

Review paper

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INFORMATION AND COMMUNICATION TECHNOLOGIES IN EDUCATION AS A STIMULUS TO ECONOMIC DEVELOPMENT

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Education has always been a driving force behind economic prosperity. However, this has become especially important in a globalized knowledge- and new-technology-based economy. The research presented in this paper focuses on the relationship between ICT, population education, and economic growth and development. The analysis of this relationship is based on the latest data collected from relevant national and international institutions. The results obtained from a survey conducted at the Faculty of Economics, University of Belgrade, are also analyzed. The paper highlights the challenges faced by the education systems in general, and the education system of the Republic of Serbia in particular, confronted with the new wave of technological innovation which is fundamentally changing the nature of work and imposing new requirements with regard to the necessary knowledge and skills. Our research results indicate that ICT and education have been recognized by the Government of the Republic of Serbia as the important determinants of economic and the overall social development.

Keywords: information and communication technologies (ICT), education, economic growth, economic development

JEL Classification: O14, M15, L63

INTRODUCTION

Information and telecommunication technologies (hereinafter referred to as ICT) are dramatically transforming the world, enabling better connections between people and communities, innovation and productivity increases, as well as improving the global standard of living. While changing the ways

people interact and do business, ICTs have been shown to be the key pre-requisite for economic and societal modernization and fostering competitiveness, as well as an important element of overcoming social and economic divides (WEF, 2011, 6).

ICT can be regarded both as a consequence and one of the causes of economic growth, i.e. the strength which acts as a driving force behind economic progress. These technologies contribute to economic growth and foster competitiveness, and they are particularly important to developing countries since they

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accelerate their necessary transformation and allow them to more quickly join the globalization process. ICTs are the key element of economic growth as they contribute to the infrastructure and human potential building and development. However, without skilled labor and the accompanying infrastructure, ICTs alone are an investment loss and only if they complement one another can they generate economic growth. ICTs can also be regarded as a result of economic growth. In developed economies, ICTs are increasingly gaining in significance in an attempt to optimize the rising labor costs.

Why is education essential for economic growth and development? To answer this question, that population education is simultaneously a development instrument and a development goal should be emphasized. On the one hand, education has the key role in enabling a country's economy to absorb new technologies and build a capacity for sustainable growth and development. On the other hand, it is the key development goal and an important dimension of human well-being (Todaro & Smith, 2011, 359; McCowan, 2016, 506).

Investing in education is investing in human capital, and it is future-oriented. A more narrowly defined concept of human capital includes knowledge and skills, embodied in people through the process of formal education and training, which is in accordance with Becker's minimalist definition of this form of capital (Hanushek & Woessmann, 2008; Laskowska & Dańska-Borsiak, 2016). Research has shown that \$1 invested in knowledge and skills acquisition generates earnings and health benefits of as much as \$10, depending on the level of a country's economic development (Education Commission, 2017, 35).

The main issue addressed in this paper is the relationship between ICTs, population education, and economic growth and development.

Due to the complexity of this relationship, in addition to the main goal of the paper, which is to examine the effects that the introduction of ICTs in the education system has on economic growth and development, there are also some sub-goals relating to the following

relationships: the impact of ICTs on education, the impact of education on economic growth and development, as well as the impact of ICTs on economic growth and development.

In line with the main issue discussed in the paper and its research goals, the following main hypothesis will be tested:

H0: In order to create a more effective and more efficient education system, it is necessary to integrate ICTs in all of the aspects of the educational process.

This hypothesis and the research goals set have induced an additional hypothesis:

H1: Efficient operation in the digital working environment increases the interestedness of young people in acquiring new knowledges of and skills for information-communications technologies.

Testing the main hypothesis required a detailed analysis of education development and information society strategies from the global to the national level, whereas in order to test the additional hypothesis, a research study was carried out in the form of a survey conducted among students.

The paper is structured in the three main sections. After certain introductory remarks dealing with the main issue discussed in the paper, the first section focuses on the different projections of the future of education, as well as on education for the future, in the context of sustainable economic development. In the second section, the ways and models of introducing ICTs in the educational process with the aim of preparing workforce for using ICTs in the workplace are analyzed. The focus of the third section is on the Republic of Serbia (RS) and the impact that the application of ICTs in education has on achieving national economic development. In the concluding section, a summary of our research results particularly pointing out the importance of introducing ICTs in education systems with the aim of better preparing the young to operate in the digitized

workplace and contribute to the macroeconomic and social performances of the country is provided.

THE FUTURE OF EDUCATION AND EDUCATION FOR THE FUTURE IN THE CONTEXT OF (SUSTAINABLE) ECONOMIC DEVELOPMENT

Education for the future is paid a lot of attention to in development strategies from the national to the global level. At the UN General Assembly in September 2015, the global leaders of 193 UN member states unanimously adopted the 2030 Agenda for Sustainable Development, aimed at achieving steady and high-quality economic development, based on solid economic foundations, environmental responsibility and meeting the criteria for social justice. This is not the present development achieved at the expense of the future one, but the development which meets the needs of the current generations without compromising the future generations' ability to meet their own needs (Mulamula & Amadi-Echendu, 2017, 123). The above-mentioned global agenda for sustainable development encompasses 17 goals, 169 sub-goals and 244 progress-monitoring indicators. From the perspective of this paper, Goal 4 is especially important - to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all, with its sub-goal 4.4. - by 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship (UN, 2015, 20).

The European Union has recognized the importance of education for the future and its role in achieving sustainable development, which has now been accepted as a universal development model at the level of this regional integration. Consequently, education and training have a prominent place in the EU strategy for the next decade, entitled Europe 2020, which puts forward the following priorities: "Smart growth: developing an economy based on knowledge and innovation. - Sustainable growth: promoting a more resource efficient, greener and more competitive

economy. - Inclusive growth: fostering a high-employment economy delivering social and territorial cohesion" (EC, 2010, 8).

In the EU strategies, higher education, research and innovation play the key role in fostering economic growth, global competitiveness and social cohesion. As European societies desire to become knowledge-based, higher education is an essential component of socioeconomic and cultural development. An increasing demand for skills requires higher education to respond to this demand in new ways (EURASHE, 2015, 6).

The Bologna process plays the crucial role in the European higher education development. It is a process of the European higher education reform, aimed at constructing a common area for higher education ("European Higher Education Area, EHEA"). In 2014, the "Bologna Follow-up Group, (BFUG)" adopted the "Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG)", also adopted by the EHEA Ministers in 2015. The key goal of these standards is to contribute to the common understanding of quality assurance for learning and teaching across borders and among all stakeholders.

Providing broader access to higher education, which is emphasized in the above strategies, is an opportunity for higher education institutions to make use of increasingly diverse student experiences. This diversity and growing expectations for higher education require a fundamental shift in the way it is provided: "a more student-centred approach to learning and teaching, embracing flexible learning paths and recognizing competences gained outside formal curricula. Higher education institutions themselves also become more diverse in their missions, mode of educational provision and cooperation, including growth of internationalization, digital learning and new forms of delivery" (ENQA, 2015).

According to a report of the Education, Audiovisual and Culture Executive Agency (EACEA), in 47 countries of the European Higher Education Area, there are around 37.2 million tertiary students, out

of whom 82% are enrolled in theoretically-based programs, whereas only 15.6% of them are in more occupationally specific programs. Those enrolled in doctoral programs account for 2.6% of the total student population (EACEA, 2015, 38).

European higher education institutions are predominantly funded by public sources. More than half of the countries spend over 1.3% of their GDP on higher education, with the Nordic countries spending the most (from 2% of the GDP in Sweden to 2.4% of the GDP in Denmark). Annual public expenditure on higher education is the lowest in Bulgaria, Croatia, Italy, Romania and Slovakia, namely below 1% (EACEA, 2015, 29-31).

The same report states that the number of young adults with tertiary education as a share of the unemployed is very low in Denmark, Great Britain, The Netherlands, whereas Germany is even facing a shortage of such people. On the other hand, young adults with tertiary education in Bosnia and Herzegovina, Greece, Croatia, Cyprus, Portugal, Romania and Serbia are being faced with a high unemployment rate.

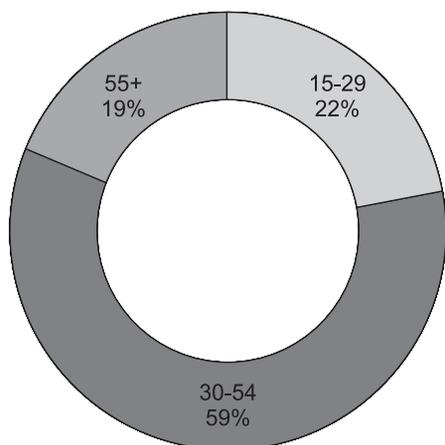


Figure 1 The share of the unemployed by age group in the total number of the unemployed, 2017

Source: Nacionalna služba za zapošljavanje (RSZ - DevInfo, 2018, 3).

According to data obtained from the Statistical Office of the Republic of Serbia and the National

Employment Agency, young adults in RS aged 15-29 account for 22% of the total number of people unemployed (Figure 1). Unemployment is one of the reasons for leaving the country by young adults and especially increased talent outflows.

In line with the need to adapt its education system to modern requirements and in accordance with the strategies approved of in a wider context, especially in the EU area, the Government of Serbia adopted the Strategy for Education Development in Serbia 2020. The Strategy deals with establishing goals, objectives, directions, tools and mechanisms for the development of the education system in the Republic of Serbia until 2020. The Strategy particularly emphasizes the following development goals (Vlada RS, 2012):

- directing the structure of educational and research activities towards meeting the developmental needs of the economy and society;
- increasing the share of population with tertiary education in the total population;
- directing the financing system towards the formation of creative, innovative, responsible people with tertiary education necessary for the achievement of economic growth and reducing unemployment.

INFORMATION AND COMMUNICATION TECHNOLOGIES IN EDUCATION

ICTs require different knowledge and skills in order to fully exploit their power both in private and professional settings. This relationship may be viewed from the two perspectives: firstly, ICTs are required for the improvement of the teaching and learning process, and secondly, there is a need to learn through the education process how to make the best use of these technologies in various areas of human activities, including business.

The use of ICTs makes the education process go beyond the traditional instruction and the barriers of time and the location, which is why it is often referred to as e-education.

The term e-education is most frequently defined as educational activities conducted by using ICTs or as electronically assisted learning. E-education has the following goals: independent and permanent learning, improving instructional efficacy, the flexible organization of instructions and the inclusion of a larger number of people willing and able to learn in the instruction process.

Some of the benefits of e-education are the following: the ability to access the instruction process at any time or place; a better teacher-student interaction; time saving; an improved efficiency; flexible learning; an individual approach to students and respecting different learning styles; the adjustment of content and the pace of learning to individual students (adaptive learning); fostering analytical thinking and independent problem-solving skills in students; synthesizing the acquired knowledge; the easy monitoring of student progress; easier training and retraining; offering new opportunities for lifelong learning; easy access to lectures by world-renowned experts by means of video-conferencing; a greater learner diversity (the employed, students from remote areas, mobility-impaired students, etc.).

Some of the modern technologies used in e-education are as follows: smart learning environments, the Internet of things, a virtual learning environment, virtual reality technologies, mobile technologies, etc.

Another dimension to learning has been added by Virtual Learning Environment (VLE), a web-based system which creates an environment designed to facilitate the learning course management. The VLE also includes distance learning.

Also used in education are new technologies such as IoT (Internet of Things) and Cloud Computing, which create Smart Learning Environments. The Internet of things (IoT) is a concept which expands the virtual world and the Internet to real-world physical things, thus enabling resource virtualization. Cloud Computing is a technology that enables interaction between users and different services available on the Internet.

The power of Virtual Reality (VR) technologies is particularly manifested in opportunities for learning

by experience through conducting experiments which can teach students how to solve complex problems in the ways different from traditional teaching methods.

The use of mobile technologies in education is another way of learning transformation. Mobile technologies can significantly impact the development of the learning environment.

Respecting the needs of the EU education systems, in its document *Opening up Education: Innovative Teaching and Learning for all through New Technologies and Open Educational Resources*, the European Commission points out that technologies and open educational resources offer an opportunity to reshape education (EC, 2013).

This document sets out an agenda for stimulating the high-quality, innovative ways of learning and teaching through new technologies and digital content. *Opening up Education* proposes actions towards creating more open learning environments to ensure the education of a higher quality and efficacy, thus contributing to the Europe 2020 Strategy's goals, predominantly related to boosting the EU competitiveness through better skilled workforce and increased employment. The main goals are reducing early school leavers and increasing the number of people with tertiary education. The document also proposes actions at the EU level: helping learning institutions, teachers and learners to acquire digital skills and learning methods; supporting the development and availability of open educational resources; deploying digital devices and content in the classroom; mobilizing all stakeholders (teachers, pupils and students, families, companies and social partners) in order to change the role of digital technologies at educational institutions (EC, 2013).

New technologies in higher education contribute to creating the workforce necessary for a significant economic impact on the ICT sector development (Kvochko, 2013): the GDP growth; the emergence of new services and industries; business innovation; workforce transformation; job creation. This is why the document *Strategy for Education Development in Serbia 2020* sets the following as one of its goals - the harmonization of academic study programs with

the needs of the economy, as well as cooperation in the implementation of the practical training of students, so that students at university acquire more knowledge, skills and competences that are relevant to employers' needs (Vlada RS, 2012).

The Strategy for Education Development in Serbia 2020 emphasizes the importance of digital technologies for the overall development of the education system. However, the first official document which thoroughly deals with the integration of digital and online learning in education was adopted by the National Education Council of the Republic of Serbia in 2013 and presented to the public - Guidelines to Improve ICT in Education.

ICT IN EDUCATION AS A STIMULUS TO SERBIAN ECONOMIC GROWTH AND DEVELOPMENT

ICTs have for many years now been a central issue in debates about economic growth and the functioning of developed, and also of undeveloped and developing economies.

The deployment of ICTs in education and raising the level of the knowledge and skills necessary for using new technologies by the wide population have been recognized by the Government as a significant driving force behind the development of the Serbian economy and society.

The most important goals of the fuller implementation of ICTs in education in Serbia have been put forward in the Information Society Development Strategy in the Republic of Serbia 2020. These goals are the following: establishing a modern education system adapted to the needs of information society; enabling the use of ICTs in the workplace in a way which raises the level of efficiency, improves work quality and ensures better jobs; and introducing the concepts of e-learning and open distance learning.

To meet the social and economic objectives, competencies are required. These competencies are acquired by reforming the education sector in

such a way as to create preconditions for building a knowledge economy and stimulating ICT training programs. Consequently, changes need to be made in education in order to modernize the learning process and encourage creativity and innovation. The connection between the ICT sector and education will help young people to acquire the skills necessary for the digital work environment.

The current state of the Serbian ICT sector is presented in the below analysis.

According to the data obtained from the Statistical Office of the Republic of RS (SORS), and the Chamber of Commerce and Industry of RS (CCIS), in 2015, there were 3,401 enterprises operating in the RS ICT sector, accounting for 3.7% of the total number of the registered enterprises in the Republic of Serbia. Out of this number, the most registered enterprises operate in the field of computer programming (54.9%), then computer, electronic and optical products manufacture (26.8%), only to be followed by telecommunications (11.5%).

As can be seen in Table 1, the micro- and small-sized enterprises accounted for 97.0% of the total number of the registered enterprises, whereas the highest turnover was generated by the largest enterprises. It can also be seen that the number of the employees is the highest in large and medium-sized enterprises (Table 1).

Table 1 The structure of the enterprises in the electronic communications and information society sector - 2015

	Total	Micro 1-9	Small 10-49	Medium 50-249	Large 250+
Enterprises	3,401	85.6%	11.4	2.4	0.6
Employees	55,159	10.5%	14.1	15.5	59.8
Turnover (in RSD bn)	418.9	7.8%	14.2	21.4	56.6

Source: RSZ and APR, calculation based on the PKS data.

In 2016, the ICT sector in RS employed 61,077 persons, which was a rise of 2.5% compared to 2015. A significant increase (23.9%) in the number of employees relative to the period January-December 2015 was recorded in computer programming, consulting and related activities (PKS, 2017).

In the period January-March 2017, the highest gross salary paid in the ICT sector was RSD 205,259 in computer programming, consulting and related activities, which is about three times higher than the Republic average (RSD 62,588) (PKS, 2017).

According to the RSZ and PKS data (PKS, 2017), the year 2015 recorded a positive contribution of all ICT sectoral activities to the interannual growth of the GDP. A significant interannual growth of gross value added was recorded in computer programming and consulting activities (25.3%) and information services (27.9). The gross value added created in computer programming, consulting and related activities in 2015 totaled EUR 402.2 mil. The total fixed assets investment in all of the IT-related activities was EUR 476.8 mil in 2015, of which the largest share (EUR 225.3 mil) was invested in domestic and imported equipment (47.3%), while 41.8% was invested in intellectual property (research and development, software, databases, etc.) - EUR 199.2 mil. In computer programming, consulting and related activities, almost 69.2% of the total investment accounted for those made in research and development, software and databases.

According to the RSZ and PKS data (PKS, 2017), in industries comprising electronic communications and information society in 2016, there was a foreign direct investment net inflow by non-residents in the amount of EUR 100.2 mil. In the three-year period between 2014 and 2016, there was an average annual rise in the foreign direct investment net inflow of 70.1%.

According to the NBS and PKS data (PKS, 2017), Serbian telecommunications, computer and information services exports in 2016 totaled EUR 739.5 mil. In the four-year period 2013-2016, these exports rose at an average annual rate of 19.2%. There was a trade surplus of these services worth EUR 407.3 mil. In the four-year period 2013-2016, the trade surplus in

these services increased at an average annual rate of 36.9%, with the largest surplus recorded in trade in computing services (43.2%).

Based on the data presented, a conclusion can be drawn that the ICT sector in RS, although accounting for 3.7% of the total number of the registered enterprises and 3.2% of the total number of the employed in our country, recorded exports worth EUR 739.5 in 2016, with a trade surplus in the services in the ICT sector worth EUR 407.3 mil. In addition, in RS, a country characterized by high unemployment, IT-related positions are among the rare ones where demand exceeds supply.

At the global level, the ICT sector is one of the fastest-growing industries, which directly impacts job creation and encourages the development of the other sectors of the economy. In order to be competitive on the global market, modern companies need to use the latest technologies, simultaneously keeping their costs at a low level. This has resulted in the transfer of such technologies from the economically most developed countries to India, China and other Asian countries with cheap and skilled workforce. These trends are now affecting RS as well, as a country which has an insufficient number of the highly educated people capable of using ICTs in business (Bartlett, 2009, 33).

As can be seen from the above analysis, computer programming and providing a variety of information services are becoming the increasingly important factors of the Serbian economic development. IT-related occupations are the most in-demand in the labor market. Therefore, the Serbian IT industry is offering important opportunities to young talents and highly educated people to develop their careers in the country and be satisfied with their social status and a chance to contribute to the country's prosperity. However, there are important shortcomings of the Serbian ICT industry: a large number of micro-enterprises with a low financial capacity and insufficient technological and managerial skills, as well as a shortage of skilled labor.

Yet another shortcoming should be mentioned here: the fact that we are not capable of retaining talents in the country, because, according to the World

Economic Forum data showing a country's capacity to retain talents, RS ranks the 134th of 137 countries (WEF, 2017, 257).

However, we should bear in mind the fact that the conclusion that investment in education is worthwhile and that it will result in an accelerated economic growth is only valid under the assumption that people will be given jobs and thus simultaneously an opportunity to contribute to economic development. The positive experience of some countries indicates that, instead of directing the whole economy, it is much better for countries to focus on the sectors capable of ensuring progress, such as the ICT sector in Serbia. Consequently, this entails the need for adjusting the education system accordingly.

FORMAL IT EDUCATION IN THE REPUBLIC OF SERBIA

In primary school grades 1-4, there is an optional subject entitled From Toys to Computers. In September 2015, Informatics and Computer Programming was introduced in primary school grade 5 as a compulsory subject. This subject will also be a part of the curricula of primary school grades 6-8.

In high school grades 1-4, as well as in secondary vocational school grade 1, Informatics and Computer Programming is taught as a compulsory subject. In secondary vocational school grades 2-4, the informatics-related subjects have been adjusted to a particular field. Thus, for example, Business Informatics is taught in vocational schools offering the economics, law and administration programs.

Technical faculties and faculties of mathematics lie at the core of ICT tertiary education, research and development. These faculties focus on engineering informatics, whereas the study programs in business informatics are still scarce.

The fact that study programs in the field of business informatics, particularly at state-owned faculties, are still scarce is mainly due to the fact that informatics

engineers in RS are recognized as IT experts, while business informatics professionals have not been sufficiently established yet. Nevertheless, commendable changes have been made in this respect, mainly being manifested through precisely defining the skills and knowledge deemed essential by the employer in the field of business informatics. Namely, a business component in informatics is increasingly in demand, which can be concluded on the basis of job advertisements posted on poslovi.infostud, one of the leading job search websites in Serbia. Out of the total number of the IT jobs offered (around 300), approximately 200 are those requiring competencies both in the ICT and a particular business areas that students are supposed to have upon graduation (INFOSTUD, 2018).

Currently, Serbia's labor market is faced with a shortage of informatics experts oriented towards the use of information technology in business, developing business software, IT project management and the business information system development. The factors that have contributed to such increased demand for these occupations are as follows:

- the number of domestic and in particular international IT companies dealing with business software development has significantly increased in the last several years in RS, which offers IT professionals an opportunity to work from RS for companies worldwide;
- quality university programs in the area of business informatics could significantly improve the Serbian software industry;
- an increased interest in the university courses providing the knowledge and skills that integrate economics with information technology and offer good job opportunities after graduation.

Based on the data about the Serbian labor market's needs presented in this paper and aiming at obtaining more information about the students' interest in the subjects liaising ICT and economics, a survey was conducted among 535 students at the Faculty of Economics, Belgrade University. The survey contained a large number of questions, but for the purposes of

this paper, only the questions referring to the subjects connecting ICT and economics were selected.

The analysis of the students' interest in the subjects oriented towards the use of ICT business, included in the Business Informatics Module (Business Informatics, Databases, Data Analysis, Object-Oriented Programming, Mathematics for Programming, Web Design, Information Systems and Business Analytics, E-Business, Software Development, IT Project Management, ERP Software, New Information Technologies, E-Commerce, E-Payment Systems. Digital Marketing and Accounting Information Systems), indicate that the students are particularly interested in the following subjects: Digital Marketing - 63.6% of the students surveyed, E-Commerce - 60.9%, Web Design - 60%, E-Business - 54.9%, IT Project Management - 51.6%, E-Payment Systems - 49.6%, New Information Technologies - 47.1% of the students surveyed. The details of the students' interest in these subjects are accounted for in Tables 2-8 below.

Table 2 The level of the students' interest in Web Design

	No	%	% of valid responses	% of total
Valid responses	Not interested	45	8.4	8.6
	Somewhat interested	50	9.3	9.6
	Moderately interested	106	19.8	20.3
	Interested	130	24.3	24.9
	Very interested	191	35.7	36.6
	Total	522	97.6	100.0
Missing data	13	2.4		
Total	535	100.0		

Source: Authors

Table 3 The level of the students' interest in E-Business

	No	%	% of valid responses	% of total
Valid responses	Not interested	39	7.3	7.4
	Somewhat interested	53	9.9	10.1
	Moderately interested	139	26.0	26.5
	Interested	158	29.5	30.1
	Very interested	136	25.4	25.9
	Total	525	98.1	100.0
Missing data	10	1.9		
Total	535	100.0		

Source: Authors

Table 4 The level of the students' interest in Object-Oriented Programming

	No	%	% of valid responses	% of total
Valid responses	Not interested	133	24.9	25.4
	Somewhat interested	131	24.5	25.0
	Moderately interested	120	22.4	22.9
	Interested	87	16.3	16.6
	Very interested	52	9.7	9.9
	Total	523	97.8	100.0
Missing data	12	2.2		
Total	535	100.0		

Source: Authors

Table 5 The level of the students' interest in Software Development

	No	%	% of valid responses	% of total
Valid responses	Not interested	130	24.3	25.0
	Somewhat interested	118	22.1	22.7
	Moderately interested	123	23.0	23.7
	Interested	93	17.4	17.9
	Very interested	56	10.5	10.8
	Total	520	97.2	100.0
Missing data	15	2.8		
Total	535	100.0		

Source: Authors

Table 7 The level of the students' interest in E-Commerce

	No	%	% of valid responses	% of total
Valid responses	Not interested	31	5.8	5.9
	Somewhat interested	49	9.2	9.4
	Moderately interested	118	22.1	22.5
	Interested	161	30.1	30.7
	Very interested	165	30.8	31.5
	Total	524	97.9	100.0
Missing data	11	2.1		
Total	535	100.0		

Source: Authors

Table 6 The level of the students' interest in New Information Technologies

	No	%	% of valid responses	% of total
Valid responses	Not interested	55	10.3	10.6
	Somewhat interested	94	17.6	18.1
	Moderately interested	119	22.2	22.9
	Interested	131	24.5	25.2
	Very interested	121	22.6	23.3
	Total	520	97.2	100.0
Missing data	15	2.8		
Total	535	100.0		

Source: Authors

Table 8 The level of the students' interest in Digital Marketing

	No	%	% of valid responses	% of total
Valid responses	Not interested	33	6.2	6.3
	Somewhat interested	48	9.0	9.2
	Moderately interested	102	19.1	19.5
	Interested	138	25.8	26.4
	Very interested	202	37.8	38.6
	Total	523	97.8	100.0
Missing data	12	2.2		
Total	535	100.0		

Source: Authors

As the survey results indicate, the students are especially interested in the business-oriented informatics subjects, i.e. the subjects focusing on the use of ICTs in a particular business area.

CONCLUSION

This paper points out the key role of the high-quality inclusive education necessary for achieving dynamic and sustainable development and defining a desirable direction of change in line with the demands of the new age.

Investing in education is investing in the future. A strong impact of new technologies on education and the world of work is a global trend. These changes are manifested by the emergence of new job and occupation categories, which will partially or entirely replace the existing jobs. The required knowledge and skills will also significantly change. It is essential to promptly deal with the challenges of the new age in order to avoid enormous economic and social costs imposed on individuals, companies and the economy. The paper points out that the new wave of technological change offers tremendous opportunities to countries across the globe, including those less-developed, to significantly enhance their economic and social performances by transforming their education systems. In this context, education is recognized as a development opportunity for the Republic of Serbia. This is corroborated by our research results, as well as by the necessity for change, ranging from the way education is treated in the society, via the reforms in the education system itself, to the construction of relevant economic, legal and political institutions so as to motivate young people to acquire knowledge and thus increase the country's capacity to retain and attract the most qualified workforce.

The paper also stresses the necessity to integrate new technologies in all of the aspects of the education process, with the goal of providing more efficient and more effective education. New technology skills are decisive for the global competitiveness of the national

economy and the maximizing of the job-creating potential.

In addition, changes need to be introduced in schools, universities and other educational institutions in order to modernize the learning process and encourage students' innovation and creativity by fully exploiting the opportunities provided by new technologies. The introduction of new technologies in education should enable young adults with tertiary education, equipped with the adequate knowledge and skills and capable of using cutting-edge technology, to contribute to the development of their country's economy.

This paper contributes to the scarce literature on the indirect effects that the application of ICTs in education has on economic growth and development as these effects have not been researched extensively and in their entire complexity.

The systematic analysis of education and information society development strategies conducted in this paper from the global level (UN) and the EU level to the level of RS and the particular curriculum applied at the Faculty of Economics of the University of Belgrade has confirmed our basic hypothesis: in order to create a more effective and more efficient education system, it is necessary that ICTs should be integrated in all the aspects of the educational process.

The detailed analysis of the ICT sector and the labor market in Serbia based on the data obtained from the relevant institutions (NSZ, NBS, PKS, NEA, etc.), as well as the survey data, has confirmed our additional hypothesis referring to the increased interest of young adults in acquiring the ICT-related knowledge and skills necessary for their efficient working in a digitized workplace, which will enable them to contribute to the country's economic growth and development.

The research study conducted and presented in this paper provides the answer to the question of how the application of ICTs in education fosters economic growth and development. However, one open question still remains, relevant for further studies, which refers to measuring the extent to which the use of ICTs in education fosters economic growth

and development. Additionally, a more precise analysis of the students' interest in applying ICTs in the economy would benefit from a broader and more comprehensive survey designed after that conducted at the Faculty of Economics, Belgrade University, encompassing several higher-level educational institutions in the Republic of Serbia.

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REFERENCES

- Bartlett, W. (2009). Economic development in the European super-periphery: Evidence from the Western Balkans. *Economic Annals*, 64(181), 21-44. doi:10.2298/EKA0981021B
- EACEA (Education, Audiovisual and Culture Executive Agency). (2015). *The European Higher Education Area in 2015*. Brussels, Belgium.
- EC - European Commission. (2010). *Europe 2020 - A Strategy for smart, sustainable and inclusive growth*. Brussels: COM(2010) 2020 final. Retrieved March 24, 2018, from ec.europa.eu/eu2020/pdf
- EC - European Commission. (2013). *Opening up Education: Innovative teaching and learning for all through new Technologies and Open Educational Resources*. Brussels, Belgium.
- EC - European Commission. (2014). *Digital Agenda for Europe*. Brussels, Belgium.
- EC - European Commission. (2016). *A New Skills Agenda for Europe*. Brussels, Belgium.
- EC - European Commission. (2017). *National Student Fee and Support Systems in European Higher Education, 2017/18*. Brussels, Belgium.
- Education Commission. (2017). *The Learning Generation - Investing in education for a changing world*. Retrieved December 13, 2017, from report.educationcommission.org
- ENQA - European Association for Quality Assurance in Higher Education. (2015). *Standards and Guidelines for Quality Assurance in the European Higher Education Area*. Brussels, Belgium.
- EURASHE - European Association of Institutions in Higher Education. (2015). *Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG)*. Brussels, Belgium.
- Hanushek, E., & Woessmann, L. (2008). The role of cognitive skills in economic development. *Journal of Economic Literature*, 46(3), 607-678. doi:10.1257/jel.46.3.607
- Infostud. (2018). *Poslovi Infostud*.
- Kvochko, E. (2013). *Five ways technology can help the economy*. World Economic Forum.
- Laskowska, I., & Dańska-Borsiak, B. (2016). The Importance of human capital for the economic development of EU regions. *Comparative Economic Research*, 19(5): 63-79. doi.org/10.1515/cer-2016-0038
- McCowan, T. (2016). Universities and the post-2015 development agenda: An analytical framework. *Higher Education*, 72(4), 505-523. doi:10.1007/s10734-016-0035-7
- Mulamula, G., & Amadi-Echendu, J. (2017). An examination of the potential links between ICT technology transfer and sustainable development. *International Journal of Technology Management & Sustainable Development*, 16(2), 119-139. doi:10.1386/tmsd.16.2.119_1
- NPS - Nacionalni prosvetni savet Srbije. (2013). *Smernice za unapređenje uloge informaciono-komunikacionih tehnologija u poslovanju*.
- PKS - Privredna komora Srbije. (2017). *Bilten, april 2017*. Udruženje za elektronske komunikacije i informaciono društvo.
- RZS - Republički zavod za statistiku DevInfo. (2018) *Republika Srbija - profil*. Retrieved March 11, 2018, from <http://devinfo.stat.gov.rs>
- Schwab, K. (2016). *Fourth Industrial Revolution*. Geneva, Svis: World Economic Forum.
- Vlada Republike Srbije. (2010). *Strategija razvoja informacionog društva u Srbiji do 2020. godine*. Službeni glasnik RS, br. 51/2010.
- Vlada Republike Srbije. (2012). *Strategija razvoja obrazovanja u Srbiji do 2020. godine*. Službeni glasnik RS, br. 107/2012.
- Todaro, M. P., & Smith, C. S. (2011). *Economic Development*. Harlow: Addison-Wesley.

- UN. (2012). *The Future We Want*. Geneva, United Nations: Retrieved March 14, 2018, from <http://sustainabledevelopment.un.org/content/documents/733FutureWeWant.pdf>
- UN. (2015). *Transforming Our World: the 2030 Agenda for Sustainable Development*. Geneva: United Nations.
- UNESCO. (2016). *Global Education Monitoring Report - Education for People and Planet: Creating Sustainable Futures for All*. Paris, France: UNESCO.
- WEF - World Economic Forum. (2011). *The Global Information Technology Report 2010-2011*.
- WEF - World Economic Forum. (2017). *The Global Information Technology Report 2016*.

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