- Cedefop (2020). Empowering adults through upskilling and reskilling pathways. Volume 2: Cedefop analytical framework for developing coordinated and coherent approaches to upskilling pathways for low-skilled adults. Luxembourg: Publications Office of the European Union. Cedefop reference series; No 113. Available at: <http://data.europa.eu/doi/10.2801/61322>
- David, H. (2015). Polanyi's Paradox and the Shape of Employment Growth."In Reevaluating Labor Market Dynamics, Federal Reserve Bank of St. Louis: Economic Policy Proceedings, pp. 129-177. <https://doi.org/10.20955/wp.2015.009>
- Delloite. Expected skills needs for the future of work: Understanding the expectations of the European workforce [online]. 2018. [cit. 2022-01-19]. Available at: <https://www2.deloitte.com/be/en/pages/public-sector/articles/upskilling-the-workforce-in-european-union-for-the-future-of-work.html>
- Dondi, M. et al. (2021). Defining the skills citizens will need in the future world of work: public and social sector practice [online]. McKinsey & Company, 2021, online. 19 p. [cit. 2022-01-08]. Available at: <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/defining-the-skills-citizens-will-need-in-the-future-world-of-work>
- Edquist, H. (2021). The Internet of Things and economic growth in a panel of countries. In Economics of Innovation and New Technology, 30(3). Web of Science. pp. 262-283. <https://www.tandfonline.com/doi/full/10.1080/10438599.2019.1695941?src>
- Európska Komisia. Smerom k udržateľnej Európe do roku 2030. Diskusný dokument zo dňa 30. januára 2019 (COM (2019) 22 final). [online]. EUR-Lex, 2019b, online. 44 s. [cit. 2022-01-03]. Available at: <https://eur-lex.europa.eu/legal-content/SK/TXT/DOC/?uri=CELEX:52019DC0022&rid=8>
- Európska Komisia. Správa o Slovensku 2019. Oznámenie komisie Európskemu parlamentu, Európskej rade, Rade, Európskej centrálnej banke a Euroskupine. [online]. 76 p. Available at: https://ec.europa.eu/info/sites/default/files/file_import/2019-european-semester-country-report-slovakia_sk.pdf
- Fakunle, S.O., Ajani, B.K. (2021). Peculiarities of ICT adoption in Nigeria. *Insights into Regional Development*, 3(4), 51-61. [http://doi.org/10.9770/IRD.2021.3.4\(4\)](http://doi.org/10.9770/IRD.2021.3.4(4))
- Frey, C.B., Osborne, M.A. (2013). The future of employment: How susceptible are jobs to computerisation? University of Oxford. Available at: https://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf
- Georgieff, A., Milanez, A. (2021). What happened to jobs at high risk of automation? In: OECD Social, Employment and Migration Working Papers No. 255. Available at: <https://www.oecd-ilibrary.org/docserver/10bc97f4-en.pdf?expires=1647589653&id=id&accname=guest&checksum=11CD6CE1958FBD7A0FCABCFAEF6403C8>
- Graczyk-Kucharska et al. (2020). Knowledge accelerator by transversal competences and multivariate adaptive regression splines. *Central European Journal of Operations Research*, 28, 645-669. <https://doi.org/10.1007/s10100-019-00636-x>
- Gregory, Terry; Zierahn, Ulrich; Salomons, Anna. (2021). Racing with or against the machine? Evidence on the role of trade in Europe. *Journal of the European Economic Association*, jvab040 <https://doi.org/10.1093/jeea/jvab040>
- Gruzdev, M.V., Irina V. Kuznetsova, I.V., Irina Yu. Tarkhanova, I.Y, Elena I. Kazakova, E.I. (2018). University Graduates' Soft Skills: The Employers' Opinion. *European Journal of Contemporary Education* E-ISSN 2305-6746, 7(4), 690-698. <https://doi.org/10.13187/ejced.2018.4.690>
- Hrnčiar, Michal; Rievajová, Eva. (2019) Vplyv industry 4.0 na sektor dopravy a súvisiacich služieb v kontexte rozvoja ľudských zdrojov v podmienkach Slovenskej republiky. Registered: Web of Science. In Vplyv Industry 4.0 na tvorbu pracovných miest 2019. International scientific conference. Vplyv Industry 4.0 na tvorbu pracovných miest 2019: zborník vedeckých príspevkov z medzinárodnej vedeckej konferencie = Proceedings of Scientific Papers from the International Scientific Conference. - Trenčín: Trenčianska univerzita Alexandra Dubčeka v Trenčíne, 2020. ISBN 978-80-8075-903-2, p. 133-141.

- Kamasak, R. (2015). Determinants of innovation performance: a resource-based study. In *Procedia - Social and Behavioral Sciences*, 195. Elsevier. pp. 1330-1337. <https://www.sciencedirect.com/science/article/pii/S1877042815037908>
- Kordos, M., Vojtovic, S. (2016). Transnational corporations in the global world economic environment. 3rd International Conference on New Challenges in Management and Organization. Dubai, U Arab EmiratesI. Book Series: *Procedia Social and Behavioral Sciences*, Vol. 230, pp. 150-158 K <https://doi.org/10.1016/j.sbspro.2016.09.019>
- Kutrzeba, F. (2018). Smart skills and education in a future economy. *E-Mentor*, 2(74), 37-43. <https://doi.org/10.15219/em74.1350>
- Laskey, M. L., Hetzel, C. J. (2010) Self-regulated Learning, Metacognition, and Soft Skills: The 21st Century Learner. *Metacognition and Soft Skills*. Available at: <https://eric.ed.gov/?id=ED511589>
- Lednárová-Dítětová L., et al. (2021). Skills analysis for the future of a competitive labor market in Slovakia. Available at: <https://www.ruzsr.sk/sk/article/zrucnosti-pre-buducnost/>
- Naudé, W. (2021). Artificial intelligence: neither Utopian nor apocalyptic impacts soon. *Economics of Innovation and New Technology*, 30(1), 1-23. <https://www.tandfonline.com/doi/full/10.1080/10438599.2020.1839173>
- Nedelkoska, Ljubica, Quintini, Glenda. Automation, skills use and training práce [online]. OECD, 14.3.2018, online. 125 p. [cit. 2021-12-09]. ISSN: 1815199X. Available at: https://www.oecd-ilibrary.org/employment/automation-skills-use-and-training_2e2f4eea-en;jsessionid=ESOUum3UYcht16MwHQWNkH2I.ip-10-240-5-165
- Niebel, T. (2019). BIG data – BIG gains? Understanding the link between big data analytics and innovation. *Economics of Innovation and New Technology*, 28(3), 296-316. <https://www.tandfonline.com/doi/full/10.1080/10438599.2018.1493075?src>
- Prince, Emma-Sue. (2016). 7 měkkých dovedností, které vás posunou kupředu. V Brně: BizBooks. ISBN 978-80-265-0451-1
- Sinlarat, P. (2016). Vzdelávanie 4.0 is more than Education. Annual Academic Seminar of the Teacher's Council 2016 on the topic of Research of the Learning Innovation and Sustainable Educational Management. Bangkok: The Secretariat Office of Teacher's Council
- Snieska, V., Navickas, V. Grecikova, A., Safrankova, J.M, Sikyr, M., (2020). Fundamental Human Resource Management Practices Aimed at Dealing with New Challenges in the Labour Market. *Transformations in Business & Economics*, Vol. 19, No 2 (50), pp.38-51.
- Šárka, J., Petříková, R. (2015). The using of innovation and creativity is inexhaustible. In *Procedia Economics and Finance*, 34, Elsevier. pp. 638 – 643. <https://www.sciencedirect.com/science/article/pii/S2212567115016792>
- Trexima Bratislava. Prognózy vývoja na trhu práce v SR II [online]. 2019a, online. 29 s. [cit. 2022-01-08]. https://www.employment.gov.sk/files/slovensky/praca-zamestnanost/podpora-zamestnanosti/manazerske%20zhrnutia%202020/man_zhrn_metodika.pdf
- Ústredie práce, sociálnych vecí a rodiny. Národný projekt Sektorovo riadenými inováciami k efektívnemu trhu práce. Available at: <https://www.employment.gov.sk/sk/praca-zamestnanost/podpora-zamestnanosti/np-sektorovo-riadenymi-inovaciami-efektivnemu-trhu-prace/>
- Vojtovič, S. (2016). Creative Clusters and Their Importance for Regional Development. *Political Sciences, Law, Finance, Economics and Tourism*. Book Series: International Multidisciplinary Scientific Conferences on Social Sciences and Arts. Albena. Vol. III., pp. 799-806.
- Wu, Y., Cegielski, C.G., Hazen, B.T., Hall, D.J. (2013), Cloud Computing in Support of Supply Chain Information System Infrastructure: Understanding When to go to the Cloud. *Journal of Supply Chain Management*, 49(3) 25-41. <https://doi.org/10.1111/j.1745-493x.2012.03287.x>
- World Economic Forum. The Future of Jobs Report 2020 [online]. 2020, online. 163 s. [cit. 2022-01-10]. https://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

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