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ICT FOR COLLABORATIVE LIFELONG LEARNING TO SUSTAINABLE ECONOMIC DEVELOPMENT OF EU

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Abstract

There is a constant attention paid in European Union to increasing the quality of life and the quality of services provided to citizens, to human development, sustainable development and economic growth. This paper highlights the importance of applying information and communication technology in education as one of the main pillars of a strong society, as it is responsible for staff training and hence for the increase of quality of services in all areas. Technological progress is reflected in education through the diversification of educational services and through the high quality of their provision to all actors implied in the educational process, either instructors or students. Everyone benefits from a permanently optimized environment with a constantly growing flexibility. The analysis conducted in the article aims to research the impact of information and communication technology on society through data series and meaningful graphical representations. Educational field represents one of the most important elements in the transformation of Europe into the most competitive and dynamic knowledge based economy in the world, which promotes a sustainable economic development, as the representatives of European Higher Education Area member countries publicly announced their intentions since 2003 in the Berlin Communiqué in Germany.

Keywords: Lifelong Learning, Collaborative Learning, Information Technology and Communication, Economic Sustainable Development

1. Introduction

Information technology represents the domain developed as an outcome of rigorous application of scientific research results that provides solutions to automate the activities of design, development, maintenance, optimization and customization of operations specific to each society domain.

The term information technology is a concept made up of the words technology and information. Both words are key words used separately for a long time as society evolved in terms of technology. Based on the individual definitions of the two words, it is possible to define information technology as the application of theoretical scientific knowledge in practice in order to store, extract, transmit and process a large amount of information by using computers and communication systems, in order to conduct and simplify different activities.

Both in everyday speech and in literature, when one refers to the concept of information technology, usually he replaces it with the IT acronym. As communication means evolved, the concept of IT has been extended to ICT, Information and Communications Technology.

2. Impact of ICT Evolution on Society

Information and communication technology is an area in a continuous evolution. According to Chastain (2011), Murdock (2008), Meadowcroft (2011) and Carlson *et al.* (1996), the events that determined or marked substantially the evolution of information technology are grouped in significant time intervals.

The graphical representation in Figure 1 identifies the main events that marked the evolution of information and communication technology over time.

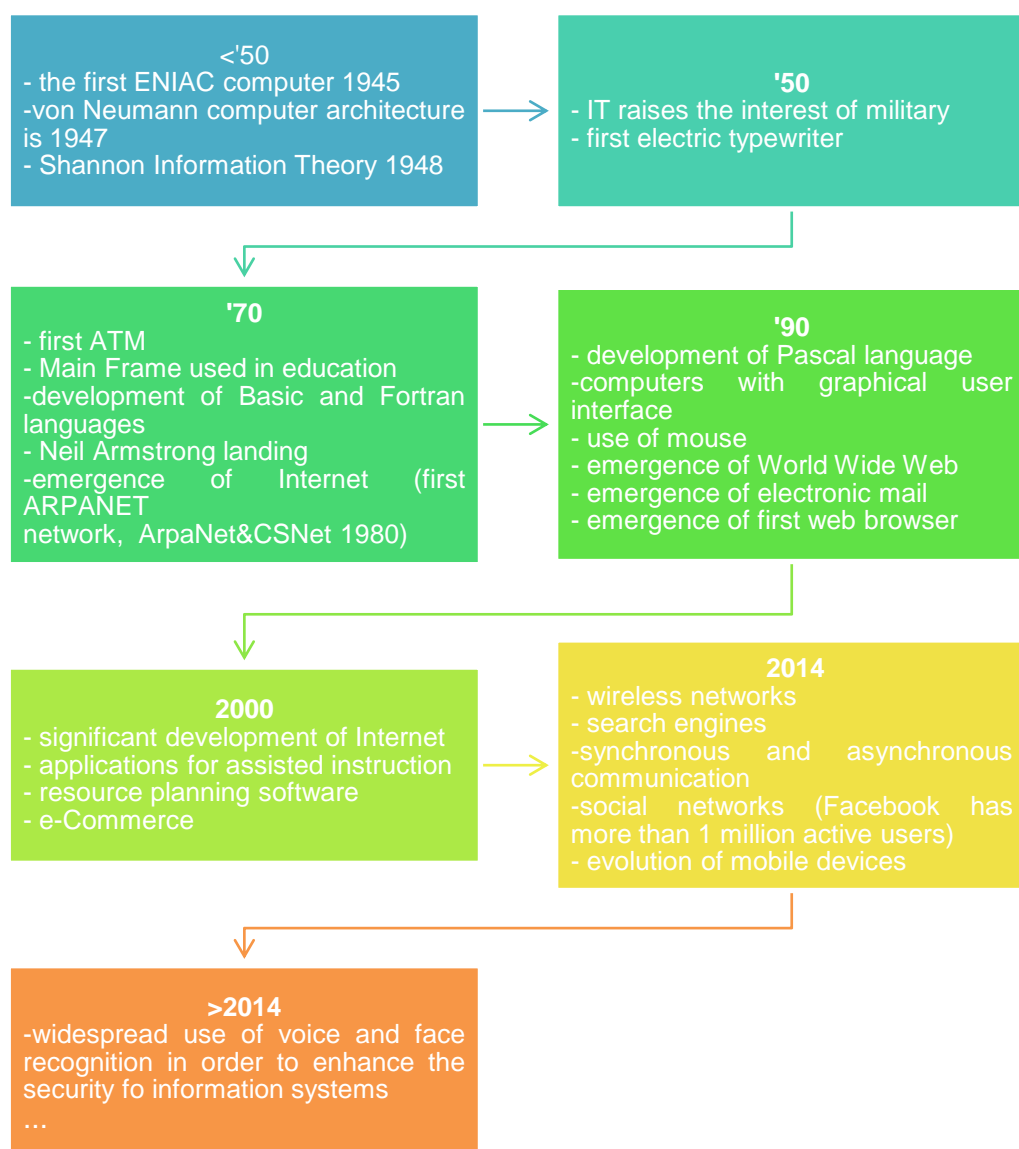


Figure 1. Evolution of information and communication technology

The period after 2000 was characterized by technological development based on the Internet, the evolution and the extent of wireless networks overpassing any prediction. Currently, the pieces of information published on the Internet form the largest knowledge base

of all specific domains of our society. This information can be directly accessed by the final users through web sites, often as results of simple or complex searches through search engines and directories like Google and Yahoo respectively.

Also in this period, the applications that facilitate synchronous and asynchronous communication become more and more popular. The most spectacular evolution belongs to social networks. In terms of research for the development of information technology, this period is highlighted by studies in voice and facial recognition and in developed technologies security.

In the next period after 2014, a continuation of developments in mobile technologies and their inclusion in all fields of activity can be foreseen.

Characteristics of Information Technology (IT), viewed from the perspective of using computers to automate activities in any field, generally refer to quick access to information, data processing speed, accuracy of information and real time data transmission.

In the long run one of the greatest achievements will be the development of technologies that allow widespread use of wireless electricity to power electronic devices used for communication, such as mobile phones, tablets, laptops.

3. The Role of ICT in Sustainable Human Development

Information and communication technology applied in any fields provides greater transparency and efficiency of the activities deployed.

The significant reduction of the size of computers, due to technological developments, from the first ENIAC computer built in 1945, which weighted more than 30 tons and occupied approximately 100sqm to laptops today that weigh less than a kilogram, determined their widespread use.

Due to the technical specifications of the new generation of personal computers and laptops, according to the latest central values published in 2014 and the World Bank (2014), the average number of computers in the European Union increased from about 25 computers per 100 inhabitants, value recorded in 2001, to about 50 computers per 100 inhabitants, value recorded in 2007 (Figure 2).

At European Union level, the increase of number of computers per 100 inhabitants in 2007 was 1.9 compared to 2001, unlike Romania where the number of computers per 100 inhabitants was 5.32 times higher in 2007 than in 2001. The difference between Romania and the average in the European Union countries is still significant, Romania approaching only half the values recorded at European level. An explanation justifying this situation is the difference between the standard of living of the population in Romania and average living standards in Europe.

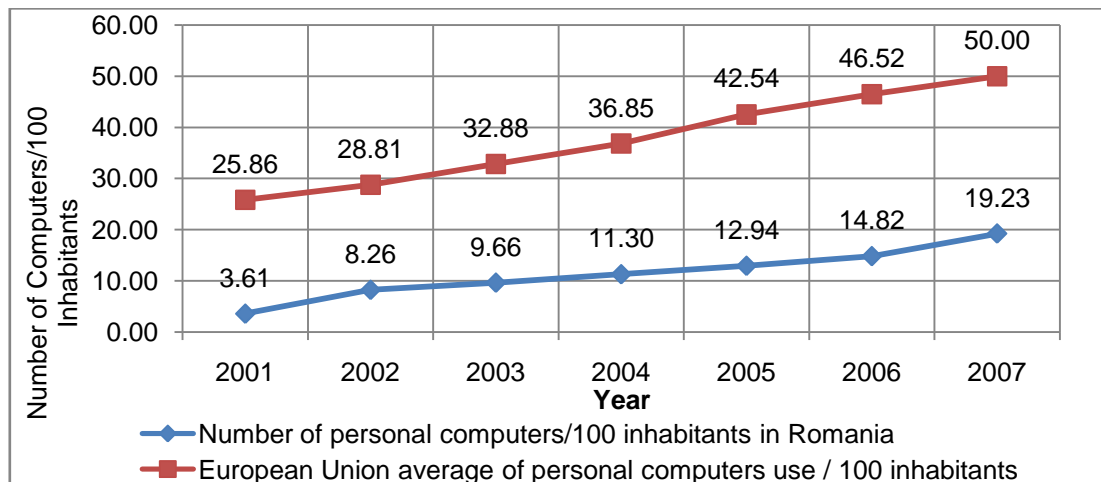


Figure 2. The use of personal computers

Source: The statistical data were taken from Eurostat (2014) and World Bank (2014).

The impact over the society of the developments in information and communication technology favoured the inclusion of the most representative component, the personal computer, in almost all fields of activity.

According to statistics of the European Commission (Eurostat, 2014), the percentage of those who used the computer in Romania's total population increased from 33% in 2006 to 55% in 2013. The survey refers to people who have used the computer for current activities in the last 12 months, relative to each year analysed from 2006 to 2013. After a 5% increase in 2006-2007, there has been a stagnation of computer use in 2007 and 2008. For the period 2008-2009, the percentage of those who use the computer recorded a new increase by 6 percentage points (Figure 3). A similar increase of 5 percentage points can be observed also in the 2011-2012 period, the percentage of those who use computers thus increasing from 48% to 53%.

Both stagnation and percentage increases in use of computers are explained by the economic crisis Romania also faced. The first, the stagnation, appeared during the period when economic crisis began to affect directly Romania in 2007-2008. The latter, the evolution by 6 percentage points between 2008 and 2009 and by 5 percentage points between 2011 and 2012 is explained both by the increase in use of computers in recent years and the fact that some active population, unemployed because of the crisis, began to intensively use computers to search for new jobs, to attend training or professional conversion courses to get employed or to change current place of employment.

In parallel with the development of information technology and consequently of the personal computers, a special interest was expressed towards the development of opportunities to communicate using these technologies. Thus, the appearance of the first ARPANET network of interconnected computers in 1969 and its connection to the CSNET network in 1980, making the foundation of the Internet, represented efforts made to facilitate communication and to share electronic resources.

Currently, the Internet is automatically identified with the computer component. According to Figure 3, for the particular case of Romania, in 2006 the percentage of those who used the computer was 33% of the total population and the number of Internet users was 25% of the total population. The advantages provided by the Internet, such as communication and content sharing, have significantly increased its use, so that in 2013 the percentage of those who use the computer became equal to that of Internet users. Basically, for 2013, we can say that the use of computers has become synonymous with the use of the Internet.

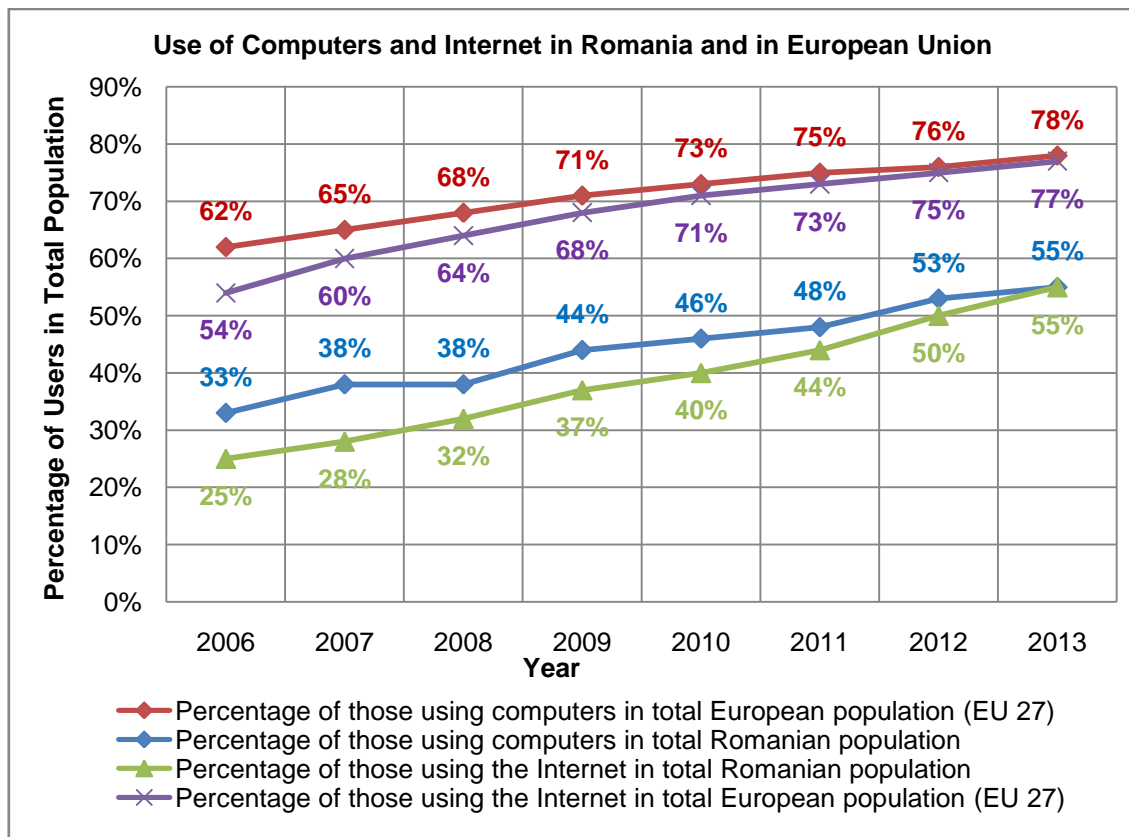
A similar interpretation can be done also for the percentage of computer users and of Internet users in Europe's total population. As shown in Figure 3, in 2013 at the European level the two percentages have similar values.

Based on the analysis for the period 2006-2013, we can conclude that both the percentages of computer users and of Internet users in Romania's total population will continue to increase.

Due to the recent evolution of mobile technologies represented by the use of tablets and smart phones, in the near future, it is possible to record an increase in the percentage of population using the Internet, in parallel with an increase less significant, or even stagnation in the percentage of population using computers in the total population, both in Romania and in Europe.

The percentage of computer users may not raise significantly, as some older users will migrate to the exclusive use of tablets to take advantage of the Internet connection. To some extent the society has reached a level close to the maximum in terms of computer use, and as information and communication technology is a continuous process of development and innovation, new devices that facilitate access to the Internet will gradually replace personal computers and laptops.

This process is supported by software development companies which provide users with applications that can be installed and used on tablets and mobile phones, applications that until recently were exclusively designed for personal computers and laptops. In the near future software versions will be available for all applications, both for installation on a PC and on a mobile device. The advantage of mobile devices is represented by the flexibility of use and by the significant reduced dimensions compared to a last generation personal computer or laptop.



Out of the total population of Romania, the most users that use computers frequently for current activities are those aged between 16 and 24.

If between 2006 and 2008, at European Union level, the percentage of those who used computers was almost doubled than the percentage of computer users in Romania, related to the total population, starting with 2009 and up to present we can observe an increase of the percentage of computer users in total population of Romania compared to the European average.

Based on study we made, we observed that the percentages recorded in the 2006-2013 period of personal computer users in Romania and average percentage values at European level for the same period, in total population aged between 16 and 24 are the closest, Figure 4.

The close up of percentage values for the age range 16 to 24 years is explained by the use of computers by new generations of children, pupils and students at an earlier age. For the personal computer, in the future, the differences between the percentages of computer users from different countries will be explained by the standard of living of the population, which will be reflected in the possibility to acquire and access new technologies.

In order to increase the use of computers as representative components of information and communication technology by young people in Romania, the Romanian government started various programs in past recent years that provided financial help to disadvantaged families in order to purchase personal computers.

Intensive use of computers is explained by the fact that for the age range mentioned, most users are either pupils or students enrolled in educational system, or employees in the early years of employment. These types of users involve carrying out intense learning, research and documentation activities which automatically implies an intense use of computers.

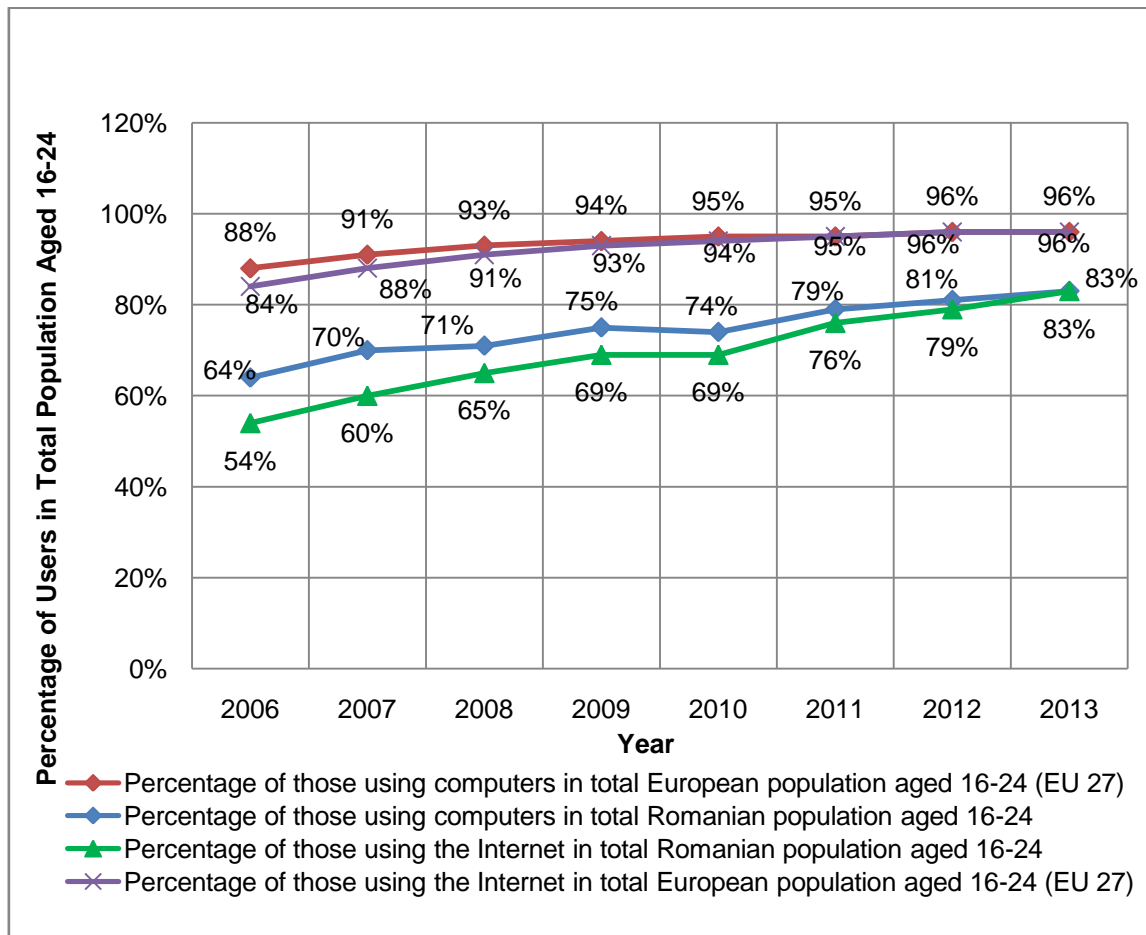


Figure 4. Percentage of computers and internet users aged 16 to 24

Source: The statistical data were taken from Eurostat (2014).

Unlike percentage values relative to the total population of Romania and the European population aged between 16 and 24, the use of computers has become synonymous with the use of Internet since 2009 at European level and from 2012-2013 in Romania, as shown in Figure 4.

Obsolescence is a critical aspect of information and communication technology. All components of information technology are subject to obsolescence, often before being subjected to physical depreciation. In the future, the indicators that will be of interest are those related to physical wear and to the possibility of population to replace information technology and communications that are obsolete or physically depreciated with new components.

4. Collaborative Lifelong Learning in the Context of Information and Communication Technology Development

Information and communication technology supports the education sector by encouraging collaborative learning and lifelong learning processes. With the help of modern technologies new methods of instruction are developed providing students the freedom to study at their own pace and according to their level of training, under the guidance of a professor / instructor.

As the mobile phone has become an object used daily and new models are more and more performant and incorporate more and more useful services, they can be considered a basic tool that supports lifelong learning (Ion, 2012). The concept of lifelong learning has been an important topic for the member states of the European Higher Education Area since 2001 when the Prague Communiqué was signed in Czech Republic. Through this statement countries have committed to implement the concept of lifelong learning.

Collaborative Learning is a social activity and the use of computers to support this type of educational process aims at facilitating and encouraging communication. During the collaborative learning process using the computer, students interact one with each other, communicate, exchange information, without being physically present in the same location, but with the condition of being present at the same moment in time. Thus they acquire new knowledge more effectively, as they also better understand it. Through the collaborative activities undertaken in the educational process using information and communication technology, learning through observation, known as Vicarious Learning, is also encouraged (Ion et al. 2012).

Through collaborative learning, the level of knowledge of an individual is completed with information acquired from collaboration activities. Once with the development of technology, the cost of implementing collaborative learning at school level or at individual courses level corresponding lifelong learning decreased significantly.

5. Conclusion

Significant evolution of information technology and communications domain has led to its integration in all fields of activity. Thus, it was thus possible to develop new technologies specific to education, having a didactic character and aiming at enabling content modelling and transmitting it towards assisted instruction systems.

The development of information and communication technology and of computer networks sustained by default the appearance of collaborative activities, whether in education, business or other area of society.

Information and communication technology provides support to all areas of activity, and turned into an indispensable component of sustainability and durability of human and economic development, both in the European Union and worldwide.

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