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The Development of eServices in an Enlarged EU: eLearning in Hungary

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PREFACE

Policy context

At the European Council held in Lisbon in March 2000, EU15 Heads of Government set a goal for Europe to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion. The renewed Lisbon goals of 2005 emphasize working for growth and jobs, and include plans to facilitate innovation through the uptake of ICT and higher investment in human capital.[1]

Information and Communication Technologies, and related policies, play a key role in achieving the goals of the Lisbon strategy. In 2005, the new strategic framework for Information Society policy - i2010[2] - identified three policy priorities: the completion of a single European information space; strengthening innovation and investment in ICT research; and achieving an inclusive European Information Society.

Education and training systems play an important role in reaching these goals. As ICT is a driver of inclusion, better public services and quality of life, all citizens need to be equipped with the skills to benefit from and participate in the Information Society. Enabling lifelong learning[3] for citizens with the facilities that ICT can offer is an important way of fostering their competitiveness and employability, social inclusion, active citizenship and personal development. Policy actions such as the Education and Training 2010 Work Programme[4] and Lifelong Learning Programme[5] have set objectives for education and support the development of learning in the knowledge society. One of the special focus areas of the Lifelong Learning Programme is developing innovative ICT-based content, services, pedagogies and practice in order to promote better education and training throughout a citizen's life.

Research context

IPTS[6] has been researching IS developments in acceding countries[7] since 2002.[8] The outcomes of this prospective research, which aimed to identify the factors influencing Information Society developments in these countries and the impacts these developments have on society and the economy, point to the need for better understanding the specific contexts in each member state for the take-up of e-applications, in particular eGovernment, eHealth, and eLearning. These key application areas have an impact not only on the relevant economic and public service areas but also on the development of the knowledge society as a whole.

Taking the above into account, IPTS launched a project to support eGovernment, eHealth and eLearning policy developments managed by DG INFSO and DG EAC. The research, which was carried out by a consortium led by ICEG EC in 2005, focused on the three application areas in the ten New Member States[9] that joined the European Union in 2004, in order to build up a picture of their current status and developments in the field, the most important opportunities and challenges they face, the lessons other member states may learn from them, and the related policy options. National

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1 http://ec.europa.eu/information_society/eeurope/i2010/index_en.htm

2 "i2010 – A European Information Society for growth and employment" COM(2005) 229

3 Lifelong learning means all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective.

4 http://ec.europa.eu/education/policies/2010/et_2010_en.html

5 http://ec.europa.eu/education/programmes/llp/index_en.html

6 Institute for Prospective Technological Studies, one of the seven research institutes that make up the Joint Research Centre of the European Commission

7 Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia, and Turkey

8 For a list of complete projects and related reports see http://fiste.jrc.es/enlargement.htm

9 Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia

experts from each country gathered the relevant qualitative and quantitative data for analysis, in order to develop a meaningful assessment of each country's current state, and trajectory, and to find out the main factors. This allowed them to derive the relevant conclusions in terms of policy and research.

The IPTS team designed the framework structure for the research, the research questions and methodology. This team and the consortium coordinator jointly guided the national experts in their work through workshops, extended reviews and editing of the various interim reports. Data sources such as international and national survey data, literature, policy documents, and expert interviews were used to capture the most recent situation of the country.

In addition to national monographs describing eGoverment, eHealth and eLearning developments in each country, the project has delivered a synthesis report, based on the country reports, which offers an integrated view of the developments of each application domain in the New Member States. Finally, a prospective report looking across and beyond the development of three chosen domains was developed to summarize policy challenges and options for the development of the Information Society towards the goals of Lisbon and i2010.

eLearning in Hungary

This report was produced by ICEG European Center, the consortium member from Hungary, and it presents the results of the research on eLearning in Hungary.

First, the report describes Hungary's educational system and the role played by eLearning in it. Then, the major technical, economic, political, ethical and socio-cultural factors of eLearning developments, and the major drivers and barriers for them in Hungary, are assessed. These provide the basis for the identification and discussion of policy options to address the major challenges and to suggest R&D issues for facing the needs of the country. The report reflects the views of the authors and does not necessarily reflect the opinion of the European Commission. Its content has been peer reviewed by national experts, ICEG EC coordinators, and IPTS.

In this study, eLearning is defined as encompassing both learning through the use of ICT and learning the necessary competences to make use of ICT in the knowledge society. Hence, the study considers the use of ICT in formal education[10] (schools and higher education), the use of ICT in training and learning at the workplace (professional education), the use of ICT in non-formal[11] education (including re-skilling and training for jobseekers) and the use of ICT in everyday life (digital literacy/digital competences and informal learning[12]).

All reports and the related Annexes can be found on the IPTS website at: http://ipts.jrc.ec.europa.eu/

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[10] **Formal Education** is typically provided by an education or training institution. Formal learning is structured (in terms of learning objectives, learning time or learning support) and leads to certification. Formal learning is intentional from the learner's perspective.

[11] **Non-Formal Education** is provided by any organised, structured and sustained educational activities outside formal education. Non-formal education may take place both within and outside educational institutions and cater to persons of all ages. Non-formal learning is intentional from the learner's perspective, but typically does not lead to certification.

[12] **Informal Learning** is learning that results from daily life activities related to work, family or leisure. It is not structured (in terms of learning objectives, learning time or learning support) and typically does not lead to certification. Informal learning may be intentional, but in most cases it is non-intentional (or "incidental"/random).

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

ADSL	Asymmetric Digital Subscriber Line
CEE	Central and East Europe
CMS	Content Management System
ECDL	European Computer Driver's Licence
EPICT	European Pedagogical ICT Licence
ERDF	European Regional Development Fund
ESF	European Social Fund
EU	European Commission
EU-10	The new member states joining the European Union on 1st May 2004
EU15	The member states of the European Union before 1st May 2004
EU25	The member states of the European Union before 1st January 2007
ETR	Standard Education System
GDP	Gross Domestic Product
HUF	Hungarian Forint
ICT	Information and Communication Technologies
IPR	Intellectual Property Rights
IS	Information Society
ISCED	International System of Classification of Education
IT	Information Technology
KSH	Hungarian Central Statistical Office
LMS	Learning Management System
MTA	Hungarian Science Academy
LOM	Learning Object Metadata
NIIF	National Information Infrastructure Development Institute
NGO	Non Governmental Organization
NMS	New Member States, see EU-10.
OECD	Organisation for Economic Cooperation and Development
PC	Personal Computer
PIAP	Public Internet Access Points
PPP	Public Private Partnership
PPS	Purchasing Power Standard
R&D	Research and Development
SCORM	Shareable Content Object Reference Model
SME	Small and Medium Sized Enterprises
TFP	Total Factor Productivity
VAT	Value Added Tax

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

Hungary is a middle-income economy situated in Central Europe. The area of the country is 93,000 km^2 and the population is slightly more than 10 million.

ICT usage indicators show significant growth over the past years. In 2006, half Hungarian households were equipped with personal computers and 32% of the households had Internet connection. This performance is still far from the EU15 average (64%). Broadband Internet penetration is still low in comparison to the EU average. Only 22% of Hungarian households access the Internet with broadband connection, while 34% of EU15 countries have broadband connection. Only 89% of Hungarian enterprises with more than 10 employees have computers, which is far below the EU15 average (97%). In accordance with that, only 80% of Hungarians are connected to the Internet. Due to measures taken by the Hungarian government, computer penetration in schools has been significantly improved in the past years. The number of computers per 100 students is 9.6, while the EU15 average is 12.1. (Eurostat, 2006)

In comparison to other European countries, digital literacy is very low in Hungary. More than 50% of the Hungarian population does not have basic computer skills (Eurostat, 2006). Significantly fewer people use computers and the Internet in Hungary than in most EU countries. Younger people, higher educated people and non-manual workers have better digital skills than the Hungarian average.

Due to these facts, the state of eLearning developments in Hungary is significantly below the EU average. According to the Economist's eLearning index, Hungary ranks 30th (out of 60 countries) with a score of 6.09, and only Poland, Slovakia, Bulgaria and Romania have worse figures among EU members. Taking the usage of eLearning indicators into consideration, it is clear that Hungary does not exploit the potential of eLearning. However, more and more state schools, private schools and other institutions provide eLearning opportunities. The role of ICT supported education in the class has gained more importance in the past years. At primary and secondary schools, digital learning materials are used in almost every subject. Computer science is compulsory in public education. An increasing number of Hungarian higher education institutions provide courses within the framework of distance education. There are examples showing ICT usage for teaching, storing information and for administration and communication, as well as for searching and learning.

Generally, adult participation in learning activities is very low. Only 11.7% of Hungarian adults participated in any learning activities in 2005, while the EU15 average was 43.9% (Eurostat). However, learning and eLearning have become more popular in the workplace, especially in large enterprises. eLearning provides appropriate formats for individuals taking part in lifelong learning, whether formal, non-formal or informal.

The most important sources of financing eLearning developments are the state budget and the ministerial budgets, and the municipalities' own resources. EU Structural Funds and the European Social Fund play an increasing role in financing different programmes for improving Information Society developments. European strategies and action plans related to the Information Society have influenced Hungarian policy making in the field of eLearning. The eLearning developments are supported by national policies, which focus on the improvement of the quality of the workforce and the development of ICT infrastructure in formal education institutions. The first comprehensive policy for the Hungarian information society was the Hungarian Information Society Strategy in 2004. The National Broadband Strategy focuses on the improvement of broadband access in the whole country and emphasizes developments in the field of eGovernment, eBusiness and eCulture. The most relevant strategy regarding eLearning is the strategy of the Ministry of Education and Culture, which aims to establish an IT network and to elaborate teaching methods in order to meet the requirements of a modern knowledge-based economy.

Due to these strategies and other programmes set up by the government and ministries, progress has been achieved and further progress can be expected both in ICT infrastructural developments and human resource developments. The digital divide has been reduced, since greater access to ICT in

households and public institutions has been provided. Education and research institutions and libraries are well equipped with computers and the number and quality of digital learning materials has increased significantly. ICT in-service training for teachers has been successful; the number of teachers with qualification in informatics has significantly increased. In the future an increasing demand for eLearning solutions can be expected.

Different factors have affected the eLearning developments in the country. On one hand, the general macroeconomic situation in the country in the past years has influenced ICT advancements and eLearning developments positively, as has the labour market created the need for more qualified people. On the other hand, legal factors, like slow legislation processes or slow accreditation processes influence eLearning developments negatively. Socio-cultural factors, like a low level of digital literacy and a negative attitude in older age groups towards ICT and participation in learning activities hinder the dissemination of eLearning.

Hungary has prioritised the development of employment (to raise the employment rate from 57% to 63% by 2013). In order to reach this goal, education and training systems must adjust to the requirements of the knowledge-based economy. Lifelong learning is an essential policy option for increasing employment. It should be emphasized that the education sector must take advantage of technological developments, by using better quality learning methodologies and higher quality and more effective teaching and learning processes. Elaboration of a qualification system for eLearning services and the harmonization of different national eLearning-related concepts are needed. Enhanced cooperation of different learning and technology experts is advisable. The ICT infrastructure needs to be further improved and the state should take responsibility for improving digital literacy. It is very important to raise the motivation of teachers to use new methodologies in the teaching process.

One of the R&D challenges is to harmonize content development with the development of technologies. Among the most important questions is how to ensure more user-friendly and user-oriented eLearning services. Technological developments in connection with security in the field of eLearning are also of high importance, for example regarding online identification of learners. Research should take special account of the role of the private sector in this domain, and the cooperation between Hungarian eLearning actors. eLearning can provide new ways of learning for people with disabilities, and eLearning solutions can improve the situation of disadvantaged people in the labour market. The role and opportunities of eLearning in improving equal opportunities are among the important research topics in the country.

INTRODUCTION

Table 1. Country Profile: Facts and figures

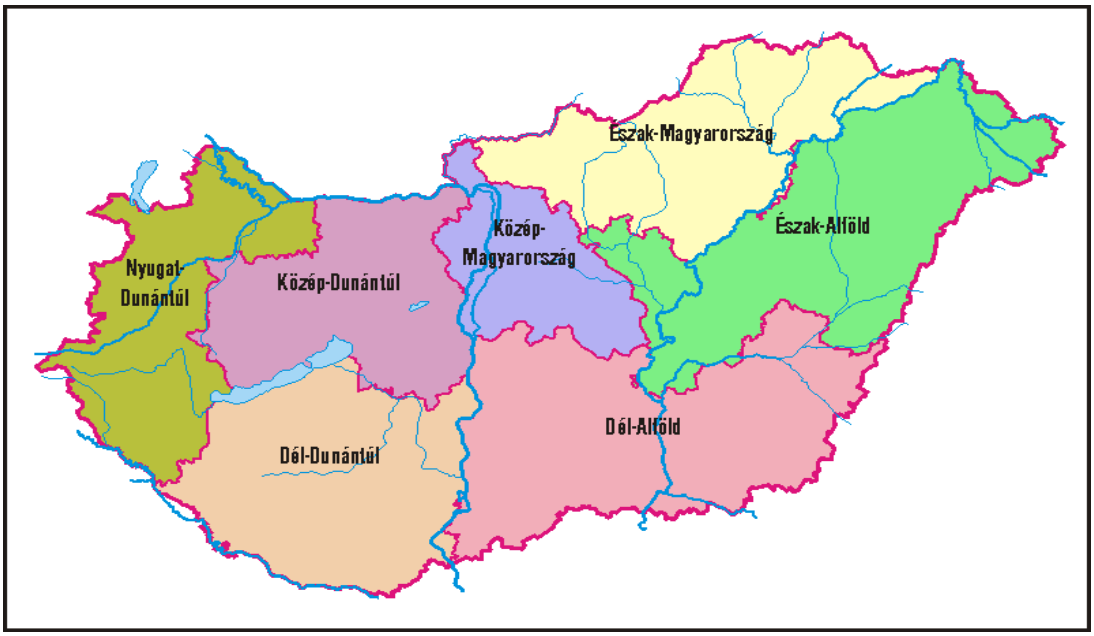
General data	
Population (2005)	10 070 000
Area (sq. km)	93 000
Population density (2005)	109.6/sq. km
Urban population (2005)	64.6 %
Currency Unit (February 2007)	Forint (1 EUR = 255 HUF)
Economic data	
GDP per capita PPS (2005)	13,400 EUR
GDP growth rate, av. 2002-2006	4.1 %
General government deficit/GDP (ESA'95) (2006)	10.1%
Consumer price index (2006)	3.9%
Unemployment rate (2006)	7.5%
Composition of GDP (2005)	Agriculture: 3.7% Industry: 25.1% Services 72.2%
Percentage of households connected to the Internet (2006)	32%
Broadband penetration rate (2006)	7.5%
Administrative structure	19 counties and the capital city

Source: Central Statistical Office, Eurostat and ICEG European Center

The administrative division of the country to NUTS-II regions is the following:

- Central Hungarian region (Közép-Magyarország),
- Central Transdanubian region (Közép-Dunántúl),
- Western Transdanubian region (Nyugat-Dunántúl),
- South Transdanubian region (Dél-Dunántúl),
- North Hungarian region (Észak-Magyarország),
- Northern Plain region (Észak-Alföld),
- Southern Plain region (Dél-Alföld)

Administrative Divisions in Hungary (NUTS-II regions)

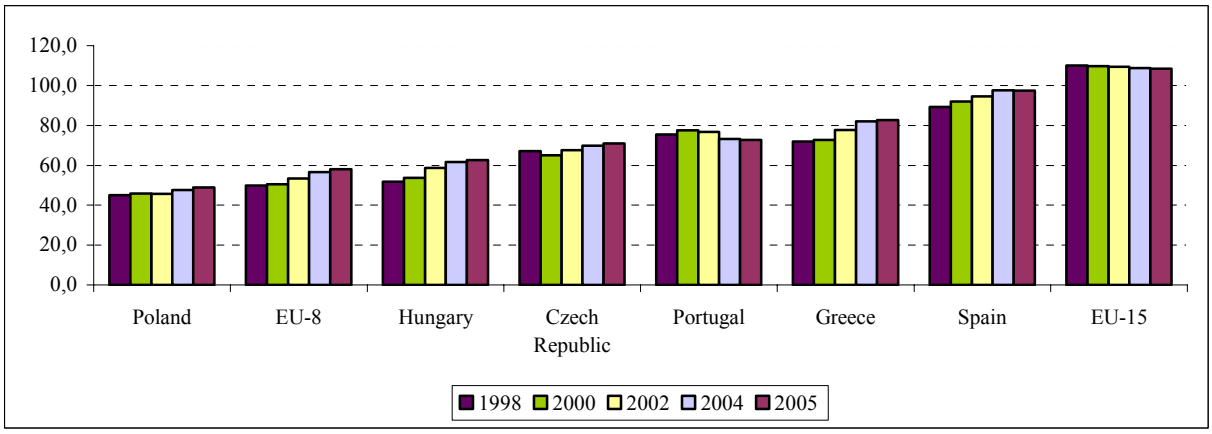


General data

Level of economic development

Hungary is a middle-income economy whose per capita GDP measured in Purchasing Power Standards (PPS) in 2005 was around 13 500 Euro, placing Hungary in third place among the EU8 countries. In comparison with the EU15, the per capita GDP stood at 62% in 2005. As a result of fast GDP growth the country was able to reduce the income gap in regard to the EU15 in the last decade (in 1998 the per capita GDP measured on PPS was 54% of the EU15 average). Per capita GDP measured both at PPS and at the current exchange rate is lower in Hungary than in the cohesion countries and Slovenia, but it is slightly higher than the average of the EU8 countries.

Figure 1. GDP per capita in PPS between 1998 and 2005, where the EU25=100[13]



Source: Eurostat (2006)

[13] In the report the calculation of various averages for EU-10, EU8, etc is based on Eurostat data but is prepared by the ICEG European Center, using unweighted averages of the respective countries.

Economic growth

Between 2002 and 2006 the average GDP growth was 4.1%, while GDP expansion gradually slowed down with the GDP growing in 2006 by only 4.0%. Hungarian economic growth has been characterised by three distinct phenomena in recent years. One has been the significant increase in the contribution of private consumption to growth, thanks to the rapid expansion of nominal and real wages as well as weakening liquidity constraint of households due to financial deepening (increased lending to households and access to financial instruments that were previously unavailable (mortgage lending, consumer credits, foreign currency denominated borrowing). As a result, consumption growth was close to or has even exceeded GDP growth in recent years. The rapid increase of private consumption was accompanied by a significant rise in public consumption, reflected in high fiscal deficit and increasing public debt in addition to other factors.

The second distinct feature of recent growth has been the volatility of private sector capital formation. While the investment rate remains low,[14] private capital formation has been highly volatile and it was possible to sustain investment growth in the last two years mainly through public sector investments associated with major infrastructure outlays.

Finally, an important and promising element of growth is the high level and fast expansion of exports especially following the accession to the European Union. The average expected increase of exports for 2004-2006 was 12.5%, which raises further the already high real openness and level of integration with the EU15 markets. Export growth was already significant, but accession resulted in its further acceleration, mainly due to the traditional export markets (Germany, Austria and Italy) but interestingly due to the EU8 countries too. Hungarian exporters have been able to gain market share in recent years, showing the rise in their competitiveness.

Table 2. Summary table on macroeconomic developments in Hungary

	2003	2004	2005	2006*
GDP (%)	**3.4**	**4.6**	**4.5**	**4.0**
Private consumption (%)	8	3.5	3.5	1.5
Public consumption (%)	5.5	-1.5	-1.5	-4.7
Gross fixed capital formation (%)	3.5	8.2	8	1.9
Export (%)	7.5	15.5	11	15.6
Import (%)	10.5	14	8	11.8
Consumer price index (average, %)	**4.7**	**6.8**	**3.6**	**3.9**
Unemployment ratio (%, ILO definition)	**5.8**	**6.1**	**7.3**	**7.5**
Real wages (%)	4.5	2.6	6.0	3.7
General government balance/GDP (%)	**-7.2**	**-5.5**	**-6.3**	**-10.1**
Public debt/GDP (%)	57	58	60	69.0
Current account/GDP (%)	-8.5	-8.9	-8.3	-6.3

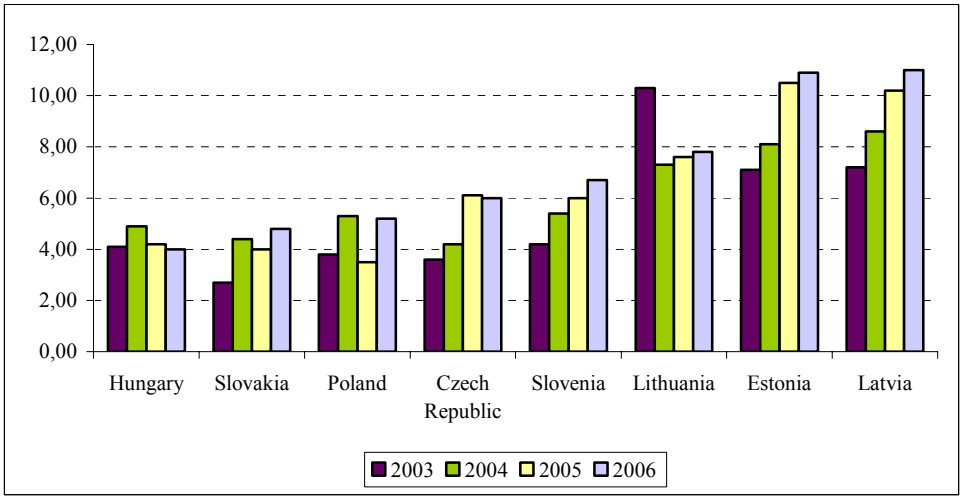
Source: ICEG EC (2007)

While compared with the EU15 average economic growth in Hungary is robust, however, if the other EU8 countries are considered, it is less spectacular. As the Figure below shows, GDP growth was the second lowest among the EU8 after either Slovenia or Poland in the last four years. As the study of the World Bank (World Bank (2006)) reflected, in a growth accounting framework the major factor determining the growth of Central European EU8 countries in recent years was the rise in total factor

[14] Private investments to GDP equal only 19% of the GDP, while public investments make an additional 3.5%, leading to an investment rate of 22-23% of GDP. This is high when compared to the advanced European countries, but remains low when assessed against the investment rate of the NMS and other middle-income economies.

productivity (TFP), while at the same time the contribution of the accumulation of factors of production (labour and capital) remained moderate.

Figure 2. GDP growth rates in Hungary and in the EU8 countries (%)



Source: Eurostat (2006)

This structure is even more characteristic for Hungary, as manufacturing production and export-led growth has been characterised by sizeable increases in labour and total productivity, especially between 1997 and 2002. However, in recent years there has been a slowdown in productivity increase while at the same time the contribution of the labour supply to growth remained moderate and the low investment rate did not increase. The slowdown of TFP increase as well as low capital formation have been the two major factors accounting for the relative deterioration of Hungarian growth performance in comparison with the other EU8 countries.

Labour market developments

In terms of labour market indicators, Hungary is a country with low unemployment and low employment/activity rates. Its unemployment rate in 2006 was the second lowest - together with Latvia and following Slovenia - among the EU8 countries. The unemployment rate was especially low in the early years of this decade as both strong output growth and the exit of many unemployed people from the registries led to a substantial fall of the rate to below 6% of the labour force. In recent years there was a 1.5 percentage point increase in the rate due to structural changes and ongoing rationalisation in the private sector as well the negative effect caused by the reallocation of certain industries from Hungary to neighbouring and East Asian countries with lower wages.

The low unemployment is accompanied by low employment and activity rates, which has remained among the lowest in the EU25 in the past 7-8 years. There is an almost 8 percentage point gap between the average of the EU15 and Hungary, and the Hungarian level is far from the Lisbon targets. Several long-term factors explain employment and activity levels, including labour market rigidities, the exit of numerous unemployed people from the labour markets, a high proportion of long-term unemployed people, and a sharp rise in the number of early pensioners. In addition to this skill and education problems also contribute to low employment and activity rates, as they reduce the entry or re-entry of the unemployed to the labour market.

Table 3. Employment and unemployment rates in Hungary and other selected countries (%)

Country	Unemployment rate				Employment rate			
	1998	2001	2004	2005	1998	2001	2004	2005
Czech Republic	6.4	8	8.3	7.9	67.3	65	64.2	64.8
Greece	10.9	10.8	10.5	9.8	56.1	56	59.4	60.1
Poland	10.2	18.2	19	17.7	59	53.4	51.7	52.8
Hungary	8.4	5.7	6.1	7.2	53.7	56.2	56.8	56.9
Portugal	5.1	4	6.7	7.6	66.8	69	67.8	67.5
Spain	15	10.3	10.6	9.2	51.3	57.1	61.1	63.3
EU15	9.3	7.3	8.1	7.9	61.4	64	64.7	65.1
EU25	9.5	8.4	9.1	9	61.2	62.8	63.3	63.8

Source: Eurostat (2006)

Public sector imbalances

A critical element of the macroeconomic performance of the Hungarian economy is the state of public finances. The deficit of the general government in 2006 was the highest in the EU25 and public debt approached the Maastricht level. With its average general government deficit equalling 7.5% of GDP between 2002-2006, Hungary recorded the worst fiscal performance among the EU8 and its general government debt level was the highest in the same country group in 2006. The worsening fiscal performance was due to the very strong deficit bias and pro-cyclical nature of fiscal policy in recent years.

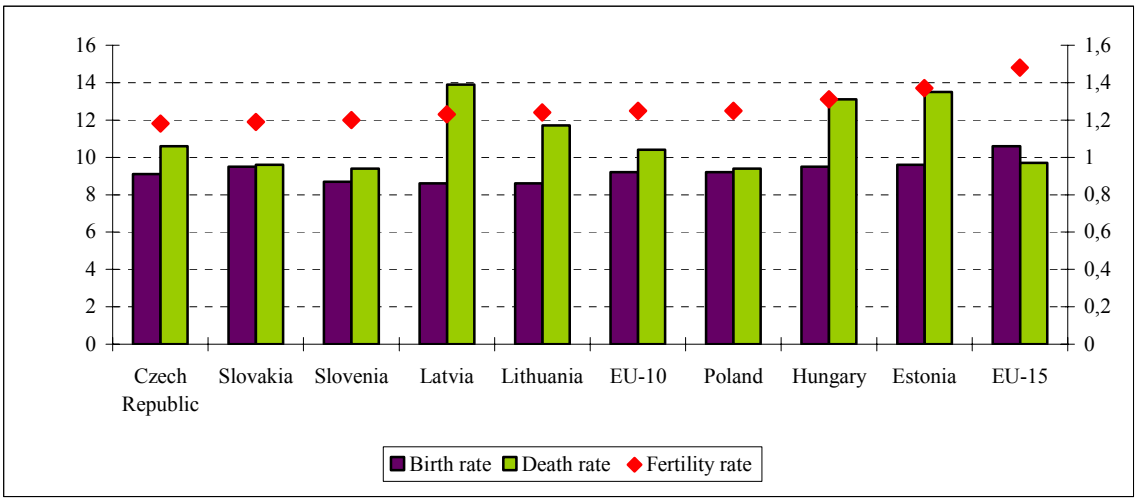
The pro-cyclical nature of fiscal policy was linked to significant increases in public sector employment and wage levels, recent growth in capital formation and public investments, generous tax cuts affecting mainly indirect taxes (VAT among others), which were the easiest kind of revenues to collect. The lack of public sector reforms in such significant spending areas as education, public administration, health care, pensions led in the analysed years to an unsustainable and unmanageable increase in general government outlays.

As a result of pro-cyclical fiscal policies and the increase of expenditures, the primary balance worsened between 2002 and 2006 from a small surplus to a deficit of almost 5.5% of GDP. The high primary and total general government deficit resulted in a snowball effect on public debt, leading to its growth from 52% of GDP in 2001 to 69% in 2006. In addition to its growth, public debt has been increasingly financed from net foreign savings making the country more vulnerable to exogenous shocks (an increase of interest rates in advanced economies, a change in investor sentiment concerning emerging economies, etc.), and such concerns have been gradually materialising since early 2006. A high public sector borrowing requirement has been associated with the net dissaving of the public sector, which together with declining net private savings led to the increase and stabilisation of sizeable current account deficit reaching on average 7.5% of GDP in 2002-2006. This has created the well-known twin deficit problem, which stands at the core of the current macroeconomic imbalances.

Population development

The Hungarian population has been shrinking in recent decades. The population reached its peak in 1980 with 10.7 million inhabitants and this had declined to 10.077 million inhabitants by 2006, representing an almost 6% decline in 25 years. There are various demographic, social and economic reasons behind these developments, but the major factor is the high death rate compared to other countries. In 2004 the death rate was by 3-4 percentage points higher in Hungary than in the EU-10 and EU15 average and was exceeded only by Estonia and Latvia among the EU-10. While the number of births declined the birth rate nevertheless remains equal or close to the average of the EU-10 countries, as other countries have also experienced relative declines in birth rates.

Figure 3. Birth, death and fertility rates in Hungary and other selected countries (%)



Source: Eurostat (2006)

In addition to shrinking, the Hungarian population is also aging, reflected especially through the shift of the age composition of the population. While life expectancy - as will be seen - has not been increasing and has remained low compared to the average life expectancy in the EU15 and EU-10, the proportion of population over 65 years has grown constantly in recent years and currently this group represents 15.3% of the total population, which is higher than in the EU-10, but lower than in the EU15 on average. The aging of the population and the low birth rates are reflected in the almost lowest proportion of the generation below 14 in the total population: this group represents 16% in Hungary, compared to 16.5% in the EU-10 and 17.5% in the EU15 average.

In Hungary there are many minorities, see Table 4. The Roma population forms the largest ethnic minority in Hungary, with authoritative estimates putting their number at between 400 000 and 600 000. Demographic change in Hungary is characterised by an ageing, falling population while the number of people of Gypsy origin is rising and the age composition of the Gypsy population is much younger than that of the overall population. Integration of Roma minority to the society is the biggest challenge in the Hungarian ethnic policy. As regards education there are special problems associated with this group. More than 70% of Roma children complete the primary schools, but only one third goes to secondary schools. Only one percent of the Roma minority holds higher education certificates. Chances of the Roma minority is in the labour market is extremely low.

Table 4. Major minorities in Hungary

Minority	Estimated numbers
Roma	400 000-600 000
German	200 000-220 000
Slovak	100 000-110 000
Croatian	80 000-90 000
Roman	25 000
Serbian	5 000
Slovenian	5 000

Source: The national and ethnic minorities in Hungary, Fact sheets

Major education indicators

Since 1990, organization and administration changes have been carried out in the Hungarian education sector. Due to the decreasing number of the population, the reduction of the number of schools has become a current problem, since the maintenance of schools is expensive, especially for local

governments of small settlements. Merging and closing schools, as well as new dissemination of new teaching methods are among the most urgent topics.

In the 2005/2006 academic year 2,278.8 thousand pupils and students took part in full-time and part-time education. 1 990 thousand pupils and students participated in full-time education, which is more than 87% of the 3-22 year-old population. One hundred and eighty-eight thousand teachers worked in the educational institutions during this year.

The aging population syndrome can be clearly recognized in the decreasing number of pupils taking part in elementary education. Pupils entering first grade were less than 859 thousand in the 2005/2006 academic year, which is a mere 74% of the 1990/1991 academic year.

The secondary education structure changed significantly during the period between 1990 and 2002. The proportional number of vocational school pupils has been declining since the beginning of the nineties, whereas vocational secondary schools providing both a maturity and technical degree gained more importance. In the 2005/2006 academic year 572 thousand students studied secondary education, of which almost 23% were in vocational schools, 43% in secondary vocational schools and 34% in secondary general schools.

The demand for tertiary education increased significantly during the nineties. In order to meet policy objectives of expanding higher education and improving labour market chances for the greater number of young people born in the mid-seventies, enrolment opportunities have been made broader. A comprehensive development Programme for higher education has been proposed, which focuses on the improvement of the flexibility and adaptability of the higher education system according to the Bologna Declaration. The establishment of multi-cycle training and more efficient and autonomous management of institutions, as well as the involvement of private capital can ensure a more competitive higher education sector.

In the 2005/2006 academic years there were 231 thousand students in full-time tertiary education. This number is almost triple the figure for 1990. The number of students taking part in part-time and distance higher education has also increased considerably; 193 thousand students were not enrolled in full-time higher education in 2005/2006.

Lifelong learning has recently gained more importance in Hungary too. In formal education the role of evening and distance education has become more determining. Besides compulsory and higher education, non-formal education has also gained more importance in recent years.

The establishment of a knowledge-based society requires involvement of significant sources in the education sector. In 2004 public expenditures on education was approximately 4.3 billion euros, which is 16% more than in 2003. Seventy-four percent of the sources were used by public education and 20% in tertiary education. Public education is free in Hungary. In order to finance the increasing expenditures of higher education institution tuition fees will be introduced from 2008 in tertiary full-time education.

Education and Training 2010 indicators

The total number of graduates in maths, science and technology in the EU should increase by at least 15% by 2010, while at the same time the level of gender imbalance should decrease. The number of graduates in mathematics, science and technology is below the EU average in Hungary. The total number of graduates has increased reaching 7,200 in 2000 and 7 600 in 2003. The proportion of graduates in this field to all graduates in tertiary education was 12.4% in 2002, while the EU average was 25%.

By 2010, an EU average ratio of no more than 10% early school leavers should be expected. The percentage of early school leavers has been fluctuating around 12% in Hungary. The indicator is below the EU average (15.9), however the EU 2010 target (10%) has not been fulfilled yet.

The Council agreed that, by 2010, at least 85% of 22-year-olds in the European Union should have completed upper-secondary education. However, the completion rate has been fluctuating around 76.5% since 2000. Hungary represents 83.5% in 2004. In comparison, in 2004 the indicator for the EU25 reached 76.4.

By 2010, the European Union average level of participation in lifelong learning should be at least 12.5% of the adult working-age population (25-64 age group). In 2004 an average of 9.4% of adults aged 25-64 in the EU25 participated in education and training activities. In Hungary only 4.6% of the given population participated in lifelong learning in 2004 and so Hungary's performance was the second worse among the new member states.

By 2010, the percentage of low-achieving 15-year-olds in reading literacy in the European Union should have decreased by at least 20% compared to the year 2000, to reach 15.5%. The percentage of Hungarian pupils with reading literacy proficiency level 1 and lower in the PISA reading literacy scale was 20.5 in 2003. Reading literacy shows similar values as the EU average.

General ICT usage indicators

The diffusion of ICTs in the Hungarian economy is presented by certain general access, household and enterprise sector specific usage indicators. The level of the ICT market in per capita value in recent years on average was around 40% of the EU15 level. While the size has been expanding, the level still remains below some other EU8 countries.

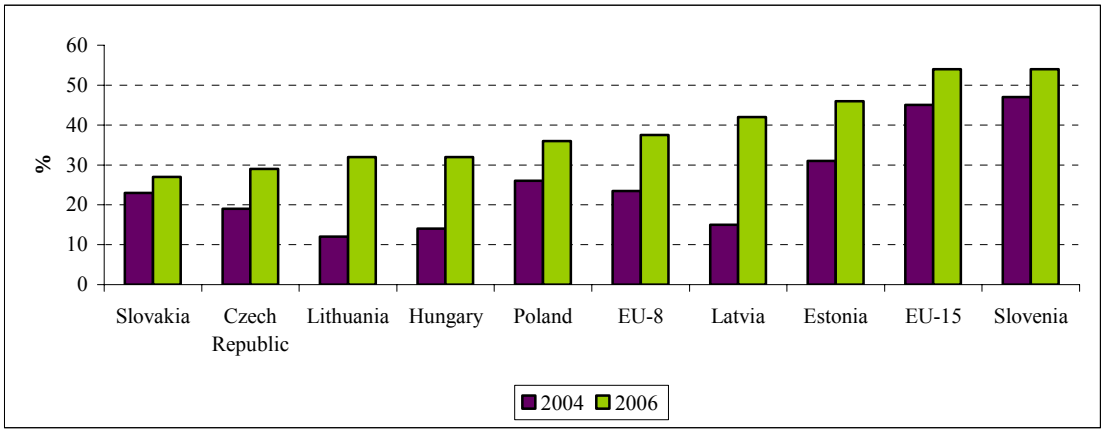
The number of fixed telephone lines has been decreasing continuously in the past years in Hungary due to the increasing role of mobile phones. Barely thirteen years after the launch of GSM services in Hungary, the number of mobile telephone subscriptions surpassed the total population count in April 2007. There are 100.4 subscriptions per one hundred inhabitants in Hungary today.

The access and its equity are strongly influenced by the number of personal computers per 1000 of population. According to recent figures, 45% of the population above the age of 15 used personal computers on a regular basis in 2005, which is quite low compared to other European countries. The gap between Hungary and the EU15 average has been almost one to three in the number of PCs per 1,000 of population. Moreover, only 32% of the population had a PC at home, while the respective figure for the EU15 was 58%. While a rapid rise of wages and incomes as well as various government programmes contributed to the increase in the proportions of households with PCs by 10 percentage points in 2005, the gap with the EU15 still remained 20 percentage points.[15]

Internet penetration in the household sector is considerably lower than in EU15 and it is slightly below the EU8 average. While the proportion of households having Internet connections at home almost doubled between 2004 and 2006, this was sufficient to keep Hungary among the lower level EU8 countries lagging behind Estonia, Slovenia and Latvia. The gap between the average level of households having Internet connection at home in the EU15 and Hungary is almost 25 percentage points, while in the case of regular Internet users it is 10% points.

[15] Various factors are behind this gap, including existing income differences, shortcomings in digital skills and last but not least the apparent high cost of Internet access.

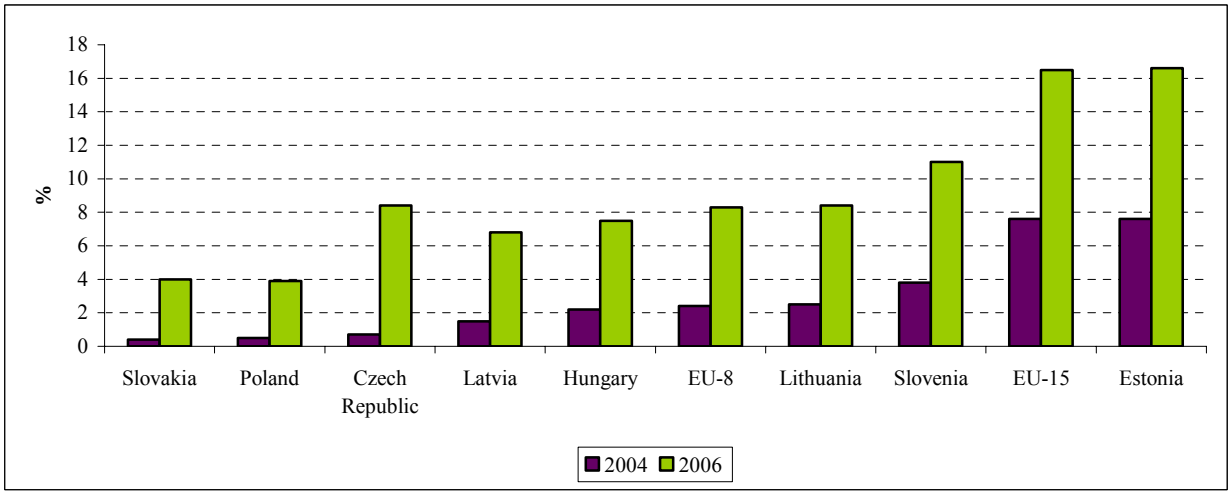
Figure 4. Percentage of households having Internet connection at home



Source: Eurostat (2006)

In addition to the low level of Internet access, Hungary also lags behind in broadband penetration: the average penetration for the EU15 in 2006 was slightly more than two times higher than in Hungary. Due to the expansion of broadband that was faster than earlier, the country was able to reduce the gap with the EU15. Broadband penetration rate (especially due to the ambitious Programmes launched in the last year to develop it) reached in 2005 and stood at the average of the EU8, while it was around half of the EU15. The gap in broadband lines in percentage of the population in 2004 and 2006 narrowed: earlier it exceeded 1:3, and it declined to around 1:2 by 2006. However the expansion of broadband access was slower in Hungary than in the majority of the EU8 and currently broadband penetration is higher in the Czech Republic, Slovenia, Lithuania and Estonia than in Hungary.

Figure 5. Broadband lines in percentage of the population in 2004 and 2006 (%)



Source: Eurostat (2006)

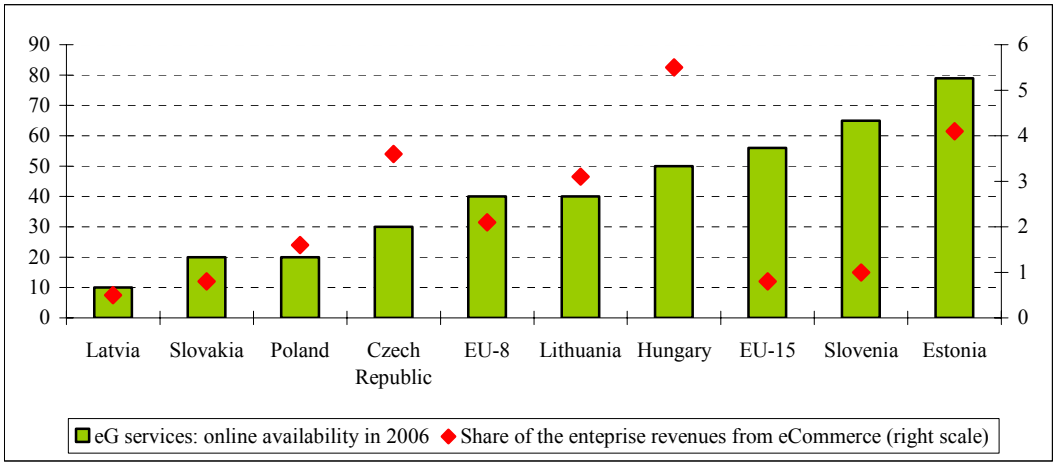
There are several reasons explaining the speed of the spread of broadband: affordability (high price of PC and broadband access – compared to disposable income), lack of attractive content, digital divide and broadening income gaps may be the most important ones. One encouraging sign is that the share of broadband among the new Internet connections is equal or even higher in Hungary than in the EU15, which shows that the penetration rate may increase much faster than in the past.

Following access indicators some summary indicators on the usage of eCommerce and eGovernment services by the private sector and citizens are presented. The level of eCommerce is rather advanced in Hungary, when compared with the EU8, but lags behind (especially in the case of bigger companies) the respective figures of the EU15. The proportion of eCommerce revenues from total turnover of the

enterprise sector was 3.6% on average in 2006, which lagged behind only Lithuania and almost equalled the average of the EU15 (4.1%). The gap between Hungary and other advanced economies is higher for bigger enterprises and smaller for SME's.

When looking at the infrastructure of public institutions, one may notice sizeable gaps within the EU15 but a very fast catch up in the supply of eGovernment services. Among the basic 20 public services 50% was available in 2006 online in Hungary, which was the third highest level among the EU8 after Estonia and Slovenia and remained only 6 percentage points lower than the respective figure of the EU15.

Figure 6. The level of eGovernment and eBusiness services in 2006 (%)



Source: Eurostat (2006)

While the supply of eGovernment services has been expanding only recently, the demand for them both in the household and corporate sectors has been increasing and has reached high levels. A recent survey showed that the proportion of companies that use eGovernment services in Hungary is above the respective figures of the EU15 and EU25, notwithstanding the fact that the scope of available service is more limited.

Altogether in comparison to the EU15 and several other new member states, like Estonia or Slovenia, Hungary lags behind in the diffusion of information and communication technologies and the level of eServices provided. The differences are indicator specific with some areas experiencing significant catch up in recent years (online availability of public services, proportion of revenues from eCommerce, the proportion of households that have broadband connection), with others showing persistent gaps compared to the EU15 and frequently the EU8 too (Internet penetration, number of PC's in households, level of ICT spending to GDP).

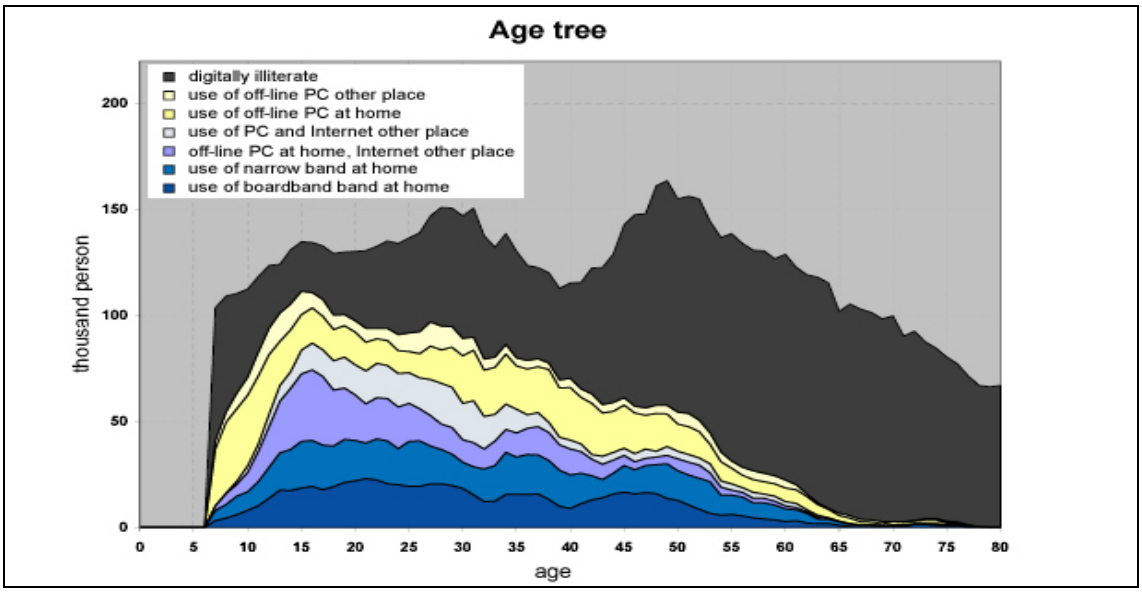
Besides presenting figures about the major segments of Internet usage it is worthwhile presenting information about the educational background of Internet users. Almost 60% of the Internet users had either university or college graduation, while the share of those who had finished secondary school was 42% of the total number of users. It is interesting to note that almost one fifth of the internet users had finished vocational schools, which seems to be a bit above the figure one would expect from them.

Finally, only 6% of the Internet users were those who had only the basic primary education, though it is advantageous that their proportion may increase from 2% in December 2004 to 6% by the end of this year.

We can tell there are really a big amount of reserves in the lower educated population; they have determination to change and start of using the Internet in spite of hard financial means. But there are

some negative results in the research. If we evaluate the age tree, there is a quite an amount of digitally illiterate especially in the elderly population.

Figure 7. Age tree of Internet users



Regarding the digital divide, several studies show that there is a significant gap in Internet penetration and other usage indicators between younger and older generations and between urbanised and rural areas.[16] Education also seems to be a crucial factor: in households where the head of household had tertiary education, Internet penetration was above 50%, while in the case of those with only elementary education it was 2%. (For those with different types of secondary education, it was between 12 – 30%).

The regional aspect of digital divide is also present in Hungary, showing more favourable data for Central Hungary (which includes the capital, Budapest) than for the other regions, and the western half of the country (Transdanubia) is also more advanced than the Eastern part (Southern Plains, Northern Plains, North Hungary).

[16] For households, regarding place of living, the following values were found by the study at the end of 2004: Internet penetration for households in the capital was 37.5%, in major cities (county capitals) 19.5%, but in other cities/villages the penetration rate hardly exceeded 10%.

Table 5. Regional digital divide in Hungary

		ISDN lines per 1000 flats	Cable TV connected per 1000 flats (2003)	PCs in public admin. per 100 empl.	PC supply of households (%)	Access of population to broadband (%)	Access of population to ADSL (%)
Western part of the country	**Southern-Transdanubia**	4.7	502	76	29	65.5	58
	Western-Transdanubia	58	586	70	36		
	Central Transdanubia	45.2	573	83	35	69.8	66
	Central Hungary	109.3	527	117	41	98.4	85
Eastern part of the country	**Southern Plains**	26	333	70	24		
	Northern Plains	33	292	75	22		
	North-Hungary	37	451	81	27		
	Altogether	**59.3**	**465**	**98**	**31**	**76.3**	**70**

Source: ICEG EC (2005) Regional aspects of Hungary's competitiveness

I. CURRENT EDUCATIONAL SYSTEM AS THE PLACE OF E-LEARNING

I.1. Description of the education and training system

The Hungarian education system principally consists of three years ***pre-primary school*** (óvoda), generally eight years ***primary school*** (általános iskola), three to five years ***secondary school*** (középiskola) and three to five years ***tertiary education*** (felsőoktatás).

Adult education and lifelong learning are ensured by public and private secondary schools, as well as by private and state-owned higher educational institutions. Private institutions offer a wide range of vocational and adult training. The role of the workplace in further training and in adult education in Hungary is increasing, A growing number of community centres and civil organizations provide all kinds of learning courses.

I.1.1. Education structure in general

The Hungarian education system is typically decentralised and regulated by three acts: the *Act LXXIX of 1993 on Public education*), the *Act LXXVI of 1993 on Vocational education* and the *Act LXXX of 1993 on Higher education*).

Administration and operational responsibilities of state owned educational institutions are horizontally shared between the Ministry of Education and Culture, the Ministry of Social Affairs and Labour, Ministry of Finance and Ministry of Local Government and Regional Development. Vertically, administration is shared among the central (national), the local (regional) and institutional levels.

The ***Ministry of Education and Culture*** oversees the pedagogical, professional and educational efforts in public education. It is responsible for drawing up the necessary development plans, creating the legislation required for such operations and ensuring that the institutions work at the required standard of quality. To this end, it organises pedagogical, professional assessments, examinations and surveys in the field of public education. It ensures that children are supplied with high-quality textbooks by elaborating the order and conditions of schoolbook registration. Administration is based on legislation, and technical control is exercised through the National Core Curriculum, national pedagogical guidelines and ministerial decrees.

There are two agencies contributing to the national administration of public education. The ***National Public Education Council*** is responsible for preparing decision making on technical issues and the ***Public Education Policy Council*** is in charge of issues of education policy.

The ***Ministry of Social Affairs and Labour*** is responsible for determining vocational training conditions in accordance with the Ministry of Education and Culture. The Ministry of Social Affairs and Labour plays an important role in encouraging life long learning in Hungary. It is in charge of elaborating strategies, action plans and programmes in the field of adult education and it operates adult education institutions in the whole country.

The state operates the system of public education primarily through ***local governments***. Apart from that, it is entitled to establish or operate institutions of public education directly.

The Hungarian ***Parliament*** fulfils the role of the creation of the Act on higher education and public education. It sets development directions and takes decisions about establishing and closing down educational institutions,

The role of the ***President of the Republic*** is to hand over the assignment to the heads of universities and to appoint university professors.

It is the right of the ***government*** to support the creation of faculties within an institution, and specify standards of qualification.

In accordance with European practice, higher education institutions also participate in the administration of higher education. Their role is usually to give their view on issues of education policy and professional matters (***Higher Education Scientific Council***; Felsőoktatási Tudományos

Tanács), and control the quality of higher education on an on-going basis (***Hungarian Accreditation Council,*** Magyar Akkreditációs Bizottság).

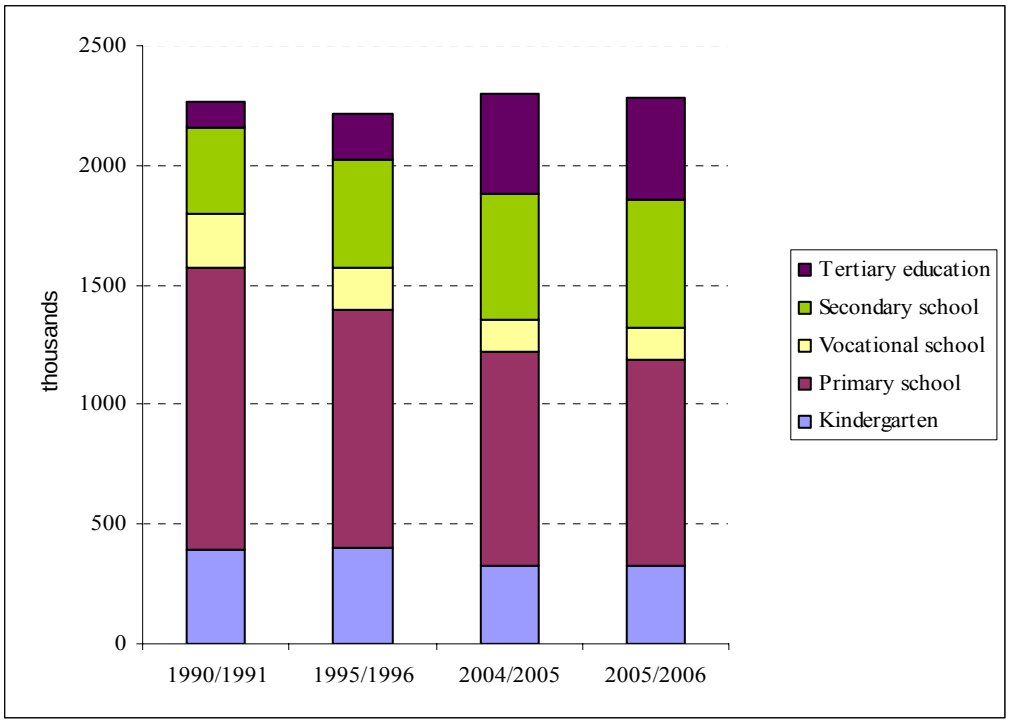
Institutions of ***higher education*** are universities (egyetem) and colleges (főiskola), both ***independent legally and professionally***, and are controlled by their own government. Universities and colleges draw up their own organisational and operational procedures, determine conditions of transfers of students among institutions, scholarship fees, test questions, rules on doctoral courses, or facilitation procedures, etc. The institution's council holds priority entitlement in managing the institution.

I.1.2. Educational levels

I.1.2.1. Changing number of students

The number of students taking part in any kind of formal education has been relatively constant since 1990. However, the number of pupils participating in elementary education and vocational education decreased between 1990 and 2005, as a result of the phenomenon of an aging population. In contrast with that, the number of students taking part in secondary and in tertiary education has increased in the period mentioned (See Figure 8.). This tendency shows that non-compulsory education has gained more importance in recent years.

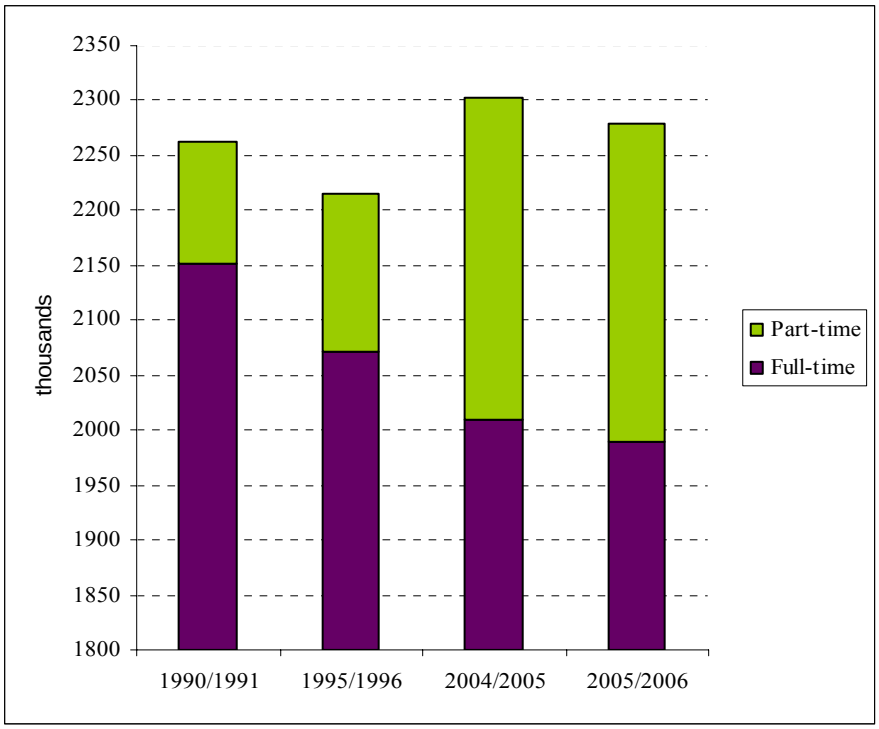
Figure 8. Number of Hungarian students in full-time and part-time education (thousands)



Source: KSH Data on education, 2006

The number of students taking part in full-time education has slightly decreased during the last 15 years, while the role of part-time education has become more determined. This shows that lifelong learning has gained some importance. The number of part-time students (adult education) more than doubled between 1990 and 2005 and the highest increase (six-fold) can be experienced in tertiary education.

Figure 9. Number of students in full-time and in part-time education (thousands)



Source: KSH Data on education, 2006

I.1.2.2. Detailed description of the Hungarian education levels

The Hungarian formal education system can be divided into the following levels:

- Pre-primary education
- Compulsory full-time education
- Post-compulsory education; upper and post-secondary education
- Higher education

a. Pre-primary education

This educational level is considered as an important integrated part of the school system, which caters for children from 3 to 7 years of age. Participation in pre-primary education at this level is optional, except for the final year (beyond age of 5), which is compulsory. Currently, the attendance rate with regard to the age groups 3-5, is above 86%. The average duration of participation of children aged 3-7 in pre-primary education is just over 3 years (3.3), which is the highest average value in Europe.

b. Compulsory full-time education

According to the *Public Education Act (Act 1993/LXXIX. on Public Education)* education is compulsory up to the age of 18. The child must begin attending kindergarten from the first day of education of the year in which he/she reaches his/her fifth year of age. The child reaches compulsory school age in the year he/she reaches the age of 6, but not later than the age of 8, on the condition that the child reached the level of maturity to attend school. Vocational studies may not be commenced before the age of 16, up to which pupils are to acquire fundamental education. Table 6 shows the structure of compulsory full-time education according to ISCED levels.

Table 6. The structure of compulsory full-time education[17]

	Entry at age of	Exit at age of	Comment
Pre-primary - one preparatory year, compulsory (ISCED 0-1)	5/6	7	
Primary school - single structure) (ISCED 1 + 2)	6/7	14	1st cycle: age 6-10; 2nd cycle: age 10-14
General lower and upper secondary) (ISCED 2 + 3)	10/12/14	18/19	
Vocational secondary school (ISCED 3)	14	18/19/20	usually: 4 years
Vocational training school [1] (C course) (ISCED 3)	14	18	2+2 years
Remedial [2] (A course / B course [3]) (ISCED 2) + Vocational training school (ISCED 3)	15/16	18/19	1-2 + 2 years
Post-secondary vocational course [4] (D course) (ISCED 4)	18	19/20	1-2 years

Source: www.eurydice.org

The law imposes the provision of free compulsory education. Nevertheless, private schools may charge fees.

A three level structure comprising the National Core Curriculum (1995), the Frame Curricula[18](2000) and local curricula (institutional level) provide a regulatory framework for teachers to develop syllabi. Based on a central definition of each discipline, the schools and the local teaching staff can define and adopt local curricula and syllabi for each class and each subject.

The revised National Core Curriculum will have the special feature of giving priority to the improvement of skills and abilities. The choice of teaching methods is discussed by the teachers, the parents and all stakeholders of each educational institution. The choice of textbooks is the responsibility of the teaching staff; however the Ministry of Education and Culture approves the list of eligible textbooks.

The work of pupils is assessed by the teachers throughout the school year (written and oral tests). All schools are required to elaborate a comprehensive evaluation and assessment regulation based on the consensus of teachers, maintainers and parents.

[17] [1] This new type of vocational training school (called in Hungarian 'Szakiskola') effectively replaces the former training school (called 'Szakmunkásképző Iskola'). It consists of 2 years general studies and a 2-year vocational course. (Course 'C')
[2] The new type of remedial vocational training school consists of a general (basic) remedial course of 1-2 years, and a short vocational course of 2 years. These schools mostly accept students who could not finish primary school, or have difficulties with basic skills (reading/writing/calculus).
[3] Course 'A' and 'B' differs only in the level at which they start remedial training. (for students of different level of extra basic education needs).
[4] Supplementary, post-secondary vocational course of 1 or 2 years organised in vocational training school. (Course 'D').

[18] According to the Public Education Act education is based on Frame Curricula ellaborated for the classes 1-4, 5-8 and 9-12. The Frame Curricula has been in force since 2001.

c. Post-compulsory education; upper and post-secondary education

Education is compulsory till 18 years of age. Table shows the types of education after the compulsory years.

Table 7. Types of education [19]

Gimnázium (general lower and upper secondary) (ISCED 2 + 3)	Age 10/12/14 - 18/19/20
Szakközépiskola (vocational secondary school (ISCED 3)	Age 14-18/19/20 (generally: 4 years)
Szakiskola[5] (C course) - vocational training school (ISCED 3)	Age 14-18 years (2+2 years)
Szakiskola[6] (A course / B course[7])- remedial (ISCED 2) + vocational training school (ISCED 3)	Age 15/16-18/19 (1-2 +2 years)
Szakiskola[8] (D course) - post-secondary vocational course (ISCED 4)	Age 18-19/20 (1-2 years)

Source: www.eurydice.org

It is typical that upper secondary schools organise entrance examinations. The law imposes free education at upper secondary level.

The three different curricular sets exist for general lower and upper secondary (gimnázium), vocational secondary school (szakközépiskola) and vocational training school (szakiskola). The requirements of the maturity exam (érettségi vizsga) define the exit criteria for upper secondary school (gimnázium) and the criteria of the given profession(s) define exit requirements for the vocational schools (szakiskola). In case of the vocational courses, only vocational secondary school (szakközépiskola) will provide (without extra years) the possibility to take a maturity exam (érettségi vizsga).

The arrangements for pupil assessment are identical to those in primary education. At the end of upper secondary courses in upper secondary school (gimnázium) and vocational secondary school (szakközépiskola) pupils may pass the national secondary school leaving examination (érettségi - maturity exam). This certificate is a prerequisite for admission to higher education. Vocational schools (szakközépiskola) may also award a vocational qualifying certificate.

d. Higher education

Types of institutions

In Hungary, higher education institutions are the public and private/denominational ***universities*** (egyetemek) and ***colleges*** (főiskolák) that are accredited and formally recognised by the state. These are specialised and organise courses in their particular field of specialisation. The range of higher education institutions includes non-university institutions (főiskola) and university level institutions (egyetem). According to the ***Bologna Process*** the former higher education structure has changed significantly. The Hungarian higher education system switched from the traditional college and university degree Programmes to the ***Bachelor and Master system***. The new tertiary education system was launched in September 2006. The multi-cycled education system ensures compatibility with the European higher education systems. In the new system the initial training cycle of 3-4 grades (undergraduate degree) will be followed by the second training cycle. The initial cycle providing bachelors degree ensures sufficient knowledge, and technical competence applicable in practice

[19] [5] This new type of schools provides 2 years general studies and a 2-year vocational course.
[6] The new type of remedial Szakiskola provides a general (basic) remedial course of 1-2 years, and a short vocational course of 2 years. These schools mostly accept students who could not finish primary school studies or have difficulties with basic skills (reading/writing/calculus).
[7] Course 'A' and 'B' differs only in the level at which they start remedial training. (for students of different level of extra basic education needs).
[8] Supplementary, post-secondary vocational course of 1 or 2 years organised in Szakiskola. (Course 'D').

(application requirements) to enable immediate success in the labour market, and at the same time it provides appropriate theoretical grounding for continuing studies uninterrupted or later following some years of work, to obtain the MA, the graduate degree.

The successive educational levels providing tertiary qualifications in higher education from 2005:

- undergraduate
- postgraduate, master
- postgraduate, PhD/DLA

In 2004 the number of students who applied for higher education more than doubled in comparison to 1990. The number of students in 2006 was almost fourfold compared to 1990. In the academic year 2005/2006 72 institutions were involved in tertiary education in Hungary.
Tertiary education institutions provide not only bachelor and master courses, but also one or two year courses in the frame of higher vocational programmes. However the role of master and bachelor level education has become more significant in recent years. All in all, the number of people taking part in higher education has increased considerably.

Table 8. Major data about the tertiary education

Denomination	**1990/1991**	**1995/1996**	**2003/2004**	**2004/2005**
Institutions	***77***	***90***	***68***	***69***
Students	***108,376***	***195,512***	***409,075***	***421,520***
Of which:				
higher vocational Programme	—	—	7,219	9,122
university level education	47,498	70,153	133,274	138,169
college level education	54, 889	109,412	233,673	240,279
professional further training	5,989	12,565	27,074	2, 991
PhD and DLA training	—	—	7,835	7,941

Source: KSH (2006)

The most popular fields of training are social sciences, human sciences, law and technical sciences at master level and business administration, teacher training, technical sciences and services at bachelor level.

e. Special needs

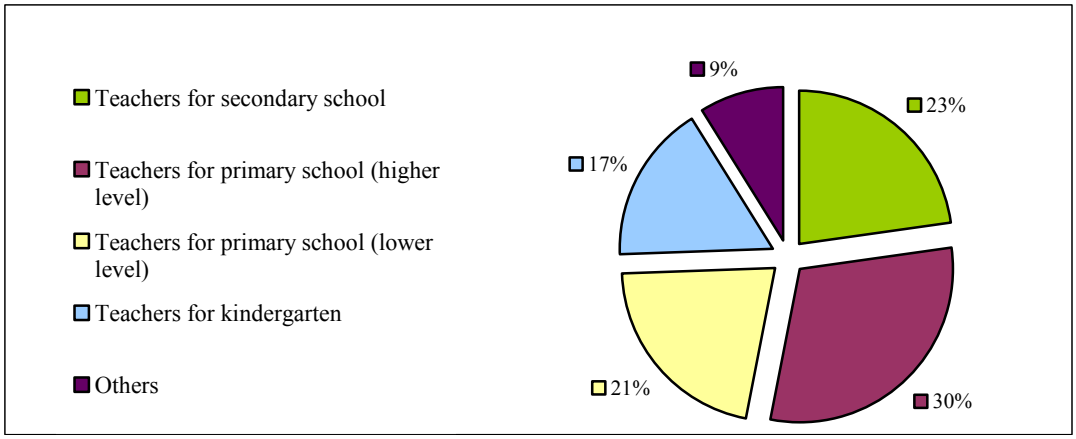
As the Hungarian ***special education services*** have long traditions (started at the mid 19th century) there are separate institutions for the blind and for pupils with hearing impediments, physical and mental deficiencies in primary and lower secondary education. These institutions also function as multiplier-training centres for the latest special educational methodologies and they prepare specialists to introduce integrated educational and training modules. In light of recent changes, integrated education is compulsory at all levels of school provision, with the exception of completely deaf, blind or semi-seriously, seriously mentally retarded pupils. A number of special education teacher training programmes are organised. After finishing general school, pupils with special needs may continue their studies in special vocational training schools as well.

f. Teachers

In 2004/2005 school year, the number of full time teachers in the public education sector was 180 910. Teachers who work in primary schools obtain their qualifications through a bachelor higher education course lasting four-five years. Teachers at lower secondary level follow a four (five)-year training course. Teachers at upper secondary level obtain their qualifications through a general university course lasting five years, plus an additional year of general and professional training. Most teachers have public servant status.

The number of teachers in elementary and vocational education has significantly decreased during the last 16 years. The number of primary school teachers was more than 85 thousand in the academic year 2005/2006, which is 10 thousand less than in 1990. Task units have also significantly decreased in elementary education. In special vocational education more and more teachers have been involved during the discussed period, since the number of students more than doubled.

Figure 10. The distribution of teachers by qualification 2004/2005



Source: KSH (2006)

g. Training system

Lifelong learning does not have a long tradition in Hungary. European and international trends have considerable influence on the developments of the Hungarian training system. A lifelong learning strategy was devised in 2005 by the Hungarian government.

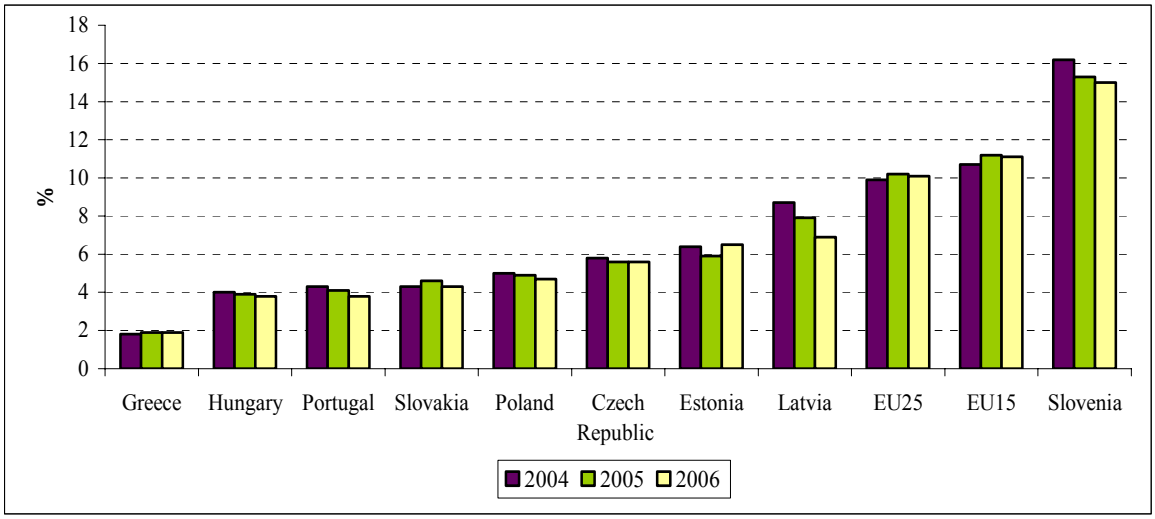
The Ministry of Social Affairs and Labour is responsible for lifelong learning and vocational training, while the Ministry of Education and Culture is in charge of managing formal adult education. Local employment agencies and Regional Training Centres provide a wide range of training and re-training.

Measures encouraging efficient investments are mainly present in the field of vocational education and training, as well as higher education. Both European and Hungarian sources support training at the workplace and for different risked groups.

The percentage of Hungarian adults taking part in education and training in 2005 was 3.9 of the total population aged 25-64, which in comparison to the EU15 (11.2%) and NMS-10 (6.53%) averages is very low. In the last three years, among the new member states Hungary showed the worse results considering adult education. According to Eurostat statistics it is clear that the number of people taking part in lifelong learning is very low: only 11.7% of Hungarians participated in any learning activities in 2005, while the EU15 average was 43.9%.[20]

[20] Lifelong learning in Europe, Statistics in focus, Eurostat, 2005

Figure 11. Development of lifelong learning in Europe (percentage of individuals taking part in lifelong learning)



Source: Eurostat, 2006

One of the main barriers involved in lifelong learning is the geographical inaccessibility of the courses. It is quite difficult for rural population to reach adult training or courses provided in cities. This situation could be improved by using eLearning solutions, in which case only ICT infrastructural equipment should be made available. eLearning could also be the solution for disabled people who want to take part in lifelong learning.

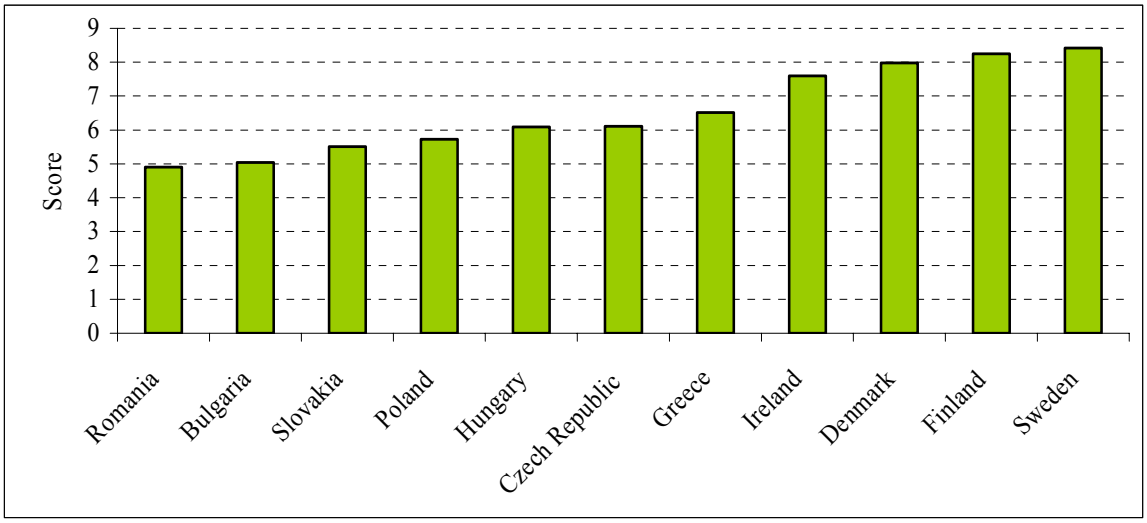
Evening schools provide general adult education for unqualified people. An increasing number of private schools offer a wide range of vocational training. Further education centres at higher education institutions are also involved in adult education and also language schools play an important role in providing adult education services.

I.2. Place of eLearning in educational system

eLearning has become more popular and widespread in Hungary recently and has infiltrated into formal and non-formal education, as well as into informal learning. According to statistics only a narrow segment of the population use eLearning services, however eLearning may have great potentials in Hungary. In order to make eLearning more popular and widespread in Hungary huge obstacles should be overcome.

In comparison to other EU countries, the level of eLearning usage is among the lowest. According to the Economist eLearning index, Hungary ranks 30th (out of 60 countries) place with a score of 6.09, only Poland, Slovakia, Bulgaria and Romania have worse figures among EU members. Taking the usage of eLearning indicators into consideration, it is clear that Hungary does not exploit the potential of eLearning.

Figure 12. eLearning readiness index



Source: Economist Intelligence Unit, 2003 The eLearning readiness rankings

I.2.1. eLearning in schools

Using computers at nursery schools promotes early ***socialisation*** to the information society. In pre-primary education computers are used first of all for playing. According to a Hungarian survey one third of the children in this age band have already used computers.[21] The aim of using computers at nursery schools is to base the attitude of children towards ICT supported education and to ***reduce the digital divide***. There is very little digital content for this age group available in Hungarian, however developing ICT skills in childhood should be very important.

Hungarian primary and secondary schools started to use eLearning services a few years ago. Due to the action plans of the Ministry of Education and Culture almost all Hungarian schools use computers for teaching and have Internet access. 77% use the Internet via broadband connection. With this figure Hungary ranks at number 11 of the 27 countries (EU25 and Iceland and Norway) participating in a survey.[22]

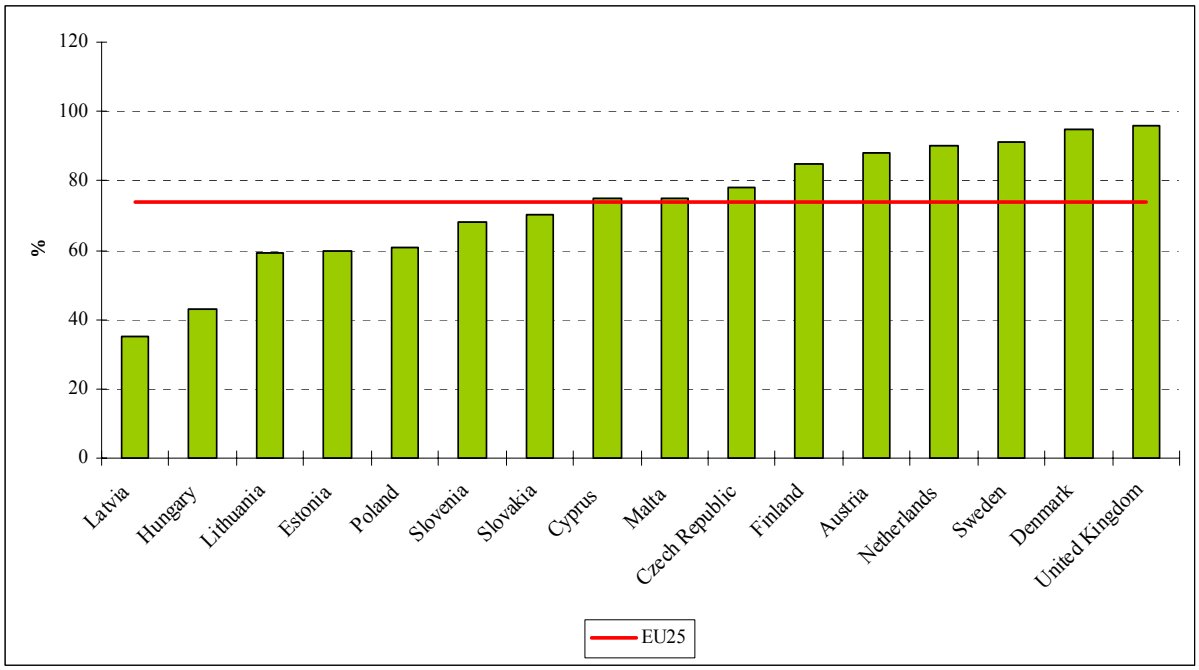
The use of computers in Hungarian schools has almost reached the 100% saturation point. According to European data, the number of computers per 100 pupils is the highest in Denmark, where there are 27 computers per 100 pupils, while the EU average is 11.3, and the NMS average is 7.1. Hungary is not so far from the EU average with its 9.6 computers per 100 people, out of which 8.6 computers are Internet connected. ***Improving computer and Internet penetration*** in schools was one of the measures of the Ministry of Education and Culture. The Ministry of Education and Culture ensured that all Hungarian schools are equipped with computers, labs and Internet connection. Due to the Sulinet Programme launched in 1996 by the Ministry, most of the Hungarian state schools are equipped with computers and labs; however primary schools represent lower ICT penetration rates than secondary schools. Moreover, in 2004 more than 1100 schools received digital trolleys and suitcases equipped with multimedia devices.[23] As a general rule Hungarian schools are equipped with hardware, although ICT penetration in schools could be significantly improved. These ***infrastructural developments*** can make teaching traditional subjects more colourful and fulfil the infrastructural requirements of using digital content in everyday education.

[21] Török Balázs: Számítógépek az óvodában 2004 FKI
[22] Use of computers and the Internet in schools in Europe, Statistics in Focus, 2006.
[23] Digital trolley consists of mobile projector, notebook and loudspeakers.

Besides technological conditions the number and quality of ***digital content*** have strongly advanced in Hungary. According to a ministerial initiative the Sulinet Digital Knowledge Base, which was completed in September 2004, is available for teachers and students via Internet. The Database contains digitalized teaching materials for grades 7–12, and the elaboration of further materials for grades 1-6 will be completed in 2007. Digital materials are available in all main subjects. Besides that, digital learning materials for vocational schools in 19 subjects are provided.

The low ***level of ICT knowledge*** of teachers and their ***low motivation*** to use eLearning applications in traditional education are big problems. In order to solve or at least to alleviate them, in-service training is organised for teachers. The Ministry of Culture and Education enable teachers to take part in ICT training where they can learn how to integrate ICT in teaching process. According to a survey[24] only a very low percentage (43%) of Hungarian classroom teachers used computers in class. Comparing this figure to other EU countries one can conclude that Hungary is far below the EU average (74%). Only Greece and Latvia performed worse in 2006. Among the reasons for not using ICT application in teaching factors such as lack of computers, lack of skills, no or unclear benefits in using ICT and lack of interest were mentioned.

Figure 13. Percentage of teachers who have used computers in class in 2006



Source: Use of computer and Internet in schools in Europe, Statistics in Focus, 2006/17

Computers are used for various purposes in schools. At elementary schools children start to base the ICT knowledge by using computer programmes. Most of them are games or learning materials based on games. The most popular eLearning materials are related to the environment of children or language learning.

The establishment of the information and communication culture is among the highlighted development tasks of the National Curriculum. Among the aims of the National Curriculum the effective usage of ICT tools in education, as well as improving ICT competences and providing access to information have been included.

ICT literacy of pupils and students is quite good, since ***compulsory computer science*** is among the basic subjects. Sulinet Digital Knowledge Base provides ***digital curricula*** for teachers and students via the Internet. The role of using ICT supported education methods in secondary schools is to make the

[24] Use of computers and the Internet in schools in Europe, Statistics in Focus, 2006.

learning process more effective. It gives the opportunity to complete the traditional frontal education and makes it possible to enhance teamwork among students. In ***vocational schools*** the role of ICT is stronger than in secondary grammar schools. As the main aim of vocational schools is to prepare students for the labour market, more intensive computer-based education is required than at secondary grammar schools. The Vocational School Development Programme I. provided huge sources for informatics developments.

Private schools provide a wide range of courses for adults. Among them distance education has become increasingly popular.

I.2.2. eLearning in higher education

Hungarian universities are ***well equipped with ICT***. All of them are connected to the Internet with broadband connection. Internet and PCs are available not only in universities or library buildings but it is very common to have Internet access at student hostels for free or at a low price.

Using ICT applications in teaching is already accepted, but the technological gap can be considered as a huge obstacle (e.g. very few rooms are equipped with projectors and computers).[25] Hungarian universities provide ***eLearning courses***, which usually mean that students do not take part in the traditional education in a given subject, or traditional education is completed with eLearning materials via the Internet. In this sense eLearning is used as a complementary solution.

More and more Hungarian higher education institutions provide courses within the framework of ***distance education***. Many courses can be attended both online and offline eLearning. Some universities and colleges play a leading role in Hungarian eLearning by providing well-elaborated, user-friendly distance courses. eLearning activity may include not only learning, but also consulting with tutors or professors and taking exams or tests online.

According to the statistical data of the Ministry of Education and Culture 16 higher education institutions provided distance education at 44 faculties in 2005. Besides that, 12 public education institutions operated distance vocational education. In adult education, in the framework of formal education 25 professions were available in a distance education form. In 2006, 34 thousand people took part in distance education.

Computer supported ***administration systems*** – ETR or Neptun system – are already well accepted and used in everyday life. These systems facilitate all administration tasks related to higher education. It provides e-registration for courses and exams; it supports financial operations and registration of grades, as well as serving as a common information base for users.

Another main task of higher education institutions is to ensure advanced equipment in ***libraries and in computer and language labs. Online public access catalogues*** facilitate research work for students and professors within the local systems. Furthermore, access to international catalogues and electronic journals is also provided.

In higher education there is a definite expectation from students to ***have basic eSkills***, which they have to use daily. Most of their home assignments, reports or presentations have to be submitted using computers. Computer labs are available at universities and colleges; however the levels range from the simple word-processed training materials to the professional multimedia labs. In the field of natural sciences, engineering, public administration or economics ***special software use*** is widespread.

Evermore higher education institutes are buying ***LMS*** – Learning Management System – or use free access systems e.g. ***Moodle*** to establish their virtual campuses using their own, adapted or purchased eLearning materials. The Cisco Academy exists at several technical colleges and universities. They use high quality eLearning materials for the preparation for internationally recognized exams.

[25] Based on the interviews with Hungarian eLearning players.

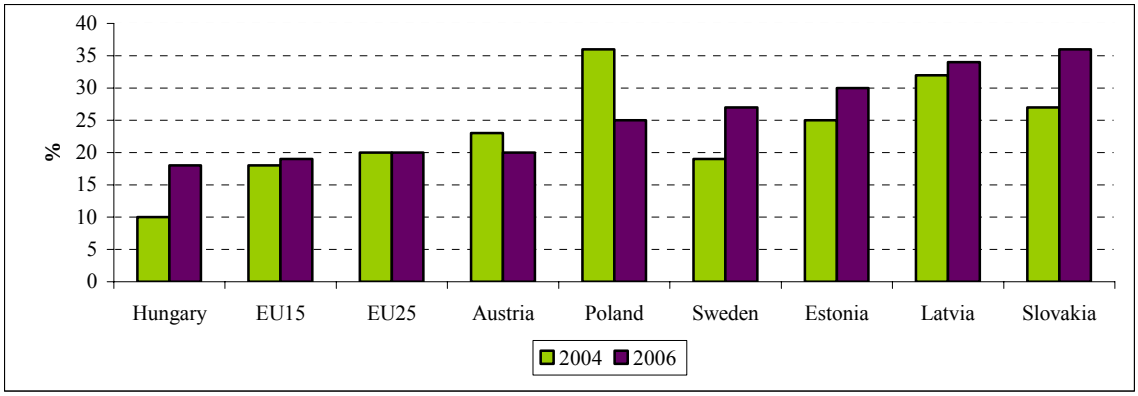
I.2.3. eLearning in the workplace

Using eLearning at the workplace has become more common in past years, both at private and public organisations. However the role of eLearning is not as important in Hungary as in most EU15 countries. Most likely it is based on the fact that Hungarian companies ensure less training in general than companies from most EU15 countries. According to Eurostat data, the course hours per 1000 working hours was only 3 hours in Hungary, meanwhile in case of the leading European countries (like Denmark, Sweden and Finland) it exceeded ten hours in 1999.[26]

Regarding ICT infrastructure, 89% of Hungarian companies have computer access while the EU-10 average is 93% and the EU15 average is 97%. Internet usage of enterprises has slightly improved in the last years, however only 78% of companies with more than 10 employees use the Internet. This figure is far behind the EU15 average which reached 90% in 2004 and exceeded this in 2005.[27]

Usage of eLearning by enterprises represents a very low level in comparison to other EU countries. Only 14% of Hungarian enterprises used eLearning applications for the training and education of employees in 2005, while the EU15 average was 20% and the NMS-10 average was 25%. (Eurostat, 2006).

Figure 14. Percentage of enterprises using eLearning for training and education of employees in 2004 and 2006



Source: Eurostat, 2006

It is relatively common to provide ICT supported training for employees at larger companies and at multinational companies in Hungary. It is evident that ensuring company training through eLearning is the simplest way at places where ***computer and Internet usage is a part of everyday work***. ICT supported company trainings are well accepted in the ***financial, telecommunication and IT sectors*** (e.g. OTP Bank, Telecom Hungary, T-Mobile-Hungary, Hungarian Post). Besides that, the public sector also prefers eLearning solutions.

According to estimates, enterprises in Hungary spend approximately 2-3 million Euros on eLearning solutions.[28] These investments are financed generally from the own budget of the enterprise, but different financial supports are also available, mainly for SMEs. However, there is no available data about the number of people taking part in training at the workplace. Nevertheless, companies supplying eLearning management systems have estimates about companies using eLearning. According to Oracle, the market leader eLearning system may operate on 10 thousand computers. Mobile communication companies like T-Mobile and Pannon GSM and banks like K&H and Inter-Európa Bank use this system.

[26] Working time spent on continuing vocational training in enterprises in Europe, Statistics in Focus 1/2003
[27] Eurostat database, 2006
[28] http://www.antennamagazin.hu/2006-01/05-valos-06.html

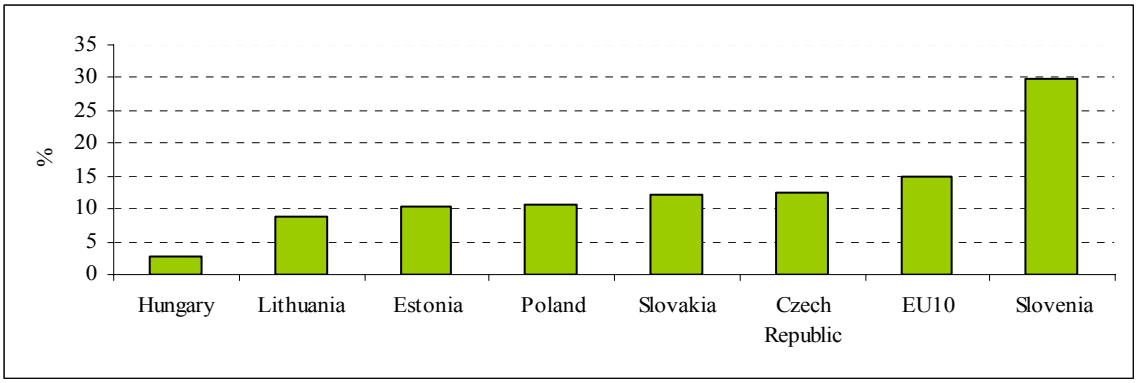
I.2.4. eLearning and Lifelong learning

An increasing number of educational institutions provide more and more courses for adults but besides that the number of courses and trainings outside the formal education is increasing. Both in the framework of formal and non-formal education distance education, ICT supported education and computer-based training have gained importance. Computer and informatics training is also offered to unemployed and disabled people. Other disadvantaged groups, such as elderly people or elder women, young mothers or uneducated people can be enrolled in different supported training. Potentials of eLearning can be well exploited in adult education and in lifelong learning both in formal, non-formal and informal learning. In order to improve digital literacy the so-called IS-Mentors can help by using computers and the Internet at public access points. Parallel with that the role of libraries, trainings centres, and cultural establishments is gaining more importance in lifelong learning.

Since appropriate digital skills are preconditions for creating an information society, emphasizing the role of computer training and other informatics training is very important. According to Eurostat data, only 29% of Hungarian people (aged 16 to 74) took part in training course on computer use (in the last three or more than three years ago), while the EU25 average is 41%.[29]

According to Eurostat data computer based learning is extremely low in Hungary among adults. Only 2.8% of people aged 25 and 64 took part in computer-based learning. The proportion of employed people using computer for learning was higher than the proportion of unemployed or inactive people.

Figure 15. Percentage of adults using computer for learning in 2005



Source: Eurostat, 2006

I.3. ICT skills and attitudes towards ICT usage

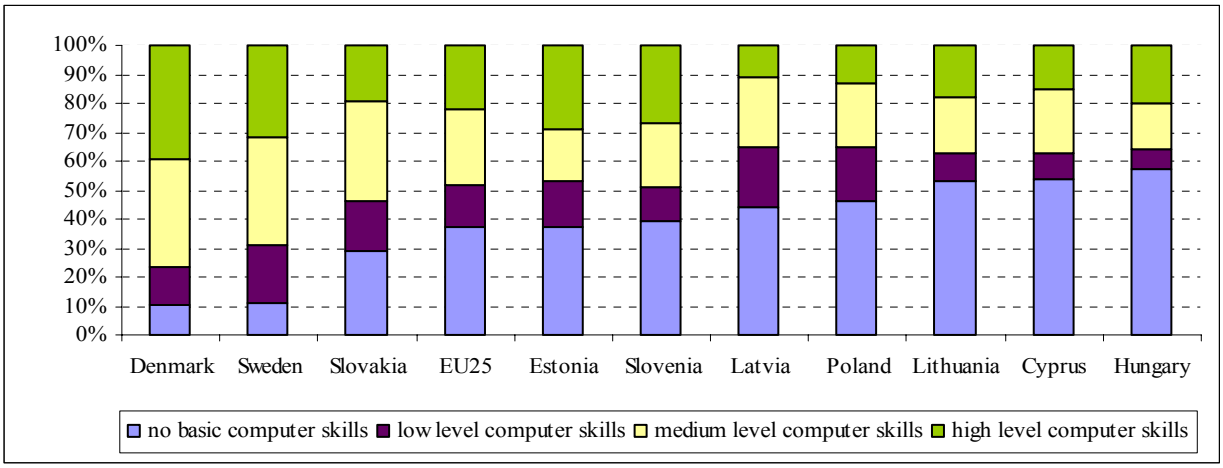
One of the most remarkable developments in the past ten years is the way in which the Internet has infiltrated and become an important part of our everyday lives. It has also been the case in Hungary, but the rapid spread of using the Internet has faced an obstacle, namely the capability of citizens and the labour force to use information and communication technologies. A ***considerable proportion*** of Hungarian citizens ***have no computer skills*** at all. According to a survey,[30] 57% of Hungarian people aged 16 to 74 have never used a computer, while this indicator represents 28% in Slovakia and 34% in Estonia. 34% of EU citizens have never used a computer, ranging from 8% in the Nordic countries (Sweden, Denmark) to 65% in Greece. It is obvious that the lack of eSkills of Hungarian (and also other European) people prevents them from participating fully in the information society.

More than half of the EU citizens (57%) do not regularly use the Internet. The worst figures are represented by Greece, where only 18% of people aged 16 to 74 are regularly online. In Hungary ***66% of individuals aged 16 to 74 do not use the Internet regularly***. Older people or those with lower level of education are far less likely to use the Internet. ***More than half of the Hungarian population*** aged

[29] How skilled are Europeans in using computers and the Internet? Statistics in Focus, 2006
[30] How skilled are Europeans in using computers and the Internet, Statistic in Focus, 17/2006, Eurostat

25 to 54 is ***unlikely to use the Internet***. In general this means ***low motivation for taking part in ICT supported further training or lifelong learning***. As these people, aged 25 to 54, belong to the active population, they can experience the lack of ICT skills as a disadvantage when looking for a job. Those people who should need further training to be more competitive in the labour market, cannot be involved in specific eLearning programmes or cannot search at jobsites. Most unemployed people do not use the Internet.

Figure 16. Individuals' level of computer skills in 2005



Source: How skilled are Europeans in using computers and Internet, 2006

Generally, low computer skills can be seen in nearly all new member states. In Hungary 57% of the population aged 16-74 do not even have basic computer skills. Only Estonia and Slovenia are doing better than the EU average. Gender aspect of eSkills is not very relevant, but the ***generational aspect*** plays a very important role. Basic computer skills are a problem for many people in the age group 25-54: 50% of the people of this age band are incapable of using computers, while Denmark represents only 3%. The highest skill levels can of course be found among younger people, although one out of three young people have no basic computer skills. More than two out of three unemployed people are unskilled in computer use. 83% of lower educated people lack eSkills, while this is 17% among people with higher educational background. Within the group of employed people, manual workers are about three times more likely to have no computer skills than non-manual workers, which can be explained by the fact that non-manual workers are more likely to need computers at work.

Due to the description above, it can be already expected that only ***few people have attended computer-training courses*** recently in Hungary. 70% of the Hungarian population has never taken part in computer training courses, while the EU25 average is 59%. However, computer training is only one way to improve digital literacy. Informal methods, such as assistance from friends, colleagues or self-study are very important. For women, training in a formal setting is slightly more common than for men, while for the latter self-study is more common. Training courses in adult education centres are far more popular among people with higher education level than among those with lower education.

In conclusion, it can be stated that Hungarian digital literacy level enormously depends on the level of education, the type of work and the age.

II. OVERVIEW OF E-LEARNING IN HUNGARY

II.1. Institutional structures and resources for eLearning

0In Hungary a national co-ordination function for eLearning does not exist. On the ministerial level, the Ministry of Education and Culture[31] and the Ministry of Social Affairs and Labour[32] have important leading functions in determining ICT and eLearning related issues. Background non-profit and partner institutions of ministries, as well as professional organisations and different associations take part in affecting the Hungarian eLearning developments.

Table 9. Institutional structure of eLearning

RESPONSIBILITY	ACTORS	FUNCTIONS
Policy /Strategy formulation, Coordination	**Ministry of Economy and Transport** www.gkm.hu	Coordination between relevant agencies and ministries (tasks of the former Ministry of Informatics and Communication .have been overtaken)
	Interministerial Committee on Information Society (ITKTB) www.itktb.hu	Provides advices on various Information Society-related policies
	Ministry of Social Affairs and Labour www.szmm.gov.hu	Responsible for vocational training, adult education, lifelong learning, as well as for training of disabled and unemployed people
	Ministry of Education and Culture www.okm.hu	Responsible for public and higher education
	Local governments	Responsible for financing public education institutions
Other actors influencing eLearning developments	**Associations**	Promoting the importance of eLearning developments and Information Society. In some cases co-ordinating functions
	Research institutions	Research activities in the field of Information Society and/or eLearning, promoting and lobbying

II.1.1. Organisational structure for eLearning – public institutions

a. Ministry of Economy and Transport

The former Ministry of Informatics and Communication was abolished in 2006 and its tasks and functions were integrated into the Ministry of Economy and Transport. The Ministry of Economy and Transport is largely responsible for IT infrastructural developments and eEconomy, hence for a wide aspect of Information Society.

[31] www.okm.hu
[32] www.szmm.gov.hu

b. Interministerial Committee on Information Society

The Interministerial Committee on Information Society (ITKTB) was established in 2003. It co-ordinates and promotes the elaboration of national informatics and telecommunication norms and standards, the technological developments of information safety and European integration policies connected to Information Society. The Committee co-ordinates the investments of the – non-governmental – information and communication networks financed by the central budget, and contributes by measuring the effects of the development of Information Society.

c. Ministry of Education and Culture and its background institutions

The main institution taking responsibility for promoting and co-ordinating the use of eLearning in public education is the Hungarian Ministry of Education and Culture. Since it is responsible for all issues related to the Hungarian education sector, strategies, tasks and projects in the field of eLearning, ICT infrastructure are determined by this governmental institution and its background institutions. It guides the implementation of the development plans in the field of eLearning and their further elaboration, relates them to other strategic documents in the field of education and creates the legal environment required for achieving the objectives. Recently, the Ministry of Education and Culture set up two important non-profit background institutions (Educatio Public Company, Sulinova Public Company) in order to implement the tasks determined by the Ministry in strategies and action plans, regarding ICT infrastructure developments and eLearning developments in the education sector.

d. Ministry of Social Affairs and Labour and its background institutions

The Ministry of Labour and Social Affairs determines strategies, plans and legal issues in the field of adult and vocational education. It emphasizes the role of eLearning in lifelong learning and encourages improving digital skills and dissemination of distance education in adult training, continuous training and training for special groups. Its background institutions, the employment agencies and nine regional training centres play a crucial role in providing computer training, ECDL training and they also offer courses through distance education.

e. Local governments

Local governments of settlements and local governments of counties participate in financing nursery, primary and secondary schools. In accordance with this, they are responsible for ICT equipment and Internet access of those institutions. Local governments shall take responsibility for creating better technological infrastructure in their community centres, public access points or libraries.

II.1.2. Other actors in eLearning

Besides public actors, different associations and civil organisations, as well as research institutions can influence Hungarian eLearning developments with lobbying and promoting the role of eLearning in education and training.

a. Associations

Professional associations play an important role in the Hungarian eLearning market. The ***Hungarian Distance Education Foundation***[33] (MATAL) was founded in 1992, in order to improve the situation of the Hungarian labour force through the method of distance education. Its mission is to enforce the dissemination of eLearning and distance education. The aim of the association is to develop distance learning programmes and packages. Since its foundation it has carried out various eLearning related projects which resulted in eLearning services.

[33] www.matal.hu

The ***Association of the Hungarian Content Industry***[34] (MATISZ) operates as a representation of interests of the Hungarian actors in the field of content development and service supply. Its mission is to ensure free information flow, to enhance the Hungarian market for eContent and eServices. It effectively takes part in creating regulations and in co-ordinating the interests of the affiliated organizations. It also organises training and conferences in the field of eLearning.

The ***Hungarian Association of IT Companies***[35] plays an essential role in formulating information society. It supports small and medium-sized businesses to improve their ability to establish positions in the market and develop an "Info communication" Association, and integrate telecommunications companies into it. The Hungarian Association of IT Companies represents a strong and effective lobby force, one that works with the government to ensure that the Association is consulted before important decisions are made. It organises conferences regularly on information society issues, accordingly on eLearning issues too.

Hungarian Telecottage Association (Magyar Teleház Szövetség) was created in 1995 as a private non-profit organisation. It operates independently to encourage the establishment of more Telecottages. The most important goal of the Association is to reduce the digital divide. As such, it provides local Telecottage managers and organizations with guidance and advice on establishing, funding and running Telecottages. This association has helped give the movement a national presence, allowing it to participate in existing networks and to establish new partnerships. Telecottages also help the public in accessing government services and offer assistance in official matters, moreover they have taken an active role in building links between local communities and the business world.

The primary mission of the ***Digital Library Directorate of John von Neumann Digital Library and Multimedia Centre***[36] (Neumann House) is to participate in the digitalisation of Hungarian cultural heritage, co-ordinate all related activities and manage the network services built on these digitalisation projects.

The ***Hungarian Association of Virtual University Network*** established in 2006 supports the role of eLearning and distance education within Hungarian higher education.

b. Research institutions

Research institutions dealing with information technology and society may also promote the role of eLearning. The ***National Institute for Public Education***[37] supports the professional development of teachers, like retraining and the in-service training of teachers. It organizes conferences related to distance learning, eLearning and lifelong learning and it also does research in the field of eLearning both on macro (system or policy-oriented) and micro (individual school) levels. It takes a very important role in the dissemination of eLearning throughout public education.

The ***Centre for Multimedia and Educational Technology***[38] serves all teacher-training faculties of the universities with courses on Educational Technology and ICT in Education as well as it serves as a national research centre and develops educational software. Some other universities also do research in the field of eLearning, distance learning and adult education. Their role is important in forming the acceptance of eLearning and blended learning. They are active in the co-ordination and participation of European projects.

Centre for Education Innovation and Adult Learning[39] (former name: Centre for Distance and Adult Learning) at the Budapest University of Technology and Economics participates in international

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34 www.matisz.hu
35 www.ivsz.hu
36 http://www.neumann-haz.hu/index_en.html
37 http://www.oki.hu/oldal.php?tipus=index&kod=english
38 http://edutech.elte.hu/kozpont/english/index.html
39 http://www.bme-tk.bme.hu/index.php

research activities and elaborates, initiates and co-ordinates projects in the field of adult and distance education. The institution is a member of MENON (European Education Innovation Network). Its research activities cover education innovation and methodology. The secretariat of European Distance and eLearning Network (EDEN) has been operating since 1997 inside the institution.

The ***BME UNESCO Information Society Research Institute***[40] (ITTK) focuses on various issues of the information society, social utilization of information technology and the Internet. It operates a network of Information Society Research and Education Groups of Hungarian higher education institutions.

The ***eLearning Department of the Computer and Automation Research Institute of the Hungarian Science Academy*** is an important actor in the Hungarian eLearning market. It is engaged in research activities regarding eLearning, as well as participating in international projects and providing expertise in international organisations and committees.

II.1.3. Main actors providing eLearning services

Table 10. Actors in service providing

RESPONSIBILITY	ACTORS	FUNCTIONS
Implementation, Service provision	**Educatio Public Company** www.educatio.hu	Implementing the action plans elaborated by the Ministry of Education and Culture for the education sector. Different divisions of the public company provide eLearning services.
	Apertus Public Foundation www.apertus.hu	Co-ordinating eLearning and distance education related tenders. Providing digital materials.
	Employment agencies and Regional Training Centres	Providing courses for improving digital skills.
	MTA SZTAKI www.sztaki.hu	Developing and providing digital materials and organising conferences.
	Neumann House www.neumann-haz.hu	Main centre for ECDL. Providing digital materials.
	Universities and colleges	Providing eLearning courses and distance education courses.
	Private schools	Providing online courses and training as well as ICT literacy courses.
	Telecottages	Providing ICT literacy courses, IT-Mentor service.
	Different Foundations and Associations	Providing ICT literacy courses.
	Content developers	Developing and providing eLearning systems and digital materials.

The background institutions of the Ministry of Education and Culture - like ***Educatio Public Company*** - play an important role in eLearning provision. The Educatio Public Company was established in 2000 with the aim of developing the tasks related to higher education admission procedures. In 2002 the functions of the organization was expanded. To date the Educatio Public Company has seven divisions. One of them is the Sulinet Programme Office, whose aim is to ensure better computer and Internet penetration in public education institutions. It implements tasks set up by the Ministry and provides different services related to eLearning, like digital learning materials or in-service training. Another division of the Educatio Public Company is the Kempelen Farkas Student Information and Resource Centre, which operates like a modern learning centre. The National Higher Educational Centre provides online assistance for people applying to higher education.

[40] www.ittk.hu

The ***Apertus Public Foundation for Distance Education and Open Learning*** was established in 2001. Its aim is to help in the dissemination of distance education and open learning in Hungary. It co-ordinates the related tenders of the National Development Plan and provides database for searching digital materials in more languages.

Employment agencies and Regional Training Centres also provide high and medium level vocational training courses, such as Business Management, diverse Information Technology or ECDL training courses via distance education. Furthermore, the number of computer literacy courses provided is increasing.

An increasing number of ***universities and colleges*** provide courses in the framework of distance education. Universities or colleges, where advanced distance education evolved in the past years can be found include the University of Miskolc, Szent István University in Gödöllő, Budapest University of Technology and Economics, College of Dunaújváros, Széchenyi István University, or College of Szolnok.

State schools provide computer literacy courses and other IT training for students.

Private schools taking part in adult education play an essential role in the dissemination of the concept of lifelong learning. An increasing number of such organizations is involved in the Hungarian education market. They provide a wide range of vocational training courses. Computer and Information Technology related courses are very popular and many language schools provide high level learning materials via the Internet.

Libraries also provide ICT related services, like online catalogues or digital literacy training.

Different associations, foundations and organizations provide diverse eLearning courses and eLearning services, as well as digital learning materials. Like the Hungarian Distance Education Foundation, the National Association of Handicapped People, ***John von Neumann Digital Library and Multimedia Centre*** or the eLearning Department of MTA SZTAKI (***Computer and Automation Research Institute of the Hungarian Academy of Sciences. Telecottages also provide ICT related services, like IT-Mentor or ECDL training.***

The number of Hungarian ***content developers*** is emerging. Many of them not only develop digital materials, but provide and operate eLearning services, like Mimóza Ltd, which operates Coedu Knowledge Network and also provides several eLearning courses via the Internet.

II.1.4. Financing of eLearning and ICT related measurements and projects

Specific data related to the financing of eLearning services and ICT equipment is not available. Since education is financed predominantly from public sources, ICT developments and eLearning related measures and projects realized in the education sector are supported mainly from public sources. EU sources are of high importance in financing eLearning developments. However, the private sector is becoming more important in financing different projects.

The most important sources of public financing are the ***state budget and budget of the ministries***, as well as the ***municipalities'*** own resources. The greater part of state support is a normative sum per head of students, which depends on the level of education concerned. ICT equipment of schools of all levels and of public libraries is financed from the central budget, but the local governments also allocate financial resources to local schools.

The EU Structural Funds and European Social Fund play an increasing role in financing different programmes of improving Information Society developments. In the framework of the National Development Plan I. significant resources were allocated for financing programmes aiming at improving digital skills of different target groups and infrastructural developments. Table 11 shows the targets, projects and available sources for the development of the human resource infrastructure.

Table 11. Sources of the Human Resource Development Operative Programme

	TARGET	PROJECT	SOURCE
Measure 3.1.	Promoting the development of skills and competencies necessary for lifelong learning.	In-service training for teachers. Support the competency based.	71 Million Euro
Measure 3.2.	Developing the content, methodology and structure of vocational training.	Developing new qualification structure. Establishment of integrated vocational training centres.	42.5 Million Euro
Measure 3.5.	Developing the system of adult training.	Development and application of up-to date adult education. Development and modernisation of the institutional system.	39 Million Euro

Source: Human Resource Development Operative Programme, 2004

In the period 2007-2013 ***two Operative Programmes*** focus on the tasks related to the dissemination of ICT supported education, training and the improvement of digital skills, as well as the development of ICT infrastructure at national and regional level. The ***Social Renewal Operative Programme is*** financed by the European Social Fund and focuses on re-qualification and lifelong learning. The ***Social Infrastructure Operative Programme*** financed by ERDF focuses on ICT infrastructure developments.

The ***Private sector*** gains importance in financing eLearning at public institutions. For example Microsoft, Cisco Systems or Hungarian T-Online support different educational institutions and finance ICT and eLearning projects.

II.2. Strategies, policies, action plans and projects

II.2.1. Description and evolution of the major government policies that focus at eLearning developments

In Hungary there is ***no national eLearning strategy***, however different strategies of ministries encompass important aspects of lifelong learning and eLearning.

The Ministry of Education and Culture is responsible for the dissemination of ICT supported education and learning in the education sector, while the Ministry of Social Affairs and Labour determined the lifelong learning strategy. This subchapter discusses different strategies in order of relevance.

Table 12. Strategies and policies with affect on broad sense eLearning developments

NAME	ACTOR	SCOPE	FORCE
a. National Development Plan – Human Resource Operative Programme	Government	Education and training sector.	2004-2006
b. National Development Concept	Government	Encompasses every sector.	2005-2020
c. New Hungary Development Plan – Renewal of the Society Operative Programme and Society Infrastructure Operative Programme	Government	Education and training sector.	2007-2013
d. Strategy of the government of the Republic of Hungary for Lifelong learning	Government	Adult education. Vocational education.	2007-2013
e. Hungarian Information Society Strategy	Former Ministry of Informatics and Communication	Beside education, culture, public administration, healthcare and environment protection.	2004-2006
f. National Broadband Strategy	Former Ministry of Informatics and Communication	Education, culture, public administration.	2005-2013
g. Information Technology Strategy in the Education	Ministry of Education and Culture	Public education. Vocational training. Adult education. Higher education. Background institutions.	2004-2006
h. Mid-term Public Education Development Strategy	Ministry of Education and Culture	Public education.	2004-
i. Vocational Education Development Strategy	Ministry of Education and Culture and Ministry of Social Affairs and Labour	Vocational education.	2005-2013
j. Knowledge for Everyone! Action Plan	Ministry of Education and Culture	Education Sector.	2005-2013

a. Hungarian Development Plan

The Hungarian Development Plan (2004-2006) contains lifelong learning and eLearning related development targets. In the framework of the ***Human Resource Operative Programme*** 3.1., the development of competencies and skills needed for lifelong learning is supported. Furthermore, it supports the role of in-service training for teachers, digital content developments and the elaboration of eLearning materials, as well as research activities carried out on education methodologies. The improvement of ICT infrastructure is also among the priorities. The Human Resource Operative Programme 3.2. aims at improvements of vocational training regarding content and methodology. The Human Resource Operative Programme 3.3. disposes of the modernisation of education and training systems and co-operation between educational institutions, as well as of social integration.

b. The National Development Concept

In 2005 the Hungarian Parliament passed the National Development Concept for the next 15 years. The aim of the Concept is to prepare measures, which enable a sustainable development for the discussed period, ensuring more workplaces, higher incomes, safe and clear environment and better health for citizens. In order to reach these results it is essential to improve the competitiveness of the Hungarian economy, to increase the employment, to ***extend the information society, to create a***

knowledge-based economy, to improve the physical infrastructure and regional development. Among the horizontal aspects: ***expanding the ICT infrastructure***, ensuring equal opportunities and increasing employment are the most important ones referring to eLearning.

The document emphasizes the ***role of ICT possibilities*** in improving the economic competitiveness and technological development. In order to realize the information society in Hungary it is ***essential to create digital equality*** and to involve the widest circle of citizens into the exploitation of possibilities of the information society.

One of the most important priorities is to ***do away with the access barriers to ICT technologies.*** Parallel to this, ***improving ICT skills*** is essential in order to use e-services and e-opportunities at high level in the information society. Encouraging the ***dissemination of online content*** **and** ***new e-services*** is also among the core tasks. The driving forces of the state are determinant in this issue. The state has to take part in supporting R&D activities as well as innovative products and technologies.

It is essential to encourage eWork and ***eLearning and the education of IT professionals.*** Supporting eGovernment, eHealth, eLearning, eWork and digital culture is in the hands of the state. Considering these changes the ***regulatory principles and the system have to be adjusted***. Specific adaptations of the existing regulations and the creation of the missing legal regulations (like platform independency or interoperability) have to be carried out.

The New Hungary Development Plan lays down the most important objectives: to expand employment and to create the conditions for long-term growth. For this purpose it launches co-ordinated state and European Union developments in six priority areas: economy, transport, ***renewal of the society***, environment and energy, regional development and state reform. The programmes of the plans will be financed from EU funds in the period between 2007 and 2013.

The overall objective of the Strategy is to ensure that more and more people have the ***opportunity to enter the labour market*** Employability can primarily be increased through education and training, and therefore labour market suited training and lifelong learning should be promoted. The Strategy states that the role of ICT solutions and alternative teaching methods is essential and improving IT and foreign language skills, as well as enterprise training are unavoidable in order to enhance the competitiveness of employees.

Modern info-communication technologies are of huge importance. In order to achieve the long-term improvement of the productive sector, support is provided to integrate the elements of ***knowledge-based economy and info-communication technologies*** in the operation of enterprises. Providing and developing basic infrastructural conditions for information technology, including the establishment of broadband networks; increased IT safety is a fundamental requirement in developments strengthening IT society.

Considering the role of eLearning and ICT in education and training, the priorities of the ***Renewal of the Society Operative Programme*** should be mentioned. The basis for the renewal of society is the improvement of the quality of human resources. In order to raise employment ***developing educational infrastructure*** is of great importance. Besides that, the development of the ***conditions for intelligent learning*** in higher education is also of primary importance. The reconstruction of buildings, the establishment of intelligent learning space, the ***provision of modern IT tools and networks*** and the ***establishment of ICT supported university*** administration are all priorities. The system of vocational and adult training should be developed and integrated employment and social services and supply systems should be built up. Regarding the employment service, investments will be focused on the physical and IT development of the integrated employment and social service system, spreading the new service model to the micro-regional labour offices all over Hungary.

Improving basic ICT skills are promoted. Generally, the role of ICT supported education and training, as well as reducing the digital divide are among the priorities. In the framework of the ***Society***

Infrastructure Operative Programme, among others, the development of the education and training infrastructure and the establishment of regional and local centres providing electronic services are of high importance.

The improvement of the ***electronic and ICT related services*** in the case of cultural centres and libraries, as well as the establishment of training systems are also emphasized. The modern service provider universities and colleges will enable electronic administrative systems, digital content services and distance education at high quality level.

c. Strategy for Lifelong Learning

The Strategy covers the period 2007 -2013, in compliance with the structural planning of the European Union; nevertheless, it contains several objectives whose implementation is envisaged by 2010 in line with the EU's Lisbon Strategy. Having regard to the universally accepted components of the European paradigm of lifelong learning, and the opportunities and the desired development trends of Hungary, the specific steps to be taken for a practical implementation of Hungary's lifelong learning strategy are best defined as ***five priorities***:

1. Strengthening the role of education and training in creating opportunities.
2. Strengthening the ties between education, training and the economy.
3. Application of new governing methods and public policy procedures.
4. Enhancing the efficiency of education and training, increasing their total social expenditure.
5. Improving the quality of education and training.

As education and training play an important role in mitigating social and geographical disparities, quality and accessibility of education and training systems should be significantly improved first of all with ***extensive application of information technologies*** that ensure the expansion of learning opportunities. ***Development and dissemination of ICT*** at all levels and in all forms of education are inevitable. Furthermore, it is necessary to ***develop the IT content of education*** and to further enhance the digital knowledge of educators.

According to the strategy, it is of great importance to increase the number of distance education programmes in the field of initial training, and to grant assistance for the setting up of student support schemes for the forms of distance education.

More institutions and teachers have to be involved in using distance education elements in the framework of traditional education. The quality improvement of distance education is also an important step. Besides formal education non-formal education and further training have to be enhanced. More company-organized training should be carried out in the framework of eLearning. The possibilities of ICT solutions and Internet adult education has to be strengthened and more courses should be provided in the framework of distance education. Considering the decisive role of teachers and appearance of new learning methods, the range *of* ***in-service teacher training*** programmes must be broadened and directed towards the acquisition of competences that are necessary for rapid responses to labour-market challenges.

d. Hungarian Information Society Strategy

The first crucial strategy related to Hungarian information society was the Hungarian Information Society Strategy (Magyar Információs Társadalom Stratégia), which concerns the period 2004-2006.

Considering education the Strategy defines three strategic goals, such as continuous training of teachers, provision and usage of digital learning materials and establishing a unified administration system.

The ***overall aim of the strategy*** was to help the Hungarian economy and society to catch up with the European rate of development. Considering its objectives and solutions, it follows the European values and courses of action, while focusing on specific Hungarian characteristics and possibilities. It emphasizes that opportunities of ***wide-ranging applications of information technology*** should be exploited in all fields.

The Strategy classifies ***national wide broadband infrastructure*** as a key area. Operatives have to be launched as a result so that over a period of 4 to 6 years a nation-wide high-speed network will be created satisfying the long-term info-communication needs for all settlements locally. The National Broadband Strategy was set up in order to carry out broadband goals.

The second key area covers the tasks ***facilitating access to info-communication tools***, computer systems and services. Some form of community access must be provided in every settlement within the shortest possible time. The number of public access points – eMagyarország points – reached 4000 in 2006.

In the information society everyone should be able to ***gain access to the information*** important for them. Through the ***promotion of digital literacy*** it has to be ensured, on the one hand, that everybody is able to use the continuously renewing information and communication tools, on the other hand it has to be ensured that the information obtained becomes applicable knowledge. In accordance with these goals several projects have been carried out, such as the growing importance of IT-Mentors all over the country, in-service training for teachers and supported ECDL training for secondary schools students.

The strategy has set the maintenance of ***social equal opportunities*** as one of its main goals. The task of the social equal opportunities target area is ***to reduce traditional social exclusion through the promotion of access to and use of ICT tools and online services,*** and to achieve a much wider social participation relying on these aids. In accordance with this, projects for improving the digital literacy of different disadvantaged groups, like Roma people or the disabled have been elaborated.

The Strategy emphasizes the role of ICT supported education and socialization of children and students in the information society. ***Distance education and distance learning*** have to become important means of lifelong learning; eLearning is the version of these supported by ICT tools. By the end of the decade ***comprehensive public eLearning networks*** offering accredited higher education and further training courses need to be established in Hungary.

e. The National Broadband Strategy

In order to face the challenges of the information society, the most important measure is to ensure the ***physical infrastructure.*** The National Broadband Strategy was formulated by the Hungarian Ministry of Informatics and Communication in 2004. The Strategy focuses on the ***improvement of the broadband access*** in the whole country and emphasizes the developments in the field of eGovernment, eBusiness and eCulture. The National Broadband Strategy defines that broadband is of high priority, information society services should be available for everyone from anywhere and any time, safely!

The Strategy suggests involvement of significant sources: 100 billion Ft was allocated for these goals. According to the Strategy the main barriers regarding the dissemination of electronic communication are the ***relatively high Internet prices***, inadequate accessibility, the lack of relevant content and unequal opportunities. For these reasons the Strategy focuses on the problems of the accessibility, content and equal opportunity and determines the ***concrete strategic goals*** as follows:

1 broadband Internet penetration – number of broadband subscription per 100 citizens – to reach the EU average by the end of 2008 and the EU15 average by the end of 2013;
2 the use of services of eAdministration to reach the EU average by the end of 2008 and the

EU15 average by the end of 2013;

3 the proportion of eCommerce to reach the EU average by the end of 2008 and the EU15 average by the end of 2013;
4 90% covered area with broadband services by the end of 2008, total coverage by the end of 2010;
5 the proportion of ”digitally illiterate” population will be less than 50% by the end of 2008 and less than 33% by the end of 2013.

The National Broadband Strategy suggests regulation and campaign related tools, as well as fiscal tools for the implementation of the tasks. First of all, it emphasizes supporting the creation of the broadband public network. It highlights of course, the relevant public administration, business and cultural content development.

f. Information Technology Strategy in the Education

The most relevant strategy regarding eLearning is the strategy of the Ministry of Education and Culture, whose aim is to establish an IT network and to elaborate teaching methods meeting the requirements of a modern knowledge-based economy. The Strategy encompasses the years 2004-2006 and its scope stretches to public education, vocational training, adult education, higher education operators and background institutions. It marks the key development areas:

1 Development of ICT supported education.
2 Digitalisation of learning materials and ensuring access to eLearning materials.
3 Ensuring broadband Internet access.
4 Improving the ICT infrastructure.
5 Teacher in-service training.

According to the main points of the strategy, a range of projects have been carried out in recent years in Hungary. Improving broadband Internet access is ensured by the Public Net Programme (Közháló Programme) and Wireless Programme. Due to the Digital Trolley, Digital Table, Clean Software Programmes and Sulinet Expressz Programme the ICT infrastructure in public education has been improved.

Table 13. Number of computers in the education sector between 2002-2006

Computers per 100 pupils (students)							
School year	Kinder garten	Primary school	Vocational school	Special vocational school	Secondary general school	Secondary vocational school	Tertiary education
2002/2003	0.7	6.0	9.1	12.4	8.4	16.7	10.9
2003/2004	0.7	6.5	10.2	13.4	9.1	18.0	11.7
2004/2005	0.9	7.3	11.4	15.4	10.4	19.5	12.2
2005/2006	1.1	8.2	12.6	17.7	10.7	21.3	14.0
Computers with Internet access per 100 pupils (students)							
School year							
2002/2003	0.1	2.3	5.9	7.3	6.9	12.4	10.1
2003/2004	0.2	3.1	7.3	6.9	7.8	14.0	11.0
2004/2005	0.2	4.3	8.7	9.4	9.2	16.2	11.4
2005/2006	0.4	6.0	10.1	11.8	9.7	18.2	13.3

Source: Statistical Yearbook of Education, 2005/2006

The Sulinet Digital Knowledge Database and Digital Library provide a wide range of digital content at primary and secondary school level. ICT based further training has provided teachers with the opportunity to learn to use digital learning materials. Table 14 shows the growing number of teachers with qualification in informatics.

Table 14. Number of teachers with qualification in informatics

School year	Kindergarten	Primary school	Vocational school	Special vocational school	Secondary general school	Secondary vocational school	Tertiary education	Total
2003/2004	1 139	22 038	1 775	188	5 548	6 635	1 820	39 143
2004/2005	2 001	25 916	2 226	253	6 620	7 978	1 863	46 857
2005/2006	2 772	29 958	2 407	342	7 068	8 341	1 853	52 741
2006/2007	3 235	32 668	2 700	397	7 430	8 487	1 752	56 669

Source: Statistical Yearbook of Education, 2005/2006

g. Mid-term Public Education Development Strategy

The Mid-term Public Education Strategy was elaborated by the Ministry of Education in 2004. It emphasizes seven targets:

- Developing key competencies in order to establish lifelong learning.
- Narrowing inequality in education.
- Developing the quality of education.
- Supporting the development of pedagogical professions.
- Development of ICT applications.
- Improvement of infrastructure in education.
- Establish a cost effective administration in public education.

h. Vocational Education Development Strategy

The Vocational Education Development Strategy was issued by the Ministry of Education and Culture together with the Ministry of Social Affairs and Labour in 2005. The strategy emphasizes building appropriate ICT competencies during the secondary school education, since possessing advanced digital skills raises the chances in the labour market. Elaborating and providing eLearning courses are among the development goals. It highlights the role of an administration system embedded in an IT network, which would enable the set up of a credit system.

i. Knowledge for Everyone! Action Plan

The Knowledge for Everyone! Action Plan was elaborated by the Ministry of Education in 2006. The Plan contains 163 Programmes. In the public education sector the improvement of digital literacy, using eLearning and ICT supported education are among the priorities. Infrastructural development in public education and the modernisation of vocational training based on modern information technology can be also found in the Plan.

II.2.2. Impacts of the European eLearning policies on national policy setting

Considering policies and strategies related to the field of eLearning is significantly influenced by policies, options and strategies of the European Union, Hungarian documents are strongly influenced by European values.

The objectives of the Hungarian Information Society Strategy and the programmes aiming to implement them are fully adjusted to the strategy and strategic programmes of the European Union, the ***eEurope+ and the eEurope 2005*** action plans. This allows joining those programmes of the Community which support eEurope, and it also enables Hungary to use the EU's structural funds as resources for the construction of the information society.

The Hungarian Lifelong Learning Strategy and New Hungary Development Plan are strongly influenced by the ***Lisbon Strategy***. In the case of the National Broadband Strategy besides EU plans and strategies English, Italian, Dutch and Canadian ***best practices*** were taken into consideration.
The New Hungary Development Plan takes into consideration the ***Community Strategic Guidelines, i2010, the European Information Society for Growth and Employment Programme and the Lisbon process.***

In conclusion, we can state that ***EU influence is noteworthy*** in elaborating Hungarian information society strategies and policies. The objectives and priorities determined at EU level are decisive in Hungarian eLearning related policies. However, it would be useful to take international best practices into consideration more intensively. Land specific issues are also infiltrated into Hungarian policies.

II.2.3. Major public and private projects in eLearning: their aims, financing and results

In line with the policies and strategies laid down by the government or ministries, different projects were implemented in order to enhance eLearning in Hungary. The projects can be divided into the following main areas:

Table 15. eLearning programmes and projects

	Name of the project	Main target of the project
Public projects and programmes	Publicnet Programme	Infrastructural developments.
	Wireless Network	
	Telecottage	
	eMagyarország project	
	Sulinet Expressz Programme	
	Digital Knowledge Base	Developing digital contents.
	National Audiovisional Archives	
	European Pedagogical ICT Licence	Improving digital skills.
	IT-Mentor Programme	
	Standardized Education System	Improving administration in higher education institutions.
	National Higher Educational Information Centre	
	European Innovative Schoolnet	Improving acceptance of ICT supported education in public education.
	eTwinning Programme	
	Digital Secondary School	Improving chances of disadvantaged groups in the labour market by the means of eLearning.
	Blind Program	
Private or Public-Private projects	Partner in eLearning	Improving computer skills Infrastructural developments.
	Innovative School and Teachers	
	Cisco Academy	
	Projects of Microsoft	
	Encompass	Providing online learning materials.

II.2.3.1. Public projects

Infrastructural developments

The ***Publicnet Programme*** (Közháló) was initiated by the Ministry of Informatics and Communication, the aim of which is to ensure broadband access at educational institutions, public community centres and the so called Telecottages. Közháló is used for public services in general, to offer high speed Internet access to every settlement with special regard to local public institutions and civil societies. By the end of 2005, 5550 access points were established and at the beginning of 2007, 7300 broadband public access points were available in Hungary.

The establishment of ***Wireless network*** was launched in 2004 by the Ministry of Informatics and Communication. Its aim is to enable wireless connection in all Hungarian schools and higher education institutions and public libraries. Besides that, wireless connection is provided in more and more public places, Internet Cafés and restaurants.

Governmental ICT policies have aimed at offering access to citizens living in remote and less developed regions by building a network of so-called ***Telecottages*** and offering various ICT related subsidies to local governments located in these areas within the framework of regional policy. The Telecottage project established local information and computer centres in smaller settlements and villages providing Internet access and cheap eServices. The telecottage movement was originally a local initiative, later it grew into a national association. So far 500 Telecottages have been established in Hungary, mainly in regions with poorly developed infrastructure and economy, and another 500 are under construction.

The aim of the ***eMagyarország*** (eHungary) Programme is to provide for free or at low prices, Internet access points throughout the whole country. The eMagyarország points are public access points providing high-level services in a franchise-like system and cover the entire area of the country, thus spreading digital culture. The points provide citizens with assistance to learn how to use the Internet; they also provide minimum services like Internet access at least 16 hours per week or access to ECDL learning materials. Another initiative of the Ministry of Informatics and Communication was setting up 182 eMagyarország points in the Hungarian settlements outside Hungary in order to contribute to their modernization.

The ***Sulinet Express Programme*** is a governmental initiative, which was launched in 1996. Until 2003 the main goals were to provide schools with Internet connection and computer labs, to help the teachers through a portal with structured extra teaching materials, to organize training for teachers and camps for students, teachers and system administrators and to announce calls for applications. In 2003 – besides the traditional activities – new challenges appeared within the framework of the programme. Another initiative of Sulinet Express Programme offered tax allowance provision for students and parents of students for purchasing computers, however this programme ended in 2006.

Projects in content development

The ***Digital Knowledge Base Programme,*** the content development programme of the background institution of the Ministry of Education and Culture has been developed and operated on the principles of broad sense eLearning. The aim of the programme on the one hand is to operate a website, where digital learning materials in all nine basic subjects are available, and on the other hand to develop digital educational supplementary materials, which can be used in the field of public education as an open source.

The ***National Audiovisual Archives (NAVA)*** collects and contains Hungarian or Hungarian related television and radio programmes and provides a database with searching and downloading functions. NAVA has been operating since the beginning of 2006 and to date more than 90 000 hours of programming are available on the Internet. Downloading and watching these files are only available at

the so-called NAVA points, at educational institutions and libraries. NAVA enables the use of audiovisual materials for learning purposes. In the framework of the NAVA an additional service will soon be available, which can be used as supporting digital learning materials in accordance with the National Curriculum.

Projects for improving digital literacy

The aim of the ***Sulinet Express ICT based modular in-service teacher-training programm***e is to provide training for teachers in order to be familiar with ICT supported education. The teacher training encompasses the following fields:[41]

- operation and use of the Sulinet Digital Knowledge Base within the process of teaching and learning,
- opportunities of computer use within the process of teaching and learning,
- application of multimedia-based software and tools in effective pedagogical work,
- theoretical and practical questions of the constructive teaching-learning methods,
- use of digital educational tools whilst teaching scientific, art, Informatics and Mathematics subjects.

The accreditation and adaptation of the ***European Pedagogical ICT Licence*** in Hungary means an important step towards improving ICT literacy among teachers. EPICT is a comprehensive, flexible and efficient in-service training course introducing a European quality standard for the continued professional development of teachers in the pedagogical integration of information, media and communication technologies (ICT) in education.

It comprises content, method, technology and processes, all of which are controlled internationally by the EPICT Group and nationally by the EPICT country, enabling the national environment to obtain both recognition and accreditation for its professional development. This kind of further training for teachers is different from the traditional ones. One of the advantages of the programme is that courses are provided in the framework of distance education. Teachers form groups and do exercises together with the help of the facilitators.

IS-Mentor network project started at the beginning of the 90's. To date, approximately 3000 IS-Mentors help in public places to learn and use the Internet and online services. It can be considered as a very positive development, since people who are not familiar with computers can learn to use online services. Some public access points report that there is an increasing demand.

Projects for improving administration process in higher education

The ***Standardized Education System*** (ETR) and ***Neptun Administration System*** facilitate the tasks regarding organizing exams and subjects, registration of grades and financial issues arising in connection with higher education. It is a common system, which was introduced at the end of the 90's and during the year 2000 almost at all Hungarian state universities and colleges. Due to these developments administration systems of higher education institutions meet more the requirements of the knowledge-based society.

The ***National Higher Educational Information Centre*** (OFIK) operates under the aegis of Educatio Public Company, the background institution of the Ministry of Education and Culture. The original mission of the organization is providing assistance for people applying to higher education institutions. The central database and programmes of the organization support the admission procedures. Students can get online information about the higher education programmes and read about experiences of other students. Profession orientation related topics, tests and career consultation are also very useful.

[41] http://www.oki.hu/printerFriendly.php?tipus=cikk&kod=link-Sulinet-Express

Admission procedure is provided through the Internet, which makes the application process more simple and transparent.

Projects for improving acceptance eLearning in public education

The ***European Schoolnet*** announces a competition among European schools every year. Hungarian schools take part with their own developed digital materials very successfully in these competitions (e.g. the Sounds of the chords were among the most successful learning objects).

In the framework of the project - ***European Innovative Schoolnet*** -co-ordinated by European Schoolnet, 30 Hungarian schools have participated since 2003. They are involved in elaboration and usage of ICT methods, as well as taking part in testing modern technologies and tools.

eTwinning is the main action of the European Union's eLearning programme. The aim of the programme is to promote ICT supported education at schools. 477 Hungarian schools are registered in the programme and 172 schools are engaged in projects. In comparison to this, 1279 Czech schools are registered and 517 of them are involved in projects.

Specific programmes to disadvantaged groups

Associations of ***disabled people*** provide a relatively wide range of eLearning for their target groups. The Hungarian Association of the Blind or the National Association of Handicapped People (MEOSZ) provide ECDL training and courses in the field of business management courses, eMarketing, Computer Programming and English language in the framework of distance learning.

The Hungarian Association of Content Developers has managed different projects for disadvantaged groups. One of its current projects targets blind people. The aim of the ***Blind Programme*** is to develop the skills and competencies of blind people in the field of information technology. In the framework of the project complex training is provided largely in the framework of eLearning.

The ***Digital Secondary School*** was established in 2003 with the support of the Ministry of Education and the Ministry of Informatics and Communication, which ensures equal chance for learning. Its aim is to help disadvantaged adults to pass the maturity exam mainly in the framework of distance learning. It is available in the North Hungarian Region, in the county of Borsod-Abaúj-Zemplén, where the ***Roma minority*** rate is the highest in Hungary. Most of the participants of the Digital Secondary Schools belong to the Roma minority. The importance of this initiative lies in the fact that the Roma minority has huge disadvantages in the labour market, partly because of the lack of education and this project enables them to participate in secondary education. Currently the School has 526 students, who enjoy free education. Teachers are available for consultation in 11 schools of the county, where computers and Internet are also provided for those students who do not have a computer and Internet in their households.

II.2.3.2. Private and public private projects

Some private actors take a very important role in encouraging eLearning developments. ***Microsoft*** allocates significant resources for the program called ***Partners in eLearning***. The aim of the program is to emphasize the role of ICT in the education, teaching and learning. In the framework of the program called ***Innovative School and Teachers*** Microsoft co-operates with schools, where ICT supported education is encouraged. Microsoft launched the Innovative Teaching Club with the aim of collecting best practices and experiences as well as ideas in the field of eLearning. The company pays attention to the further training of teachers. Free three-day long in-service training sessions are organized for teachers yearly. Microsoft focuses on higher education in the field of informatics. Different events, seminars and conferences are organized, where new products and developments of the company are presented.

Cisco Systems Hungary Ltd. also supports ICT related programmes. The ***Cisco Network Academy*** launched in 1997, is a non-profit training programme and network, which is a co-operation between educational institutions, enterprises, the government and Cisco Systems. The central mission of the Network Academy is to increase the number of IT professionals, which is ensured by an eLearning-based curricula. Cisco Network Certified Associate and Networking Professional, or Internetworking Expert degrees can be obtained. These courses are available for students above 16 years of age. Local and Regional Academies are established in secondary schools and higher education institutions supervised by Cisco Academy Training Centres. Cisco Systems ensures the curricula and the network tools.

Cisco is among the leaders in providing and using eLearning solutions. The Cisco Networking Academy Management System is an innovative model, which enables online learning and testing, evaluation and controlling. All training and courses are based principally on online learning.

Other initiatives of Cisco, like the ***F-email project*** targets risked groups. In the framework of the F-email project chances of Hungarian women will be improved in the labour market. Since the level of digital literacy is becoming more decisive in the labour market, the programme also provides computer training and informatics training among others, like communication training.

One of the most popular projects is the ***Mindentudás Egyeteme*** (Encompass), which was created under the aegis of public and private partnership with the academic supervision of the Hungarian Academy of Sciences and sponsorship of the Hungarian Telecommunications Company (now Magyar Telekom) and its affiliate, Axelero Internet (now T-Online). It regularly provides lectures in different subjects through television and the Internet. Besides that it offers online courses, for example in astrology.

Due to the ***'Clean software' Programme*** (Tisztaszoftver Program) public and higher education institutions and their students, employees and teachers, as well as public education teachers can use clean Microsoft Office and Windows upgrade products for free at home. The aim of the licence agreement between the Hungarian Ministry of Informatics and Communication and Microsoft is to foster the dissemination of open source systems in the education sector.

A good example for the co-operation between the private, public and non-profit sectors is the collaboration of ***Microsoft, the Non-profit Information and Training Centre*** Foundation and the Ministry of Social Affairs and Labour. Microsoft supports the project with more than half a million USD. In the framework of the project 19 community technological centres will be established. The aim is not only to establish IT infrastructure, but also to provide training and mentor programmes, as well as to ensure online availability of civil services. According to the plans, more than 2000 people can gain basic knowledge in informatics and nearly 20 thousand people are served through the technological centres during the three years. It is very important to improve the skills and competencies of disadvantaged people that are principally the target groups of civil organizations. Due to this project their chances in the labour market will be better. Other programmes of Microsoft have supported civil organizations of disabled people and the Roma minority.

II.3. The legal framework supporting eLearning

There is no a specific Hungarian legal framework in the field of eLearning. Several acts dealing with education and information society issues have relevance for eLearning.

II.3.1. Education-specific legislation

The *government act 130/1995 (X. 26.)* describes the National Curriculum to be used in public education. It consists of three levels: the top level defines the main visions and approaches to be applied. The second level, which consists of the framework-curricula orientate the authors of

textbooks and the teachers about issues to be covered and the requirements. The third level of the curriculum is the competence of each individual school.

II.3.2. Information Society-related legislation, relevant for eLearning

The 'screenplay' for Hungary's closing up to the European Union outlined the timetable for legislation supporting the formation of information society. Between 1998 and 2003 the basic legal rules were created to settle the questions or to ground the further development of data protection, electronic commerce and payment, customer protection and copyright. Legislative culture was further enriched by Hungary's joining to a number of international IT related agreements, so in some cases there was no need for legislation at the national level, where there was acceptable EU law.

The legislation process was further accelerated in 2001, when a row of IT related laws were made. The *Act on Electronic Signature (2001. XXXV.), Act on Communication (2001. XL.), Act on Electronic Commerce Services and other Services in Information Society (2001. CVIII).* After the Act on Electronic Signature was passed, the ministers were authorized to introduce ruling in the scope of their authority, at the institutions and legal relationships, procedures, where electronic documents and signatures can be issued and accepted. However, this was too early, because electronic data management, filing and workflow were underdeveloped, lacking procedural legal regulation. It blocked the introduction of e-government in administration, in spite of the laws being passed. The effectiveness of the above-mentioned laws was further blocked by the lack of government decisions. It resulted in the delay of outlining the exact fields and responsibilities of the execution and operation of the laws and legal regulations.

The legislation 'industry' was started again in 2003, initiated partly by the forthcoming European Union accession and partly by the problem caused by the paralysed laws and legal ruling. There were missing decrees and decisions needed to facilitate the legal network for e-government. It was the time when a new law on communication was passed by the Parliament. This Act integrated the (tele) communication and postal rights. The Act 2003 C. came into effect on 1st January 2004.

Another Act came into force regarding the modification of the protection of industrial and copyrights, 2003. CII. Another Act, 2003. XCVII concerned the modification of the *Act on Electronic Commercial Services and Other Services in Information Society (2001. CVIII.).* (This was necessary because of the EU compatibility to answer the Directive 2000/31/EK.) The *Act 2003 LXXXI.* is of primary importance since it was the first Hungarian Act to ensure the opportunity of full electronic procedures in electronic in-company incorporation and electronic publication of company data. This was followed by the *Act 2003. CXXIX.* on Procurement, providing the necessary legal ruling for electronic procurement. Thus 2004 was an important date for two reasons.

On the one hand the *Act 2004. CCCVII. on the National Digital Data Assets* including the National Audiovisual Archives, which represent a significant part of national cultural heritage was passed, and on the other hand, the Parliament also passed *Act 2004. CXL.* on the General Rules of Administrative Procedures and Services. This latter one, having come into effect on 1st November 2005, replaced the *Act 1957. IV. on State Administration Procedures* that had served for half a century. The new Act on administrative procedures gives way to electronic government services, depending on the ability of government institutions and local governments. The list is closed with the Act 2005. XC., defining the rules of the freedom of electronic information.

Freedom of Information legislation

- *Act on Protection of Personal Data and Disclosure of Data of Public Interest* (1992).
- *Act on the Freedom of Information by Electronic Means* (2005).
- *Act No. LXIII of 1992* on the Protection of Personal Data and Disclosure of Data of Public Interest is a combined Data Protection and Freedom of Information Act. The Act guarantees that all persons should have access to information of public interest, which is defined as any information processed by government authorities except for personal information. The

Parliamentary Commissioner for Data Protection and Freedom of Information oversees the application of the 1992 Act. In July 2005 the Hungarian Parliament adopted the Act on the freedom of information by electronic means, which establishes the legal environment required to create a transparent digital state.

Data Protection/Privacy legislation

- *Act on Protection of Personal Data and Disclosure of Data of Public Interest* (1992).
- *Act No. LXIII of 1992 on the Protection of Personal Data and Disclosure of Data of Public Interest* is a combined Data Protection and Freedom of Information Act. The Act sets rules and safeguards regarding the processing of personal data by public and private bodies. Its application is overseen by the Parliamentary Commissioner for Data Protection and Freedom of Information.

E-Communications legislation

- *Act on Electronic Communications* (2003).
  The Act implements the new EU Regulatory Framework for Electronic Communications.

E-signatures/E-identity legislation

- *Act on Electronic Signature* (2001).
  The Act on Electronic Signature was adopted on 29th May 2001 and entered into force on 1st September 2001. It creates a legal framework for the provision of certified electronic communication and data transmission in business, public administration and other areas of life affected by the information society.

II.4. Dedicated ICT infrastructures and applications

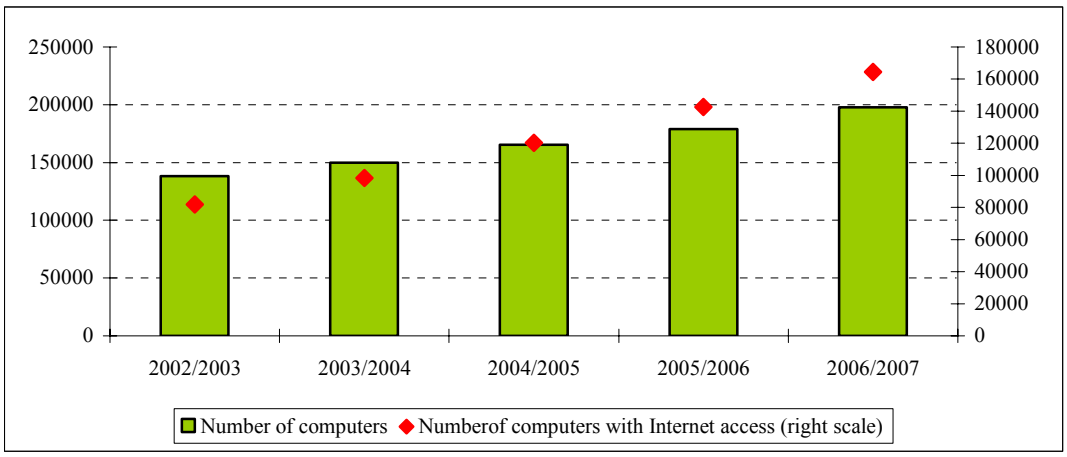
The developments of the ICT infrastructure are among the greatest challenges regarding information society issues.

II.4.1. Technical background for eLearning services in the education sector

Generally, the level of ICT equipment in Hungarian schools lags behind the EU average. However, ICT penetration and Internet penetration have improved in the last years.

In 2006, almost all Hungarian schools (97%) used computers for teaching and had Internet access. Secondary schools are better equipped with computers and computer labs, as well as with digital appliances than primary schools. 97% of the primary schools used computers, while all upper secondary and lower secondary schools used computers. 96% of Hungarian schools had Internet and 77% of all schools had access via broadband connection. With this figure Hungary ranks at number 11 and is over the EU average (67%). Among the new member states only Estonia (95%) and Slovenia (85%) represent better percentages. Figure 16 shows the development of computer and Internet access in schools in the past years.

Figure 16. Number of computers and computers with Internet access in the education sector, 2002-2007 (without tertiary education)



Source: Statistical Yearbook of Education, 2006/2007

The total number of computers per 100 pupils was 9.6 for all Hungarian schools, while this number was 6.8 in primary schools, 7.8 in upper secondary, 11.6 in lower secondary and 16.4 in vocational schools. Considering the differences between rural and urban areas, we can conclude that 81% of schools in densely populated areas have broadband access compared to 73% of scarcely populated areas. 56% of Hungarian schools have websites in comparison to 63% EU-average. 43% of the schools offer e-mail address to teachers and 26% of them to pupils. Though computer penetration is not so low, only 19% of Hungarian schools use computer for teaching. The majority used the computers in labs only.

In comparison to the EU average (61%) using computers for teaching in classrooms is very low (19%). In order to mobilize ICT appliances the Ministry of Culture and Education equipped 1117 secondary schools with the so-called digital trolleys, partly with wireless technology. The trolley consists of a notebook, a projector, a DVD player, and loudspeakers. These mobile appliances ensure the physical requirements of using ICT applications more often in teaching, however only few (43%) classroom teachers had used computers in class in the 12 months prior to the survey. In case of primary schools only one third of teachers used ICT in class, in the vocational schools this figure is almost two thirds. The situation is only worse in Latvia and Greece across the EU. It is typical that younger teachers use ICT in class, however also a fourth of the older teacher generation uses ICT in class. Still, 57 % of teachers in Hungary still do not use computers in class. The key barrier to this is the lack of computers – according 49% of the answers. Other barriers like lack of adequate materials or lack of skills are also mentioned. Those teachers, who use ICT in teaching, obtain digital materials mainly from the Internet (82% of the teachers), from electronic offline materials (72%) or from existing online material from established educational courses.

Broadband access to the Internet is available via the Közháló, in Hungary's 2530 state-owned schools. It has had a great effect on the improvement of eLearning by providing Internet access and ICT equipment to educational institutions, various primary and secondary schools.

II.4.2. Technical background for eLearning services in public and private institutions and at households

ICT equipment of the Hungarian public sector is below the EU average. Administrative staff in the central public sector is better equipped with computers. The main backbone of eGovernment services, the ***Electronic Government Backbone*** (Elektronikus Kormányzati Gerinchálózat, EKG), provides secure broadband infrastructure for the public sector exclusively. It connects the 18 county capitals and the capital of Hungary, Budapest. The EKG is not used directly for educational services, but

connects certain actors, most importantly the Ministry of Education to other actors of public administration.

The other key network used for public services is Közháló (***Publicnet***), which was launched in 2003 as a government initiative. Contrary to the EKG, which is used solely for the institutions of the central administration or with national competence, Közháló is used for public services in general, to offer high speed Internet access to every settlement with special regard to local public institutions and civil societies. Local governments can have Internet access via the Közháló. Also it is used for the operation of the eMagyarország (eHungary) points, which are public access points. These PIAPS are installed in ***libraries, community centres, telecottages, clubs and foundations***. Finally, Közháló has an important role in education as primary and secondary schools, being part of the Sulinet Programme, gain access via the Közháló. Sulinet, besides providing content and services, is also an infrastructural programme, a sub-net of Közháló, to which more than 5000 educational institutions are connected.

The national budget financed the initiative of Közháló by HUF 15-18 billion (approximately EUR 58 Million). The developing process could be divided into three steps:

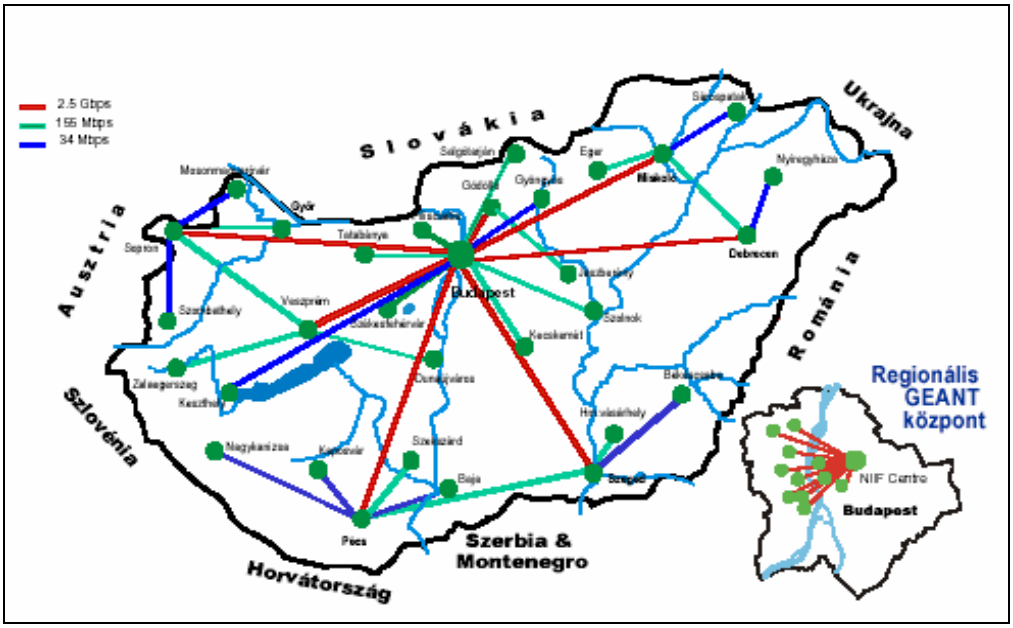
- the establishment of ***eMagyarország (eHungary***) points with all the infrastructure and services systems until may 2004,
- ***broadening of the Közháló*** to every settlement by introducing the basic services of the network by 2006,
- the integration of the different economic sectors, government institutions and civil societies into a ***multifunctional on-line service system***.

The aim of governmental initiative with Közháló was to extend the ***Internet to the public utility category of goods***. In the case of public goods, every citizen has the right to access it regardless of how much he/she has paid into the budget being redistributed among the members of the society. This was a generous action on the side of the government, but has its limitations from the view of future development of this network. Encouragement of public- private co-operation would be very useful in this issue.

II.4.3. Internet access and networks

Broadband accessibility has increased in the last few years in Hungary, due to actions of the National Broadband Strategy.

Figure 17. The spread of broadband infrastructure at the end of 2005



Source: NSZS (National Broadband Strategy), 2005

The dominant Internet technologies on the market are DSL and cable television access, but there are many – some though still under technological development – alternative ways of electronic communication technologies, which could concur with the two dominant technologies of today. In the short run, the technologies providing broadband access remain DSL and cable modem access, but the quickly developing technologies of WiFi, WIMAX and the mobile networks capable of broadband transmission (EDGE, UMTS) could radically shape the future of technological developments. Thanks to stiff competition between the three Hungarian mobile providers and the quick pace of development of other alternative technologies of broadband communication, data transmitting is one of the most dynamically developing sectors of the Hungarian economy, thus providing supportive background for eLearning services and its development.

Besides the commercially available broadband possibilities, three major networks must be described which are relevant to various actors of eLearning.
In 2006, the number of broadband Internet accesses in Hungary increased by 53 percent. At the end of 2006 nearly 1 million people had a subscription for ADSL or cable modem broadband service in Hungary.

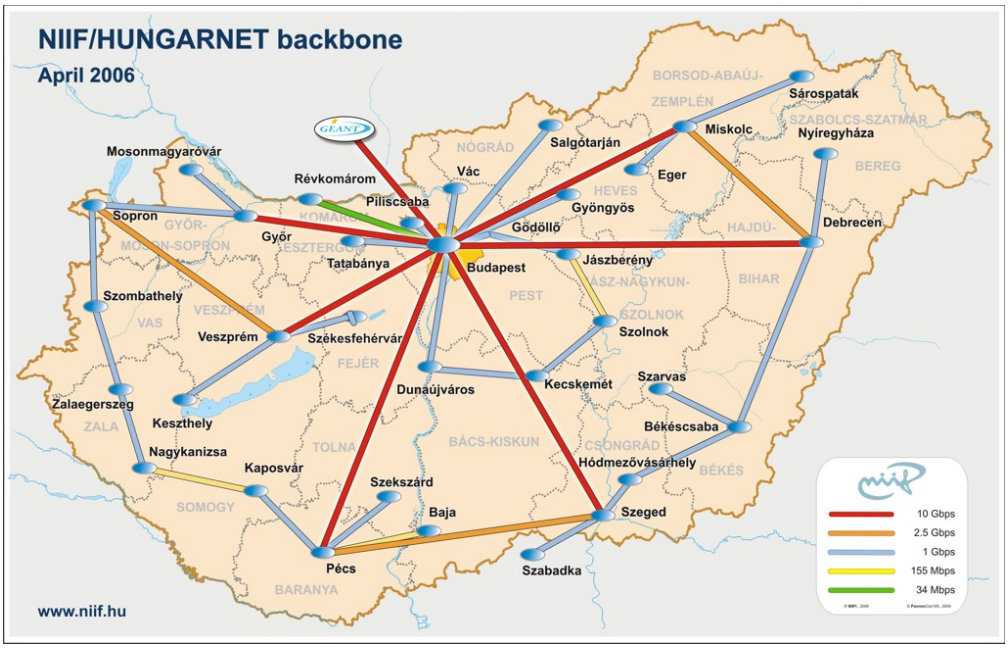
II.4.4. NIIF

The National Information Infrastructure Development Programme (Nemzeti Információs Infrastruktúra Fejlesztési Program) provides the dedicated infrastructure, access, connection and selected services for:

- the R&D institutions, including the research institutes of the Hungarian Academy of Sciences,
- for the higher education institutes (both universities and colleges),
- for public collections, museums and libraries.

The programme is financed by the central budget. The backbone of NIIF is called HBONE, which is the network for the Hungarian academic institutions. It serves higher education institutions, libraries and research institutions and numerous other public institutions. The major links of HBONE are of 10 Gbps speed, the international and long-distance connections apply DWDM technology.

Figure 18. Backbone topology: (only high-bandwidth domestic long-distance connections are shown)



Source: www.niif.hu

II.4.5. Learning Management Systems in Hungary

There are different complex LMS systems available in Hungary. Besides multinational companies, Hungarian developers also offer LMS and LCMS systems.

Oracle, IBM Lotus, Microsoft, Hewlett-Packard Hungary, Sun Microsystem provide LMS systems. Among Hungarian developers Számalk, SZTAKI, Sabedu and Mimóza Ltd. should definitely be mentioned. The Coedu EducatioNet distance education system – developed by Mimózs Ltd. - is used by the biggest number of users in Hungary today, applied in public education, in higher education and in adult education as well. It is appropriate to use the term "system" in connection with Coedu, since the Coedu EducatioNet software contains the applications performing curricula edition, curricula display and training administration (tutorial and training department).

Availability of open source learning management systems is given in Hungary. Most of the Hungarian educational institutions use the Moodle software package. Moodle is used as a basis for eLearning courses.

II.5. eLearning services

II.5.1. Major eLearning services

The eLearning services can be divided into the following categories according to target groups:

- eLearning services for pupils and teachers at primary and secondary school levels,
- eLearning services at universities,
- eLearning services in adult education and for the unemployed,
- eLearning services for people with disabilities and other disadvantaged groups.

II.5.1.1. eLearning services for pupils and teachers at primary and secondary school levels

a. SDT - Sulinet Digital Knowledge Base

SDT[42] is a digital curriculum database and a content management tool for teachers and students, launched in September 2004. The goal was to create a ***complete curriculum database*** covering the curriculum of grades 1-12. Subjects of History and Geography were available at the beginning, and by the end of 2004 eight other subjects were involved in the system, resulting in about 200 000 learning assets. Examples, animations, demonstration films, supplementary databases, background information, lecture drafts and methodological assistance are available for free. At the beginning of 2007 digital learning materials in nine major subjects are available for all grades. Besides that, extra learning materials in Arts or in Music are also presented.

SDT provides digital materials for vocational schools in 18 subjects, from Economics to Healthcare.

The internal storage of data and publishing is aligned with international standards (SCORM, IMS, LOM, Dublin Core) towards the enhancement of independence from the content-suppliers and the portability of the content. Book publishers and teachers are also involved in the process, and the development also takes place in form of voluntary work.

The content is divided into two parts: syllabus of public education and syllabus of vocational subject. Together they contain almost 30 subjects. In May 2005, the SDT provided 5,100 school lectures, 12,000 animations, simulations, 48,000 picture and 3,400 video files.

Besides the developing of the Sulinet Digital Knowledge Base, the ***training of the teachers*** was on-going. In March 2004 the vocational qualification started for ten thousand teachers, selected by tenders. Most of the 22 subjects of the training were to improve the ICT skills. In May 2005 another 17 thousand teachers started this training which helped them use ICT in different fields too. This

[42] www.sdt.sulinet.hu

project provides training for teachers in order to be familiar with ICT supported education specified in all subjects.

II.5.1.2. eLearning services for students, professors and researchers

a. Electronic Information Service (EISZ)

The Electronic Information Service (EISZ)[43] is a national software programme whose purpose is to purchase the necessary electronic data sources of the higher education and scientific researches centrally, on the basis of a national licence in order to provide a wider group of users with more information.

The services of EISZ are available for education and research institutes. It facilitates learning and research through digitalized materials available online. A part of them are librarian services available through Internet, like Science Direct, the database service of the Elsevier scientific publisher. It provides electronic dictionaries and a database for the European Union issues.

Within EISZ the ***Quick to Action*** Programme is available, which provides language-exam tests in English and German. The programme is able to generate tests on the basis of individual requirements, to check answers or to save results. It contains a grammatical resume, and interactive exercises related to the grammar categories. Furthermore, 20 exercises are available in order to improve the text taking skills after listening to the text.

II.5.1.3. eLearning services in adult education and for unemployed

a. The training of different training and education institutions for adults

An increasing number of educational institutions provide formal and non-formal courses for adults. Private schools also gained more importance in the provision of computer and programming training, and many courses are offered in distance learning with offline or online digital materials.

b. eLearning services of language schools

The demand for online language courses and exercises has increased significantly in the past years. Most of the important language schools already provide complementary digital exercises and online tests. The Dint Language School[44] provides, for example, a very practical service called Daily Language Minutes.[45] Participants receive exercises through their email address, which creates a good base for continuous learning. The service is free and currently available in eight languages. More than 120 thousand people are registered and according to the demand exercises in further languages will be available.

A new development of Lingvico,[46] the Daily Language Reviving service is available in English and German through mobile phone. Users get new exercises every day, which can be done in a few minutes. The solutions are evaluated and so the performance can also be controlled.

Other schools like Netbábel,[47] and national institutions like Cervantes or British Council also provide such courses. By Netbábel for example live on-line teacher-student communication is provided through web camera, which is unique in the Hungarian market.

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43 www.eisz.hu
44 www.dint.hu
45 http://www.dint.hu/alap.php?nmod=hirlevelek
46 www.lingvico.hu
47 www.netbabel.hu

c. Services of Regional Training Centres

The Network of the Regional Training Centres was established in 1993 through the support of the Ministry of Social Affairs and Labour and the local authorities. Nine regional centres were set up in the following cities: Budapest (Central Hungarian Region), Debrecen and Nyíregyháza (Northern Plain Region), Békéscsaba and Kecskemét (Southern Plain Region), Miskolc (North Hungarian Region), Székesfehérvár (Central Transdanubian Region) Szombathely (Western Transdanubian Region), Pécs (South Transdanubian Region). The centres co-operate with the regional and local labour offices. They provide a wide range of accredited training for adults (one part of them belongs to the National Vocational Qualification Register (Országos Képzési Jegyzék, OKJ)). Besides basic computer training courses (ECDL, software-handling courses) other high level courses, such as multimedia developer or economic information technology courses are also provided. Special courses, such as computer-handling courses for the blind are also offered. In the framework of distance education all institutions provide different eLearning courses, for example entrepreneurial courses or pedagogical courses.

d. Services of employment agencies

The ***Hungarian Public Employment Service*** (Állami Foglalkoztatási Szolgálat[48]) has an organizational network in the whole country with 20 county-based labour centres and 173 local labour offices. These institutions play an important and efficient role in responding to challenges arising in the changing labour conditions. The unemployed and people with disabilities can take part in ECDL, ECDL start and software-handling courses focused on acquiring ICT knowledge. These services are principally subsidized.

II.5.1.4. eLearning services for people with disabilities and other disadvantaged groups

European Commissioner Viviane Reding said at the UN World Summit on Information Society in Tunis, in November 2005 that "an eSkills society is the most valid guarantee against exclusion." Therefore, gaining digital literacy competencies and promoting equity through ICT in education are large steps towards reintegration of disadvantaged groups.

Due to initiatives of the Ministry of Education and Culture, Ministry of Social Affairs and Labour and its background institutions and different NGOs and associations different services are provided for disadvantaged groups.

a. Digital Secondary School

The programme called Digital Secondary School started in 2003. The purpose is to provide certificates for those who dropped out of the conventional secondary school. It has been created for the less fortunate students, who have the aptitude, open mind and willingness to learn and take the final exam but because of their disadvantageous situation, financial or mobility difficulties, they are not able to join conventional education.

Most of the participants of the Digital Secondary Schools belong to the ***Roma minority***. The importance of this initiative lies in the fact that the Roma minority has huge disadvantages in the labour market, partly because of lack of education. The North Hungarian Region is the most disadvantaged region in Hungary, where the ratio of Roma population is high. But not only gypsies took part in this programme: prisoners and workers of the Criminal Enforcement Institute of Youth also joined it.

In the first year 264 students started the trial school year in Digital Secondary School, currently 526 students can enjoy free education.

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[48] www.afsz.hu

The purpose of the digital syllabus made by Digital Secondary School itself and made up within SDT Programme in connection with the system, is that students can complete the 4 years of education in distance learning with the help of multimedia and Internet communication. The Digital Secondary School provides access to the computer for all the students at their place of residence or near that, in Regional Consultation Centres, where local teachers also help in learning. Students have contacts with their teachers via the Internet, they have 4 subjects in each module, and they regularly have consultations and examinations.

b. Services for elderly people

Computer literacy is very low among elderly people in Hungary. In 2005, 83% of people aged 55 to 74 did not have any computer skills, which is far below EU average. In order to improve ICT competencies in this age band, community centres and libraries organize computer training for retired people. The private sphere (like T-Online or UPC Hungary Ltd.) also takes responsibility for the success of these programmes. It is very important to convince elderly people about the importance of the Internet in order to live in an information society.

Box 1. Programmes for elderly people

With the support of UPC Hungary Kft. the so-called ***Click on, Grandma!*** (Kattints rá, Nagyi!) computer training is offered for at least 700 elderly people in 15 settlements. In the course of the 25-hour long training participants become familiar with relevant online services, like searching for information, using e-mail and video-telephone. This programme in recent years enabled more than 1000 pensioners to get to know how to use the Internet. This initiative is organized in the framework of the www-golden-age international Socrates/Grundtvig Programme, whose aim is to improve digital literacy of elderly people.

The ***T-Grandma*** (T-Nagyi) Programme has been organized since 2003 by T-Online Hungary and T-Com. The aim of the training is to increase the popularity of Internet usage among elderly people.

A ***Grandchildren-grandparents competition*** has been organized since 2003 in Hungary. Growing number of grandchildren and grandparents take part in this competition, where different exercises have to be done with the help of computer and the Internet.

II.5.2. Accreditation techniques

According to the National Curriculum, Computer Sciences are compulsory both in primary and secondary education. For objective evaluation of computer literacy, the ECDL certification system is used. The ECDL certification system has been used since 1997 in Hungary. The number of people taking part in ECDL (Start and Basic) training exceeded 240 thousand by mid-2006 and more than 127 thousand ECDL certificates were awarded.

The Cisco Network Academy Programme offers training for advanced computer literacy certificates. In Hungary more than 2300 students have been involved in the programme and the number of certificates awarded exceeded 1000.

II.6. Specific issues and solutions

ICT equipment level and usage of computers for teaching are still below EU average, however some progress can be experienced. A growing number of schools have homepages and some provide education materials via the Internet. A growing number of students and teachers use digital learning materials provided by Sulinet Digital Knowledge Base. The number of teaching staff trained to use ICT for teaching has increased. There are also policy documents that encourage the dissemination of ICT usage in schools for teaching and learning purposes. Information Technology Strategy in

Education highlighted the importance of the improvement of ICT the infrastructure and integrating ICT applications into education.

The usage of eLearning solutions is increasing at the higher education level. Some universities focus on the usage eLearning solutions intensively. The number of universities providing distance education courses has increased considerably in the past years. Co-operation for common implementation of digital learning materials between Hungarian and international universities has also become more widespread in the past years. The Hungarian Association of Virtual University Network established in 2006 promotes the co-operation of higher education institutions in the field of eLearning.

eLearning solutions in the workplace are used mainly by multinational and large Hungarian companies, however several central public administration institutions also use them. eLearning solutions have also gained importance in lifelong learning activities.

II.7. Acceptance and usage of eLearning services

The usage of ICT and the Internet has become more common, both in households and schools and at workplaces. However, as it emerges in previous subchapters, Hungarian eLearning is at its infancy. Acceptance of eLearning exists largely at workplaces – mainly at multinational companies, web page based courses, at higher education and secondary and primary school level, as well as in adult education. Emphasizing lifelong learning has become more frequent both in policy making and in the media. Since one of the most effective tools of lifelong learning is eLearning, the acceptance of eLearning has improved among people, who take part in adult education.

ICT competencies and the acceptance of eLearning by teachers and pupils in schools is better than some years ago.[49] Digital learning materials provided by Sulinet and increasing number of teachers participating in ICT in-service training show an increase in using ICT supported education at schools. The usage of ICT in schools is generally below EU average, but in cases of vocational schools using eLearning in education it was relatively high.

Taking part in different eLearning contests organized by Hungarian and international organizations shows increasing interest and demand for eLearning services. Increasing number of projects in the field of eLearning both at secondary school and higher education level may represent a higher demand towards eLearning.

However, statistical data about using different eLearning solutions by different target groups can be hardly represented. Data about using Internet for educational purposes shows that 10% of individuals used Internet for formalised educational activities in 2004; in 2005 this figure was 11%. The percentage of enterprises that have used eLearning for training and education of employees increased from 10% to 14%.

There are significant differences between rural areas and cities regarding eLearning. It can be explained by the worse quality ICT equipment and Internet access in the disadvantaged regions. Hardly any differences can be experienced in the usage of Internet for educational purposes between men and women. Digital literacy and according to this using eLearning is higher among younger people. ICT competences are very low, 16 % among people aged 55 to 74 and among people with a lower educational level (17%). Accordingly, their participation in eLearning is definitely insignificant.

It cannot be stated that a great increase in using eLearning can be experienced, but a positive trend is supposed. This lies likely in the increasing number of eLearning services provided for different target groups. The highest demand for eLearning services is expected in towns and cities, from people with a higher education level and from students and non-manual workers.

[49] This statement is based on the interviews carried out with eLearning players.

II.8. Impacts of eLearning developments

As it reveals from the previous subchapters, Hungarian eLearning today is in its beginning phase. Therefore, far-reaching consequences and effects of eLearning on the educational system and on the digital divide can hardly be determined. There are only relatively few national surveys and data about eLearning and surveys about information society do not really focus on the role of eLearning.

a. Impact on education sector

eLearning developments in Hungary can be connected to different projects mentioned in the previous chapters. One of the most popular programmes is Sulinet and its different subprojects. Besides public education, good projects in higher education also have to be mentioned. More and more universities and colleges provide courses in the framework of distance education. Eszterházy Károly College, the College of Szolnok, the University of Miskolc, Gábor Dénes College and the Eurocontact Business School represent leading roles in eLearning at the higher education level. These developments of eLearning also show that reform of the education sector is needed. A more flexible education system is required, which prepares the students for the challenges of a fast changing knowledge-based economy.

It is not yet usual to use ICT in teaching, however increasing numbers of teachers are involved in further training, which helps teachers use ICT in classrooms. Practice-oriented teaching methods are mainly missing from Hungarian education. In schools where ICT is used, both teamwork and individual learning are emphasized, which can be considered as advancement in the educational paradigm change. The usage of ICT in education may introduce a new style of education.

Among the positive impact, the acquisition of basic eSkills can be mentioned. Pupils using computers and the Internet for learning in the schools may acquire useful ICT competencies and skills. Furthermore, teachers taking part in in-service training gain experience in using ICT for education.

Since ICT supported education needs high quality ICT tools and broadband Internet connection, besides content developing (see Sulinet Digital Knowledge Base) ICT equipment of Hungarian schools had to be ensured by nation-wide programmes. Due to this, computer and Internet penetration has increased significantly in Hungarian schools.

Since eLearning services have been becoming more widespread, public interest is also increasing. More and more private schools provide courses in the framework of distance education, which enhance their competitiveness in the Hungarian education market. Distance education enables more intensive lifelong learning, since taking part in such courses requires less gross time than traditional classroom education, because travelling time can be saved. It is an important point if one takes into consideration that many learning services are only available in urban areas.

ICT supported education is not readily accepted in Hungary, since several negative impacts of eLearning have been raised. Using computers and other ICT appliances enhances the costs of infrastructure and personal staff (for example the need for system administrators). The preparation of materials for classroom education needs extra time, especially when teachers are not so familiar with computers.[50]

b. Impact on usage of ICT

Hungarian eLearning programmes have contributed to a better usage of potential of digital materials. Students and pupils are more likely to use ICT technologies for learning, when in schools and at universities computer and Internet usage in learning or research is required. Therefore, usage of

[50] Based on interviews with Hungarian eLearning actors.

computers and the Internet is more likely in households, where members of the family take part in any kind of education.[51]

The role of informal learning is not negligible. Learning any ICT skills from family members or from colleagues also has an effect on the frequent use of information and communication technologies.

More distance education courses and a higher acceptance of information and communication technologies in education contribute to a higher level of ICT usage.

c. Impact on narrowing digital divide and eInclusion

It is clear that appropriate eSkills are essential in an information society. People who are familiar with computers and the Internet have more motivation to use eServices. Programmes and projects which target disabled and unemployed people, contribute to the reduction of the digital divide. For example services, which provide basic computer training for old people could narrow the digital divide among generations. Although there are such initiatives, they are only available for certain groups of old people.

Courses provided for disabled people improve the chances of this target group in the labour market. In the framework of distance education not only is ECDL or computer training available, but knowledge and competences for example in business management or in languages can be acquired. Due to the advancements of eLearning, the inclusion of disadvantaged individuals to the information society can be improved.

It is doubtless, that ICT infrastructure developments and improving eSkills can contribute to reducing the digital divide existing between rural settlements and cities. One of the simplest ways of inclusion of citizens from disadvantaged regions into the labour and learning market is eWork and eLearning. If digital skills, computer and Internet access are given, the main requirements for eWork and for using different eServices are ensured in disadvantaged regions.

[51] Based on interwievs with Hungarian eLearning actors.

III. ASSESSMENT OF THE STATE AND DEVELOPMENTS OF E-LEARNING

III.1. Current main achievements and shortcomings

The major goal of this chapter is to assess the various data collected and analysed in Chapters I-II. in order to lead to identifying the major factors - drivers and barriers – that influence eLearning service developments.

III.1.1. Achievements and shortcomings in eLearning functions

a. Achievements

The most widespread achievements regarding eLearning are proclaimed at the level of ***public education***, since the initiatives of the Ministry of Education and Culture in the framework of the programmes of Educatio Public Company and Apertus Public Foundation have promoted eLearning in primary and secondary education. Very good progress has been made in content development, which now enables the use of digital materials for free in almost all subjects taught at secondary and vocational schools. Digital curricula for primary education have recently been developed. Sulinet provides further training for teachers in order to use effective ICT appliances and digital materials in classes.

An increasing number of ***higher education institutions*** uses eLearning and provides distance courses. Some colleges and universities offer distance education courses for the full education period, like Szolnoki College, Eszterházy Károly College and Eurocontact Business School. More and more state universities have recognized that providing education by means of eLearning can make the education and learning process more effective, therefore they work on eLearning developments. Taking part in international projects has become increasingly important for them. Administration management systems have been operating for years at higher education institutions facilitating administration tasks arising in any education and teaching related administration, financial tasks for students and professors and administrative staff.

An increasing number of ***companies*** use eLearning solutions for training. Among larger companies - where computer usage in everyday work is general and digital literacy is appropriate - the most ideal way of training is eLearning. Among multinational companies it is more widespread to use digital learning materials, but Hungarian banks, telecommunication and IT companies, as well as public firms also favour eLearning in the training of their employees.

It can be assumed that online learning is already widespread regarding ***informal learning***. Different free courses are available for anyone who has Internet connection. First of all, digital language materials, EU related courses and diverse hobby related Internet-based materials should be mentioned.[52]

Computer sciences and ***informatics*** are compulsory subjects in public education, as well as in higher education. Due to this fact, every secondary school and higher education graduate possesses at least basic digital skills. Employment agencies and the Regional Training Centres provide ECDL courses and other programming courses for unemployment people. For disabled people basic computer training and eLearning based courses are also provided. These possibilities make it possible for disadvantaged groups to gain or improve their digital skills and to be involved in the information society.

[52] Growing registration numbers on different sites may confirm this statement.

b. Shortcomings

In spite of the initiatives, tenders and measures of the Ministry of Education and Culture which have equipped ***state schools*** with ICT appliances and the increasing number of teachers taking part in ICT training and the digital materials available, the usage of eLearning is quite rare in comparison to most of the EU15 countries. Motivation of teachers and the presentation of best practices are missing.

The lack of co-ordination and co-operation between Hungarian ***universities and colleges*** is considered a barrier to the dissemination of eLearning. Hungarian universities and colleges develop their own materials, and a mutual exchange of experience regarding content development is not common. If faculties of different higher education institutions enhanced co-operation in developing specified digital learning materials, tasks and costs could be better shared. Standardization of digital material requirements is also among the obstacles.

Using eLearning at the ***workplace*** is usual mainly at larger companies. Small or medium sized companies cannot afford tailored eLearning training, since developing digital materials is still expensive for smaller firms.

III.1.2. Achievements and shortcomings in the field of eLearning contents

a. Achievements

Major achievements in digital eLearning material developments are proclaimed in the eLearning materials for ***public education*** initiated by the Ministry of Education and Culture and co-ordinated by its background institutions. Sulinet Digital Knowledge Database provides high level quality eLearning materials for teachers and pupils in public education in Mathematics, Biology, Physics, Chemistry, Informatics, Geography, History, Hungarian Literature, Arts and Languages.

A lot of Hungarian ***schools and higher education institutions*** as well as other organizations have taken part in eLearning projects supported by the Leonardo da Vinci Programme. Between 2002 and 2006 Hungarian co-ordinated digital learning projects were carried out by Szent István University, E-Kollégium, University of Miskolc, Corvinus University, University of Szeged and Széchenyi István University. In the framework of international co-operation high quality level digital materials were developed, like ESP-C (English for Specific Purposes – Chemistry).
Universities and colleges have mainly developed good eLearning materials themselves and provide these courses, like College of Szolnok and Gábor Dénes College.

There are good ***developers*** in the Hungarian eLearning market; some of them have also gained international acknowledgments in content developing, like Eduweb or Coedu.

On the Internet there are a lot of informal digital materials for free. Language courses, EU related training or hobby training are available for everyone who has Internet connection. Also the materials of Sulinet Digital Knowledge Database are available for the general public.

b. Shortcomings

Considering ***public education***, the available eLearning materials are not fully utilized, since teachers lack competence and motivation. The attitude of teachers towards ICT supported education is largely negative. Hungarian education is rather theory-oriented than practice-oriented, which could be solved with a paradigm change in education.

Although there is progress in providing distance education, the ***accreditation*** requirements and standardization hide difficulties regarding eLearning content development. Intellectual property rights should also be adjusted to the requirements of the information society.

In general we can state that the unique results and achievements of different universities and colleges are not shared. ***Effective co-operation*** in content development between Hungarian universities and colleges is missing, as well as between higher education institutions and content developers in general. Another problem is that different Learning Management Systems are in use. For example even inside some institutions different LMS are in operation.

III.1.3. Achievements and shortcomings in usage of eLearning in different target groups

a. Achievements

Due to the measures of the Ministry, compulsory computer science education plays an important role in improving ICT literacy among ***young people***. Advanced computer training at higher education institutions ensure more compatibility, however informal learning via Internet and computer programmes are very important. For pupils and students it is essential to use computers and the Internet in the education institutions, libraries and at Telecottages. Not surprisingly, the usage of computers and the Internet also for learning purposes is gaining more importance.

In the case of ***unemployed and disabled people*** there are positive developments. ECDL training, computer programming courses and courses in the framework of distance education are financially supported for unemployed and people with disabilities in order to create better chances for them.

For other disadvantaged people, like for Roma minority supported programmes are provided, also in the field of eLearning.

b. Shortcomings

Basic computer skills are missing in more than half of the Hungarian population and using the Internet regularly is also not common. While younger and educated people often use a computer and the Internet, lower educated and elderly individuals do not have the motivation or possibility to gain basic computer skills. 84% of people aged between 55 and 74 lack basic computer skills, while the EU25 average is 65%. Having basic computer skills is also scarce among unemployed people.

Most of the disadvantaged people with ***lower incomes*** cannot afford computer and Internet connection at home; consequently eLearning usage is limited in their case.

Generally speaking the use of eLearning solutions is frequent among pupils, students, higher educated and younger people, but unemployed, lower educated and elderly people are not involved in using the Internet and online services. In comparison to other European nations a very low level of Hungarian people take part in any kind of learning. According to this, the usage of eLearning could not be developed appropriately in the past years.

III.1.4. Achievements and shortcomings in the field of infrastructure

a. Achievements

As ***ICT infrastructure*** is one of the preconditions for developing eLearning, the public sector has made significant developments: state schools have been equipped with ICT applications and Internet connections. Higher educational institutions, as well as libraries and research and academic institutions are well equipped with computers and have fast broadband Internet connections. Internet access points at public places, libraries and the so-called Telecottages ensure Internet access also in disadvantaged settlements. Significant sources have been used for the improvement of broadband infrastructure. In the capital and in some other cities wireless Internet connection has been set up at public institutions and public places.

b. Shortcomings

The ***prices for Internet*** subscription for households and companies have decreased during the past years, therefore the access for eLearning has become more attractive, however Internet access costs are among the highest in the EU. Doubtlessly it is a huge barrier to the dissemination of using eLearning at home. For example, if Internet connection or computers are not given to households, digital-based homework should be done in school or libraries, or taking part in distance adult education is problematic if computer and broadband Internet is not available. Computer and Internet penetration is lagging behind in Hungarian households and enterprises in comparison to the EU averages and to other NMS countries. Though ICT penetration in schools has significantly improved, using computers in classes is not so common as it is in other EU countries.

The statistics show clearly that using Internet and computers for learning is rare in ***rural areas*** in comparison to cities. Using ICT application in public education is more often in schools in cities than in schools in rural areas or smaller settlements.

III.2. Factors behind the existing developments

III.2.1. Economic factors: macro- and microeconomic environment

Regarding the macroeconomic situation, two-way factors influence eLearning developments. On one side, even the relative low ***economic growth*** in the country in the past years has influenced ICT advancements and eLearning developments positively; however the austerity package has influenced the ***consumption of households*** negatively. On the other side, the ***labour needs more qualified persons***, which may affect eLearning developments positively.

The Hungarian economy has shown a deceleration in growth performance in the past years. Among the new member states the Hungarian GDP growth rate was the worst in 2006. GDP growth is expected to be fewer than 3% in 2007, which is far below the NMS-8 average (6%). Inflation was creeping in 2006 and in 2007 it is expected to jump to 7.5% as a result of indirect tax increases and rising regulated prices. Hungary saw ballooning deficits in 2005-2006, reaching 10.1% of the GDP in 2006. An austerity package is expected to bring the deficit to 7%, still the largest in the region. Due to the ***austerity package*** Hungary will experience a sharp drop in real incomes in 2007, which ***influences private consumption.***

The unemployment rate has been getting worse. On the one hand, the level of unemployment also influences aggregated demand for ICT goods and services negatively, if considering private consumption, on the other hand in the framework of ***re-training,*** a growing number of unemployed have taken part in computer training. Due to structural changes of the economy and ***international openess*** an increasing number of educated people with e- and language skills are needed in the Hungarian labour market. Multinational companies setting up their divisions in Hungary need an increasing number of higher educated people. To be more competitive on the labour market may raise the motivation of employed and unemployed people to acquire or improve their eSkills. The need for education services, indeed eLearning services, has been increasing in the past years.

Balanced GDP growth and growing real incomes at the end of the nineties and at the beginning of the new century had definite positive effects on creating information society developments. For example, the increasing growth of tax revenues enabled improvements of infrastructure, especially regarding ICT infrastructure. During the past years a number of projects concerning information society have been implemented. Growing income of households in this period enabled more consumption, therefore more ***consumption of ICT applications and eServices***. According to this, computer penetration within households as well as Internet and mobile phone penetration increased, however these figures are still under the EU average. One of the obstacles is definitely the relatively high price of Internet and ICT applications. This may discourage people with lower incomes to use the Internet at home.

Earlier government investments into information society were influenced by balanced growth. Investments and consumption regarding information society - also eLearning and ICT infrastructure developments - are expected to stay at a low level, since Hungary's fiscal austerity package will limit domestic demand growth. In conclusion, the current unfavourable macroeconomic situation in Hungary may affect government investments, like eLearning related developments or ICT infrastructure investments negatively.

Another aspect has to be mentioned, namely when Hungarian ***enterprises*** do not have resources for further training, which can be considered as a disadvantage in competitiveness. Due to the austerity package more ***expenditure can limit the number of investments of the companies***, including also improving ICT infrastructure or further training. The high costs of implementing systems for eLearning either in educational institutions or at small and medium sized companies is an unfavourable factor.

On the other hand, to fulfil the requirements of growing international competitiveness, Hungarian companies are encouraged to raise the level of quality of employees. Since the service sector has gained importance in the Hungarian economy in the past years, the demand for more qualified workers has increased. Due to these developments both from employee and employer sides a growing demand for learning, lifelong learning and eLearning can be experienced. A growing number of workplaces require basic or advanced computer skills and competencies, which is expected to increase the share of employed and unemployed being familiar with computers.

Information society aspects become a priority in the ***New Hungary Development Plan***. Investments earlier supported by the public budget will be realized largely from EU funds. Significant financial support from the Social Renewal Operative Programme and the Social Infrastructure Operative Programme are available for infrastructural and human related ICT and eLearning developments.

III.2.2. Policy factors

There is ***no organisation responsible for Hungarian eLearning*** issues. Although different strategies in the field of eLearning have been elaborated, a specific eLearning strategy and action plan has not been prepared in Hungary. There are no significant sources for the development of the information society, since policy makers suggest that these investments should be carried out by the means of EU funds. Accordingly, eLearning does not seem to be among Hungarian development priorities. This is also revealed in information society related policy documents: developments in the field of eLearning are not so promoted at policy level. However, in the frame of educational reform improvements in ICT equipment and Internet connection has been carried out. Furthermore, service-in training for teachers have been prioritized in education related policies.

The Ministry of Education and Culture and the Ministry of Social Affairs and Labour have the main role in affecting eLearning developments. Though both institutions have elaborated strategies that include some eLearning subjects, an overall strategy with aims and tasks has not been passed.

Pressure for developing eLearning came earlier mainly from the public sector - as the initiatives and action plans of the ministries show. Public-private relationships have improved in some degree in the past years, but one of the main barriers in the Hungarian eLearning market is that effective co-operation between eLearning actors is missing.

In conclusion: policy initiatives have ensured better ICT equipment at schools, content development, training of teachers, Internet access points for citizens as well as reducing the lack of digital skills for different target groups. A ***coherent national strategy for eLearning does not exist***, ICT priorities are set up by the ministries.

III.2.3. Legal factors

Legalisation and acts, as well as directives play definite enormous roles for radical changes. Using ICT in teaching is not obligatory, but computer sciences for pupils and students at schools and universities are compulsory.

Considering legal factors, one of the most important steps has been made in the ***liberalisation of the Hungarian telecommunication sector***. Liberalisation in the telecommunication market has led to more intensive competition among service providers, which also influences phone, mobile phone and Internet prices, however, Internet prices are still higher than in the other 12 EU countries.

One of the factors influencing eLearning services negatively is that ***accreditation of digital materials*** have no concrete legal base. Furthermore, accreditation of distance education faculties is quite difficult. Another problem should be mentioned regarding the standards of digital curricula.

Acts at all levels of education today ensure that young people have digital skills, due to compulsory computer science and informatics subjects at schools and universities.

Legally determined compulsory training for teachers can contribute to better use of ICT in class and improve digital literacy among teachers.

III.2.4. Technological factors

In the recent years appropriate technology has been available in Hungary. Open source software is used at educational institutions. Hungarian developers are very active in elaborating new systems, which are largely compatible with international standards. Good framework systems are available, making it possible to create self-made digital materials. By the means of the elements of Sulinet Digital Knowledge Base self-structured eLearning material can be built up. Recently developed eLearning products and systems are more ***user-friendly***, which can lead to an increasing demand for eLearning services. ***Interactivity of eLearning solutions***, like interactivity between students and tutors via the Internet is very important in the case of distance learning. If an eLearning service, digital material or a distance education course is interactive and user-friendly, it is more obvious to use it. Therefore, technological developments have had a positive impact on eLearning evolution.

III.2.5. Socio-cultural factors

The general attitude towards ICT and eServices is not positive in the Hungarian society in some age groups. Though the number of Internet users and the general uptake of eLearning is increasing; the ***larger part of the society is not involved in the information society***. According to a report[53] not using the Internet and computers are explained rather by cognitive reasons than materials. The majority of respondents in the survey is averse to using computer and Internet because of their assumed complexity. This attitude influences eLearning developments negatively.

On the one hand, the relatively high average level of education in case of the young population can be considered as a positive factor. On the other hand, adult education and lifelong learning are not of high importance. ***Educated people*** are more able to acquire new skills, for example ICT skills than low-educated people. The ***lack of digital skills*** in the Hungarian society is the main negative factor for dissemination of eLearning. Only 43% of the population has basic computer skills and it is even lower in the case of low-educated, unemployed and elderly people. The ratio of educated people to acquire new skills is higher than for non-educated ones. The lack of knowledge of the English language may affect ICT usage and eLearning developments negatively.

III.2.6. Regional factors

Hungary is divided into 8 regions. The ***Eastern*** part of the country is considered generally as ***disadvantaged regions*** in comparison to Western regions and the capital. Structural unemployment is

[53] Hungarian Information Society Annual Report 2006, ITTK

higher in these regions, which generally speaking influences the economic situation of population, their purchasing power and therefore possibilities to use ICT or to improve their digital skills. According to statistics computer and Internet penetration is below the Hungarian average in the North Hungarian region, in the Northern Plain region, in the Southern Plain and in the Southern Transdanubian region.

Similar differences can be experienced between ***cities and smaller settlements***. In smaller villages the economic situation of the population and municipalities is usually worse than in the cities. Consequently, technological infrastructure is less developed in rural areas. The ratio of the old population in villages is significantly higher than in cities and therefore motivation to use any eLearning services or to strengthen ICT skills is less likely in villages than in cities.

According to a report[54] schools in densely populated areas are better equipped with ICT applications; however the gap between rural and urban schools in ICT infrastructure is narrowing. The number of computers per 100 students is 10.4 in towns, while in scarcely populated areas this is only 8.9. The percentage of teachers who use computers in classroom was a little lower in villages (42.2%) than in towns (45%). The ***regional digital divide*** affects eLearning developments rather negatively.

III.2.7. Demographic factors

The population of Hungary is continuously decreasing. The ageing population influences the education sector and eLearning developments very strongly.

Computer and Internet usage, as well as eServices are quite common among ***young people*** aged 15 to 24.[55] Only a very low percentage of elderly people use the Internet and a computer regularly. The younger generation is usually socialized in the information society and also takes part in computer training at educational institutions, while improving ICT skills among elderly people is very rare.

The ***size of households*** is also an important factor in Hungary considering eLearning developments. There is more likely to be a computer in households with more household members. Computer penetration in households with more than four members was 65%, while in the case of households with one person it was only 12% in 2006.[56]

Integrating the Roma ***minority*** into the Hungarian society has been a big challenge for Hungary. Their participation in learning activities is far behind the Hungarian average and their chances in the labour market are extremely small. Low levels of ICT skills and low education levels of this disadvantaged group hinder the usage of eLearning services.

III.3. Drivers and barriers for future eLearning in Hungary

III.3.1. Drivers

<u>Economic drivers influencing eLearning developments</u>

The ***changing structure*** of the Hungarian economy is influencing the Hungarian eLearning developments positively. The ***service sector*** gains more importance in production and employment, where more qualified labour force is needed and therefore the demand for acquiring more skills and competencies is increasing. This phenomenon drives both ICT literacy courses and any other training courses provided via a digital way.

However, Hungary is currently behind the NMS-9 countries considering economic growth, recent years have brought increasing ***purchasing power*** and a favourable ***business environment***. It made it

[54] Use of Computers and the Internet in Schools in Europe in 2006, European Commission-Empirica
[55] Eurostat, 2006
[56] Mapping the digital future: Hungarian society and the Internet 2006

possible for individuals, enterprises and public institutions to invest into ICT infrastructure and eLearning products and services. Decreasing prices of ICT equipment may affect eLearning developments positively.

Sources of EU Structural Funds affect eLearning developments positively. There are significant sources available both for infrastructural development and for human resource development in the framework of the Hungarian Development Plan I. and New Hungary Development Plan. This can be considered as an important financial driver in eLearning developments.

To remain competitive and to ensure productivity, companies are strengthened to employ ***workers of high quality*** and to equip workplaces with ICT applications. The national and international competition therefore influences both computer literacy and eLearning training, as well as distance learning positively. eSkills are considered as a part of general knowledge in an increasing number of workplaces, which may also motivate the older generation to acquire ICT skills in order to be more competitive on the labour market.

Technological drivers influencing eLearning developments

Activities of ***multinational companies in the ICT sector*** in Hungary can influence the up-take of eLearning positively. The Hungarian mobile communication sector hides strong potential in developing eLearning solutions through mobile communication tools. As ICT and Internet penetration in the business sector is much better than at household level, using eLearning at workplace shows high potential for eLearning developments.

The number of Hungarian ***content developers*** has increased significantly in the past years. The most successful content developers have won international competitions too, which show the high quality of Hungarian digital materials.

Some Hungarian universities have a long tradition in educating ICT specialists. As the example of content developers shows, Hungary has very ***good ICT specialists***, which means a very good potential for content development.

An increasing number of eServices, like eBanking or eGovernment presses both citizens and companies to acquire digital skills. The integration of ICT into the daily life requires digital skills, which has a positive effect on the demand of computer training courses.

Technological developments have definitely positive effects on eLearning developments. Content developers and service suppliers offer more and more user-friendly eLearning products, which may raise the demand of eLearning services.

Institutional drivers influencing eLearning developments

Compulsory computer sciences in education can be considered as driver for improving digital literacy in Hungary. Initiatives of the Ministry of Education and Culture, like ***in-service training*** for teachers, can serve as a good base for further eLearning improvement.

More and more people take part in ***higher education***, using new alternative learning and teaching methods, like eLearning. The increasing role of higher education and the increasing number of students can be considered as an important driver factor for distance education developments. Competition between higher education institutions can lead to exploiting eLearning potentials better.

Increasing demand for ***lifelong learning*** may have positive effects on eLearning developments.

Research institutions and universities with research centres take part very actively in international eLearning and information society related projects. Many of them have been involved in FP6 projects.

Political drivers influencing eLearning developments

Several initiatives from a political level influence Hungarian eLearning developments positively. Programmes of the Ministry of Education and Culture have largely contributed to better ICT infrastructure in schools and enabled teachers to gain competence on how to use ICT in the teaching process.

III.3.2. Barriers

Economic drivers influencing eLearning developments

The current ***unfavourable macroeconomic situation*** in Hungary – described in the previous subchapter – may hinder developments in the field of eLearning, too. Stabilization of the Hungarian economy may also mean fewer sources for the education sector and the implementation and developments of ICT infrastructure for public institutions.

The recent ***decrease in real wages*** does not affect ICT developments positively, which may hinder spending on ICT equipment.

Relatively ***high prices of the Internet*** can be considered as a barrier to faster dissemination of eLearning.

Mainly large enterprises use eLearning solutions for corporate vocational training. The ***high costs of eLearning solutions*** and ICT equipment creates a barrier for dissemination of eLearning, especially in the case of small and medium sized enterprises.

The relatively ***low employment rate*** (57%) affects eLearning developments negatively. The rate of inactive people is very high and their motivation to be involved in lifelong learning and eLearning is low. Since they are not pressed by the labour market requirements to acquire digital skills and other skills, their motivation to use eLearning (participate in digital literacy courses or do an online course) will remain extremely low.

Political and legal drivers influencing eLearning developments

There is ***no strong political will*** to establish an information society and a knowledge-based economy in Hungary. ICT developments are still not considered as priorities at political level. This throws back progress in the field of eLearning, too. If overall ICT developments were better promoted, better progress could be experienced in the field of eLearning. eLearning and a higher level of digital literacy have not been set as priorities in the education reform. eLearning has not yet been defined in legislation and political attitudes towards eLearning have not improved in the recent years. A lack of concrete goals and plans hinder eLearning developments.

The lack of an overall eLearning strategy may hinder the progress of a Hungarian information society. The lack of precise targets and tasks in the field of eLearning can be considered as an obstacle. Although the different strategies mention eLearning, the role of eLearning in education reform and in alternative teaching methods, as well as in forming an information society has not been adequately emphasized. Accordingly, institutional framework, functions and tasks are not satisfactory elaborated.

There is ***no central institution*** responsible for eLearning developments. Activities of different organisations are not harmonized, which obstructs eLearning developments.

Legislative and regulatory barriers slow down the growing usage of online services. The lack of easily accessible registry of laws and regulations or legislations hindering co-operation and collaboration, as well as unsolved problems of privacy and data protection can be considered as barriers. Slow accreditation process or problems with copyrights can also be considered as barriers.

Socio-cultural and demographic barriers influencing eLearning developments

Generally, low motivation and a ***low level of Internet usage*** in Hungary hinder the up-take of eLearning. A lack of interest in using the Internet is a major obstacle for the up-take of eLearning. Demand for using online services is very low in Hungary; accordingly demand for using digital learning materials is also low. If Internet usage was more popular with Hungarian people, the possibilities of online based learning could be made better use of. Generally speaking, ***taking advantages of ICT possibilities*** is not satisfactory. ICT potential should be better exploited in all fields of the Hungarian economy.

The lack of promotion of the role of eLearning in education and in lifelong learning is a huge obstacle for the spread of eLearning. The ***motivation of teachers*** to use ICT in teaching is lagging behind other European teachers' motivation.

As already discussed in the previous chapters, ***very low levels of digital literacy*** in Hungary can be considered among the greatest obstacles in dissemination of eLearning and using other online services. In comparison to other European countries Hungarian people have very low-level computer skills. Having appropriate ICT skills among teachers is also very rare, however different programmes offer in-service training for teachers. Computer skills are better among younger people, but one of the main problems is the lowest level of computer skills in the EU among people aged 25 to 55, in which group the role of life long learning and usage of eLearning would be very important. Digital literacy is extremely low among people living in Hungarian disadvantaged rural areas, as well as among unemployed and low educated people. Since eLearning and blended learning can be very effective tools for training disadvantaged groups, digital literacy should definitely be improved.

Low-level participation in any kind of learning activities influences eLearning up-take in Hungary negatively. Lifelong learning does not play such an important role in Hungary as in other European economies. Demand and motivation for continuous learning are not strong, which can be definitely considered as a barrier.

A relatively ***low level of English knowledge*** may also hinder dissemination of using eLearning services.

The digital divide in Hungary has been slightly reduced in the recent years, but the digital gap is still large between rural and urban areas, between the skilled and unskilled population and between people with high and low education levels. It is more likely that the Internet, eServices and eLearning is used in urban areas, by younger people and educated people. The digital divide is still considered as a barrier for eLearning developments and eLearning dissemination.

Infrastructural and institutional barriers influencing eLearning developments

The ***generally low level of ICT infrastructure***, computer and broadband Internet penetration also hinder dissemination of eLearning. Relatively high prices of the Internet may also prevent people from using Internet at home. However, progress can be experienced in public institutions, libraries and schools, but more public access points, learning centres, better equipped of rural schools would be essential.

Lack of co-operation among higher education institutions regarding eLearning can be considered as a further obstacle in the faster dissemination of eLearning.

IV. ANALYSIS OF POLICY OPTIONS

This chapter reviews those main policy options that are available for policy makers to promote the further development of eLearning. The supply side options focus mainly on those sector-related aspects that affect the amount and quality of public services, while demand side policies include framework ones that increase the capacities of users and produce positive spill-over effects among the users.

IV.1. The most important policy objectives in Hungary

Supply-side policies

Among the policy options available for the Hungarian authorities there are several important ones related to supply-side measures. The first set of measures is still not related to eServices, but the services themselves, to their undergoing restructuring and reform of provision, financing and institutional set-up of the educational sector. Besides the widely publicised and well-known fiscal imbalances and built-in absence of equity, these reforms are needed to make the provision of these services more efficient and cost sensitive.

Besides changing existing regulations and institutional structures, an important precondition for the successful eLearning service development is the provision of funding. In the forthcoming years Hungary will be able to use the Structural Funds for human resource development. It is a vital policy issue to use this funding for the most important bottlenecks, to spend them on such developments which may generate sizeable spill-over effects and additional spending and contributions from the private sector.

An important policy issue is to finalise the basic infrastructure developments and enhance the level of connection and technological background for service providers. In the past two years there has been a widespread expansion of the Public Net (Közháló).[57]

Human capital and its development are also integrated and important elements of improving the application of eLearning services. One of the major impediments within the educational institutions is the low level of eSkills of teachers. As teaching with the use of eLearning solutions differs from the traditional case, it is also important to teach the new pedagogical methods that go parallel with eLearning.

Finally, the educational reform should go hand-in-hand with the application of new selection and incentive techniques in public education: the recruited teaching personnel should already be eReady and should be able to utilise these tools, while the incentive techniques should ensure the continuous application of the up-to-date solutions in education.

Demand side policies

There are five major areas where demand side policies could enhance the scope and quality of online public services, mainly stimulating the demand from citizens and the corporate sector.

First, as the major penetration rates are still low, there is still a potential for the stimulation of the use of ICT by citizens, including personal computers and broadband access among others. In recent years some centrally managed programmes were successful (though very costly in fiscal terms, especially due to their improper and too generous design) in increasing the demand for ICT hardware and software. There are two lines of policy action which may bring additional demand for ICT services and goods.

[57] Out of these two networks the first network connects the administrative units, while the latter one the other providers of public services.

One is the provision of various fiscal incentives (tax deductions from personal and corporate income taxes in the case of small enterprises) in the case of purchasing ICT equipment or services. Another major element which, may help is the deregulation of the access to these services, including local loop unbundling and opening the market for broader competition among infrastructure and service providers. Several studies have indicated that the use of broadband by citizens is very cost sensitive and positively reacts to the decline of prices below a certain threshold level. These developments may reduce the costs of services and hardware, thus it may widen the circle of those who may have access to eLearning services.

A crucial precondition to many – although not all – eLearning services is the enhancement of eSkills of the population in order to raise the level of digital literacy, which would ease the use of eLearning solutions and would provide an increasing demand by stimulating the motivation of potential users. The major tools of eSkills enhancement are appropriate curricula, inclusion of much broader use of and education with computers and ICT equipment. While this is a longer-term process in case of the younger generation and should involve the incorporation of these materials to the standard curricula, there are various social groups (older generations, disabled and others) who need to be approached through special courses and education tools to increase their awareness and raise motivation to use online public and healthcare services.

It seems to be clear that state's responsibility in developing eLearning has been significant. Since the structure and methods of education and training systems are principally determined at ministerial level, it is obvious that the state can take measures to support digital literacy and usage of eLearning at schools and universities. Moreover, strategies and concepts of policy makers can strongly influence ICT related lifelong learning, adult education and the training of disabled groups. Hungary has prioritised development of employment (to raise the employment rate from 57% to 63% by 2013). In order to reach this goal, education and training systems must adjust to the requirements of the knowledge-based economy. Lifelong learning is an essential policy option for increasing employment. It should be emphasized that the educational sector must take advantage of technological developments, which leads to using higher quality learning methodologies and higher quality and more effective teaching and learning processes.

IV.2. Suggested policy measures

IV.2.1. Institutional framework and strategies

It is definitely positive that different organisations were established in order to fulfil tasks in developing eLearning. Concepts connected to eLearning have been elaborated, but a national eLearning strategy has not been issued. ***Different strategies*** of the Hungarian government and ministries refer to eLearning, but its important function and role has not been concluded in an overall concept. Due to this fact, measures carried out in the field of eLearning have been rather ad hoc than conceptualized. Consequently, the operation of specific organizations set up to fulfil tasks in the field of eLearning has not always been effective. However efforts have been made, and particularly in public education, better results could have been reached if action plans and measures on the basis of an eLearning strategy had been implemented.

According to this, it seems to be reasonable to prepare an overall ***eLearning conception***, which describes the current Hungarian situation and determines priorities and goals. eLearning should be used as a tool for improving the quality of education and training. The role of eLearning, eServices and ICT supported education should be more emphasized in national policy documents, since broad sense eLearning is an important part of information society. The role of using technological developments and eLearning should serve as a means for improving the educational achievements and creating a knowledge-based economy. eLearning is needed to be included in development plans and policy documents.

The Ministry of Education and Culture is responsible for public education, while the Ministry of Social Affairs and Labour is responsible for adult and vocational training. ***Concepts*** of these ministries highlight the role of eLearning, however concrete visions, goals and tasks in this field have not been laid down. If an eLearning strategy cannot be conceptualized, at least harmonization of the different fields (public education, higher education, lifelong learning) would be essential. More attention should be paid to the harmonization of educational goals of different policy makers. Education, training, lifelong learning developments should form a framework for eLearning developments.

It would be useful to set up a public ***organisation*** with responsibility for eLearning, Internet support and generally information society issues. Since three different ministries are engaged in information society and economy issues, it seems to be difficult harmonize different development programmes and projects. An institution in charge of elaboration and coordination of information society issues, like eLearning in education, Internet support or ICT literacy would be a useful step towards exploiting the advantages of an information society.

At an institutional level it would be essential to set up a ***board*** that consists of specialists of education experts, distance education experts, eLearning professionals, ICT specialists, services providers and suppliers. The board would discuss all issues related to eLearning.

Co-operation between private and public actors should be strengthened. Collaboration between public organizations and private companies or content developers has already existed and has been very successful. More attention should be paid to the cooperation, where teachers take part in content developing with their professional and teaching experiences.

The elaboration of a qualification system for eLearning service providers would be essential. Requirements of eLearning services should be determined. It is very important to help with mutual recognition of qualifications and degrees.

IV.2.2. Education sector

Public education

The reform of the education sector is currently underway. ***Changes in education*** should concentrate on how to learn and use knowledge and skills gained through education. This aspect is very important in a fast changing knowledge-based society. A new concept for education should fulfil the requirements of a modern education system, in which applicable skills and competences can be acquired. All in all, the biggest challenge for Hungarian education is to elaborate and use new teaching methods, which prepare pupils and students for the rapid changing requirements of the labour market. The effectiveness of education should be targeted. In order to reach this goal new methods and a new approach are necessary.

The performance of teachers is not appropriately evaluated. Another ***system for evaluation*** and control of teachers' work would ensure better performances. If teachers are pressed for more effective teaching, their motivation to use new methods in education can be increased. In accordance with this, operating a new financial system, which is linked to the performance of teachers, would motivate teachers to perform better. In order to establish a good performance evaluation system, different aspects should be taken into consideration, such as teachers' individual performance.

It has been revealed from the interviews and statistics that the ***motivation of teachers*** to use eLearning in teaching is relatively low in Hungary. Teachers have compulsory further trainings, but it is not required to be involved in ICT related further trainings. If having digital skills was a requirement for teachers, more ICT supported teaching hours would could be expected. ***Compulsory ICT in-service training*** teaching teachers how to use ICT in the class would definitely motivate them to use eLearning in the class.

ICT courses, like using text-editor, the Internet and different software, are compulsory at university level. However, there are no compulsory courses for pedagogical students, where they could learn how to use and create digital materials or how to integrate ICT tools into the teaching process. Compulsory courses would enable pedagogical students to acquire new teaching methods, which would raise the motivation to use this knowledge at schools after graduating.

A set of measures is related to the undergoing ***restructuring and reform*** of provision, financing and institutional set up of the educational sector. Besides the widely publicised and well-known fiscal imbalances and built-in absence of equity, these reforms are needed to make the provision of these services more efficient and cost sensitive.

The ***ICT infrastructure*** needs to be improved in public education. The Information Technology Strategy in the Education highlights the role of infrastructural developments. However, the strategy encompasses all related fields, it covers the period 2004-2006. A concept for the strengthening role of the ICT in education is needed, which sets up infrastructural development targets and financial sources for the coming years.

Tertiary education

Requirements for distance education courses should be defined. ***Accreditation of distance education courses*** takes a long time. Therefore a flexible accreditation system is needed, which determines the requirements for eLearning distance education courses and ensures faster accreditation. A flexible and adaptable quality system for distance education courses and programmes is necessary.

Credit recognition between higher educational institutions is quite difficult because of the autonomy of universities. A system for mutual recognition of credits, also for distance education courses credits is advisable. It is important not only for the Hungarian education market, but it opens ways to European distance education courses.

Determining ***quality standards*** is an important step towards eLearning developments. An organisation should be set up that would responsible for accreditation and quality standards of eLearning services and distance education courses.

IV.2.3. Infrastructure and technological aspects

ICT infrastructural matters are among the most important issues in Hungary, since ICT and Internet penetration is relative low in comparison to other EU countries. However in the case of schools computer and Internet accessibility has been improved and Hungary ranks in the middle among the EU-27 countries.

Further support and sustainability of the equipment is required. The Ministry of Education and Culture should take further responsibility in elaborating strategies and plans for sustainable equipment of educational institutions. The Ministry should lay down ***infrastructure development plans for a longer period***.

Broadband Internet connection should be ensured in all educational institutions.

Supporting the use of open source systems would stimulate using eLearning services.

IV.2.4. Digital skills

Since the late 1980's, according to the Hungarian National Curriculum, computer science has been taught as a compulsory subject for pupils aged 13 to 18 in a once weekly period. At the universities and colleges students have compulsory ICT subjects. Therefore digital skills of young people are relatively good.

According to statistics – also described in Chapter II – the digital skills of middle-aged and old people are extremely low. In order to improve digital literacy in all age groups, subsidized computer training would be beneficial. Since ICT training cannot be compulsory outside formal education, motivation of disadvantaged people should be raised. Solutions, like providing free ECDL courses for disabled and unemployed people seem to be very useful initiatives. The preparation of a ***national programme for improving computer literacy*** could define short-term and long-term targets, as well as projects and tasks. Computer literacy training provided by the private sector or by educational institutions and financed by the state budget would give a chance to every citizen to gain digital skills.

From a political level the support of specific target groups, such as elderly people and handicapped would be essential. In a national comprehensive computer literacy program disadvantaged persons could have the possibility to acquire eSkills enhancing their chance on the labour market and gaining competencies for a comfortable living in the information society.

The Czech National Programme for Computer Literacy can be considered as a good practice in Hungary too. A similar program enabling different levels of ICT training for citizens for a symbolic fee (for a few euros) could improve the level of eSkills of the Hungarian population over several years. Also the promotion of importance of digital literacy and eLearning from the state level wouldn't be negligible.

IV.2.5. Financing

Since the role of eLearning and ICT in the education sector is not clearly defined, financial support of these developments is not clear either. Most of the eLearning related developments have been financed from state sources. EU structural funds also allocate significant sources for lifelong learning and education sector developments. On the one hand, the ***state should support digital literacy programmes***, eLearning developments in public schools and at higher education institutions and disadvantaged groups. On the other hand, eLearning and lifelong learning at the workplace are usually financed from private sources, however support can be obtained from the EU structural funds.

If priorities, goals and tasks are clearly laid down in a conceptual document, financial sources could be utilized more effectively.

Financially, the support of programmes is more advisable than that of single projects, because programme-based financing enables the setting up of long-term goals.

V. MAJOR R&D CHALLENGES FOR E-LEARNING

The development of eLearning services are not strongly monitored and measured in a way that would allow a deeper national analysis of the trends and future prospects of the domain. A key research challenge for the area is to have the appropriate surveys on needs, application areas, the benefits (in practical and financial terms) as well as the shortcomings of the application of eLearning solutions.

If we wish to determine major research questions, we have to concentrate first of all on issues in which developments should be expected. The reasons for the overall lag of ICT and eLearning usage should be analysed, furthermore international comparison and best practice analyses are essential. The most decisive future technical and non-technical RD challenges in connection with eLearning are described in this chapter.

Hungarian key research areas in eLearning are determined by the global and European trends and developments. However, country specific challenges should be combined with these aspects. The final purpose of the research would be to identify better solutions for effective eLearning usage in Hungary.

V.1. Technological developments and challenges posed by their application in the New Member States in the domain

Rapid changes in the ICT sphere mean new possibilities for better and more user-friendly ICT applications in everyday life. Better performance and mobility of the applications should be made use of in the field of education and training, too. New technologies, hardware and software are provided by multinational companies and also by Hungarian developers. It is not rare that Hungarian content developers develop new framework systems or their own technologies.

One of the challenges is to ***harmonise content development*** with the development of technologies. The sustainability and control of digital materials are very important questions, since digital materials can only be competitive if their content is always up-to-date. Quality insurance and standardization are also crucial questions, because standardization usually means higher quality and better acceptance.

A very important research and development issue is ***the integration of various technologies*** (like mobile services, Internet or digital television) and services for the provision of eLearning services. Both mobile services and digital television have the potential to stimulate the provision of certain eServices.

Further research is needed to determine the preferences and motivation of users, when selecting between personal computers, mobile or digital TV connections to use online public and healthcare services, to assess which services may be switched to mobile or digital television provision, which both have bigger acceptance and popularity among the final users than personal computers, to evaluate which services could be brought online for users through these two technical possibilities.

Convergence between telecommunication, media and informatics has been a current issue for years. Hungary is among the countries where IP based television service is provided. This can open new opportunities regarding eLearning services. The dissemination of IP based ***Next Generation Network*** is expected, which means that all kinds of communication will be provided through IP solutions. These new developments will definitely affect the eMarkets and ICT branches, accordingly eLearning market, too. New research tasks should be enhanced relating these technological developments.

It is among the most important questions how to ensure more user-friendly and ***user-oriented eServices.*** Usage of not complicated eLearning solutions is more frequent, therefore more resources should be allocated to research issues dealing with developments of new technical solutions.

Framework system and software of eLearning services are very determining. ***Open source Programmes and systems*** definitely have synergy effects on eLearning development. Free availability

of learning management systems and software Programmes for users would lead to better exploitation of Hungarian eLearning potentials. The role of open source and web 2.0 should be more emphasized from the viewpoint of eLearning. Improvement of ***user-friendly Learning Content Management Systems*** is also among the technological tasks. More simple content creation would more likely attract Hungarian teachers to use ICT in class. All in all, more user-friendly systems with help functions would lead to better utilization of eLearning either from the supply or demand side. Therefore, research into more user-friendly and flexible software solutions is a great challenge for IT developers.

It is revealed from the previous chapters that the relatively high costs of ICT appliances and Internet are among the obstacles for widespread usage of eLearning in Hungary. ICT and Internet penetration is far below EU average. Improving computer penetration and accessibility is among the main challenges in Hungary. However, mobile penetration is quite good in Hungary. Research activities in the field of ***wireless communication*** potentials and eLearning services should also be enhanced. Wireless Internet connection is accessible at more and more public places, institutions, restaurants, mainly in Budapest. Some hot spots are available for free connecting to the Internet, which is very beneficial for using eServices, including eLearning. The potential of ***UMTS*** and GPRS can be exploited by the development of new eService solutions. ***Voice of Internet Protocol*** technological advancements may also mean exploitable possibilities regarding eLearning services. Video-conference solutions in education can open new perspectives in eLearning provision, since live presentation and communication by the means of advanced technologies would enable distance education to become more personal. However, this kind of eLearning would still require expensive technologies. Generally speaking, the development of much cheaper technological tools would enhance all eLearning usage in long term.

The diminishing of online hindrances should be also among the research questions. Fortunately, more and more surveys and data are available related to this issue. Most of the Hungarian and other European sites are not available for blind people. However, the right of access to eServices for everyone is declared by the i2010 document. More R&D resources should be allocated for this area.

Technological developments in connection with ***security*** in the field of eLearning are also crucial. ***Online identification*** is an important issue in case of eLearning, for example if checking the identity is required or when an online exam takes place.

V.2. Non-technological developments and challenges posed by their application in the New Member States in the domain

One of the main challenges regarding eLearning is to ***ensure appropriate ICT and Internet penetration*** in the whole country at schools, public institutions and households. The potential of Hungarian eLearning can be exploited if appropriate infrastructure is given. According to statistics, it seems to be clear that in countries where ICT and Internet penetration is high, the usage of eLearning is also more advanced. Deep analyses regarding eLearning and ICT infrastructure have been carried out by different Hungarian research programmes. The aim of these researches should be to attract attention of policy makers. The role of eLearning and digital skills in creating the Hungarian information society should be forced by research studies.

eLearning can be a tool for more effective teaching and learning processes. New teaching methodology, new approaches for learning would affect learning achievements. It is an important question if ***ICT supported education leads to better achievements***. Another interesting question is how the new technology in education influences the role of schools, educational institutions and teachers.

The research should especially take into account the ***role of the private sector*** in the domain, and the cooperation between Hungarian eLearning actors. The co-operation of private and public sector in Hungary is not satisfactory; more attention should be paid to this area. Improving partnership between service providers, for example between universities should also be enhanced. Besides research

activity, the role of eLearning forum should be more emphasized, since changing experiences and opinions is very important.

Improving overall digital literacy and motivation of teachers are among the main tasks in Hungary. Best practice analyses and benchmarking research studies would lead to better understanding ***of what factors cause eLearning gaps*** and which development directions should be followed.

eLearning is a very practical way of learning for people with disabilities. Fortunately, more and more services are provided for them, but the research in the area is not satisfactory. At the same time reducing the digital divide and using eLearning solutions can improve the situation of disadvantaged people in the labour market. The role and achievements of eLearning in improving equal opportunities should definitely be analysed.

V.3. Financing

In the case of financing the most important question is to ***what extent should the state take responsibility for financing eLearning developments***. Digital contents are financed both from public and private sources. Public education and its financing belong to the tasks of the state. Developments in education and eLearning should principally be based on state sources. However, the involvement of private actors is very important.

Intensive competition among content developers would lead to better quality eLearning materials. The way of commercialisation of producing digital learning materials would need investigation. It is an important question, how the profitability of e-book providers and digital learning content producers could be reached.

The public-private partnership in the eLearning domain should be more emphasized. Investigation in this area is also important, for example analyzing those international best practices which are adaptable in Hungary, as well.

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Abstract

In 2005, IPTS launched a project which aimed to assess the developments in eGoverment, eHealth and eLearning in the 10 New Member States at national, and at cross-country level. At that time, the 10 New Member States were Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovenia and Slovakia. A report for each country was produced, describing its educational system and the role played by eLearning within both the formal education system and other aspects of lifelong learning. Each report then analyzes, on the basis of desk research and expert interviews, the major achievements, shortcomings, drivers and barriers in the development of eLearning in one of the countries in question. This analysis provides the basis for the identification and discussion of national policy options to address the major challenges and to suggest R&D issues relevant to the needs of each country – in this case, Hungary.

In addition to national monographs, the project has delivered a synthesis report, which offers an integrated view of the developments of eLearning in the New Member States. Furthermore, a prospective report looking across and beyond the development of the eGoverment, eHealth and eLearning areas has been developed to summarize policy challenges and options for the development of eServices and the Information Society towards the goals of Lisbon and i2010.

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