# THE DEVELOPMENT OF THE INFORMATION SOCIETY DURING THE ECONOMIC CRISIS

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***Abstract:*** *In order to have a successful economy based on knowledge, countries need to act simultaneously in the system of education, innovation and the exchange of information and communications technology infrastructure. Education is of paramount importance in the society of knowledge, as a source of jurisdiction, as the Foundation for the development of new knowledge and innovation, and as an engine for socio-economic development. Education is therefore a critical requirement in the establishment of knowledge societies, which may foster the development, growth, and prosperity. It represents not only the means through which individuals become skilled participants in society and economy, but is also a key factor in the expansion of the use of ICT*

***Keyword:*** *information society, quality education, research, development, innovation*

Investment in education is needed because economic and social development, development of education appear as requirements of the overall progress of the society. Long-term higher education contribute to the economic development of a country, stimulates growth and raise the standard of living of the population. However, quality education requires considerable investment in people, research, programs, and technology schools. It is not by chance that precisely the countries that know to invest in their education to broaden access to training and to improve educational standards have obtained, over time, the most spectacular and long-lasting economic growth, the effects of the whole quality of life healthy populations.

Any economy is based on a flexible system of education. This system starts with basic education, which provides the Foundation for continuous learning, then secondary and tertiary which develop the basic skills (including technical skills) and encourages creativity, extending it to the system of learning throughout life (from childhood to retirement). Investing in human capital is the key to innovation and economic growth. The increasing number of producers and users of knowledge lead to the increasing the number of jobs and the living standards of developing countries. The problem that faced and still face the educational system in Romania is chronic under-financing. Another negative factor was the fact that the primary education system (primary, secondary and upper secondary) suffered numerous changes, in a relatively short time, so that the negative effects of these sudden changes were felt at the level of higher education.

Acording to the article 117 of the National Education Law mission of University education system is "to generate and to transfer knowledge to society through:

a) initial and continuing training at university level, with the purpose of personal development;
b) scientific research, development, innovation and technology transfer through individual and collective creation in the field of Engineering Sciences, Sciences, arts and letters, by ensuring performance and physical and sports development, and dissemination and exploitation of results ".

In the field of education, Romania has set the objectives of the Europe 2020 strategy, the European Council of Spring 2010: 11.3% the percentage of early school leaving and abandonment 26,7% share of tertiary graduates.

**Table 1- Early school leaving rate's forecasted evolution**

| An | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|
| Indicator | 14,8% | 14,3% | 13,8% | 13,3% | 12,8% | 12,3% | 11,8% | 11,3% |

*Source: European Comission, Europe Strategy 2020, 2010*

The most tangible result of the education system is the integration of graduates in the labour market. Workers with higher education are the key point in both the private and public sectors. According to Eurostat data, in 2011, the budget for education was equivalent to 4.1% of GDP, and the budget for 2012 anticipated a percentage of around 4%. In 2013, the percentage lies somewhere close to 4.2%. For comparison, the average in the EU is only 5.3%, Bulgaria (3.6%) and Slovakia (4%) falling under the us in 2011. Denmark lies in the top with Cyprus with 7.8% 7.2%, and Sweden with 6.8%. In Poland, the percentage was 5.5%, Hungary 5.2% and 4.9% in the Czech Republic. Analyzing bloom between 1995-2013 budget educational sector has never surpassed the equivalent of 4.5% of GDP.

Romania was confronted constantly with an underfinanced education. For example, although, according to the law on education, the Government had to spend at least 4 percent of GDP for education, in 2000 it was allocated only 2,9% of GDP, down from 3.4 percent in 1999, the lowest level among the candidate Member States. The comparative approach, are found, for example, that while public expenditure on education as a percentage of GDP in Romania were 3,37% (1999), 3.51% (2002) and 3.48% (2005), in Poland, former Communist bloc State, were recorded in the following percentages: 4,79% (1999), 5,41% (2002) and 5.47% (2005).[1] At the same time, in terms of expenditure on the training of professional employers continue to be seen as they were in Romania to 41 euros in 1995, raising to 86 euros in 2005, while in Poland they have increased from 97 euros (1995) from 171 euros (2005). Participation in continuous professional training courses in Romania has registered a rate of 8% in 1999 and by 17% in 2005, and 16% in Poland in 1999, and by 21%. The trend of participation cause us to believe that a growing proportion of employees in most of the candidate States from the former Communist bloc have been trying to catch up with the level of participation in the old EU Member States. However, the level of participation in continuous professional training in Romania have the remain very low compared to the EU average and in the next period.

The share of public expenditures for education in GDP and in total government expenditure is influenced by the importance of investment in education in the assessment of the human development index. A key indicator of performance demonstration of characteristic using high technology sectors is represented by C&D for expenditures in GDP. Although the Lisbon strategy it had proposed reaching a percentage of 3% of GDP for C&D ambition has not been achieved and became one of the five objectives of the EU 2020 strategy.

Thus, among the EU Member States the indicator exceeded the level of 3% of GDP in Finland (3,87%), Sweden (3.42%) and Denmark (3.06%), very close to the 3% objective is Germany (2,82%) and Austria (2.76%), and with values less than 2% in France (2.26%) and

[1] Source: Eurostat.

Slovenia (2.11%).Romania was the last place with 0,47%, with a further seven countries in southern and Eastern Europe, which have reported a lower level of 1% of GDP for C&D. Companies are C&D expenses allocated by business sector was 1.23 percent of GDP in the EU-27 compared with 2.70% in Japan and 2.02% in the United States the relative importance of research and development expenditure in the Government sector and in higher education was in much similar in the EU-27, Japan and United States.

**Table 2 - R&D expenses by activity sector, 2005 and 2010.**

| | Business enterprises | | Government | | Abroad | |
|---|---|---|---|---|---|---|
| | 2005 | 2010 | 2005 | 2010 | 2005 | 2010 |
| EU-27 (1) | *54.1* | *54.1* | *34.5* | *34.9* | *9.0* | *8.4* |
| Euro area (1) | *56.1* | *55.7* | *35.4* | *35.4* | *7.0* | *7.0* |
| Belgium (1) | 59.7 | 58.6 | 24.7 | 25.3 | 12.4 | 12.1 |
| Bulgaria (1) | 27.8 | 30.2 | 63.9 | 60.5 | 7.6 | 8.4 |
| Czech Republic | 53.2 | 48.9 | 40.9 | 39.9 | 4.9 | 10.4 |
| Denmark (2) | 59.5 | *60.3* | 27.6 | *27.7* | 10.1 | *8.8* |
| Germany (1) | 67.6 | 66.1 | 28.4 | 29.7 | 3.7 | 3.8 |
| Estonia | 38.5 | *43.4* | 43.5 | *44.3* | 17.1 | *11.5* |
| Ireland (1) | 57.4 | *51.2* | 32.0 | *31.3* | 8.6 | *15.6* |
| Greece | 31.1 | : | 46.8 | : | 19.0 | : |
| Spain (1) | 46.3 | 43.4 | 43.0 | 47.1 | 5.7 | : |
| France | 51.9 | *51.0* | 38.6 | *39.7* | 7.5 | *7.3* |
| Italy (1) | 39.7 | 44.2 | 50.7 | 42.1 | 8.0 | 9.4 |
| Cyprus (1) | 16.8 | 15.7 | 67.0 | 69.0 | 10.9 | 12.1 |
| Latvia | 34.3 | 38.8 | 46.0 | 26.4 | 18.5 | 33.4 |
| Lithuania | 20.8 | 24.1 | 62.7 | 47.5 | 10.5 | 20.0 |
| Luxembourg | 79.7 | *65.9* | 16.6 | *29.7* | 3.6 | *4.3* |
| Hungary | 39.4 | *47.4* | 49.4 | 39.3 | 10.7 | *12.4* |
| Malta | 46.8 | *51.5* | 25.9 | *30.5* | 26.9 | *18.0* |
| Netherlands (1) | 46.3 | 45.1 | 38.8 | 40.9 | 12.0 | 10.8 |
| Austria | *45.6* | *44.3* | *35.9* | *38.9* | *18.0* | *16.4* |
| Poland | 33.4 | *24.4* | 57.7 | 60.9 | 5.7 | 11.8 |
| Portugal (1) | 36.3 | 44.0 | 55.2 | 45.3 | 4.7 | 4.1 |
| Romania | 37.2 | 32.3 | 53.5 | 54.4 | 5.3 | 11.1 |
| Slovenia (3) | 54.8 | *58.4* | 37.2 | *35.3* | 7.3 | *6.0* |
| Slovakia | 36.6 | 35.1 | 57.0 | 49.6 | 6.0 | 14.7 |
| Finland (4) | 66.9 | 66.1 | 25.7 | 25.7 | 6.3 | 6.9 |
| Sweden (1)(5) | 63.9 | 58.8 | 24.5 | 27.5 | 8.1 | 10.4 |
| United Kingdom | 42.1 | *45.1* | 32.7 | *32.1* | 19.3 | *16.4* |
| Iceland (1) | 48.0 | 48.5 | 40.5 | 41.4 | 11.2 | 9.9 |
| Norway (1) | 46.8 | 43.6 | 43.6 | 46.8 | 8.1 | 8.2 |
| Switzerland (6) | : | 68.2 | : | 22.8 | : | 6.0 |
| Croatia | 34.3 | 38.8 | 58.1 | 49.2 | 2.6 | 9.9 |
| Turkey (1)(7) | 43.3 | 41.0 | 50.1 | 34.0 | 0.8 | 1.1 |
| Japan (3)(6) | 76.1 | 78.2 | 16.8 | 15.6 | 0.3 | 0.4 |
| United States (6) | 64.3 | *67.3* | 30.2 | 27.1 | : | : |

(1) 2009 instead of 2010.
(2) Break in series, 2007.
(3) Break in series, 2008.
(4) Break in series, abroad, 2005.
(5) Break in series, 2005.
(6) 2008 instead of 2010.
(7) Break in series, business enterprises and government, 2008.
Source: Eurostat (online data code: tsc00031), OECD

A scroll through the data in table 2 for the EU Member States shows that countries with a relatively high proportion of spending on business enterprise for C D- & namely, Finland, Sweden, Denmark, Austria and Germany have also reported relatively high levels of expenditure for C&D. and, in these countries, less than Germany, but additionally allocate significant funds to the Netherlands for C&D of

învătământul activity. C&D activity of the governmental sector, as a percentage of GDP is more intensively supported in Germany, Slovenia, France and Finland.

Regarding the number of researchers in the EU it is found their growth in recent years. In the year 2010 the number of researchers was about 1560000 compared with 2000 registering an increase of 40% (table 2).

**Table 3: Researchers/equivalent – full time by institutional sector, in 2010**

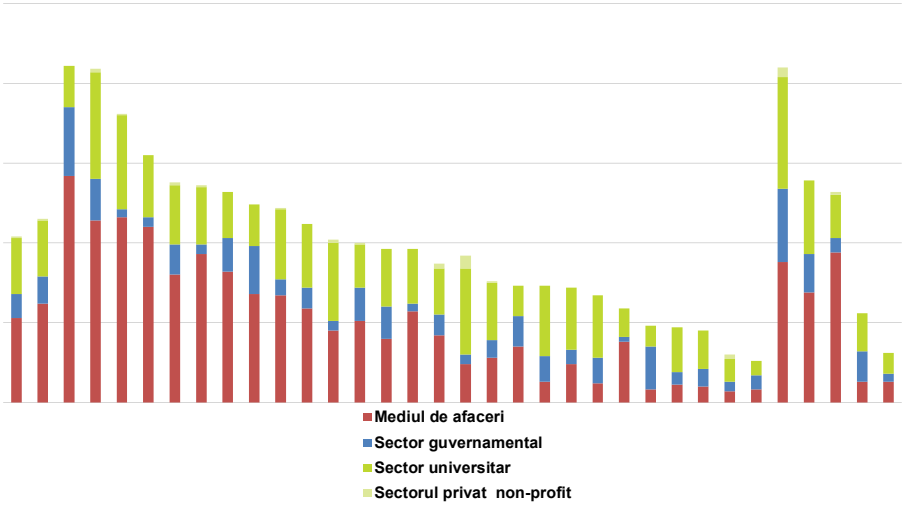
| | Total | Business enterprise sector | | Government sector | | Higher education sector | |
|---|---|---|---|---|---|---|---|
| | (1 000 FTE) | (1 000 FTE) | ( % of total) | ( 1 000 FTE) | ( % of total) | ( 1 000 FTE) | ( % of total) |
| **EU-27** | *1.564,8* | *708,3* | *45* | *198,6* | *13* | *640,3* | *41* |
| **Euro area** | *1.086,8* | *532,0* | *49* | *149,2* | *14* | *392,6* | *36* |
| **Belgium** | *38,2* | *17,6* | *46* | *3,0* | *8* | *17,3* | *45* |
| **Bulgaria** | *10,9* | *1,5* | *14* | *5,8* | *53* | *3,6* | *33* |
| **Czech Republic** | 29,2 | 12,7 | 43 | 6,2 | 21 | 10,1 | 35 |
| **Denmark** | *35,3* | *21,5* | *61* | *1,1* | *3* | *12,5* | *35* |
| **Germany** | *327,5* | *187,0* | *57* | *50,9* | *16* | *89,6* | *27* |
| **Estonia** | *4,1* | *1,3* | *31* | 0,5 | 13 | 2,2 | 54 |
| **Ireland** | *14,4* | *7,9* | *55* | *0,4* | *3* | *6,1* | *42* |
| **Greece (2)** | 21,0 | 6,3 | 30 | *2,2* | *10* | *12,4* | *59* |
| **Spain** | *134,7* | *45,4* | *34* | *24,4* | *18* | *64,6* | *48* |
| **France (3)** | 234,2 | 133,5 | 57 | 28,7 | 12 | 68,7 | 29 |
| **Italy** | *105,8* | *41,7* | *39* | *16,7* | *16* | *43,5* | *41* |
| **Ciprus** | *0,9* | *0,2* | *21* | *0,1* | *11* | *0,5* | *59* |
| **Latvia** | 3,8 | 0,6 | 16 | 0,6 | 15 | 2,6 | 69 |
| **Lituania** | 8,4 | 1,2 | 15 | 1,5 | 18 | 5,7 | 68 |
| **Luxemburg** | *2,5* | *1,4* | *54* | *0,7* | *26* | *0,5* | *20* |
| **Hungary** | 21,3 | 10,3 | 48 | 5,0 | 24 | 6,0 | 28 |
| **Malta** | *0,6* | *0,3* | *57* | *0,0* | *5* | *0,2* | *38* |
| **Netherland** | *52,1* | *24,9* | *48* | *7,0* | *13* | *20,2* | *39* |
| **Austria** | *35,9* | *22,4* | *62* | *1,6* | *4* | *11,7* | *32* |
| **Poland** | 64,5 | 11,7 | 18 | 13,6 | 21 | 39,2 | 61 |
| **Portugal** | *45,9* | *10,4* | *23* | *2,5* | *6* | *28,8* | *63* |
| **Romania** | 19,8 | 5,9 | 30 | 5,6 | 28 | 8,2 | 42 |
| **Slovenia** | *7,7* | *3,4* | *44* | *2,0* | *26* | *2,3* | *29* |
| **Slovakia** | 15,2 | 1,9 | 13 | 3,0 | 20 | 10,2 | 67 |
| **Finland** | 41,4 | 22,9 | 55 | 4,6 | 11 | 13,5 | 33 |
| **Sweden** | *49,3* | *30,4* | *62* | *1,9* | *4* | *17,0* | *34* |
| **UK** | *235,4* | *80,6* | *34* | *8,1* | *3* | *142,7* | *61* |
| **Iceland (3)** | 2,9 | 1,1 | 39 | 0,5 | 19 | 1,1 | 39 |
| **Norway** | *26,5* | *12,6* | *47* | *4,5* | *17* | *9,5* | *36* |
| **Switzerland (4)** | 25,1 | 10,3 | 41 | 0,5 | 2 | 14,3 | 57 |
| **Croatia** | 7,1 | 1,3 | 18 | 2,1 | 30 | 3,7 | 52 |
| **Turkey (3)** | 57,8 | 21,0 | 36 | 5,7 | 10 | 31,0 | 54 |
| **Japan (4)** | 656,7 | 492,8 | 75 | 32,1 | 5 | 123,5 | 19 |
| **USA (2)** | *1.412,6* | *1.130,5* | *80* | : | : | : | : |

(1) Sum of percentages is not 100 because of estimations and exclusion of data regarding non-profit private sector
(2) 2007.
(3) 2009.
(4) 2008.
Source: Eurostat (online data code: tsc00004), OECD

The analysis of the institutional sector personnel in the EU-27 C&D reveals the concentration of researchers in the business sector (45%) and in the higher education sector

(41%), and the governmental sector is concentrated in 13% of the total number of researchers (Figure 1.)

***Figure 1- Personnel in R&D by institutional sector***




In Austria, Sweden and Denmark C&D mostly air force personnel is garrisoned in businiess environment businesses, while in Bulgaria, more than 50% of the staff working in the governmental sector C&D. More than two-thirds of all researchers working in Latvia, Lithuania and Slovakia were employed in the higher education sector, and more than half of the total number of researchers worked in the higher education sector in Portugal, Poland, United Kingdom, Greece (2007), Cyprus and Estonia.

Human resources in science and technology is a very skilled population.Of the total number of persons who have been engaged in 2011 in the field of science and technology was 33,2%. Between 2008 and 2010 as its share grew by 0.9%. Personnel employed in science and technology is represented by the graduates of undergraduate studies, has a tertiary education.

**Conclusions**

Education and investing in education must be key components in order to ensure a genuine long-term human development. Education in general and investing in education, in particular must be redefined so as to focus on the abilities that individuals are able to develop them along the entire lifetimes in the context of the knowledge economy. Knowledge, creativity and innovation are key factors in a long-term sustainable development. Knowledge society pleads for diversity and cultural pluralism that can be facilitated by the environment mostly digital prefigured the new economy. Investing in human capital, in general, and the investment in education in particular, intend to invest in these three key components to define the core competencies: knowledge, skills and abilities. Evaluation of the development of the global information society carried out every year by the World Economic Forum shows that in 2010 Europe was one of the world's regions with the highest development to ICT and information society, as expressed through the Network Readiness Index. With regard to the comparison with other areas, overall EU 27 incident captured him saying to a score lower than the US and East Asia in terms of the information society dimension, but also in the C&D and innovation (a critical determinant of economic growth and competitiveness), but individual performances of the most developed European countries (Sweden, Finland, the Netherlands) are better than those of the U.S. and East Asia.

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