

# EDUCATION REALITY IN CONDITIONS OF DEVELOPING INFORMATION SOCIETY

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## Abstract

*Contemporary society is witnessing changes and processes triggered by the groundbreaking development of humankind's technical capacity, especially in the area of informational and communication technologies (ICT). In this new society, learning and a continual educational process constitute basic preconditions for the success of individuals as well as for the entire society. In this context, information literacy is becoming increasingly important. Informational literacy is generally understood as the ability to use information sources and communication technologies in order to solve problems in one's everyday activities, or to increase one's labour efficiency or the quality of life, respectively.*

*The Faculty of Education at Charles University in Prague is currently dealing with a research project entitled "Changes in education reality in conditions of developing information society". The research focused on five thematic fields: Education reality, the dynamics and connections to the spheres of knowledge and the ICT; curricular and procedural aspects of changes in context of the integration of the ICT into schools and of the training for life in the knowledge society; information and communication technology as the component of educative environment of the knowledge society; models of the support of learning and instruction via the ICT and their evaluation; preparing the teachers for educational tasks in the knowledge society and the integration of ICT into education.*

*Teacher-training colleges should consistently and purposefully prepare would-be teachers for education that encourages functional literacy, or for the implementation of a broadly defined information-based education that transcends the constraints of a specialized subject. These are the most relevant focus areas: gathering, analysing and organizing information; disseminating ideas and information, and understanding an entire complex interconnecting system; planning and organizing one's work activities; adopting teamwork and cooperation; using systemic procedures, terminology and methodology; developing the ability of logical reasoning and strategies aimed at dealing with problems; being able to use technical equipment; cultivating a spirit of solidarity and cooperation among students; using active learning methods; providing quick feedback and testing one's knowledge by means of ICT; emphasizing the deadline by which the assigned problem task has to be solved; taking into consideration the diversified talents of individual students and various ways of teaching.*

*This paper deals, in general, with the consequences of deep impact of the new information and communication technology on the society and describes its characteristic features and contributions for education. It also offers the characteristics subject of the one of meaning longitudinal research orientation of Faculty of Education of Charles University in Prague.*

**Keywords:** *education in science, information and communication technologies, information literacy.*

## Introduction

The general concept that forms the orientation of one of the meaning longitudinal research orientation of Faculty of Education of Charles University in Prague or the need for understanding the changes of education reality in the context of the development of information society, the effort to improve the

quality of educative activities and widen the possibilities through effective use of the educative potential of the information and communication technology (ICT) and implementation of innovative methods based on constructive approaches and the necessity of further development of information education at schools and in the teachers training, is still actual concept of Information Society (Bell, 1980).

The dramatic development and penetration of the ITC and information into the society is also a foundation attribute of the emerging information society, where information and knowledge through information and communication technologies are very much utilized to support an economic, social, cultural and political development. New economic priorities are created restructuralisation and diversification of the production and non-production structures of the society are under progress, leading to the changes in the qualifications structure to the growth of importance of education.

Together with the growing penetration of the contents, systems, and services into the educative practice the demands for adequate theoretical reflection of new pedagogic situations in which the participants of the learning process are found, arise. The current models and approaches towards the theory of instruction and learning should be modified and complemented with such elements that the new and dynamically developing technology enables to be effectively exploited. This implies the research of the aspects that are decisive in the successful integration of technology into education in the information society, and the characteristics and functions of education environment, in which the technology helps with learning and significantly support the educative processes both in the education institutions and outside of them aiming at offering wider theoretical framework for education in the information society.

### **Changes in Education Reality in the Information Society**

In the field of obtaining qualification and education the development of information society implies in general a shift in the qualification and education structure from a uniform standard to such a kind of qualification that enables individual activities with growing share of information processing. There is a demand for wider knowledge, communication and cooperation skills, and also the ability of adaptation. Education and lifetime learning is growing in importance having an effect on the quality of life and career of individuals and the whole society. From the perspective of accessibility of the technologies and the ability of exploiting the educative potential in the framework of lifetime learning, the society may become more differentiated into groups of successful individuals with the access to information and modern information and communication technology, and those unsatisfactorily educated and unsuccessful. This applies to individual people, regions, states, and nations. The danger of widening this negative and social process called “digital divide” mobilizes the activities of developed nations from the platform of accessibility of citizens to technology and improving their information, or ICT literacy (Prensky, 2001).

The problems of conditions and tasks of information society in relation to education and relevant changes in education environment with respect to their extreme importance and effects got into focus of state authorities, education, and wider public in developed countries and they also attract attention of scientific bodies. These countries understand that neglecting widely spread and topical education for life in information society, where the relevant research is a necessary precondition, may cause lagging in essential directions of development of the whole society. Still increasing amounts of direct and indirect fund are dedicated towards the support of research and development in this field. The predicted significant changes in economy and consequent social impacts cause awareness not only among the scientific public, but also in the sphere of politics. Creating the information society is considered a priority and has strategic importance for the whole society and is, therefore, incorporated into various government programmes of all developed countries. Also many governmental, inter-governmental, and non-governmental institutions pay special attention to this field (OECD, 2007; UNESCO, 2007; Document EU SEC 2001 rep. 236, 2002). In general it is valid, as mentioned in the introduction that one of the key educational strategies of the EU declared both in the transnational and national documents is the integration of the of information and communication technologies into education into all schools and into the system of lifetime education with the stressed topic such as key competences, information literacy, functional literacy, e-learning, blended learning, virtual university, virtual education platform, collaborative environment, learning (course) management

systems (LMS, CMS), learning objects repositories (LOR), etc.

From the curricular aspect, the research activities are dealing with the concept and links of elements of the contents and generally, and also in detail, with the elements of ICT literacy (Educational Testing Service, 2002) and relevant key competences and their integration into the system of education (EURYDICE, 2002). Among the more topical tasks of the investigation in the given field, there is the standardization of the formats of instruction contents, shared educative objects in the European and world systems of storage, unification of search engines of the instruction contents, unification of the notations of models of educative processes, curricular maps, semantic nets for analysis of educative contents, etc. (UNESCO, 2004)

The current directive style of education based on the one way communication from teachers to students and supporting the passive acceptance of facts is confronted with the possibilities of information and communication technology and, therefore, also becomes the point of focus of the scientific research as well as the contents and systems. The learning by doing and collaborative learning are understood as one of the most effective ways of gaining knowledge, while the ICT offer interactive environment with tools for the interaction with the educative contents, for visualization of information and for cooperation and communication. Psychology also supports the need for widening the autonomy of students in learning, need for the shift from directive style of management of the learning processes to auto regulation and auto construction. Education science highlights the need for educative dialogues and the necessity of wider application of methods based on actuation and cooperation, the methods that enable the students to create their knowledge through a range of activities and cooperation instead of passive acceptance, and to improve the communication skills, become keen on learning through lifetime. There is a noticeable shift from the deterministic, behavioural, models of directive oriented education towards the cognitive, constructive models based on heuristic, collaborative or cooperative learning. It also stresses the reflectivity of instruction and the work of teachers and the need to adopt such instruction methods that respect the individual qualities and individual needs of students.

The necessity for innovating and changing the education environment with the use of the educative potential of technologies has been stressed by many world renown authors (Majumdar, 2004), models of the ICT development of schools have been designed on the basis of the theory of learning respecting various stages of implementation of the ICT into school environment (UNESCO, 2005). Investigating the aspects of the modern concept of the environment on the ICT basis that suits the needs of school and lifetime education is becoming a subject of scientific research in all developed countries (Australian Council of Deans of Education, 2004).

Special attention is paid to the field of virtual educative collaborative environments that, in connection to the rapid development in the sphere of educative use of the Internet and e-learning as a specific platform of learning in information society, becomes an important factor of the education system. A signs of changes into a new stage are identified. This new stage is often called as a new generation of e-learning. It is characterized by a shift in prevailing ways of transmitting the information during the instruction and by the possibility to edit the data saved on the Web without any specific knowledge. The traditional means of synchronous and asynchronous communication are replaced by new tools implemented via so-called social networks (wiki, blog, podcasting, etc.) (Dowes, 2005). On the basis of services using these possibilities, there are new virtual communities of people being created on the platforms of common interest, and there are interactions with the intentions of transferring knowledge, and, thus, learning takes place. For the new generation growing within this environment and often called digital (Net Generation) (Papert, 1996) a Computer Mediated Communication (CMC), multimedia, and simultaneous activities in the ICT environment seems completely natural. The style of learning is also changing in favour of the so called learning “at once”, or to learn such things that are needed at the given moment with the preferences of resources that are “on demand” (Laytone, 2000). The trends in changing the ways of learning, or the manner of education are manifested also in the concepts labelled as “learner-centred” or “student-centred” that, using the educative environments created by the ICT, enable the learners to take full control of their process and manner of learning.

The sphere of evaluation is also an important field of research activities. The focus is on the investigating the ways of usage the ICT and how they contribute to achieving the educative goals. For that it is necessary to identify the instruction methods that use the ICT are the most effective and which abilities of teachers are decisive. Later the standards of using the education technology may be

defined and the methodology for their verification can be established on their basis. Many countries are dealing with this field of problems and various transnational projects are focused in this direction, e.g. European Schoolnet P2P (Daniel, 2003).

The relation between education reality and the sphere of ICT within the information society is fairly broad. The development of technology and the changes induced in the society are much more intensive in the penetration of education reality. Many transformation processes are evoked by the penetration in the whole education reality corpus. Many of the education innovations are made possible and by the information and communication technology. The technology offers a possibility to introduce the elements of constructivism into education, to induce learning by doing, implement the project oriented instruction and collaborative attitudes, and to assist with the personal growth of students into active, creative, and auto-regulative people able of self education. Modern information and communication technology may be considered not only as the cause, but also as a solution to the changes mentioned above in the field of education. It is this dual position that calls for the research activities into the changes of the components of education reality in context of the development of the ICT.

### **Subject of the research orientation**

The longitudinal project is dealing with a field of changes or transitions in education reality in conditions of developing information society. The subject of the research activities will be the relation between education and the spheres of ICT from the perspective of changes of components of the education reality in the context of the development in the technologies and it's penetrating into the structures and functions of information society. This field of problems is dealing with the influence of the ICT on the learning processes and instruction at schools within the framework of lifetime education, shifts and tendencies in the educative activities, information education, exploiting the educational potential of the ICT, preparing the teachers for educational tasks in the knowledge society.

The leading idea of the research orientation is the widely backed statement that within the information society, besides handling and using the information or knowledge derived from electronic resources and the ICT skills as such, the cultivation and education are becoming essential. The education culture, the ability to learn, and motivation for continuous high quality cultivation of an individual is appearing as a necessary pre-condition for good quality of life of successful individuals and, thus, of the whole society. Moreover, it has also become one of the basic foundations of the Information Society.

The changes of the educational reality induced by the development of the ICT and its penetration into the structures and functions of the society shall be investigated from the point of view of the pedagogical science. It adopts the thesis that the changes of educational reality in the knowledge based society are reflected in all educational dimensions, structures of educational needs, contents of instruction, the actual system and functional order of educational environment, in the learning processes and activities of the participants in instruction, in the strategies of learning as the basis for lifetime education, in the education and in-service training of teachers. It also comes out from the thesis that the educative potential of the information and communication technology grows in importance not only from the process point of view, but also from the curricular and systemic one and it opens new possibilities for education in the society. Their sensible and fruitful exploitation deserves changes in the standard approaches to education not only in the sphere of using the ICT as mere tools for the support of certain activities of students and teachers, but the changes must be of complex and radical nature in the traditional approach to instruction and to the educational environment in the concepts of instruction, methodologies and concepts of the educational contents reflecting the rapid development of modern society.

Thematic orientation of the research project may be considered as topical from the context of the declarations in national and international documents and programmes dealing with the development of information society and the role of education within it. The need for the research in the given direction is stressed by the speed and scale of the changes in the society that are connected to the development of the ICT penetrating strongly the spheres of culture, education, behaviour of people and their educative needs. Pinpointing the basic characteristics and identification of the tendencies in the relations between components of education reality and the ICT is the necessary precondition

for efficient and rational influencing of the school and outside school education as well as full exploitation of the educative potential of information and communication technology. The integration of the information and communication technology into the contents and processes of education at all schools and within the systems of lifetime education is seen as one of the key priorities of educative strategies of developed countries, including the EU, and understood as an important factor for their further development. Increasing the use of information and communication technology in education, mainly in the context of the concepts of so called e-learning, or various kinds of e-learning, on-line and blended e-learning in form of virtual learning environments for the support of presentation and distance education currently rises the growing need for their scientific and investigative reflection.

The aim of the research is to contribute to the development of educative science and methodologies of various subjects chiefly by means of offering the scientific evidence of the changes in the reality of education or its key components in the context of world development and European integration by identification of key signs, factors, and processes of this dynamically developing field, to draw prognosis of these changes and to contribute towards the increase of quality and effectiveness of education by means of elaboration, experimental implementation and verification of the new educative and evaluation models and powerful didactical processes and steps that reflect the possibilities and meet the demands of the knowledge society.

The subject of the research activities realized within the project will generally be the relation between education and the spheres of information and communication technology from the perspective of the technologies, or the development in the information society that induced changes of components of the education reality. This generally stated subject of the research orientation is specified in more detail by the five fields of problems.

#### *Education reality, the dynamics and connections to the spheres of knowledge and the ICT*

This field is reaching the identification, analysis, and description of tendencies of development and directions of transformation of the components of education reality in the knowledge society.

#### *Curricular and procedural aspects of changes in context of the integration of the ICT into schools and of the training for life in the knowledge society*

This field is dealing with the description of the genesis and curricular modelling from the perspective of integration of the ICT and information or ICT literacy, elaborating the elements of information education and relevant key competences.

#### *Information and communication technology as the component of educative environment of the knowledge society*

This field is dealing with the notion and development of the educative environment in relation to the ICT, elaboration of the characteristics of the educational environment using the systems interconnecting the participants of the learning process with the resources of information, supporting the co-operative aspects of education.

#### *Models of the support of learning and instruction via the ICT and their evaluation*

This field is dealing with the determination of innovative models of effective support of instruction and learning exploiting the educational potential of the information and communication potential and verifies the system of criteria of evaluating the teaching methods with the use of the ICT applied into school practice including the steps of its efficient use.

#### *Preparing the teachers for educational tasks in the knowledge society and the integration of ICT into education*

This field deals with the tendencies of development in the concepts, contents, methods, means,

and organization of the training of teachers in the situation of changes in the education reality induced by the development of the ICT and its implementation into the systems of training of teachers.

## Conclusion

To sum up it may be stated that the relation between education reality and the sphere of ICT within the information society is fairly broad. The development of technology and the changes induced in the society are much more intensive in the penetration of education reality. Many transformation processes are evoked by the penetration in the whole education reality corpus. Many of the education innovations are made possible and by the ICT. The technology offers a possibility to introduce the elements of constructivism into education, to induce learning by doing, implement the project oriented instruction and collaborative attitudes, and to assist with the personal growth of students into active, creative, and auto-regulative people able of self education. Modern information and communication technology may be considered not only as the cause, but also as a solution to the changes in the field of education. It is this dual position that calls for the research activities into the changes of the components of education reality in context of the development of the ICT in the purport of idea of research orientation of Faculty of Education of Charles University in Prague.

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