

## SOME CONSIDERATIONS ON THE IMPACT OF THE INTRODUCTION ICT IN THE EDUCATIONAL SYSTEM

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***Abstract:** Approximation, with fast steps, of the Information Society requires adaptation to new technologies to all sectors of activity. In this context, education has a particularly important role in stimulating the transition towards the Information Society, on the one hand, and on the other hand, should consider the orientation of the education system towards this.*

*New information and communication technologies change the perspective on educational practice; their implementation is considered one of the most important problems in at the beginning of this millennium.*

*The paper presents some elements of the actions taken at European and national levels to implement new information technologies in the education system.*

*Impact of implementation of specialized programs and computer-assisted education necessary to improve education in Romania, in the context of integration into European structures, as well as the need to continue reform of the education system is also analyzed in this paper.*

**Keywords:** education, Information Society, e-Learning

**JEL Classification:** I20, I23, I29

### 1. GENERAL FEATURES OF THE INFORMATION SOCIETY

Information Society represents a new phase of human civilization, a new way of life quality education involving intensive use of IT in all spheres of human existence and activity, with a major economic and social impact.

Technological progress in recent decades has allowed the emergence of new services and multimedia applications.

Develop new means of communication and technology of information is an important factor for increased economic competitiveness, opening new perspectives for better organization of labour force and creation of new jobs.

Also, open new perspectives for the modernization of public services, health care, environmental management and new ways of communication between the government and citizens. Also, wide access to education and culture of all social classes, regardless of age or geographic location can be achieved with new technologies.

Major changes in recent years (the exponential growth of mobile communications and Internet users, the contribution of the sector of Information and Communications Technology (ICT) to economic growth and job creation, etc.) supports the transition from the industrial era to "knowledge-based economy."

In terms of integrating new technologies, sociologist Peter Drucker said: "*People that will result from the permutation of values, beliefs, economic and social structures of political systems*

*and concepts, in other words, the concepts of the world, will be different by what could anyone imagine today. In some areas - and especially in society and its structure - the basic transformations have already taken place. The new society is practically a certainty, and is also a certainty that its primary resource will be knowledge* "[“Human resources in the Information Society”, [www.computerworld.ro](http://www.computerworld.ro)]

Construction of the new model of society raises issues such major socio-political - both national and international level- to mitigate the phenomenon of exclusion from the benefits of new technologies for some social categories and regions/geographical areas and social cohesion, to conservation and promotion of specific culture to each nation and local communities, to protection of citizen and consumer.

Information Society is more than progress and applications of information technology and communications, this having the dimensions:

- *social*, which refers to placing the items of the Information Society on health care and social protection, social democracy;
- *education*, which develops competence in design and work in a computerized regime, intelligent management of processes (education and distance education, virtual libraries, e-Teaching, e-Learning);
- *environmental*, with an impact on resource use and environmental protection;
- *cultural*, with impact on the conservation and development of heritage (museums, art galleries on the Internet, digitization of information: books digitized, the digitization of the national and international heritage);
- *economic*, which develops new paradigms of the digital economy and knowledge-based economy (e-Commerce, e-banking, e-Learning, e-Money, e-Trading, business on the Internet etc.).

Model of the Future Society - Information Society - put before the European Union issues of highest priority and urgency: a new regulatory framework, promoting a new culture of entrepreneurship and business, achieving leadership in new technologies, educating and training of the citizens, implementation of new methods in business.

In this context, the European Union, through its political and executive bodies has acted since 1993 through a series of strategic decisions and programs.

Applying digital technologies has become a vital factor in growth and insurance jobs in the new economy. Although Europe is a technological leader in many areas (egg. mobile communications, digital television), in others - particularly in the use of the Internet - is lagging behind compared with the U.S. and Canada.

As a result, the eEurope initiative aims to bring Europe in a position to benefit fully from the advantages of digital economy, to exploit its full technological priorities, and to increase the educational potential and entrepreneurial necessary.

Information Society will have a positive impact on the *Romanian economy* by contributing to the increase in productivity, to eliminate the inequalities, to decrease the unemployment, to increase the educational quality.

The main policies for the computerization of Romanian society as a whole are structured Director Project of Computerization in Romania (DPCR).

Analysis undertaken by The Economist Intelligence Unit for Central and Eastern Europe show that the score awarded many countries in this area of training of the state transition to the Information Society, places them in the second half of the list (Table. 1).

**Table. 1 The hierarchy of countries of Central and Eastern Europe and in Asia in terms of their preparation for the Information Society in 2005 and 2006**

| 2006 rating in region | 2005 rating in region | Country        | Global Location (of 68) | E-readiness score (maximum 10) |
|-----------------------|-----------------------|----------------|-------------------------|--------------------------------|
| 1                     | 1                     | Estonia        | 27                      | 6,71                           |
| 2                     | 2                     | Slovenia       | 28                      | 6,43                           |
| 3                     | 3                     | Czech Republic | 32                      | 6,14                           |
| 4                     | 4                     | Hungary        | 32                      | 6,14                           |
| 5                     | 5                     | Poland         | 34                      | 5,76                           |
| 6                     | 6                     | Slovakia       | 36                      | 5,65                           |
| 7                     | 7                     | Lithuania      | 38                      | 5,45                           |
| 8                     | 8                     | Latvia         | 39                      | 5,30                           |
| 9                     | 9                     | Bulgaria       | 44                      | 4,86                           |
| <b>10</b>             | <b>10</b>             | <b>Romania</b> | <b>49</b>               | <b>4,44</b>                    |
| 11                    | 11                    | Russia         | 52                      | 4,30                           |
| 12                    | 12                    | Ukraine        | 61                      | 3,62                           |
| 13                    | 13                    | Kazakhstan     | 64                      | 3,22                           |
| 14                    | 14                    | Azerbaijan     | 68                      | 2,92                           |

*Source: The Economist Intelligence Unit, Report 2007*

Information Society can be characterized by means of indicators such as number of personal computers (PC) in 1000 inhabitants, or the number of Internet users per 1000 inhabitants. In Romania, the use of ICT products in recent years has seen a dynamic increase, so in 2006, the number of Internet users per 1000 inhabitants was over 300 and was about 12 percentage points higher in 2005.

During January-November 2007, all seafarers on the Internet in Romania has increased by about two million people from the first eight months, to seven million users, respective 31.4% of the total population, estimated at 22.27 million inhabitants according to InternetWorldStats data.

The rate of use of the Internet has increased at the end of November 2007 was 7.5 percentage points over the interval from January to August.

After the first part of last year Romania was on the last place in the EU, compared to the rate of Internet penetration, on the end of November, Romania climbed two seats, before Poland, ranked last, with a rate of 29.6% and Bulgaria with 30%, and is coming to Malta, where the level is 31.7%

## **2. EDUCATION IN THE INFORMATION SOCIETY**

New information and communication technologies change the perspective on educational practice, their implementation being considered one of the most important issues at this end of century, built at the rank of national politics.

Since 1986, in the International Colloquium at Stanford, dedicated to science and education issues, distinguish the major responsibilities for education to avoid the remaining ago of the developing to highly industrialized. The first suggestion advanced as a result of analysis the accumulated experience is that should be given absolute priority for all research problems related to introduce the computer in education, emphasis being put on teacher training and recycling.

In the "Declaration" of the Colloquium at Stanford is shown that the essential element between education and new information technologies is that the citizens must be trained to live in an Information Society.

The most durable and most effective innovations are those which the beneficiary has assimilated, meaning it has adopted for its meet the specific needs [Huberman, AM "How to produce changes in education: contribution to the study of innovation", Bucharest, EDP, 1978, p. 11].

Robert McClintock look in the paper "Renewing the Progressive Contract with Posterity: on the Social Construction of Digital Learning Communities" that is necessary to take what happens to the concrete transformation of products of new technologies of information and communication.

Problems of education are changing profoundly, the alternative at the strategies of insufficient and expensive knowledge is finding the ways that allow the beginners to use the unlimited access to culture.

Proximity, with fast steps, by the Information Society requires adaptation to new technologies for all sectors of activity. In this context, education has a particularly important role in stimulating the transition towards the Information Society, on the one hand, and on the other hand, should consider the orientation of the education system towards the Information Society.

The European Commission has started a pioneering action using the new technologies in education some time ago, and the general objectives of European cooperation in this field were reflected in the resolutions of the Council of Europe 1983 on the introduction the new information technologies in education [Decision, 2002, p. 3]. Moreover, recent policies in the European Union have emphasized the role of e-Learning in improving the innovation in education and training [Anon, 2001]. The information technologies and communications which mediate learning are components of education and training. Action plans eEurope2002 and eEurope2005 adopted by the European Councils of Lisbon (2000), Stockholm (2001) and Barcelona (2002), identified e-Learning as a top priority.

The educational system is the main supplier of training. Universities and higher education institutions are key actors in the production and dissemination of knowledge, in social, pedagogical and technological development research, training for tutors and trainers, in continuing professional development. They use more and more e-Learning as a source of added value for their students [Decision, 2002, p. 4].

The impact of technology and communication in society resulted a normal reaction and educational systems, implementing new information technologies being considered as one of the most important issues in late twentieth century and the beginning of the millennium 3. A confirmation is that, in the last decade have been organized at UNESCO a suite of international congress on "Informatisation of education". Reference axis has been a finding that preparing teachers for an Information Society is a key factor of success of the entire process of development of human resources.

In the paper "Training teachers in the European Union and the EFTA/EEA" presented the structure and content of training courses. One of the most consistent themes is the use of information technologies (IT). States need to review the process of training educators and reassessment of priorities in a society whose development, especially technology, known strong acceleration.

It may be said that since the '80 has triggered technological revolution in education. Application of computers was born unprecedented hope for educational future approach. Technological fever was so high that, from the early years of the decade, have been launched government programs in many countries, concerned not lagging behind in this field.

Gradually, most developed countries have introduced computers in schools, starting with the upper levels, then successively higher grades primary and secondary. Even in the absence of incentives from the government, a willingness to adapt IT to the needs of classrooms was so great that many schools have purchased their own initiative from IT. In the Netherlands, almost 50% of schools have acquired IT material to support banks and the local industry, even before the start of the first governmental programs introducing computers in education. It should be noted that without prior training of teachers for the operation of new IT in the teaching/learning, the progress can not be guaranteed.

E-learning is thus a type of education which is done via the Internet. Training solutions based on Internet provide faster results at lower cost, broader access to training and a clear responsibility for all participants in the training. In the current dynamic culture, organizations that implement the Web training give to the employees the opportunity to exploit their advantage in changing. Training via the Internet ensures accountability, accessibility and opportunity. It allows people and organizations to keep pace with the global economy which now growing speed Internet.

Electronic systems can improve training methods and traditional training materials, such as discussions in the classroom, textbooks, CD-ROMs and computer training outside the Internet.

In 1994, Al Gore defined as the creation of lines of information as a central political project of the Clinton administration, which lead to the U.S. addition impulses to existing technological supremacy. A stated goal of U.S. policy was that, since 2010, all citizens age know to use with dexterity the computers, digital communications and digital television.

New information technologies have a profound impact on how the information is obtained, which communicate on their training. New skills that accompany these technologies - technical, intellectual and social - are essential for life, work and active participation in a knowledge society.

The breadth of these skills extends far beyond the "operating a computer" and are part of the "new basic skills", such as languages, entrepreneurial spirit, use of new technologies, and to be acquired through a process of learning throughout life. Firm strategies are needed that can provide qualified labour force in this field and missing not only on the Romanian market, but also at European level. Thus, in 1999, there was a call for 800000 persons qualified in information technology sector, is expected to increase to 1700000 persons. Ability to use information technologies and communication is essential in many sectors, and the priority now is to define them clearly, so that education and training systems to integrate them into their programs.

For improving education in Romania, in the context of Romania to the European structures, as well as the need to continue reform of the education system, the Ministry of Education and Research (MER) has defined the requirements of a program that includes the most important activities necessary in the field of education and computerization computer-assisted.

Thus, pre-university education, the education system computerized - SEI represent the materialization of the strategy MER for computerization of education. This is under the eEurope Action Plan prepared by the European community and being part of the initiative European e-Learning.

Among objectives of this program may be listed:

- equipping all schools in Romania with complete IT solutions for the teaching/learning.

As a result, secondary and high schools are equipped with computerized laboratories where can be teach the official program, and installed software allows activities in schools.

- introduction of technology in education through specific projects intended for educational and administrative purposes such as the computerization of national examinations (admission in colleges, baccalaureate, etc.).

Following the implementation of this program, each high school in Romania are currently receiving at least one computerized educational platform for use in classroom teaching hours of mathematics, biology, physics, chemistry, Romanian, history, etc. Educational Platform system consists of a set of technology, computers, Internet, electronic multimedia educational content, methodology and training of teachers.

Program progress was achieved during the three stages:

i) *phase I (pilot): 2001-2002* included, among others, provision of 120 computer laboratories, educational Software, projects run by administrative support, evaluation of textbooks and electronic auction for the purchase of school textbooks in 2002, creating and Internet information management portal

ii) *phase II of the SEI Program* was conducted in 2003 and included installation and configuration of the 1100 computerized platforms, educational software, multimedia educational content: 80 lessons, 30000 questions to test electronic, training system administrators, improving the over 15000 professor, running projects such as administrative support: ADLIC (Admission to high schools and vocational schools in 2003 and the movement for the teaching staff);

iii) *phase III of the SEI Program* aimed primarily complete computerization of high schools: 290 complete computerized platform, including: computers, servers, printer, scanner, connection equipment, Oracle AEL licenses, education Software, installation and configuration, training teachers, secretaries, system administrators.

Following the implementation of this program, more than 7 million people are directly or indirectly involved-students, teachers, instructors, staff and parents. 2900000 more than 110000 students and teachers have access to the platform AeL e-Learning and teaching materials in electronic format. Also, Romanian pre-university education has 4780 computerized laboratories, 52000 school teachers, 1700 multimedia AeL lessons, dictionaries, encyclopedias.

But the most important achievement is the revolution in the mentality of the school, in particular, and society in general. School proved responsiveness, willingness to change and adjustment to European standards.

Assimilation of new educational tools has reached a level of mass - an important asset strategies for educational medium and long term.

In recent years a role of increasing returns to *distance education via the Internet*. Historically, distance education means studying by correspondence, but the acceptance of current tend to be closer to the methods of transmission technology supported by audio, video and (more frequently and more opportunities opening) through global computer networks.

By this method of education ensure learning opportunities for broad categories of citizens, without interruption of their training. This is actually the main feature that makes the system to be very viable for higher education cycles, for permanent education and vocational training and it potentially puts the most requested types of education systems of the future.

A very good definition, operational value, is given by Council for Distance Education and Training: "*Distance education involves the study and enrollment in a training institution which provides teaching materials prepared in a sequential and logical order for students to study on their own. At the end of each stage, the students sent by fax, mail or computer by qualified instructors, their work for correction, grading and guidance tutorials on the topic. The tasks corrected are return, this exchange providing a student-teacher personalized relationship*" [Distance Education Training Council (DETC), [www.detc.org/](http://www.detc.org/)].

By reference to traditional education, can emphasize some advantages of education at remotely via the Internet - may apply, at least for now, at university level education and training after the model of open universities and at distance from the technological countries:

- multiple ways to purchase the highest level in all fields of culture;
- audience is considerably increased, distance education may include students who can not attend the courses from the traditional system. The access to local, regional and national networks link students from different social, cultural, economic areas and varied experiences;
- learning is facilitated in one's own pace, in a fashion, proceeding or hearing of courses can be made gradually and repeatedly. Computers incorporating various software packages extremely flexible, the student having a maximum control of information content.
- synchronous and asynchronous interaction between teacher and students can be complementary
- technologies are interactive, allowing a total feedback in real time and formative and summative assessment, quantitative or qualitative in an easy way and by the best evaluators;

Among the difficulties in implementation, which may be considered and limits of the new system, include:

- high costs for development the system, including expenses with technology (hardware and software);
- transmission of information networking, maintenance, production of necessary materials;
- difficulty in supporting the implementation of the system, a consistent and sustained effort of students, teachers, brokers offering technical support and administrative staff.
- need for students to have experience in the field of computers. Maintaining own computer will probably be one of current responsibilities.
- students must be highly motivated to participate. The phenomenon of school abandonment is more common in distance learning than in traditional frameworks of education, inter-relationships are established relatively impersonal, making for easier the option for student.

But the last experience ensure that participants in education through new technologies are quickly familiar with the digital system and come relatively recently in the natural rhythm of transmission and respectively, assimilation of knowledge.

A type of teaching-learning remote, which gain ground every day, is education by Internet which is considered the most promising form of eLearning. Support courses are stored on a computer in a specific form and a typical Internet browser, or in some rare cases, a special program, allow students to access information in their own pace of assimilation. Learning materials are presented in a form of multimedia, a structural model in which access to information is achieved through multiple links from one page.

The evolution towards the Information Society has resulted in profound changes in the services provided by libraries, with appropriate changes to this development: changing the way to perceive the importance and role of information, increasing the quantity of information available and diversification of their presentation formats, development of information sector in the modern economies, technology impact on all sectors of activity.

This evolution has implications both on libraries and their staff, which should be ready to meet new challenges and to manage changes, consequently, on the Information Society. The information in electronic form is raised each individual, both in the workplace, in society and home. Libraries, structures info-documentary with tradition, lies, in turn, on the trajectory of this information, having the potential to acquire, manage and disseminate in order to provide

products and services tailored to the needs of the modern user.

In Romania, the transition to Information Society is a priority objective of government or sectoral policies. And at the level of education and learning, in order to connect to contemporary requirements, governmental programs for the following period, in synchrony with global trends, must lie on an important place achieving of the “educational society”, which effectively capitalize human resources through lifelong learning, increased the role of the expertise in decision making, access generalized to any form of knowledge, extending the media, increased individual learning and personal emancipation. Strategy in Romanian higher education during 2002-2010, the Ministry of Education and Research stated that "improving the teaching process can not be conceived without its computerization in a large extent, without switching to an education related to resources that is available”.

Due to rapid developments in information technology domain and the penetration of these technologies in the workplace, communication, public services, in family, in leisure time, at the university level it is considered that "they are required to use these technologies, to participate in their innovation, to incorporate these technologies in training students, to benefit as soon as the advantages offered by these technologies and to protect against unwanted consequences of their use”.

In this context, the Romanian universities, have become, over time, large systems, equipped with advanced and integrated into the global flow, can and should play an important role to satisfy the information needs of their users and for their initiating into the modern process by information, in which the use of information and communication technologies play a crucial role.

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