

Characteristics of the Information Society: Implications for Education System

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Received 18 September 2018 ▪ Revised 23 December 2018 ▪ Accepted 28 December 2018

Abstract

Implications of the main features of information society for education system are discussed in this article. Information (knowledge) society is a society based on the implementation of information and communication technologies in all areas of society, in which knowledge is a worthy product. It is also a society that imposes new ways of social organizing, with the capacity to set new roles to different systems, as well as redefining and objective evaluating of different types of resources, including human and other resources. Connections and mutual dependence between the main characteristics of information society and education inside information society are very complex. Education system potentially can become the key factor of social and economic development, today and in the future. One of the main preconditions for achieving of this role of education in the actual and future society is the broad and strategically well-designed process of implementation of information technologies in the process of education and teaching. This process can be more effective and successful if the state agencies take over responsibilities for its realization.

Keywords: information society, knowledge society, education system, IT in education.

1. Introduction

The beginning of the 21st century is followed by the rapid development and implementation of information technologies (IT), i.e. information and communication technologies (ICT), in all segments of society and economy, and on the other hand by the rapid progress of globalist tendencies that create a new social reality. These tendencies surely have a complex impact on contemporary education. On this basis, the question arises, whether changes in education will take place in a planned, organized and systematic way, with a clear vision of the future, or will this take place in a kind of free process. In addition to the aforementioned global challenges, educational systems are also confronted with structural reorganization due to the essential changes that taking place in the social systems, due to the phenomena of political and economic crises, with an additional and very serious problem of the chronic lack of financial resources for the implementation of planned reforms. One of the key roles of education experts is that they basically do not bear the primary responsibility to address the common educational challenges of today's world. Therefore, their primary theoretical and research activities consist in designing concepts for sustainable development and modernizing of education, starting from real social and economic potentials of education in modern society.

The environment in which today society and economy exist and develop can be characterized as rapidly changing, which is a global context that carries with it a certain level of uncertainty in society, and it is particularly relevant to the characteristics of economy and business. The most important change that the world encounters in society is globalization – the creation of a unique economic, political and cultural space in the world (Jarvis, 2000; Drori, 2007). We are witnessing an accelerated emergence of an integrated world market where people, goods and capital are freely circulating, and whose connective tissue is a fast flow of information and using of information and communication technologies.

One of the significant changes that also shapes the world is the rise of the world's population. There is an important problem with the understanding and management of changes that take place according to an exponential law like this. Difficulties arise because the effects of change are difficult to notice for a long time, and then they suddenly appear and bring about different kinds of challenges which needs to be resolved. Based on the presence of this type of challenges, it would be necessary to establish the long-term capacities to monitor and understand such complex changes that implies different types of consequences in society and economy.

In addition, also an exceptionally significant change relates to the phenomenon of increasing the scale of knowledge in the modern world. This phenomenon implies different types of consequences, both positive and negative, when it comes to the further development of society, economy, and the way of life in the modern world. As a result of the increased number of innovations and shorter cycles of knowledge development, there is a simultaneous consequence of the fact that certain knowledge becomes more obsolete and replaced with new more usable knowledge.

When it comes to the functioning of education system in the modern world, which is defined as information society or knowledge society, education professionals and experts for studying of education are facing a permanent challenge of improving and modernizing existing educational practices. Historically, this type of challenges and needs have always existed. Throughout history, in any society that had a stronger intention of its own development, this type of intention was expressed through the need to improve effectiveness of education practice. Sometimes the spirit of time is conditioned by radical social changes and the rapid development of science and technology. Then, for certain generations, a great responsibility for the fundamental re-evaluation of the existing education system' structure is imposed.

It is undoubtedly that the need for introducing information technology into education system and educational practice is increasingly being imposed, precisely because of the key improvements in the educational practice that can be achieved by using IT in the field of education (Office of Information Technology, 2017). However, in spite of the undoubted advantages that for the realization of education process arises from the implementation of IT, in the practice of formal education there is still a persistent tendency of domination and wider presence of classical methods of education, teaching and learning. In addition, it is evident that a large number of students at home use the Internet and educational multimedia for learning and homework assignments, as well as other types of obligations arising from the realization of school programs. Using these educational materials, students, without professional help and guidance, often come up with information that by their actuality goes beyond the knowledge of their teachers in this area. Based on this fact, the exceptional educational potential of the Internet and educational multimedia can be seen. The question arises whether the time has come to begin seriously and without delay to work on the systematic introduction (implementation) of information technology into the mainstream of educational practice, in addition to the obvious fact that the potentials of information technology are rapidly increasing year after year, while the losses and consequences of ignoring these trends are growing. The lag in this sense will in reality be difficult to compensate in the future. Nevertheless, the implementation of information technology in education is still viewed primarily as an easy, interesting alternative form of transferring and acquiring knowledge.

2. Education for knowledge society

The strong expansion and accelerated development of the information technology over the past 40 years has caused major economic, social, political and cultural changes globally. The industrial society of the 19th and 20th century gradually but continuously gave way to a new form of socio-economic organization known as information (or post-industrial) society. The socio-economic changes are radical, lasting, and irreversible. The new socio-economic, political and cultural reality necessarily implies different types of consequences in all areas of social life, and therefore in all areas and at all levels of institutional education. The features of education system in the information society, bearing in mind the complexity of new challenges and the potential of the newly created opportunities brought by postindustrial societies, require an extremely extensive multidisciplinary scientific analysis (Tondeur, Van Braak, & Valcke, 2006). Building an education system in the information society presents an extremely complex and time-consuming process, and it is important that in today's designing education for the future, the course of its development should be placed on stable foundations.

In order to be a competitive and knowledge based, the economies of each country must become better in creating knowledge through research and development, in the distribution of knowledge by education, and in the application of knowledge through innovation. This is imposed as one of the key conditions for the development of society and economy at the present time, and therefore as one of the basic characteristics of the information society, that is the knowledge society. In order to keep pace with modern trends, which is of key importance for economic development, society must have a large percentage of highly educated population, and large state investment in education, science and research. Also, as the imperative of modern society, there is a need to encourage and create conditions for lifelong learning, among other things, through the formation of a quality and accessible information and communication infrastructure (Pelgrum, 2001), which should be directly a platform for broad and easy access to information. For the aforementioned reasons, education has a central social role in the knowledge society, and the education system is its key institution (Drucker, 2001).

The building and development of a information society, a society of educated, flexible and creative people, with the ability to learn, to learn throughout their lives and to participate in a creative and productive way in economy, is a task that depends to a large extent on the capacities of education system. It is estimated that in the coming decades almost half of new jobs in the European Union will require education at tertiary level, slightly less than 40% of jobs will require secondary education, and only about 15% of jobs can be done with education at the level of elementary education (Salmi, 2003).

What role in the development of a modern society can really have so-called educated elite? Despite the importance of this segment of population, the information society cannot be sustained and developed in functional ways only through the creation of an educated elite, as a kind of isolated part of population. Knowledge must permeate most of the society, so each individual must be able to use his/her knowledge, to improve it, to select what is relevant in a given context, and to understand what has been learned. All of this is a key precondition for adapting to the demands of rapid changes in the environment in which an individual lives and works. Knowledge is becoming more and more pronounced to represent a strategic social and economic resource, the only natural resource that society can build and improve (Jarvis, 2000). Countries that invest more in education and training have significant social and economic benefits – a higher level of GDP and thus a better quality of life. This is also one of the main reasons why education must be treated as very important developmental resource in society and economy.

The modern world is becoming more and more rich in information that we receive through a variety of media, and through various types of sources of knowledge and information. Today, knowledge means not only knowledge of facts, but also various types of abilities and skills

to use this knowledge immediately to solve specific problems (Liyoshi & Vijay Kumar, 2008). Therefore, the aim of education today is not only the acquisition of static knowledge and knowledge on the level of facts, but also the development of different skills to apply it immediately to solve any particular problem in the professional or everyday life of an individual. There is a need for each individual to form the capacity to process information in order to gain any benefit from the knowledge and information he/she possesses. In this context, it is very important to develop the activities of connecting information and creating knowledge from information, as well as functional facing with contradictory information and data, on which problem solving and decision-making should be based.

The information (knowledge) society is not only a society based on the implementation of information and communication technologies in which knowledge is a worthy product, but also a society that imposes new ways of its organizing, with the capacity to set new roles to different systems (one of such systems appears as education system), as well as redefining and objective evaluating of different types of resources, including human and other resources, which are an integral part of society and economy. Based on the aforementioned, education plays a vital role in the development of a knowledge-based society and economy and a new aim is to educate throughout life, because a knowledge-based society is at the same time a society of permanent and lifelong learning (OECD, 2000; Jarvis, 2000). It is a request to each education system, as one of the basic aims, that each individual should be enabled to use his/her knowledge, to improve it, to choose what is relevant in a given context, to understand what has been learned so that he/her can use knowledge to solve problems within the working and social environment, which are changing rapidly.

3. Information technology and education

Teaching practice in technologically highly developed countries suggests that using high quality educational software in classrooms, where each student has access to a computer, and with the leadership of teachers who know well their subject and methodology of education using information technology, enables to achieve a very high performance in the teaching process. In addition, frontal, individual and group forms of work can also be used. It is also possible to achieve significant results in the process of presenting new educational content, both in the process of expanding and correlating already acquired knowledge, and in the whole process of managing the teaching and learning process.

One of the priorities that is imposed is to enable the appropriate use of information technology. In this regard, it is necessary to satisfy some of the basic preconditions, such as: (1) technological equipping of educational institutions; (2) designing and production of educational software; and (3) training of professionals in education for the implementation of IT in education and teaching.

The building of the appropriate technical infrastructure implies providing a sufficient number of computers that could be used by students and their teachers, providing unrestricted access to the Internet available to all interested students within educational institutions, and providing technical precondition so that each educational institution can form a kind of its own educational database (American School and University, 2011). This would allow the elementary and basic presence of the information technology in education.

An important precondition for successful implementation of the IT in education is development of educational software. A significant part of the multimedia presentations for education, science and culture shows was produced with unsatisfactory quality of design and production, which primarily concerns pedagogical and didactic value of the materials (Dogruer, Eyyam & Menevis, 2011). The problem is based on the lack of necessary connectivity and

cooperation between educational institutions, education professionals (teachers and administrators), and companies involved in the design and production of educational software. Also, it would be helpful to make efforts in terms of animating entrepreneurs and software companies to invest their capital in the development of educational software. Establishing of market principles and relationships is an adequate way to improve situation in the field of educational software. Potential consumers of educational software are not just students, but also a wider audience that wants to strengthen their knowledge in certain areas.

An important precondition is also the provision of well-educated teaching staff trained through their initial education for the professional implementation of information technology (Tondeur, Van Braak & Valcke, 2006; Internet Society, 2017). There is a clear need for the systematic professional training of existing teaching staff, as well as the introduction of IT education within initial education of teachers, so that every future teacher will undergo professional training in IT implementation for the realization of the contents of his course, thus providing trained teaching staff, ready to implement contemporary teaching using modern teaching technologies.

4. Sharing responsibilities in the process of implementing IT in education

It can be assumed that the greatest burden of the successful IT implementation in education should be paid by the state budget and state educational institutions. However, the inevitable role in this process also certainly belongs to the private sector, which in particular refers to encouraging entrepreneurs to invest in the design and production of educational software. Since the largest number of educational institutions is state-owned, it can be expected that the state administration, to the greatest extent, will organize and financially stimulate and implement the IT in education and teaching. Naturally, in order to stimulate private entrepreneurs to participate in this process in an appropriate manner, it is necessary to find business justification (Fox, 2011), i.e. financial interest in improving and modernizing education, which contains high potential for the consumers, especially taking into account the number of educational institutions and the number of students in them. The consumption potential of education can be activated only if the necessary education reforms are carried out, that include the implementation of IT in education and teaching. Nevertheless, there are certain dilemmas regarding the interests of private sector in building of a serious strategy for investment in the area of education, bearing in mind the emergence of elements of instability which is characteristic for the market economy.

What preconditions are necessary for the successful implementation of IT in education and teaching? In this sense, one of the key preconditions is the establishment of quality communication and coordination between all interested institutions and the others interested in this process. The fact is that no one school individually and separately, nor any private enterprise, can achieve a significant progress in the implementation of IT in education by individual enterprises. The success of such individual projects is usually of a low level of effectiveness, and because of its isolation, there is no wider social significance nor the potential of achieving a wider social interest. The implementation of IT in education is a complex process which requires the long-term systematic professional operation of professional teams to develop the strategy and methodology of introducing IT into education and teaching (Tondeur, Van Braak & Valcke, 2006; Internet Society, 2017). In this sense, it is necessary to anticipate and overcome certain potential and real problems that would arise during the realization of such a broad and complex process, and it can be assumed that the capacity for this can only possess a well-organized and trained state administration. Based on this assumption, it is obvious that it is not possible to make significant progress in this area without the direct involvement of state institutions responsible for the development of education and science, based on the simple fact that they are responsible for the successful functioning of education system in whole.

For the successful implementation of this complex and long-term process, it is necessary for the state administration to transfer some of its jurisdictions to other institutions and organizations that participate in the implementation of IT in education. One of the possible solutions is the formation of special committees in which participate all the institutions and organizations that are interested to participate directly in the implementation of IT in education. In addition, these committees would take over part of state activities, which would enable continuous communication, harmonization of concepts, harmonization of interests, exchange of experiences and coordination among participants. These committees would be responsible for a variety of activities, such as: (1) establishing standards that would relate to hardware and software solutions that would be used in the IT implementation; (2) issuing of certificates for the particular individual educational multimedia programs to confirm that their quality meets certain standards for teaching use; (3) standardization of the teaching staff training process for the implementation of IT in teaching; (4) monitoring and evaluation of the IT implementation, etc.

5. Conclusion

There are necessary prerequisites that need to be realized as a basis for the successful implementation of information technology in education, within the education system. In order to realize an efficient implementation of information technology in the educational process, a well-designed developmental strategy is needed which will be based on cooperation and partnership relations between different state institutions, entrepreneurs, education experts and educational institutions. In order to achieve this, it is necessary that each of the partners, participants in this process, find their own interest and motivation for their own participation in this complex process. This is also one of the key preconditions for a successful implementation of the IT in education, which in turn means that the preconditions are created for the education system to become one of the key factors in the further development of the information society and its economy.

Acknowledgements

This work is a result of the project “Models of evaluation and strategies of improvement education quality in Serbia” (No. 179060, 2011-2018), financially supported by Ministry of Education, Science and Technological Development, Republic of Serbia.

The author declares no competing interests.

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