

Economics of the Education Sector Investment through the IT Sector Development

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ABSTRACT

The education sector has been placed at the top of the priorities for all economic education policies in the world and, as such, it is considered an indispensable element when it comes to any innovation, improvement, and reform. In recent years, through the expansion of science, technology and other branches of science, education, that is, education systems have been modernised by the introduction of IT. Profitability of such ventures and their purpose are an important issue that was imposed just before the modernisation itself. Thus, numerous studies have been conducted with the purpose to verify how effective and necessary the introduction of information technology in teaching really is. In the last twenty years, the development of IT has enabled not only the development of a new branch of science, but also the development of all other segments of society and education, which is also the subject of this paper. The development of the IT sector is profitable in every respect, and the economics of the education investment has been followed by the development of IT, combining these two elements into a single, functional, cost-effective and, above all, useful unit.

Keywords: economics, education, information technology, investment

Introduction

In recent years, education has been a burning issue in almost all economic policies and systems in the world, and consequently, the issue of education, i.e., the quality of educational systems and the cost-effectiveness of investing in the education sector, has come to us in Bosnia and Herzegovina. The economy of a country as well as its competitive position depends primarily on the quality of the available human resources. Education in the 21st century is gaining a new, important role that involves the acquisition of new skills, learning through practice and improving the training process as the labour market is crying out for new and adaptable workforce. Education is a process that does not last only up to the moment of completing formal education, but it also involves informal education and informal lifelong learning.

What is particularly interesting about this issue is actually the quality of education in BiH, that is, education in the Central Bosnia Canton, which has recently been largely targeted by numerous critics. Speaking about quality education, which is not present in Bosnia and Herzegovina, Suzić (2005) states that the analysis of educational systems in the twentieth century shows that we must seek an optimal relationship of frontal or plenary, cooperative, individual and individualized learning and teaching, and the relations between these forms and methods of work are best combined (Suzić, 2005). Given that the topic is relatively untested, especially at the state level, this paper will include the analysis of the situation in BiH with a brief overview of some investments and their benefits through the development of the IT sector.

Theoretical problem analysis

Before the theoretical processing of the topic itself, we will explain the meaning of the stated key terms. According to an American economist Paul A. Samuelson, out of the many the definitions of economy, the most accepted one defines it as the study of how men and society choose, with or without the use of money, to employ scarce productive resources which could have alternative uses, to produce various commodities over time and distribute them for consumption now and in the future amongst various people and groups of society (Samuelson, 1969).

According to Pastuovic (1999), education is a process of organized learning related to the cognitive and psychomotor characteristics of a person. Information Technology (IT) is defined by the American Information Technology Association as "the study, design, development, implementation and support or management of computer information systems, software applications and hardware."

Information technology, as a consequence of general scientific and technological development, had an extremely rapid development, which had a reverse influence on the development of science and technology.

Speaking of investment, i.e., the concept of investment, Bašić (2005) considers that, in the widest sense, this term denotes any investment that is essentially directed towards achieving a certain useful effect, while in the more meaningful sense of this term, it implies investing in the construction of new capacities.

At the level of Bosnia and Herzegovina, as the highest relevant authority, i.e., institution or administrative body, the Ministry of Civil Affairs of Bosnia and Herzegovina is, among other things, responsible for education. Its authority is regulated by the Law on Ministries and Other Administrative Bodies, and it has the following tasks:

1. Performing duties concerning the preparation and implementation of regulations, affairs and tasks which are under the jurisdiction of Bosnia and Herzegovina and which relate to the establishment of the basic principles

for coordinating the activities, harmonising the plans made by entity authorities and defining the strategy on the international level;

2. Participating in the work of international organizations;

3. Executing international obligations and preparations for concluding international agreements or agreements in the part related to education in Bosnia and Herzegovina.

Although the Ministry of Civil Affairs coordinates this field at the state level, education falls under the jurisdiction of the cantons at the level of the Federation of BiH, the entity in Republika Srpska, and under the jurisdiction of the Brčko District. In the Federation of Bosnia and Herzegovina, each of the 10 cantons has its own law on pre-school, primary and secondary education, and the cantons with universities established in them have their own laws on higher education.

In Republika Srpska, all levels of education are also regulated by entity legislation. Brčko District, as a separate organizational unit in BiH, has its own laws regulating each of the four levels of education. This decentralized system prevents a uniform approach to educational policies, enhances differences in the development of human resources in different parts of Bosnia and Herzegovina, and generates a series of problems in the hierarchy of competencies, responsibilities and coordination.

A more rational design of the educational system at different levels, respecting the character of socio-economic relations, the contribution to overcoming the negative implications of the division of labour (specialization and super-specialization) in scientific activity may lead to the fact that research in a particular sector neglects the common average and complementarity with related disciplines.

The basic forms of complementarity between education economics and other scientific disciplines and areas of social reproduction are formed under the influence of many factors such as the level of economic development, the number and structure of the population, social, political and cultural factors, personal and social standards, the natural environment, etc. In order for the educational activity to achieve the expected results in the socio-economic development and the development of democracy, it is necessary to:

1. introduce more fully the so-called principle of working income;
2. directly link education with its service users, which can be achieved through: affirming the principle of working income, respecting the specifics of the educational, as well as any other activity, and the economic cost of educational services that should and may be the basis for forming the income of educational organizations;
3. The economic price of education (ECO) is different for individual levels of education and is very exposed to changes;
4. ECO elements are the same for all levels and can be considered unchangeable;
5. ECO in our terms has the most effective form of calculation if it is determined per student or pupil, because each student or pupil should know how much his education costs (and every organization should be familiar with it), employers of the education

staff should know the cost of education per pupil, i.e., student, the price of education per student or pupil should serve the "donors" of the funds as the basis for drafting the enrolment policy, such a fixed price can serve in regulating mutual obligations between various social institutions that care about education and, based on this price, it is possible to conceive the policy of lending to students who did not fulfil the mandatory enrolment requirements and for whom no regular funds were provided (Bašić, 2005).

Looking at the parameters of the labour market from the education level aspect, it is visible that the structure of the working-age population is dominated by the category of persons with secondary-school and specialization levels amounting to 52.6%, followed by the category of primary school and lower levels with a share of 37.9%, and the smallest share is composed of those having associate degrees, academic degrees, master's degrees and doctorates with 9.5%.

	Structure of the total workforce according to their professional qualification (%)	Activity rate by education level	Employment rate by education level	Unemployment rate by education level
Primary school and lower levels	16.5%	18.6%	15.2%	18.25%
Secondary school and specialization	67.7%	54.8%	42.6%	22.3%
Associate degrees, academic degrees, master's degrees and doctorates	15.8%	71.1%	60.1%	15.4%

*Table No. 1: labour market parameters according to the education level
(source: Bosnia and Herzegovina's Labour Force Survey 2017, DEP calculations)*

In numerous education debates in Bosnia and Herzegovina, the view is that the principal limiting factors for increasing the quality of education are the availability of financial resources and low investment in the education sector. Apart from introducing IT, virtually nothing else has been changed. The education reform itself, viewed from any aspect, actually implies a content

reform that encompasses all parts of the education system, programmes and resources. Therefore, the question arises as to whether the financial resources are really too low or the problem lies in their distribution. In this regard, Table 2 brings forth an overview of investments and the budget by individual users, including the Central Bosnia Canton.

Ordinal number	The name of the beneficiary	Appropriations (in millions)	Year
1.	Federal Ministry of Education (employee salaries and compensations, expenditures for materials, consumables and services, current transfers and other expenses)	4.52	2018
2.	Ministry of Education and Culture (employee salaries and compensations, total expenditures, primary and secondary schools, University of Banja Luka, University of East Sarajevo)	178.16	2017
3.	Sarajevo Canton; Ministry of Education, Science and Youth (current expenditures, current transfers, capital transfers (alongside higher education), pre-school and primary education, secondary education)	127.79	2018
4.	Zenica-Doboj Canton; Ministry of Education, Science, Culture and Sports (current expenditures, current transfers, capital transfers, grants, primary, secondary and higher education)	70.27	2018
5.	Una-Sana Canton; Ministry of Education, Science, Culture and Sports (current expenditures, current transfers, capital transfers, grants, primary, secondary and higher education)	53.37	2018
6.	Herzegovina-Neretva Canton; Ministry of Education, Science, Culture and Sports (current expenditures, current transfers, capital transfers, grants, primary, secondary and higher education)	40.54	2018
7.	Bosnian-Podrinje Canton; Ministry of Education, Youth, Science, Culture and Sports (current expenditures, primary and secondary schools)	5.76	2018
8.	Canton 10 - Livno; Ministry of Science, Education, Culture and Sports (current expenditures, current transfers, capital transfers, primary and secondary education)	14.24	2018
9.	Posavina Canton; Ministry of Science, Education, Culture and Sports (current expenditures, current transfers, capital transfers, grants, pre-school, primary, secondary and higher education)	6.96	2018
10.	Central Bosnia Canton; Ministry of Education, Science, Culture and Sports (current expenditures, current transfers, capital transfers, primary and secondary education)	43.37	2018
11.	West Herzegovina Canton; Ministry of Education, Science, Culture and Sports (current expenditures, current transfers, capital transfers, primary and secondary education)	17.81	2018
12.	Tuzla canton; from 2018, Ministry of Education and Science, former Ministry of Education, Science, Culture and Sports (current expenditures, current transfers, capital transfers, grants, preschool, primary, secondary and higher education)	86.97	2018

Table 2: Budget allocation overview

In 2009, total expenditures for education in BiH amounted to about 1,200 million KM.

The indicator pointing at the adequacy of total allocations for education is the share of total education costs in the GDP of the country. In 2009, this share accounted for 4.5% in BiH, while this indicator for the region of Central Europe and Asia (ECA) was (on average) 4.2%. In 2009, Croatia's total public expenditure for education amounted to 4.3% of the GDP, for Slovenia, it was 5.7% and for Serbia 5.0%. Thus, according to this indicator, BiH allocates approximately the same amount for education as other countries in the region.

In addition to these indicators, the problem of (in) equality in education represents the next factor responsible for this situation in both the canton and the country. World Bank experts have provided a set of recommendations that would result in a reduction of education costs, but, above all, they would increase the efficiency of spending the available funds and create investment funds for those educational factors that can lead to an increase in the quality of education. Some of these recommendations are as follows:

- limit further salary increases and create a space for increasing other items and capital investment in education,
- change the salary structure to attract and retain the highest quality teachers. For example, salaries in education are not dependent upon the achievements accomplished by students of individual teachers,
- reallocate expenditure for salaries and other items for primary and secondary education in order to improve the quality of education,
- introduce school-based funding resting on the number of students (output) rather than on inputs, in line with contemporary trends. The experiences of many countries show that this reform results in increased efficiency, effectiveness and transparency of school funding; this would lead to a reduction in the number of teachers in line with the decrease in the number of students and the increase in the average class size,
- establish an education management information system - information that will enable the measurement of school efficiency and effectiveness, resulting in a more equitable distribution of educational resources, increasing the efficiency

and effectiveness of schools (Education Database, World Bank, data published on the Internet: <http://porodicnamedicina.com/download/Izazovi-Preporuke-Za-Reforme.pdf>).

The IT sector occupies an important place in the economic trends of BiH and the region, and it is identified in all development documents as one of the key sectors of the economy. The IT sector has great potential for investment and has the opportunity to be one of the carriers of the economic development for the whole country. According to the official classification of activities, information and communication technologies are classified among those whose structure, breadth and significance exceed the borders of BiH. According to the study on the development of the IT sector in the Sarajevo Canton from 2017, representatives of the private sector (IT companies) agreed that the systemic support was missing up until the present moment, and that there was no significant progress in the implementation of the strategic development plans for the IT sector at the level of BiH (which were developed and adopted in 2004). (The Study on the Development of the IT Sector in the Sarajevo Canton, 2017).

Soros (1999) indicates that, in an open society, people have different freedoms as well as the freedom of their own choice, although they do not necessarily have to know what they want. In circumstances where the influence of tradition is lost even in conditions of rapid change, people are subject to different suggestions. The ability of the country to ensure the well-being of its citizens is diminished by the capital's ability to avoid taxation and, consequently, unfavourable employment conditions for the workforce. It is very difficult to analyse the global economic system that does not have a global political system as its counterpart (Soros, 1999). According to the World Bank data, in all countries, education is seen as the means of increasing the country's economic strength (World Bank, 1990), while Reich (1991) considers it as the means to facilitate access to new technologies and to increase international competitiveness.

Conclusion

The characteristic of modern society in recent years is the exchange of knowledge and information through information technologies, which we have

written about in this paper. Information technologies offer tools for the production, creation, collection, organization, use and storage of information and knowledge. Referring to the interaction of economics, information technology and education, the European Employment Strategy has determined and supported the placement of education at the very top of the economic policy priorities, and thus the development of the education economy, through the development of the IT sector, would be logical. Ideas and knowledge should achieve economic progress in BiH alongside the natural resources and under the globalisation conditions, as well as technical and technological progress. Using this advancement with the investments in improving education systems, equipment and human resources, it is possible to achieve faster, better and more secure development of the economy. It is precisely the development of information technologies that would support products, services and the industry to attain stable economic growth, as well as the integration of Bosnia and Herzegovina into the European Union and the global economic processes. To summarize, the most profitable investments, considering education in general, are the investments in elementary education for the duration of 4 to 6 years, regardless of the economic development of the country and the social context.

Furthermore, secondary education has gained importance due to the technological development of certain sectors of the economy and the growing importance of higher education for the national economy. The economic benefit of higher education depends on the economic development of the country and the extent of the population enrolled in higher education (Pastuović, 1999). The school must change in order to better meet the new needs, and change can be innovation or may have a reformative character. For the success of the so-called innovations (innovations can be the result of the teachers' creativity and school leadership, while reform policies are initiated by the government), external support is important (Louis, Miles, 1990). Looking at all that has been said, we can conclude that any economic policy, investment in the education sector, as well as the development of IT, would not make IT development possible without the cooperation of all factors of society, starting with the students, all the way to the governments and those responsible for the reallocation of budgets and investments in the economic development of a country.

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Ekonomija ulaganja u obrazovni sektor kroz razvoj IT sektora

SAŽETAK

Obrazovni sektor stavljen je u vrh prioriteta svih ekonomskih politika obrazovanja u svijetu i kao takav smatra se neizostavnim elementom kada su u pitanju bilo kakve inovacije, unaprijeđenja ali i reforme. Posljednjih godina, ekspanzijom nauke, tehnologije i drugih grana nauka, došlo je do modernizacije obrazovanja, odnosno obrazovnih sistema, uvođenjem IT-a. Bitno pitanje koje se nametalo neposredno prije same modernizacije jeste isplativost ovakvih poduhvata i njihova svrha. Samim time provele su se brojne studije čija je svrha bila da se provjeri koliko je učinkovito i neophodno uvođenje informacionih tehnologija u nastavu. Razvoj IT-a posljednjih dvadesetak godina omogućio je, ne samo razvoj nove grane nauke, nego i razvoj svih drugih segmenata društva pa i obrazovanja a što je i predmet ovog rada. Razvoj IT sektora isplativ je u svakom pogledu a ekonomija ulaganja u obrazovanje pratila je i razvoj IT-a spojivši ova dva elementa u jednu funkcionalnu, isplativu i nadasve korisnu cjelinu.

Ključne riječi: ekonomija, obrazovanje, informacione tehnologije, ulaganje

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