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

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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 the Lifelong Learning Programme[5] have set objectives for education and support the development of learning in the knowledge society. One of the 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 experts from each country gathered the relevant qualitative and quantitative data for analysis, in order

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

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 Slovakia

This report was produced by the Slovak Governance Institute, the consortium member from Slovakia, and it presents the results of the research on eLearning in Slovakia.

First, the report describes Slovakia'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 Slovakia, 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, 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/

[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).

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LIST OF ABBREVIATIONS

ADSL	Asymmetric Digital Subscriber Line
CATV	Cable TV network
CNAP	Cisco Networking Academy Program
CSO	Slovak Civil Service Office (Urad pre statnu sluzbu)
CVT	Continuous Vocational Training
DIVES	Slovak Distance Learning Program through Internet
EC	European Commission
ECDL	European Computer Driving Licence
EDGE	Enhanced Data rates for GSM Evolution technology
eEDUSER	EU project
eEurope	EU Initiative for Information Society
eEurope+	EU Initiative for Information Society for NMS
EP	European Parliament
EU	European Union
EU10	EU 10 New Member States (also referred to as NMS)
EU15	EU 15 member states before May 1, 2004
EU25	EU 25 member states after May 1, 2004
eUSER	EU project
EVO	Electronic-Village-Online Concept
FAQ	Frequently Asked Questions
FDI	Foreign Direct Investment
FLARION	FLASH-OFDM system (type of mobile data technology)
FTTx	Technology Concept Fibre-to-the-(Home, Premises, Building, Business, Curb, Node)
FWA	Fixed Wireless Access
FWBA	Fixed Wireless Broadband Access
G2B	Government to Business (potential focus of eGovernment services)
G2C	Government to Citizens (potential focus of eGovernment services)
GDP	Gross Domestic Product
GER	Gross Enrolment Ratios
GNL	Open Standard platform
GOVNET	Slovak Government Network
GPRS	General Packet Radio Service (type of mobile data technology)
GSM	Global System for Mobile Communications
HDTV	High-definition Television
HR	Human Resources
HW	Hardware
ICT	Information and Communication Technology
ICV STU	Institute for Life-long Learning at the STU Bratislava
IFP	Institute of Financial Policy
INFOSTAT	Slovak Institute for Informatics and Statistics, part of the Statistical Office
INFOVEK	Slovak ICT project for primary and secondary schools in Slovakia
IPR	Intellectual Property Rights
IS	Information Society
ISCED	International Standard Classification of Education
ISDN	Integrated Services Digital Network
IT	Information Technology
LAN	Local Area Network
LCMS	Learning Content Management System
LLL	Life-Long Learning
LLU	Local Loop Unbundling
LMS	Learning Management System

M-Learning	Mobile learning
MINERVA	Slovak National Lisbon Strategy activity
MOL	Hungarian Oil and Gas Company
MOODLE	Modular Object-Oriented Dynamic Learning Environment
NETIES	EU project (6th Framework Program)
NGO	Non-Governmental Organisation
NMS	Ten New Member States of the European Union (also called EU10) during 2004-6
NMT-450	Nordic Mobile Telephone (450 MHz) system
NUTS	Nomenclature of Territorial Units for Statistics used by EUROSTAT
OECD	Organization for Economic Cooperation and Development
OFDM	Orthogonal Frequency-Division Multiplexing
OS	Operation System
OSI	Open Source Initiative
PC	Personal Computer
PLC	Power Line Communications
PPP	Public-Private Partnership
PPS	Purchasing Power Standard
R&D	Research & Development
SANET	Slovak Academic Network
SF	Structural Funds
SIBIS	Statistical Indicators Benchmarking the Information Society
SK	Slovakia
SKK	Slovak Koruna (Slovak Currency)
SME daily	Slovak daily newspaper
SMEs	Small and Medium-Sized Enterprises
SNDE	Slovak Network of Distance Education
SPP	Slovensky Plynarensky Priemysel (Slovak Gas Distributor)
SPU	Slovak Agriculture University
STU	Slovak Technology University
SW	Software
SWAN	Telecommunication Infrastructure Operator in Slovakia
TU	Technical University
UKF	University of Constantine The Philosopher
UMS	Association of Slovak Towns
UMTS	Universal Mobile Telecommunications System
UNESCO	United Nations Educational, Scientific and Cultural Organization
US	United States of America
VAT	Value Added Tax
VPN	Virtual Private Network
VRVS	Virtual Rooms Video-Conferencing System
VSAT	Very Small Aperture Terminal
VSMU	Vysoka Skola Muzickych Umeni (Academy of Music and Dramatic Arts)
WiFi	Type of Wireless Internet Access technology
WIPO	World Intellectual Property Organisation
WLL	Wireless Local Loop
xDSL	Different types of Digital Subscriber Line Concept (ADSL, VDSL, HDSL)
ZMOS	Association of Slovak Cities and Municipalities

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EXECUTIVE SUMMARY

Traditionally, Slovakia has had high levels of education attainment with respect to the share of the population with completed secondary education, and in 2006 it ranked as third in the whole EU with the upper-secondary completion rate of 91.5% (Eurostat). This reflects the fact that a significant proportion of primary school leavers proceed to four-year secondary education. With respect to tertiary education, however, Slovakia has one of the lowest shares (14.5% in 2006 according to Eurostat) among both EU and OECD countries. Recently, national level reforms and international trends have been shaping the Slovak formal education system at all levels (decentralization in primary and secondary education, joining the European Higher Education Area in tertiary education). In the case of lifelong learning, there has been no clear state strategy or reform effort. In addition, lifelong learning now faces problems of insufficient public financing, low demand for lifelong learning among citizens and difficulty with access to the places where training is provided.

In comparison with other EU and OECD countries, Slovakia has seen only little systematic government involvement in support of the development of an information society framework over the last decade. However, the Eurostat statistics for ICT usage show encouraging development, computer usage reached 68% and internet usage 62% in 2006 (Eurostat). ICT skills have been developing well despite of lower ICT access in households. According to Eurostat, in 2007 only 46% of Slovakian households had internet access (EU-15 average 59%) but 76% of Slovakian population had some level of computer skills (EU-15 average for computer skills was 75%). However, there are large skills gaps between different groups of people, as especially older people (76%) and unemployed (70%) have no ICT skills (Eurostat, 2007).

The Ministry of Education has discussed the topic of eLearning within strategic documents (e.g. Millenium Strategy of 2000), but systematic take up of ICT in the education sector (dominated by public institutions) has not yet begun. Educational institutions at all levels of formal education have been connected to the Internet. However, ICT-based activities are not integrated in education at any level. The few courses making use of ICT at schools are typically results of the individual initiative of a teacher or an institution. In tertiary education, eLearning is more widespread as several universities have developed ICT-enabled courses. Courses making use of ICT are also provided by several private training companies. Particularly, large IT companies and banks provide online training courses for their employees through their training systems at the workplace. Research on eLearning is carried out by universities and by the State Institute of Information and Prognoses in Education.

Recent macro-economic developments support dynamic growth and a flexible market for all actors involved in eLearning in Slovakia. Economic growth is influencing the gradual growth of purchasing power of both citizens and businesses. The positive trend of decreasing unemployment may reduce the negative impacts of digital divide and decrease the share of the population that has low levels of digital literacy. Recently adopted legislation (e.g. Higher Education Act in 2002) allowed for rapid development in tertiary education. eLearning development in tertiary education can serve as positive inspiration for future government legislative initiatives in preparation for new legislation on primary and secondary schools (Schooling Act). Broadband infrastructure for higher education is highly developed (project SANET). The gradual increase of general broadband penetration, individual ICT skills and multimedia technology deployment in primary and secondary schools should support further development of eLearning in Slovakia. Universities, schools, public administration and enterprises located in less developed regions have a possibility to benefit from EU structural funds for developing eLearning activities. The younger generation is able to bring new visions, dynamics, and inspiration and is able to use all kinds of ICT.

One of the most relevant drivers for future eLearning development in Slovakia is that the existing organisations involved in eLearning at the moment are acting as inspirational and innovative leaders. Other drivers are the general IST development in Slovakia, individual acceptance and discovery of the potential and impact of ICT and effective funding and coordination on national and regional levels. The

most significant barriers for future eLearning development in Slovakia include an inefficient Information Society framework, a passive public administration, growing digital divide, regional disparities and limited skills in strategical absorption and utilization of the EU structural funds.

As policy suggestions, eLearning experts recommend that a permanent national eLearning committee be established as a sectoral policy advisory body to the Minister of Education and that an effective network of guarantors of eLearning implementation in primary, secondary, tertiary education and lifelong learning be formed. A central database of eLearning projects should also be created. For wider involvement of eLearning in distance education at universities, lifelong learning institutions or in other levels of the education system, an appropriate eAuthentication regime should be established. Additionally, mechanisms for quality assurance, accreditation, certification and other related aspects of adult education need to be implemented. State budgetary policy should focus on creating a new modern, efficient and sustainable education system, ICT training programmes for different target groups and increased motivation for teachers. More attention should be paid to the development of basic ICT skills (digital literacy) for citizens in general, and for specific target groups such as civil servants, teachers, unemployed, and older people. Broadband infrastructure access for primary and secondary schools, support of open source software and legal acceptance of eAuthentication are also essential for progressive eLearning development in Slovakia. Improvement of infrastructure and digital literacy in specific target groups within the state social and employment policy framework should be backed by adequate budgetary support. Furthermore, it is suggested to implement an eLearning awareness campaign to promote the potential of ICT for learning.

Research work is required to identify the needs and prepare both basic training in this area for teachers and trainers, and also advanced training tailored to their specific needs. Furthermore, it is important to find optimal teaching methods for pupils and students of different ages, develop eLearning documentation (curricula) and eLearning management at municipality level and improve the education of new teachers implementing new eLearning approaches. It is also important to improve the awareness of parents, children and teachers of the potential risks and prepare them to use internet services for self-study or learning safely. For improving eLearning take up, it is essential to develop quality teaching resources with multimedia elements, and elaborate generally accessible archives of these resources, together with developing eLearning content creation and management tools. Possibility for using common resource repositories requires further research and development work on appropriate metadata solutions, interoperable eLearning systems and user-friendly technology accessibility for different user groups, such as physically disabled people. Furthermore, research and development on security, identity and digital rights management are needed to support the repository development.

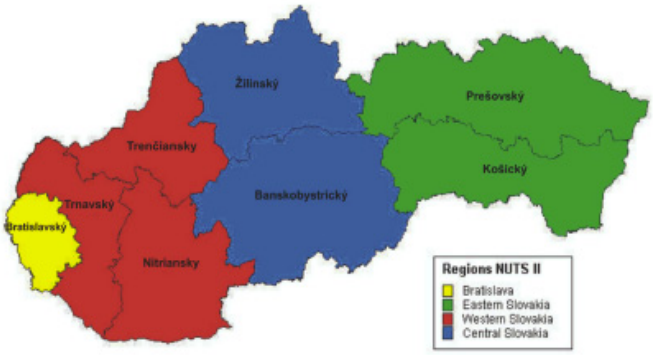
INTRODUCTION: COUNTRY FEATURES

Country Profile: Facts and Figures

Table 1: Country profile

General data (2006)	
Population	5 393 637
Area (sq. km)	49 035
Population density	110.0 per sq. km
Urban population (>500 pp per sq.km)	34.8%
Major ethnic nationalities	Slovaks (86%), Hungarians (10%), Roma (est. 5 – 10%)
Currency Unit	Slovak koruna (1 € = 37.248 SKK)
Economic data (2005)	
GDP per capita PPS	12 900 € (2005)
Real GDP growth rate	6.1 % (2005), 5.4% (2004), 4.2% (2003)
General Government deficit/GDP (ESA'95)	2.9% (2005), 3.8% (2004), 3.7% (2003)
Consumer price index	2.7% (2005), 7.5% (2004), 8.5% (2003)
Unemployment rate (Labour Force Survey)	16.2% (2005), 13.5% (H1 2006)
Composition of GDP	Agriculture: 3.5% Industry: 29.4% Services: 67.2% (2005 est.)
Percentage of households who have internet access at home	23% (2005), 23% (2004)
Broadband penetration rate	1.5% (2005), 0.4% (2004)
Administration structure (2006)	
Self-governing regions	8
Administrative districts	79
Self-governing municipalities	2 928 (incl. 17 municipalities of Bratislava-City and 22 municipalities of Kosice-City)

Figure 1: NUTS-II[13] regions and self-governing regions



[13] The administrative division of the country to NUTS - regions: Bratislava, Western Slovakia, Central Slovakia, Eastern Slovakia

Geography, Economy and Demography

Geography

Slovakia is a landlocked country in central Europe with some 5.4 million inhabitants, covering an area of 49 035 sq. km. The topography is dominated by the Carpathian Mountains spreading across most of the northern half, with fertile lowlands in the South. Slovakia borders the EU member states Austria, Czech Republic, Hungary and Poland, and non-EU Ukraine in the east.

Economy

Slovakia's gross domestic product has been growing the fastest among the neighbouring new member states over the past few years. GDP growth reached 8.3% in 2006, accelerating from 6.1% in 2005, 5.4% in the previous year and rates over 4% in the two years before. GDP per capita in 2005 reached about EUR 12 900 at PPS exchange rates. In 2005 Slovakia's per capita GDP stood at about 53% of the EU25 average and was projected by Eurostat to converge to the 60% level by 2007.

The Slovak economy is highly open with exports driving growth in recent years. Major exports are vehicles, iron and steel, machinery and energy equipment, the EU member states being main trade partners (over 85% of exports in 2005).

Unemployment stubbornly remains the country's major macroeconomic problem. Unemployment fell to 13.3% from 16.3% in 2005[14], one of the highest rates of joblessness among the EU member states. Nonetheless, it has been declining somewhat over the past several years from a high of 19.3% in 2001 on the back of radical structural reforms. The unemployment is spread geographically unevenly with extremely low rates in the Western Slovak region, specifically around the capital Bratislava.

The state budget deficit in 2005 reached 2.9% of GDP, for the first time in recent years meeting the EU's Maastricht Criteria for entry into the Eurozone, which Slovakia aims to accomplish by 2009. In 2003 and 2004 the deficit reached 3.7% and 3.8%. The decline in the deficit was mainly a result of strong economic growth as well as the better than expected performance of tax collection following the introduction of a 19% flat tax in 2005.

Along with changes in the tax code, the centre-right coalition Government led by Prime Minister Mikulas Dzurinda in 2002-2006 enacted broad reforms in a number of key sectors, thus increasing competitiveness. The labour code has been liberalised, the pay-as-you-go pension system has been replaced with a capitalised system, education financing has become formula-based, extensive privatisations have taken place and foreign investment inflows have increased, although still falling short of levels in the neighbouring countries. The centre-left cabinet of Prime Minister Robert Fico, which came to power in the June 2006 general election, has promised to partly reverse some of the reforms to reduce their social impact but most of the major measures have remained intact so far.

The stock of FDI at the end of 2005 stood at USD 13.05 billion with Netherlands, Germany, Austria, Hungary and Italy as the largest investors. Major foreign investment projects have come in the area of automobiles, with a Korean Kia plant in Zilina and a French PSA Peugeot car plant in Trnava opened in 2006, joining the large German automaker Volkswagen plant operating in Bratislava since the early 1990s and making Slovakia the world's largest per capita car producing country.

Demography

The average population of Slovakia is currently around 5.4 million. The population was 5 378 951 in May 2001, when the last Census took place, thereof 2 611 921 men (48.6% share) and 2 767 030 women (51.4% share).

[14] Seasonally adjusted, based on Labour Force Survey.

In terms of the overall population size, Slovakia recorded moderate increases in 2004 and 2005 after three years of declines, and demographers expect these moderate growth rates to be sustainable over the next several years. The share of children in the population has been declining.

Natural increments keep decreasing since the overall mortality remains almost constant (being around 10 deaths per 1,000) and birth rates decrease. The numbers of live births reached historically the lowest level in 2002: 9.45 children per 1,000. After three years of declines, Slovakia recorded moderate increases in natural population growth in 2004 and 2005, and demographers expect these moderate growth rates to be sustainable.

Since the numerous population groups born during the post-war period and during the 1970 – 1980s have now reached productive age, the largest groups of population are 20–34 year old and 45–54 year old persons. Due to the reduction of the population of children and to the growth of the numbers of productive and post-productive age individuals, the average age of the population and the ageing index increase.

The average age of the population has risen steadily in the second half of the 20th century to about 36 years in 2000 from just over 30 in the 1950s. Nonetheless, Slovakia remains one of Europe's youngest populations with one of the lowest shares of seniors. Demographic forecasts based on present fertility trends, however, predict the Slovak society will become one of the oldest by the middle of this century.[15] This is well demonstrated by the ageing index. The ageing index defined as the ratio of post-productive population (men over 60 and women over 55 years of age[16]) to pre-production age population (ages 0-14 years) keeps dramatically increasing in Slovakia, and showed an increase from 74.0 to 111.2 in 1993-2004. A similar trend can be observed in other European countries (see Figure 2). The ageing index differs significantly by gender. While the males' value was 72.0 in 2004, females exceed the value of 152.0. The reasons include the different legal retirement age with males and females and the substantially higher number of women in senior age groups caused by the higher mortality of men in these groups. Sociologists speak about feminisation of the old age.

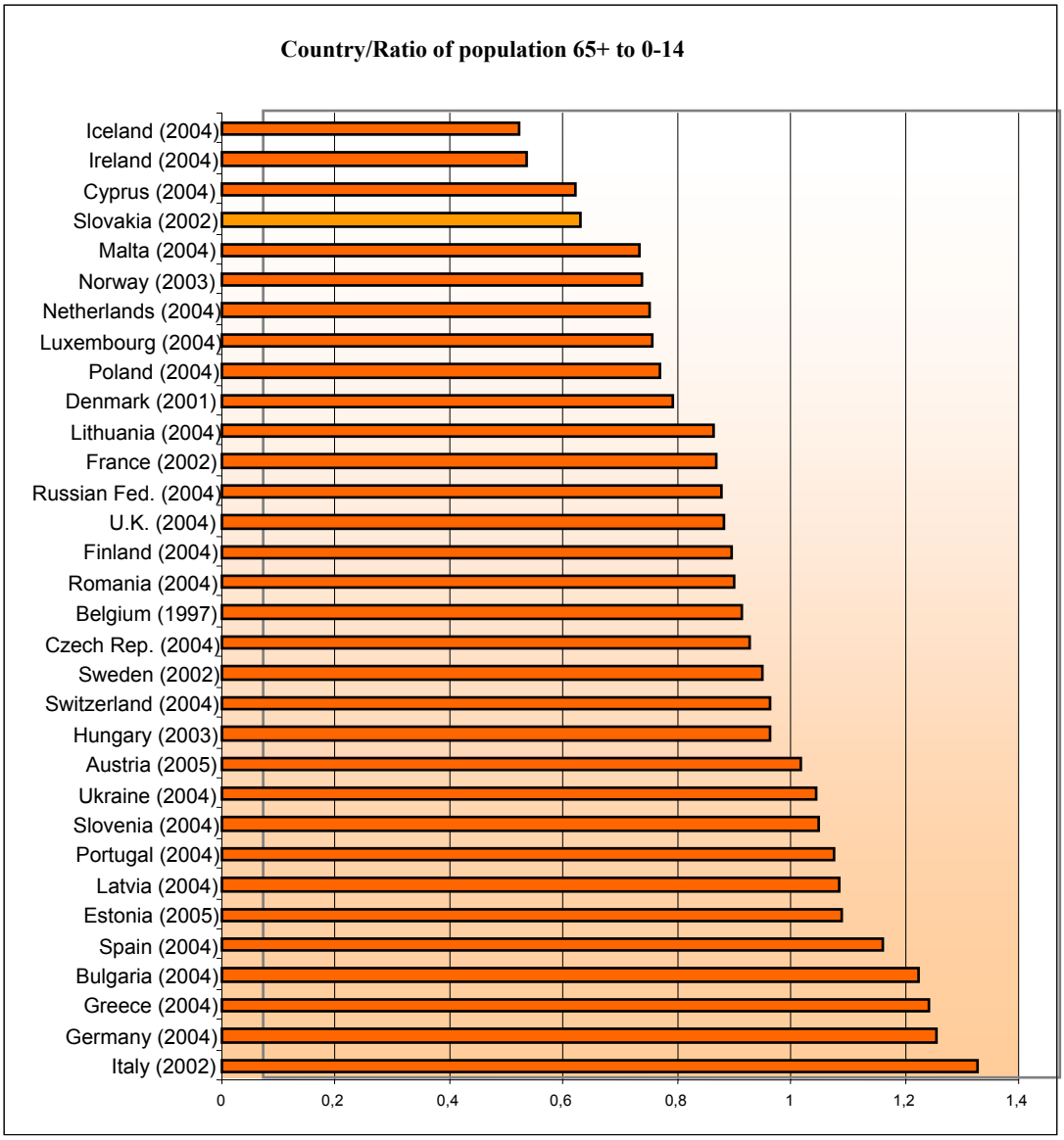
Forecasts of the Slovak Ministry of Labour for the years 2003 - 2010 predict a significant increase (approx. by 1/3) of the population in the age group 55 - 64 years. On the other hand, only a minor increase is expected in the age group between 25 - 54 years (approx. by 3 thousand persons).

Although exact data on migration are not available, according to the estimates of the Statistical Office of the SR, more than 140 000 Slovak citizens worked abroad in the first quarter of 2006.

[15] Potančoková, M., Starnutie populácie Slovenska. In: Populačný vývoj v Slovenskej republike. InfoStat – Inštitút informatiky a štatistiky, Výskumné demografické centrum, Bratislava 2002.

[16] The *Law on Social Insurance*, in force since 1 January 2004, specifies equal retirement age for both genders at 62 years. There was a 2-year transitional period for men who reached the age of 60 in 2004-2005. For women, who reached the age of 53-57 during 2004 – 2009 (2014) there is a 6 to 11-years transitional period - depending on the number of children raised - during which their retirement age will be gradually increased. Until 2004, the retirement age was 60 years for men, while it was 53-57 years for women, depending on the number of children raised.

Figure 2: Ageing index in Europe



Note: The ageing index shown in the figure is calculated as the ratio of population aged 65+ years to population aged 0-14 years. The actual average retirement age in Slovakia was approx. 57 years in 2002, which explains the difference in the data quoted in the text and shown in the figure.
Source: WHO European Health for All Database, 2005

General Education Indicators

Slovakia has traditionally had high levels of education attainment with respect to the share on population of people with completed secondary education. This reflects traditions within the education system where a significant proportion of primary school leavers proceed on to four-year secondary education.

With respect to tertiary education, however, Slovakia has one of the lowest shares among both EU and OECD countries.

In the area of adult participation in lifelong learning, Slovakia is in a similar position as the other New Member States – the levels of participation are far below the EU15 average (Table 4).

Table 2: Key education indicators (Slovakia 2000 - 2003)

Education related expenditures	Year	SK	EU15	EU10
Expenditure on education in constant prices (1995 = 100)	2000	99.92	109.66	113.4
	2003	113.58	117.79	131.49
	2003/2000	+13.6%	+7.4%	+15.9%
Expenditure on education as % of GDP or public expenditure				
Total public expenditure on education for all levels of education combined	2000	4.15	4.73	4.64
	2003	4.38	5.2	5.37
	2003/2000	+5.5%	+9.9%	+15.7%
Total public expenditure on education at primary level of education (ISCED 1)	2000	0.62	1.08	1.65
	2003	0.65	1.16	1.35
	2003/2000	+4.8%	+7.4%	-18.2%
Total public expenditure on education at secondary level of education (ISCED 2-4)	2000	2.01	2.31	1.63
	2003	2.21	2.41	2.38
	2003/2000	+9.9%	+4.3%	+46.0%
Total public expenditure on education at tertiary level of education (ISCED 5-6)	2000	0.73	1.05	0.76
	2003	0.86	1.16	1.03
	2003/2000	+17.8%	+10.5%	+35.5%
Expenditure on educational institutions from public sources as % of GDP for all levels of Government combined	2000	3.92	4.65	4.55
	2003	4.25	4.89	5.19
	2003/2000	+8.4%	+5.2%	+14.1%
Public subsidies to the private sector as % of GDP for all levels of education combined	2000	0.03	0.27	0.11
	2003	0.13	0.31	0.19
	2003/2000	+333.3%	+14.8%	+72.7%
Expenditure on educational institutions from private sources as % of GDP for all levels of education combined	2000	0.15	0.6	n.a.
	2003	0.46	0.63	0.59
	2003/2000	+206.7%	+5.0%	n.a.
Total public expenditure on education as % of gross national income for all levels of education combined	2000	4.17	4.56	4.86
	2003	4.38	5.21	5.6
	2003/2000	+5.0%	+14.3%	+15.2%

Source: Eurostat 2005

Expenditure on education remains below the comparable levels in most other EU member states both in nominal terms and as a share on GDP. A key problem, shown in Table 2, is that both public and private expenditure are low.

Table 3: Education levels in society (Slovakia 2000 - 2003)

Number of students (full-time and part-time) by level of education	year	SK	EU15	EU10
Tertiary education - levels 5-6 (ISCED 1997) (1000)	2000	135.9	12764.4	2643.6
	2003	158.1	13815.8	3297.8
	2003/2000	+16.3%	+8.2%	+24.7%
Students at ISCED level 4 (1000)	2000	5.8	944.7	360.8
	2003	6.4	766.3	845.1
	2003/2000	+10.3%	-18.9%	+134.2%
Students and pupils at ISCED level 3 (1000)	2000	262.6	18895	4327.9
	2003	288.9	19785.8	3914.1
	2003/2000	+10.0%	+4.7%	-9.6%
Lower secondary or second stage of basic education - level 2 (ISCED 1997) (1000)	2000	409	18278.1	2768.9
	2003	380.6	18437.4	3848.1
	2003/2000	-7.0%	+0.8%	+38.9%
Primary education or first stage of basic education - level 1 (ISCED 1997) (1000)	2000	309.4	23484.9	6080.6
	2003	270	22786	4852.4
	2003/2000	-12.8%	-3.0%	-20.2%
Total (lSCED levels 1-6) (1000)	2000	1122.8	74339.6	16181.7
	2003	1104	75517.7	16320.4
	2003/2000	-1.7%	+1.6%	+0.8%

Source: Eurostat 2005

Table 3 shows demographic developments in the education system. While at tertiary level, enrolments increased both for full-time and part-time students, in primary and secondary education they declined. This reflected demographic developments in the size of cohorts in primary and secondary schools. In tertiary schools, the main cause was a continually expanding capacity of higher educations institutions.

Table 4: Adults in education and training (2003-2004)

Percentage of adults in education and training (population age 25-64)	SK	EU15	EU10
2003	3.7	-	4.9
2004	4.3	10.7	5.4
2005	4.6	11.2	5.3

Source: Eurostat 2005

In pre-primary education in Slovakia there is a trend of gradual decrease of number of schools (more than 9% during period 2001-2005) and children (nearly 6% during period 2001-2005).

Table 5: Basic pre-primary enrolment indicators (Slovakia 2001 - 2006)

Pre-primary enrolment	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	Difference 2006/ 2001
Number of schools	3 243	3 235	3 210	3 046	2 945	-9.2%
Number of children	150 587	151 125	150 718	149 232	141 814	-5.9%
Female (percentage)	48.1	48.3	48.1	48.1	48.3	-

Source: Institute of Information and Prognoses on Education (web statistics 2001-2006)

The same trend (Table 6) is also in primary education – gradual decreasing of the number of schools (more than 4% during period 2001-2005) and the total number of children (more than 15% during the period 2001-2005). 99% of the children complete a full course of primary education (Table 7).

Table 6: Basic primary enrolment indicators (Slovakia 2001 - 2006)

Primary enrolment	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006	Difference 2006/ 2001
Number of schools	2 406	2 396	2 387	2 342	2 304	-4.24 %
Number of children	626 645	602 360	580 791	557 328	532 188	-15.1 %
Number of teachers	39 689	38 798	37 694	35 984	34 914	-12.1 %

Source: Ministry of Education 2002-6

Table 7: Progression and completion in primary education (Slovakia 2002-2004)

Progression and completion in primary education	2002	2004
School life expectancy ISCED 1-6 (years)	14	*14*
Percentage of repeaters, primary (%)	2	*3*
Gross intake rate to last grade of primary (%)	101	*99*
Primary to secondary transition rate (%)	*98*	*98*

Source: UNESCO 2006

The number of schools in secondary education is gradually decreasing (more than 12% during the period of 2001-2005, while the number of children increased by more than 11% during the same period).

Table 8: Basic secondary enrolment indicators (Slovakia 2001 - 2006)

Secondary enrolment	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006	Difference 2006/ 2001
Number of schools	930	858	827	808	819	- 12.0 %
Number of children	284 834	298 741	317 941	317 456	317 810	+ 11.6 %
Number of teachers	21 708	21 918	23 044	22 907	21 761	+ 0.2 %

Source: Ministry of Education 2002-6

In Slovakia, the rate of population in higher education age enrolled in tertiary education is gradually increasing - in 2004 it was 36% of the total relevant population (33% of male and 40% of female persons).

Table 9: Basic tertiary enrolment indicators (Slovakia 1999 - 2004)

Tertiary enrolment	1999	2002	2004	2004 Regional average	Note
GER for total population (%)	26	32	36	54	Gross Enrolment Ratios (GER) is the number of students enrolled in a given level of education regardless of age expressed as a percentage of the population in the theoretical age group for that level of education.
GER of male (%)	25	30	33	48	
GER of female (%)	28	34	40	60	

Source: UNESCO 2006

Due to the high participation rate in education the rate of literacy is fairly high in Slovakia too. This is shown in Table 10 below.

Table 10: Literacy rates (Slovakia 2004)

Literacy rates		2000-2004	Regional average 2000-2004
Adult (15+) %	Together	99.6	97.0
	Male	99.7	98.7
	Female	99.6	95.5
Youth (15-24) %	Together	99.6	98.6
	Male	99.6	99.1
	Female	99.7	98.1

Source: UNESCO 2006

While the level of education across Slovakia is about the European average, according to the study aimed to measure the quality of markets (published in 2006 by the Vienna Institute for the Research of Qualifications and Education[17]), Bratislava (along with the Czech capital Prague) is the most highly educated region among all post-socialist countries in the EU25. This is indicative of unequal education levels across the Slovak regions, where especially people with completed higher education are drawn to the capital (Table 11).

Table 11: Population in regions graduates from higher education institutions (Slovakia 2005)

Self-governing region with administrative centre in	Total population	Graduates from higher education institutions	Percentage of population graduating from university
Zilina	692 332	43 803	6,3 %
Trnava	551 003	30 135	5,5 %
Trencin	605 582	38 756	6,4 %
Nitra	713 422	42 117	5,9 %
Banska Bystrica	662 121	42 127	6,4 %
Presov	789 968	44 149	5,6 %
Kosice	766 012	51 960	6,8 %
Bratislava	599 015	88 966	14,9 %

Source: Statistical Office 2006, Slovak Governance Institute 2006[18]

General ICT Indicators

The overall process and progress of innovations in Slovakia is very much determined by the generally low use of the Internet. In Slovakia, tele-density in fixed network is also much lower than the EU average (Table 12). A gradually increasing trend in tele-density stopped in 2000 due to the impact of mobile competition and relatively high prices for fixed line services. In June 2006, tele-density decreased to 21.9%, which is similar to the level from April 1996 when massive infrastructure investments started to take place. A negative trend in terms of fixed network digitalisation has been observed in comparison with the EU15 average, too. In January 2003, fixed telephony had officially been liberalised, but the real impact has actually materialised only in early 2007, because the most important regulatory instruments like local loop unbundling (see also Statistical Annex - Table 9 and 11), number portability, carrier pre-selection regime or long-term absence of price regulation of specific monopoly services (e.g. leased lines in local fixed networks - see also Statistical Annex – Table 10) had not been implemented until recently.

[17] Slovak Spectator – February 6, 2006 - http://www.spectator.sk/clanok-22410.html
[18] http://www.governance.sk/index.php?id=361

Tele-density in mobile networks shows a similar trend as in the EU but with a lag of 2-3 years. The expected saturation of mobile market will be also lower than in the EU15. In Slovakia, the NMT-450 service had been provided by one operator since 1991 until June 2006 (since July 2006 the same operator provides the mobile broadband Internet in this band having launched the worldwide premiere of the Flash-OFDM technology) and cellular GSM 900/1800 services have been provided by two operators since 1997. In January 2006, mobile penetration reached 80% (compare to the Czech Republic with its 104%). In December 2005 UMTS services have been launched. In August 2006, a third mobile operator was officially awarded a network licence and has launched its services early in 2007.

The Internet penetration in Slovakia is much lower than the EU average. In June 2006 the number of Internet users was only 37.4 per 100 inhabitants (76.3% of the EU15 average) and with the broadband penetration the number was only 3.1 per 100 inhabitants (16.5% of the EU15 average). The country is lagging behind in comparison with dynamic growth seen in the EU25 (Chart 1). The slow growth is caused mainly by increasing prices of the Internet in the 2000-2003 period. Prices were high because there was no price regulation for Internet access and the incumbent was a monopoly. Most European countries witnessed the opposite trend. Unfortunately, Slovakia was the last of the former candidate countries to implement the broadband Internet access (ADSL services starting in June 2003). Slovakia's continual low position in the EU25 broadband rankings reflects this negative trend even today.

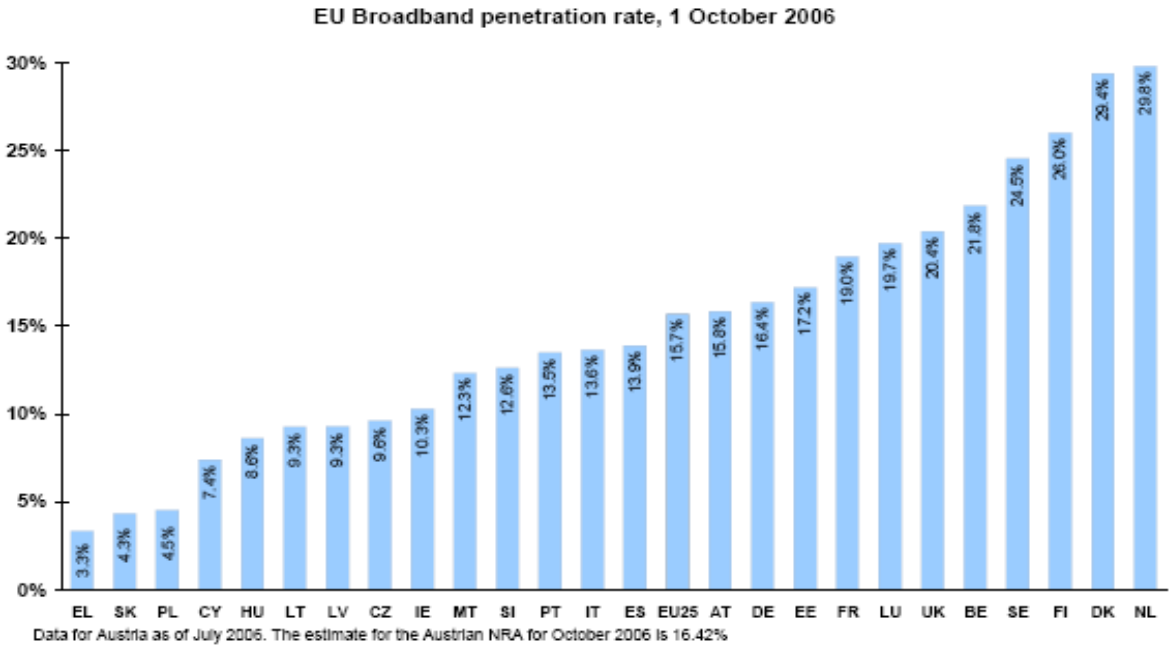
An alternative broadband infrastructure – Internet through Cable TV (hereafter CATV) networks - has also been launched relatively late - in April 2003 - and is still available only in larger cities. Penetration of CATV as the potential alternative infrastructure to the incumbent telephone network in Slovakia is higher than the EU average. Unfortunately, this infrastructure had not been used for services other than the distribution of radio and TV programs before April 2003, due to the regulation and lack of liberalisation by the telecom regulator. At present, mobile Internet services are also provided in Slovakia, e.g. GPRS, EDGE, FLARION, UMTS services (since March 2006), satellite Internet (VSAT, one-way/two way Internet). FTTx infrastructure is available only in few localities in the largest Slovak cities. Triple-Play services (voice, TV and broadband) have been launched by the trio of operators in 2006. Further xDSL services (ADSL2, ADSL 2+) should be provided by the incumbent Slovak Telecom from 2007 only in limited localities.

Table 12: Main ICT indicators (Slovakia 1998-2006)

Indicators	1998	1999	2000	2001	2002	2003	2004	2005	2006
Main telephone line penetration (%)	28.54	30.66	31.43	28.93	26.08	24.07	23.22	22.21	21.66
Household density (%)	61.14	63.39	75.43	69.48	61.80	52.02	50.23	48.36	47.19
Digitalisation of fixed network (%)	62.05	66.81	70.41	74.28	78.23	84.26	100	100	100
Mobile density (%)	8.77	12.30	20.60	39.70	54.40	68.39	79.39	84.25	90.80
Pagers density (%)	0.04	0.03	0.03	0.03	n.a.	n.a.	n.a.	n.a.	n.a.
Total Internet users per 100 inhab.	9.3	11.1	12.0	12.5	16.0	25.58	30.71	35.38	41.85
Internet users in Slovakia compared to EU15 average (%)*	93.9	73.0	46.0	43.0	40.0	67.3	74.9	76.9	n.a.
Broadband Internet density compared to EU15 average (%)	-	-	-	0	0	2.46	10.80	14.10	17.32
xDSL subscribers per 100 inhab.	-	-	-	0	0	0.08	0.71	1.94	3.38
CATV Internet subscribers per 100 inhab.	-	-	-	0	0	0.07	0.20	0.40	0.68

Sources: Statistics of the Slovak Ministry of Transport, Posts and Telecommunications 2000-6, statistical data published by the Slovak Ministry of Construction and Regional Development (* data for 1998-2002 from OP Basic Infrastructure 2004-2006, for 2003-2006 data recalculated based on EUROSTAT 2006)

Chart 1: EU25 Survey of Broadband penetration (2006)



Source: European Commission 2007

Existing research indicates a potential significant problem of a digital divide, because the Slovak population is only half as skilled in the use of modern ICT as populations in the EU25 countries - this poll was carried out[19] in October 2005 by the Institute of Public Affairs, a Slovak think tank. Slovak citizens scored 0.33 points on a "digital literacy index" on a scale of 0-1. The neighbouring Czech Republic scored 0.6, while Estonia registered the score of 0.7. The digital literacy index measures the ability to work with computers, programs and different software and hardware, as well as how people process and use the information. The same research[20] also indicates that the majority of the population (68.7%) does not consider ICT as a significant tool for communication with public administration institutions. Computers are used on a regular basis (daily or almost daily) by 31.6% of the population (aged 18+); the Internet is regularly used only by 20.5% of the population (aged 18+). All of the data mentioned present the ability of the Slovak population to use ICT, and the ability to use ICT is closely linked to the ability to participate in eLearning programs employing ICT.

The picture of ICT usage in Slovakia can be complemented by information on the use of ICT by the business sector. This survey was carried out by the polling agency TNS SK in August 2005 (G2B eGovernment Research - 304 respondents from selected sectors such as industry, construction, commerce, hotels, restaurants, transport, post and telecommunications, real estate). The main results of this research are as follows:

- 5% of enterprises from the selected sectors do not use computers. Nine enterprises out of ten that use computers do have an Internet connection, often using xDSL or ISDN technologies. 57% of the enterprises have access to the broadband Internet.
- A computer virus was considered the most frequent problem in the area of IT security in the enterprises over the past 12 months. Two thirds of the enterprises (66%) did not have any security problems in the IT area.
- In almost a half of all enterprises (49%) more than 80% employees are able to use basic computer office programs and, at the same time, more than 80% employees use computers regularly.
- The development of IT skills of employees in the selected sectors is limited. More than a half of all enterprises (56%) in the selected sectors have not provided any IT training to their own employees over the past 12 months.

Other statistical data related to the ability of Slovak enterprises to regularly use the Internet (e.g. to interact with public authorities) were published through domestic or EU research[21] centre activities or within specific EU projects[22] – the data are included in Table 13. Specific data for eLearning in the business sector are not available.

Table 13: Business Sector Internet Indicators (Slovakia, 2002 - 2006)

Business Sector Internet Indicators	2002	2004	2005	2006	Comments
Percentage of enterprises using the Internet to interact with public authorities	45	47	57	77	TNS Factum Slovakia research (2002) and Eurostat research (2004-6)
Percentage of TOP 200 Slovak SMEs using the Internet	n.a.	n.a.	71	n.a.	NETIES research (2005)

Source: TNS Factum Slovakia, Eurostat, project NETIES 2006

[19] Slovak Spectator, October 2005: Digital literacy low in Slovakia - http://spectator.sk/clanok.asp?cl=21318

[20] SME, October 2005: Počítač používa v SR pravidelne 31,6% občanov, Internet 20,5% - http://ekonomika.sme.sk/clanok.asp?cl=2436688

[21] EUROSTAT 2006 statistics

[22] NETIES project research 2005, see http://noweurope.com/neties.php?id=P389

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

The measures and changes adopted in the recent years in order to decentralise Slovakia's educational system and introduce a new model of its financing have began to yield the desired fruits. Experts' opinions about the current state of affairs vary greatly. According to one group, the Slovak education system is heading for a disaster faster than ever before.[23] Others believe that it may finally hit the bottom, bounce back and begin to cope with the problems that have plagued it for a long time. Main general statistical data related to Slovak educational indicators are included in Tables 4-10 and in Table 14. International statistical data focused on eLearning and detailed Slovak statistical data on eLearning collected during this project are included in Statistical Annex

The most perceptible changes have been those ensuing from the delegation of powers pertaining to primary and secondary schools to municipal and regional self-Governments. The new administrators after the 1998 general election had immediately began to implement systemic changes of a substantially greater scope than any changes district and regional state administration authorities previously in charge ever dared to implement. Most schools' financial condition has, however, remained difficult; unlike in the past, though, all schools are at least aware of their budgetary limitations for the given academic year.

During last few years, the country's education system has extended a much more generous hand towards socially disadvantaged pupils and students. On the other hand, most parents saw an increase in the costs of various supplementary services provided by the system (e.g. boarding in kindergarten and school canteens, after-school clubs or primary art schools). Since most of the changes have been introduced just recently, it is difficult to estimate the overall effect of these changes for the time being. As far as content changes are concerned, the progress made during 2002-2006 remained at a rather sluggish pace, mostly due to the obsolete Schooling Act. But even this field has seen some improvements thanks to introducing single standard school-leaving examinations and expanding the testing of pupils who attend the ninth grade of primary schools, which will certainly inspire further positive changes.

Table 14: Major educational indicators (Slovakia 1995 – 2005)

Major educational indicators	1995	2000	2005
Number of primary schools	2 497	2 447	2 304
Number of secondary schools	554	584	612
Number of vocational training units	367	368	210
Number of higher education units	14	20	27
Share of public to private schools (%)	98.49	97.78	95.96
Number of specialised educational units (for special needs students, etc.)	400	377	361
Training institutions	250	320	420
of them: in public sector	100	120	155
of them: in private sector	150	200	265

Sources: Statistical Office (2000), IVO: Slovakia - A Global Report on the State of Society (1997, 2005), Ministry of Education 2006

Over the past several years, Slovakia has harmonised the legislative basis of its higher education system with the EU Higher Education Area. Most academic officials describe this transformation as extremely important. As part of the process, branches of study continued to transform into study programs in 2004, which was connected with the re-accreditation of virtually all Slovak universities. Unfortunately, the transformation is rather slow in producing concrete improvements that students can perceive in the content and quality of provided education and researchers in conditions for their research. Despite a concentrated effort, the Ministry did not manage to push through the introduction

[23] Institute of Public Affairs, 2004: Slovakia 2004 - A Global Report on the State of Society (Chapter Education)

of partial tuition fees for university studies, which is closely connected to further changes within the system.

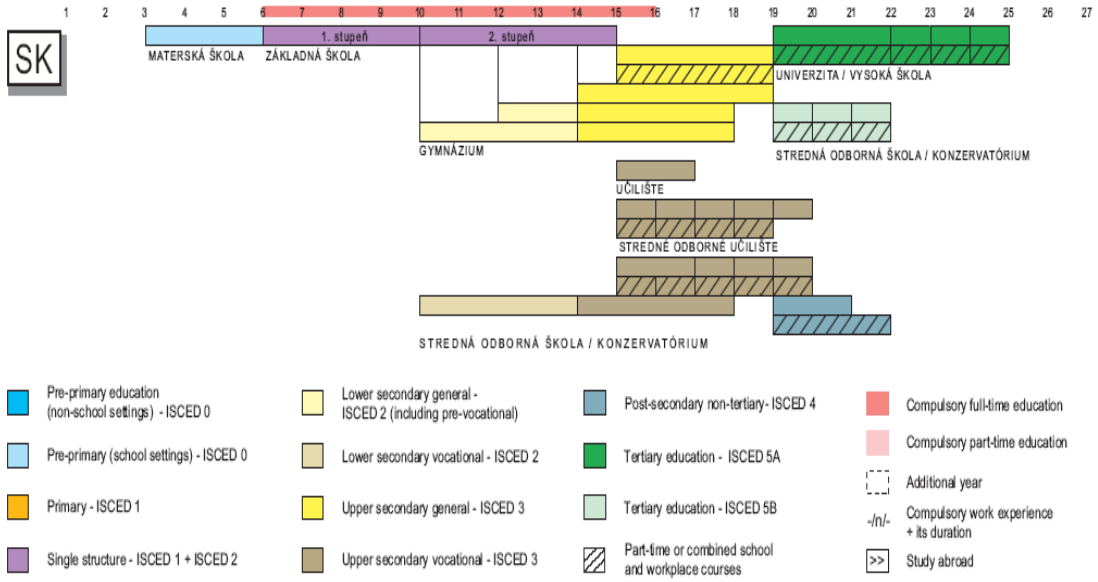
I.1. Description of the educational and training system in Slovakia

The educational system as defined by the current Slovak legislation includes the following levels of education:

1. pre-primary education
2. primary and lower secondary education
3. secondary general and vocational/technical education
4. higher (tertiary) education
5. education of adults

eLearning as a concept is relevant to all the above levels with the possible exception of pre-primary education.

Figure 3: Organisation of the Educational System in Slovakia in 2006



Source: Eurydice.

Detailed description of the current education and training system in Slovakia is available in Annex.

The quality and outcomes of the educational process in the Slovak Republic have become important topics only in recent discussions concerning changes in the education system. Signals of declining quality at all levels of education from anecdotal accounts and international measurements have increased calls for a systematic identification of quality including the development of adequate instruments and technologies for measuring and monitoring the results of education and training in primary and secondary schools. The Ministry of Education has recognised the need to obtain impartial information necessary for the efficient management of educational work at schools as well as for the decision-making of pupils and parents.

The declining quality of performance in education and training at Slovak schools has been influenced by several factors,[24] namely: a) partial absence of qualification and professionalism in teaching, b) insufficient equipment of schools with educational technology/IT, c) insufficient equipment of schools with textbooks or the absence of quality textbooks.

I.2. Place of eLearning in the educational system

I.2.1. Basic international comparison

Slovakia does not yet have a national strategy for eLearning does and the supply of eLearning activities in Slovakia is generally not well developed. The existing legislation adopted in 1997 (Act on Further Education) does not deal directly with eLearning. It only defines a general legal framework and principles concerning how an education program can be accredited. eLearning is not yet defined in the Slovak legislation.

Chart 2: eLearning Index – Europe 2003

Source: Economist Intelligence Unit, 2003

The eLearning Index (Chart 2) indicates a country's ability to produce, use and expand Internet-based learning. The Chart is based on scores for education, industry, Government and society. Slovakia was ranked the 35th out of 60 countries. The share of labour force that uses eLearning for work-related training (online/only offline) can be seen in the Uptake indicators of eLearning (Chart 3). The above-mentioned data are relatively old (2003), but there are no more recent and relevant comparable data available. Because of the trend of slow Internet development (compared to the rest of the EU) during the last few years in Slovakia, it is unlikely that Slovakia's position in relevant areas has dramatically changed. There is a realistic expectation that Slovakia still ranks among the less developed EU25 members states in the both areas.

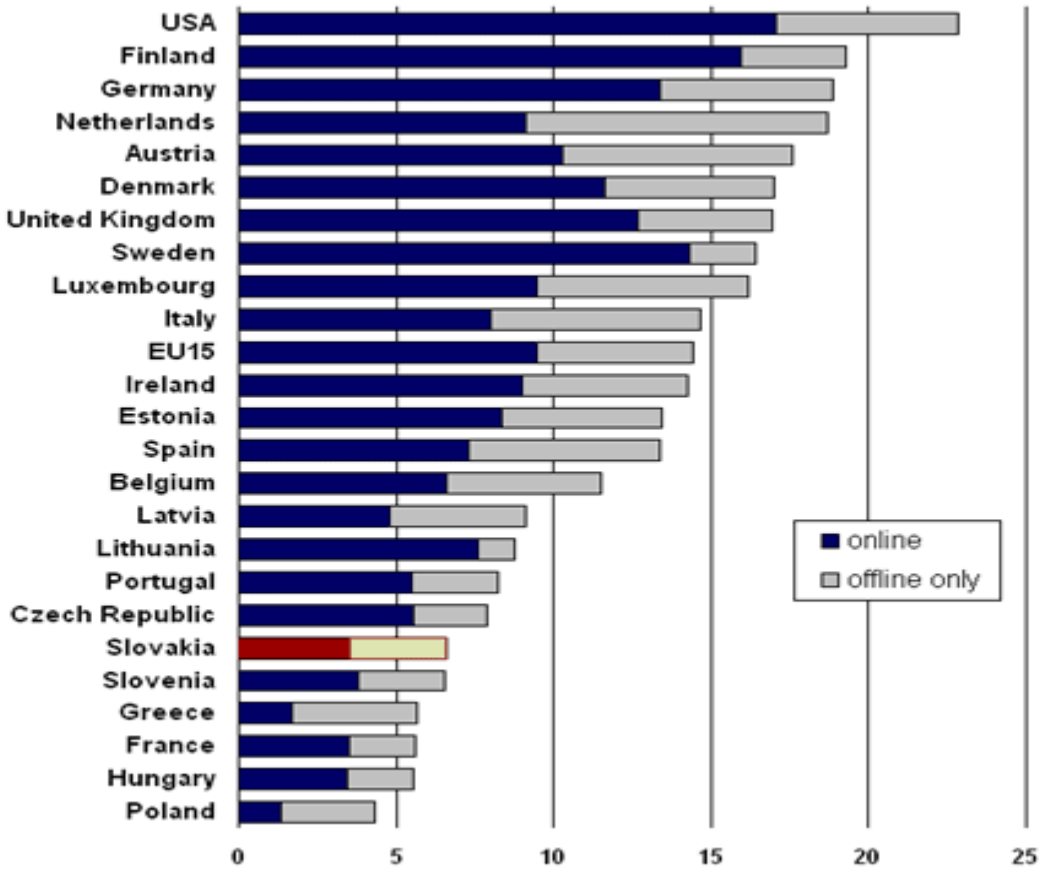
[24] Ministry of Education, Slovakia 2004: National Report – Development of Education (http://www.ibe.unesco.org/International/ICE47/English/Natreps/reports/slovakia.pdf)

Table 15: ICT penetration at schools (international comparison - 2006)

ICT penetration at schools (2006)	SK	EU15	EU10
Total number of computers per 100 pupils by school type	6.7	12.1	7.2
Percentage of schools with broadband internet access	40	-	44.9
Percentage of teachers who have used computers in class in last 12 months	70.3	77.2	61.3
ICT readiness of teachers (% of teachers fully ready to use computers in class)	36	-	41.5

Source: European Commission: Benchmarking Access and Use of ICT in European Schools, 2006

Chart 3: Uptake of eLearning - Europe and US 2003



Source: SIBIS 2003

In the field of public administration some progressive initiatives were recorded during the period 2003-2006 (e.g. a general training strategy for civil servants, obligatory European Computer Driving Licence trainings). However, new legislation changes adopted in 2006 eliminated the original aim of these initiatives.

I.2.2. eLearning activities at different levels of the educational system and in the workplace

Since 2006 every primary or secondary school has had at least six computers connected to the Internet. A third of these schools are connected to the Internet through ADSL, the rest of the schools by ISDN or dial-up only. The student/computer ratio at secondary schools is 16 and in primary schools 44. By the end of 2006, every teacher was trained in basic PC skills. The Slovak Republic has a good reputation in the field of IT thanks to several exceptional successes in programming achieved by individual students at the international level - excellent results were achieved in the international Olympiad in Informatics (e.g. Novy Sad, Serbia, in 2005 – among the total of 276 students from 72

countries, four Slovak gymnasium students were awarded gold positions and Slovakia achieved the best position[25] together with China and the United States). The use of computers in teaching is common at secondary schools. The introduction of ICT at primary schools is implemented for pupils aged 11 and older. The students have a possibility to get involved in European and worldwide projects, such as the European School Net, I*EARN, etc. All schools can use support from the INFOVEK Initiative (financially supported from the state budget through the Ministry of Education's budgetary section) for their own eLearning processes (for more details see Annex).

Table 16: Selected eLearning indicators in primary education in Slovakia 2001-2005

ICT deployment in primary education	2001	2002	2003	2004	2005
Schools with computers used for teaching and for students (%)	15	20	30	98	99.8
Schools with Internet access used for teaching and for students (%)	14.8	17.8	22.5	94.1	99.6
Schools with broadband access used for teaching and for students (%)	0	0	0	17.4	35.2
Schools with ISDN access used for teaching and for students (%)	1.3	1.9	2.5	47.6	60.8
Computer penetration rates per 100 students and teachers used for teaching and for students	0.84	1.05	1.32	3.41	3.66
Digital literacy index* (youth up to 24 years)	n.a.	n.a.	0.8	n.a.	n.a.

Sources: Infovek/ Ministry of Education 2006, * - data from EUROSTAT 2006

From the available statistical data (Table 16) it is clear that the ICT infrastructure for eLearning developed significantly only during 2004-2005. And it was not until the end of 2006 that all teachers were trained in ICT. Mainly for this reason eLearning is used at primary schools generally for the training of teachers (e.g. INFOVEK training courses) and only a few pilot activities are focused on the teaching process for children in specific areas, e.g. arts, informatics or economics. Since 2004, a few specific projects have been implemented for teaching subjects, such as the Slovak language (reading and understanding of text, selection of information, forms, discussion on the Internet, creative homework to be done primarily using MS Word, MS PowerPoint, e-mail and letter games), arts (creative tasks and problems), informatics, and web-based-learning/WBL using the methodology of student centred learning. The majority of the above-mentioned eLearning courses were prepared by the INFOVEK Project (at the Institute of Information and Prognoses on Education). At present, the real involvement of schools in eLearning prepared by INFOVEK depends on the initiative of school director(s) and/or its IT teacher(s) and their practical ICT skills. While eLearning is accepted as a specific learning method, it is still not officially recommended by the Ministry of Education as one of the standard tools in the primary education system. For this reason school directors and teachers are rather reluctant to use eLearning in their own teaching process. The aforementioned eLearning projects are available for all teachers, although the real use is small. Specific regional disparities concerning the use of these eLearning projects weren't identified.

In secondary education ICT infrastructure was better developed than in primary education (Table 17). The values are approximately two times higher in all relevant indicators in comparison with primary schools. As far as different school types are concerned, the best ICT deployment was observed in gymnasia (high schools) and secondary technical schools. Many schools developed their own ICT infrastructure thanks to local private initiatives and the parents of students, or through projects supported by the EU Structural Funds or foreign grants.

[25] e.g. SME daily, Sept.13, 2005: Slováci úspešní na olympiáde
http://www.gamca.sk/index.php?&a=/skola/napisali/napisali1

Table 17: Selected eLearning indicators in secondary education in Slovakia 2001-2005

ICT deployment in secondary education	2001	2002	2003	2004	2005
Schools with computers used for teaching and for students (%)	25	30	50	100	100
Schools with Internet access used for teaching and for students (%)	16.9	20.5	25.4	98.9	100
Schools with broadband access used for teaching and for students (%)	0	0	0	35	95
Schools with ISDN access used for teaching and for students (%)	2	3	5	60	5
Computer penetration rates per 100 students and teachers used for teaching and for students	1.47	1.85	2.04	5.70	6.15
Digital literacy index* (youth up to 24 years)	n.a.	n.a.	0.8	n.a.	n.a.

Sources: Infovek/Ministry of Education 2006, * - data from EUROSTAT 2006

In secondary education eLearning is not often used in the teaching process. eLearning is not formally included in curricula by the Ministry of Education. If employed, it is usually a pilot activity, carried out mainly by teachers who have sufficient personal ICT skills or personal experience in eLearning stemming from international cooperation or foreign courses. eLearning implementation depends on the activity of each school director and/or local teacher(s). No specific regional disparities were identified in this area.

In higher education the ICT infrastructure is better developed than in other parts of the Slovak educational system. A few years ago all public and state universities became connected to the high-quality broadband backbone network SANET. Thanks to its wide and long-term international co-operation and partnerships with foreign academic institutions (mainly from Austria, the Czech Republic and Germany), SANET is a broadband infrastructure leader in Slovakia and regularly uses standard international experience in the implementation and practical usage of ICT for academic purposes. The relevant ICT infrastructure data are presented in Table 17. Decreasing penetration rates per student reflect the increasing trend in the total number of new university students.

Table 18: Selected eLearning indicators in higher education in Slovakia 2001-2005

ICT deployment in tertiary education	2001	2002	2003	2004	2005
Schools with computers used for teaching and for students (%)	100	100	100	100	100
Schools with Internet access used for teaching and for students (%)	100	100	100	100	100
Schools with broadband access used for teaching and for students (%)	85	90	96	100	100
Computer penetration rates per 100 students and teachers used for teaching and for students (%) **	21.12	15.08	14.89	13.93	13.29
Digital literacy index* (youth up to 24 years)	n.a.	n.a.	0.8	n.a.	n.a.

Sources: Ministry of Education 2006/SANET 2006, * - data from EUROSTAT 2006, ** - project interviews 2006,

During the 1990s several local centres of distance education were established at five Slovak universities within a project co-financed by the European Union,[26] all of them as so called "special purpose units". They were coordinated by the Slovak National Distance Education Centre, which is a department at the Slovak University of Technology in Bratislava with university-wide activities. Since 1999 these centres have attempted to jointly establish a solid base for the provision of distance education in the country. From 2002 eLearning has become an important teaching method in specific subjects at some universities. The majority of universities have been very active in eLearning implementation for their own students since 2004. Because of the limited broadband penetration, eLearning activities are used mainly in urban areas (seats of universities), where broadband access is available in their student dormitories as an integral part of the university network, or where broadband access is much better developed by public telecom operators than in rural areas. At present the majority of universities have already developed and implemented their own eLearning processes and products. The level of eLearning implementation depends on the activity and professional experience of individual departments at universities. Universities focused on technology have the most experience

[26] Leonardo da Vinci Program

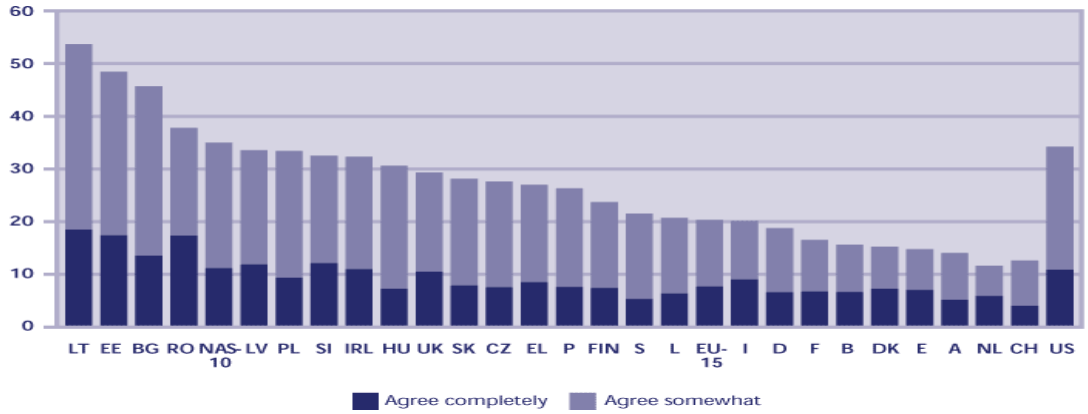
but some non-technical universities have already achieved excellent results as well (e.g. Faculty of Drama Studies[27] of the Academy of Music and Dramatic Arts in Bratislava).

In the business sector the required ICT infrastructure with broadband access (directly supporting eLearning usage) is available mainly in cities and in rural areas very close to the cities. Broadband services have been launched in a few big cities only since mid-2003. At present, in the business sector, broadband is regularly used by large enterprises and by the majority of SMEs located in cities.

In the business sector eLearning is used regularly only by big companies with foreign capital or by major domestic IT companies (using their own ICT infrastructure). The majority of SMEs does not use eLearning at present.

In the public sector the situation differs between central state administration, local state administration and local and regional self-Government. The ICT infrastructure at the central state and regional level is EU25 member states in this area.

Chart 4**: **Impact of being connected to the Internet on social integration – Europe and the USA 2003



Source: SIBIS 2003

The digital literacy index measures the ability to work with computers, programs and other software and hardware as well as how people process and use information. The Focus Agency research[28] (July 2005) indicates that in Slovakia the highest levels were achieved by people aged 18-40, people with higher education and employed people (Table 20). The weakest position was observed in the population group aged 64+, people with primary education only, older generation together with unemployed people. No significant differences were found between genders.

[27] SME daily, Dec.15, 2006: Vynikajúce skúsenosti s eLearningom má Katedra divadelnej vedy VŠMU http://www.sme.sk/c/3054444/Vynikajuce-skusenosti-s-eLearningom-ma-Katedra-divadelnej-vedy-VSMU.html

[28] SME, October 2005: Počítač používa v SR pravidelne 31,6% občanov, Internet 20,5% - http://ekonomika.sme.sk/clanok.asp?cl=2436688

Table 19: Digital Literacy – Slovakia 2005

Digital literacy	SLOVAKIA 2005
Digital literacy of population groups	
18-40	45%
41-64	25%
64-	6%
ICT literacy of the population by educational background	
Primary	23%
Secondary	45%
Tertiary	64%
ICT literacy of the population by gender groups	
Female	31%
Male	34%
ICT literacy within certain special groups of the society	
employed people	43%
people in rural areas	27%
older generations, pensioners	5%
Unemployed	15%

Source: Focus Agency 2005

II: OVERVIEW OF E-LEARNING IN SLOVAKIA

In Slovakia educational institutions are currently under pressure, as they must guarantee their students efficient learning that meets the requirements of the 21st century (the Bologna process). Knowledge economy not only calls for unprecedented flexibility of learning but also forces people absorb more and more essential knowledge. One of the aims of a modern educational institution is thus to reach a stage where its graduates will not only know how to use information and communication technologies in their future career, i.e. how they gain information literacy. At the same time such a graduate shall be able to use these technologies as a tool as well as an environment for their learning process as such.

These objectives, however, cannot be efficiently met by educational institutions using only traditional forms of education. Hence educational institutions worldwide begin to integrate massively resources available on the Internet and they also start to use communication networks as an individual teaching environment. And so this environment turns into a tool for the improvement of the efficiency of administration and management of the actual teaching process. Modern teaching trends are, thanks to the aforementioned pressure, significantly changing the perception of the actual teaching process management and differ considerably from the traditional forms based only on using printed teaching materials. In general, they assume wide usage of different elements and components of the teaching process, which leads to a more efficient process management, often called "blended learning". Here the efficient use of information and communication technologies begins to play a substantial role (eLearning).

Although a lot has been invested in education, the outcomes often could not meet all the expectations. It is therefore essential to look for solutions that would, although being low-cost, help to increase the efficiency and quality of educational processes by improving computer skills. The EU has allocated resources in the amount of €44m to eLearning programs.

With the Decision No. 2318/2003/EC of the European Parliament and the Council, a new community eLearning program had been implemented for the years 2004 – 2006. Its main objective was to efficiently engage ICT in learning and professional training in Europe as a point of departure for lifelong learning.

Slovak universities, together with R&D and other educational institutions, are also natural centres for generating knowledge, while their primary role is to educate as efficiently as possible. Nowadays almost every university, or its management, must compete for students, i.e. "their clients". Besides students involved in continuous learning, the following applicants are also considered as potential "students":

a) if they feel the need for education, but cannot study full time for financial reasons,
b) if they feel the need to change their profession, either after being motivated by their employer or as a result of retraining of unemployed people or people possibly threatened by unemployment,
c) or because of education being concentrated into periodically set time units, they feel the lack of opportunities to thoroughly acquaint themselves with theory, not mentioning opportunities to exercise it in practice.

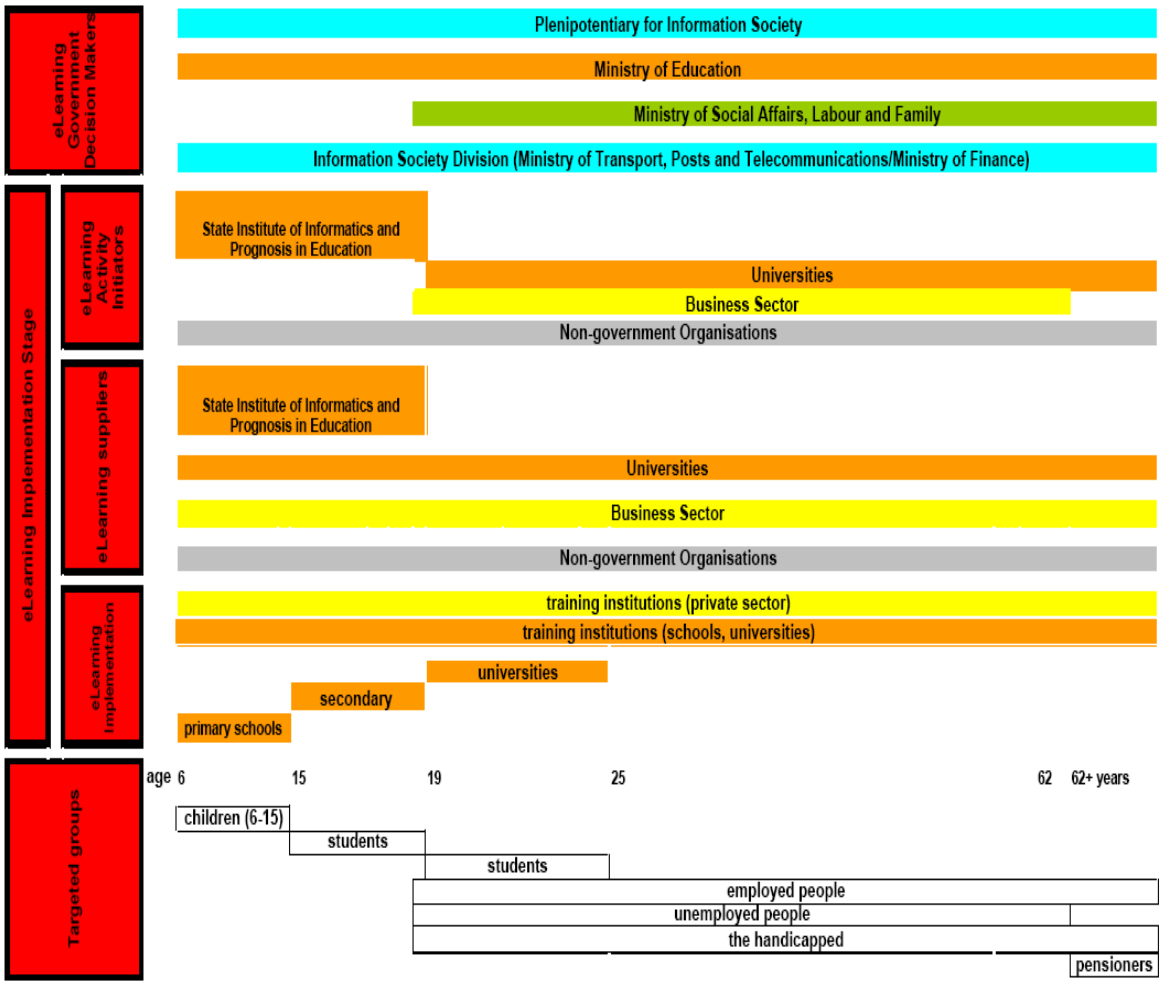
The need to search for and implement new forms and methods of education also results from the increasing interest of some educational institutions in providing other forms of studies (distance studies at some level). These forms are not dependent, or very little dependent on the number of classrooms, they are low-cost, with minimal requirements for providing accommodation for students. From this point of view, the traditional forms of full-time studies are less available for wider population. And here is the space to implement modern ICT services offering new ways of learning.

Schools – like other educational institutions – are organisations and the use of ICT challenges these organisations at many different levels concerning, e.g. personnel, students, curriculum, methods, buildings, finances, collaboration and organisational processes.

II.1. The institutional structures and resources for eLearning

Until now all most visible eLearning activities have been developed in Slovakia mainly by individual initiatives of public universities, foreign IT companies, training institutions and NGOs initiatives– the process was, generally speaking, very chaotic and lacking support from some central eLearning agency. Strategic Governmental documents relating to the implementation of eLearning in Slovakia are missing. There is a lack of specific legislation supporting the eLearning process, too.

Figure 4: General Institutional Framework for eLearning – Slovakia 2007



Source: Eurydice, 2005

The general institutional framework for eLearning in Slovakia is described in Figure 4. It presents the institutional and competence structure at all stages of the eLearning process valid under the current Slovak legislation. All existing relationships between the main actors are also linked to all relevant target groups of end-users (children, students, the employed/unemployed, the disadvantaged and the elderly).

II.1.1. Description of relevant actors, including the degree of participation of the private sector

At present, the executive branch of the Slovak Government consists of 14 ministries. The area of eLearning belongs to the responsibility of the following institutions:

a) the Ministry of Transport, Posts and Telecommunications (as an integral part of its responsibility for the Information society) – valid only until January 2007,
b) the Ministry of Finance (as an integral part of its responsibility for the Information society) – valid since February 2007,
c) the Government Office (position of Plenipotentiary for the Information Society, who should report directly to the Vice-Prime Minister for Knowledge Society, European Affairs, Human and Minority Rights) – valid from February 2007,
d) the Ministry of Education (general responsibility for education including life-long education and training).

The new Government of Prime Minister Robert Fico has been in office since July 2006 after the general election held in Slovakia in June 2006.

Since November 2004, the Government has appointed the **Plenipotentiary for the Information Society** as an advisory body to coordinate tasks in the area of the Information Society. In the area of eLearning - the Plenipotentiary plays an important role in necessary supporting activities and can influence the intersectoral coordination or discussion of relevant problems. The Plenipotentiary presented documents to the Government through the Minister. The area was within the competence of the Ministry of Transport, Posts and Telecommunications. As the Information Society is a multi-sectoral issue a specific problem of the position of the Plenipotentiary for the Information Society was his practical subordination to the Minister of transport, posts and telecommunications and not directly to the Prime Minister or to one of the deputy prime ministers. Another problem of the position of the Plenipotentiary for the Information Society was that he did not have direct influence on the Telecommunication (and Postal) Division of the Ministry. The first Plenipotentiary was Mr. Miroslav Kukucka (until the end of 2006) whose office was located at the Ministry of Transport, Posts and Telecommunications. Since February 2007 the office of the Plenipotentiary for the Information Society has been transferred to the Vice-Prime Minister's Office at the Slovak Government Office. Since August 2007, Mr. Pavol Tarina has been appointed by the Slovak Government as the new Plenipotentiary for the Information Society.

In addition to the Office of the Plenipotentiary, the **Ministry of Transport, Posts and Telecommunications** included the **Division for Information Society** (existing until January 2007 only). The Division had 25 employees and consisted of the following departments:

- Department for International, Interministerial and Regional Cooperation,
- Department of Project Management,
- Department of Information Security and Standards.

The Department of Project Management had also responsibility for the preparation and implementation of eLearning activities in Slovakia. Since February 2007, the Division for Information Society has been transferred to the **Ministry of Finance.** In May 2007, the Division for Information Society had these 5 departments:

- Department for Information Society Strategy and International Cooperation,
- Department for Legislation, Methodology, Standards and Information Security,
- Department for eGovernment,
- Department for Management of the Operational Program Information Society,
- Department for Implementation of the Operational Program Information Society.

The Ministry of Education of the Slovak Republic is a central state administration body with the responsibility for state education policy, research and development, sports and the youth. The responsibility for practical implementation of the Bologna principles in higher education policy is assumed by the organisation unit of the Section for Higher Education at the Ministry of Education of the Slovak Republic. Its Director General is a representative of the Slovak Republic in the Bologna Follow-up Group. Based on the activity of the European Commission the National Group of Bologna Promoters was established in the Slovak Republic, being composed of professors from higher education institutions nominated by the Ministry of Education of the Slovak Republic in cooperation with the Slovak Rectors' Conference and the Higher Education Council. Membership of the National Group of the Bologna Promoters also includes national advisers for ECTS and Diploma Supplement and a representative of the Slovak Republic in the Bologna Follow Up Group. The National Group of Bologna Promoters is administered through the Socrates/Erasmus Agency. The Ministry of Education of the Slovak Republic substantially supports the National Group of the Bologna Promoters by financing its activities. The Ministry has established the Institute of Information and Prognoses on Education, which provides informational support for the Ministry in the relevant areas of education. As a central body of the State administration it manages, through generally binding rules and by providing guidance to all founders, the network of primary and secondary schools and school facilities in the Slovak Republic. Through regional school authorities it provides for the performance of state administration in the respective area. The powers of the Ministry are set out by law. Higher education institutions in Slovakia are self-governing, independent organizations.

There are three bodies representing higher education institutions towards the Ministry of Education:

- Slovak Rectors' Conference,
- Higher Education Council,
- Student Higher Education Council.

The Minister of Education must consult these bodies in cases defined by the Higher Education Act. The Higher Education Act also specifies in detail the activities of the Government and the Ministry of Education in relation to higher education institutions. The Government appoints the Accreditation Commission and approves the operation of private higher education institutions in Slovakia. The Ministry of Education prepares long-term strategies for higher education, prepares and publishes annual reports on the current state of higher education, allocates subsidies to higher education institutions from the state budget and keeps the register of the selected internal regulations of higher education institutions.

The state administration in the primary education system is apart from the Ministry of Education and self-governing regions also carried out by:

- regional school authorities,
- State School Inspection Agency.

The regional school authority is established as a body of local state administration in the field of education. In the Slovak Republic there are eight regional school authorities. The regional school authority is a founder of the system of special needs education as well as counselling facilities and, in special cases, if the fulfilment of compulsory schooling is at risk, it also works as a founder of primary or secondary schools. The regional school authority is also a founder of the schools established on the basis of international agreements. In addition, the regional school authority redistributes the finances of the state budget among the individual founders of schools and school facilities and verifies their compliance with generally binding regulations except for the area, which falls under the authority of the State School Inspection Agency. The regional school authority is headed by the person that is nominated by the Government of the Slovak Republic upon the proposal of the Minister of Education.

The State School Inspection Agency provides for the state supervision of the quality of the educational process, which is carried out in schools and school facilities irrespective of their founder. It is

supervised by the Chief School Inspector who is appointed by the Minister of Education for the period of five years. Based on inspection and other findings the Chief School Inspector submits to the Minister of Education a report on the state of education and training in schools and school facilities for the respective school year, after a prior consultation with the founder the Chief School Inspector submits the proposals for the removal of a school or school facility from the network of schools, for changes in the network of schools, or for the dismissal of the head teacher (director of the respective school) when discovering serious insufficiencies in the educational process.

In the area of eLearning the Ministry has significant legal powers to define state education and lifelong learning policy, to prepare and/or adopt relevant strategic documents and to coordinate all necessary financial, institutional and legal aspects.

Ministry of Labour, Social Affairs, and Family is a central body of state administration with the responsibility for social, family and employment policy in Slovakia. In the area of eLearning the Ministry plays an important role in the preparation of legislation, preparation/adoption and coordination of relevant strategic documents and action plans focused on the improvement of existing workforce's skills and/or training (re-qualification) activities for unemployed people. The Ministry also has the legal power to define and implement the state policy for the disadvantaged people (including training support activities). Offices of Labour, Social Affairs and Family are the implementation agencies for above-mentioned policies. Since June 2006, the Ministry has also taken over the powers of the former Civil Service Office – including training activities for civil servants in Slovakia.

The most important **eLearning initiators** implementing eLearning in Slovakia are as follows:

- State Institute of Information and Prognoses on Education
- universities
- the business sector (including private training institutions)
- non-Governmental organisations.

State Institute of Information and Prognoses on Education
It is a budgetary organization under the Ministry of Education. It is a research and analytical centre of the Ministry of Education for the analysis of development, financing and prognoses concerning all levels of education. The institute collects all important statistics and it works also as a guarantor for the information system for regional educational institutions and all relevant branch databases in education sector. In the area of eLearning the Institute plays an important role in the preparation, coordination and implementation of eLearning activities (eLearning courses, ICT technology support, methodology), both for teachers and pupils, in the primary and secondary education system in Slovakia.

The business sector is an important initiator of eLearning activities in Slovakia. As far as IT companies are concerned, the most important are CISCO Slovakia (the initiator of CNAP in Slovakia since 1999) and ELFA s.r.o. Both companies were the first Slovak businesses to start dealing with the issue of eLearning in Slovakia. On the one hand they have provided eLearning to their employees and on the other hand they have offered services to other organizations from education, public administration and private sector.

In the NGO sector, it is necessary to mention the Slovak Society for Computer Science (civic association) as an important eLearning initiator, which played an important role in the creation of ECDL certification in Slovakia. It represents the ECDL guarantor[29] for ECDL implementation in Slovakia.

The main **eLearning product vendors** in Slovakia are following companies:

[29] http://www.ecdl.com/countries/index.jsp?1nID=103&pID=167&nID=229

- EEA s.r.o. – different kinds of eLearning solutions,[30]
- e-learnmedia s.r.o. Dubnica nad Vahom – different kinds of eLearning solutions,[31]
- KONTIS s.r.o. - eLearning[32] in the Czech Republic and Slovakia (in cooperation with the foreign companies SumTotal Systems and SkillSoft)
- Siemens Business Services s.r.o. (since February 2005 the former eLearning company Elas, s.r.o. has been incorporated into Siemens Business Services s.r.o. Slovakia) – eLearning on ICT topics.

II.1.2. The costs involved in terms of human resources and equipment

In Table 21 the most significant programs are presented which create possibilities for the preparation and implementation of new eLearning project activities in Slovakia. The majority of eLearning projects were/are supported by Slovak academic grant schemes or by EU structural funds. With regard to this table, it is important to note that even though future investments in eLearning seems substantially higher than before, one cannot be sure that such investments will materialise. The reasons are twofold. Firstly, in Slovakia so far, the real investments in eLearning have been always smaller than originally planned. Secondly, the new Government elected in June 2006 may change all the plans prepared by the previous Government. Table 21 shows financial resources allocated and spent by public sector in preparation of eLearning applications during the last 10-12 years. No data from private sector are available.

[30] http://www.eea.sk/sk/04_e_01.html
[31] http://www.e-learnmedia.sk/en/main.php?menu=457
[32] http://onlinelearning.kontis.net/

Table 20: Significant programs used for eLearning Project Preparation in Slovakia

Specific Program	Priority	Period	Expected Budget for eLearning (M EUR)	Implementation
Leonardo da Vinci Program	eLearning and teaching supporting activities	1995-2005	5.0	Specific eLearning projects implemented at universities
INFOVEK (National Program)	Support for primary and secondary schools	2002-2006	2.0	eLearning Courses for students and teachers
VEGA (National grants)	Support for universities	2002-2006	0.3	Few projects only
KEGA (National grants)	Support for universities	2002-2007	0.1	Two projects only
Sectoral Operational Program 2004-2006 - Human Resources	3.2 - Improved Qualifications and Adaptability of People in Employment and of Those Entering the Labour Market	2004-2006	48.8	Target for 2006: To be trained: 5 000 teachers, 100 education institutions, 8 000 civil servants, 6 000 employees and 2 000 specific trained employees
eGovernment Roadmap	ICT skills for civil servants	2005-2008	6.3	2006 – 7 thousand certificates already awarded Target: ECDL certificates for 40 thousand civil servants in state administration
MINERVA (National Lisbon Strategy)	Education and Employment	2005-2007	5.0	
National Strategic Reference Framework	Education	2007-2013	50.0	Including eLearning implementation Note: after the general election (June 2006) document was updated by Government on 6 Dec 2006)

Source: Ministry of Labour, Social Affaires and Family (2004-2006), Ministry of Education – KEGA and VEGA

There is also no official public data available about eLearning costs involved in terms of human resources, necessary equipment and infrastructure investments. A survey was prepared concerning all relevant information resources including Government documents, press monitoring (2004-2007), most relevant conference materials (2000-2006), face-to-face interviews with most important eLearning actors and Internet search. The results of this survey are presented in Table 22. It can be realistically assumed that during the period 1997-2006 approximately 290 thousand citizens were trained/educated by some of eLearning courses – it represents 5% of the total population in Slovakia. Total costs spent on human resources, necessary equipment and infrastructure investments could reach EUR 85m. The majority of the eLearning costs (EUR 67m) were generated in the public sector (approx. 79% of the total costs), 20% in the business sector (EUR 17m) and only 1% by eLearning participants. Financing from EU funds could reach approximately 30% of the total costs (EUR 25m).

Table 21: eLearning Costs – Slovakia (1997-2006)

eLearning targeted group	Priority	Period	Budget (M EUR)	Implementation
Teachers	INFOVEK project	1997-2006	10	Almost all teachers (70 000 of the total of 80 000) in primary and secondary schools were trained in ICT until the end of 2006.
Students (primary and secondary schools)	INFOVEK project	2003-2006	20	Approx. 3 000 students were trained in specific eLearning courses (e-Economics, ECDL, etc.)
University students	Universities education systems	2000-2006	10	Approx. 50 000 students (30% of the total number of students) were trained in eLearning courses
Students, employed people	CNAP	1999-2006	4	Approx. 11 000 students were trained in ICT
Lifelong learning students	Distance Education	1997-2006	7	Approx. 5 000 people were trained in specific eLearning courses
Judges	eJustice project	2004-2006	5	Approx. 5 000 people were trained in specific eLearning courses.
Civil servants	ECDL	2005-2006	1	7 000 public servants and 5 thousand students were licensed ECDL
Private sector employees (banks, telecom operators, etc.)	eLearning courses	2002-2006	15	Approx. 20 000 employees were educated in eLearning courses
Youth (aged 15-25)	Internet for Education	2006	1.2	Government initiative for the period 2006-2008 (limited financial contributions for the total of 40 000 students)
Citizens (ICT courses)	DIGISTUR project	2005-2006	1	During 2005-2006 80 000 citizens were trained
Citizens (eLearning courses)	Individual initiatives	2000-2006	1	Approx. 25 000 employees were trained in eLearning courses (foreign language, ECDL, etc.)
Total	**eLearning courses**	**1997-2006**	**Approx. 85**	**Approx. 250 thousand people were trained in eLearning courses (4.6% of the total population)**

Sources: Government documents, press monitoring (2004-2007), conference materials (2000-2006), face-to-face interviews with the most important eLearning actors and Internet search

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

II.2.1 Current policies dealing with eLearning

There has been no specific Government policy document directly dealing with the eLearning area adopted yet. However, there are two main policy documents: Government Program Declaration and National Information Society Policy that define Government's policy on eLearning.

Government Program Declaration (August 2006)

After the general election in June 2006, the new Government and Parliament adopted the Government priorities for the period 2006-2010. The Document presents the new Government's vision in eight specific areas. In the area of Information Society (priority area 2.3.) the Government declares that it will continue with improving the digital skills of public administration employees. In the area of Employment Policy (priority area 3.1.) the Government will make the effort to achieve growth in the employment rate by supporting creation of knowledge economy jobs. The Government will give more support to disadvantaged groups' integration in employment, particularly in connection with

graduates, persons with disabilities, mothers with children and persons close to the retirement age. In the area of education (priority area 5.1.) the Government declares that training and education shall develop in the spirit of modern European and world trends. The Government also considers the principle of life-long learning an important area for the improvement of the knowledge potential of society. This principle has also become one of the priorities of the Lisbon Strategy, which responds to the changes in the labour market, social cohesion and the development of modern technologies. For more detailed information see also Annex.

National Information Society Policy (2001)
The former Government has adopted the National Information Society Policy document, which indicated, in one priority (education), the necessity to give attention to modern teaching methods including eLearning in the future. Later (2004), the former Government developed this document by adopting the National Information Society Strategy. The document did not specifically deal with eLearning activities.

Millennium - National Policy for Education and Training (2000)
Strategy for the implementation of the Bologna Declaration principles was established by the Program document Concept of the Further Development of Higher Education in Slovakia for the 21st Century, which was approved by the Government of the Slovak Republic in August 2000, and also confirmed by the Program Declaration of the SR Government of 2002. Based on this Concept a new Act was developed (Act No. 131/2002 of Law Code on Higher Education) and approved by the National Council of the Slovak Republic in February 2002 and came into force on the 1st of April 2002. This Act comprises all the principles of the Bologna Declaration and the Act enables their practical implementation. In November 2003 and December 2004 the amendments to this Act were adopted to regulate some areas significant from the point of view of European Union law, particularly the adaptation of the content of education in higher education institutions according to the respective directives of the European Commission.

II.2.2. Current strategies dealing with eLearning

Like with lacking policies, there is no concrete strategy focusing only on eLearning. eLearning represents rather one part of strategies dealing with other related issues. It is also important to note that the majority of most recent strategies arose from European Union level policies.

The National Strategic Reference Framework (adopted in December 2006) for Structural Funds programming 2007-2013.
On 6 December 2006, the Government approved the final draft version of the National Strategic Reference Framework for the next programming period of 2007-2013, outlining the drawing of EU funds. Slovakia should receive around €11.4 billion from EU Structural Funds and the Cohesion Fund during the upcoming programming period, which comes to around SKK 403.8 billion. With the aid from EU funds, Slovakia is expected to increase competitiveness and performance in its regions and of the economy as a whole, as well as to increase employment hand in hand with sustainable development. The most attention will be paid to the infrastructure, human resources, and the knowledge-based economy. The funds should be distributed among eleven operating programs: the Regional Operating Program, Environment, Transport, the Information of Society, Science and Research, Development and Innovations, Employment and Social Inclusiveness, Education, Technical Assistance, Competitiveness and Economic Growth, Healthcare and the Bratislava region. Biggest part of Structural Funds should be allocated to transport projects, which are expected to receive up to €3.2 billion.

National Strategy for Lifelong Learning[33] (April 2007)
On April 25, 2007, the Slovak Government has adopted the National Strategy for Lifelong Learning in Slovakia prepared by the Ministry of Education. Strategy defines seven priorities as follows:

[33] http://www.rokovania.sk/appl/material.nsf/0/72D2F96631133B00C12572BA002D7D25?OpenDocument

1. monitoring and prognosis of education needs for citizens and employers,
2. quality system for LLL,
3. acceptance of certificates for non-formal and informal education,
4. effective investments for LLL,
5. key competencies for LLL,
6. providing of complex information services for LLL, advising and self-learning region,
7. effective planning and using of Structural Funds for LLL system development.

The Strategy seeks to implement the latest EU trends in LLL process in Slovakia. The financing of this strategy should be based on the state budget and EU Structural Funds (SOP 2007-13 Education and EU Integrated Action Program for LLL).

The Strategy of Competitiveness until 2010 (National Lisbon Strategy) adopted by the former Government in February 2005 - this strategy contains four priorities:

1. Information society
2. Science, R&D and innovations
3. Education and employment
4. Business environment

In the area of Information Society three priority areas were defined – one of them is information literacy. In the area of Education and employment three priority areas were defined – one of them is modern education policy. The strategy was later developed by the adoption of four Action Plans containing activities in all the above priority areas (for more detailed information see below Action Plan for Education and Employment of the National Lisbon Strategy and Annex). After the general election (June 2006), the present Government should prepare its own strategy related to these matters.

National Information Society Strategy (2004)
This document presents the Government's vision of how the earlier adopted strategy should be implemented. It includes the following six priorities:

- info-communication infrastructure,
- eGovernment,
- education,
- e-commerce and e-business,
- research and development,
- IT security.

The document did not specifically deal with eLearning activities.

Sectoral Operational Program - Human Resources (2003)
The document describes measures supporting the creation of centres for distance education, and the introduction of eLearning programs and programs for acquiring ICT skills. The development of new curricula for further professional education was also foreseen within this measure. Relevant operational objectives were: to improve the supply of further education by increasing the number and quality of further education programs and retraining opportunities, including the development of new forms of education (second chance programs, distance education, eLearning) - for more detailed information see Annex. The present Government has adopted a new National Strategic Reference Framework (December 2006) after its final approval by the European Commission. The new document will supersede the above-mentioned document.

Training Strategy in Civil Service (2003)
On 16 July 2003, the Training Strategy in Civil Service was approved by the Slovak Government and came into force. The training strategy aimed at defining the main strategic objectives in the area of

civil servants' training and strategic goals of Civil Service Office (hereafter CSO) in order to achieve that objective. IT skills were identified as the main priority and it was agreed that by 2008 all civil servants will have to be trained and certified in accordance with the ECDL standard. During 2005, two pilot public organisations were trained – the Ministry of Transport, Posts and Telecommunications and the Civil Service Office. During 2006, a total of 7 thousand civil servants were trained in ICT skills. Throughout 2007, further 49 thousand civil servants are supposed to be trained and during 2008 all 91 thousand civil servants (of which 41 thousand in state administration) should complete the training. However, during 2006 this plan was practically cancelled by the current Government decision stating that from 2007 on ECDL will no longer be obligatory. The main initiator of this activity – the Civil Service Office - was abolished in June 2006. In February 2007 the Information Society Division has been transferred from the Ministry of Transport, Posts and Telecommunications to the Ministry of Finance. The responsibility of the former CSO to define the training needs horizontally for all civil servants has been transferred to the Ministry of Labour, Social Affairs and Family.

National Concept for Further Education (2002)
The Proposal of the Concept of Further Development of Higher Education for the 21st Century states that the primary mission of university education is implemented by its six functions, two of which have the following features: a) contribution to education at all levels and b) facilitation of further education throughout the lives of citizens. The document did not specifically deal with eLearning activities. The new Government has officially presented the preparation of a new document.

Concept for the Education of Roma Children and Pupils (2000)
This Concept indicates within the definition of mid-term goals that a concept of non-formal and permanent education of Roma youth or supplementary education of Roma adults will be prepared in cooperation with the Ministry of Labour, Social Affairs and Family and non-Governmental organisations, and that a new system of non-formal lifelong education for adults above 18 years of age will be implemented to offer a second chance to attain education. The new Government has officially presented the preparation of a new document focused on this area.

II.2.3. Current action plans dealing with eLearning

Action Plan for Education and Employment of the National Lisbon Strategy (July 2005)
The former Government adopted the MINERVA Action Plan for Education and Employment comprising the total of 17 different tasks out of which five tasks were focused on potential eLearning implementation (for more detailed information see Annex). After the general election, the new Government has not presented the evaluation of these tasks yet.

Table 22: eLearning related tasks in the MINERVA Action Plan for Education and Employment

Task	Deadlines	Status
National Strategy for Lifelong Education	August 2006	After the general election (June 2006) the new Government started to prepare a new strategy.
Improvement of foreign language teaching	August 2006	Draft of a new model of foreign language teaching. No evaluation has been presented by the present Government yet.
ICT support in teaching processes	August 2006	Target: to train 64 thousand teachers and to equip 3500 multimedia classrooms (task implemented).
New models of teaching for gifted children	August 2006	Target: establishing first centres for gifted children. No evaluation has been presented by the present Government yet.
Lifelong Education System for teachers	August 2006	Target: Launching a specific national project for the Lifelong Education System for teachers. No evaluation has been presented by the Government yet.

Source: MINERVA project 2006

Action Plan for Information Society of the National Lisbon Strategy (July 2005)

The former Government adopted the MINERVA Action Plan for Information Society, which also contains four tasks focused on potential eLearning implementation (for more detailed information see Annex). After the general election, the new Government has not presented the evaluation of these tasks yet.

Table 23: eLearning related tasks in the MINERVA Action Plan for Information Society

Task	Deadlines	Status
European Computer Driving Licence	To approve mandatory ECDL by December 2005 To provide ECDL to at least 8000 public administration employees by August 2006 To certify all employees by the end of 2008	Pilot ECDL testing at MTPT has taken place. As of 2007, according to the decision of the new Government, ECDL testing is not obligatory for civil servants any more.
Digital access for the public at schools	250 schools in 2005 500 schools by 2006	No official evaluation has been presented by the present Government yet, but this task was fully completed.
Mapping of digital literacy and adaptability of the population to ICT	Completed by the end of 2005	This task was fully completed by the IVO research.
Internet for education (subsidised broadband access)	Approved strategy and specific conditions by February 2006 Launched in April 2006	The Government prepared 2-year financial contributions for 40 thousand young people (aged 15–25) designated for supporting the usage of broadband services (5 thousand users per region) for the period of 2006-2008. This task was fully completed.

Source: MINERVA project 2006

National Information Society Action Plan (2004)

The Action Plan includes the survey of all tasks from the eEurope+ and eEurope 2005 with the setting of responsible national coordination organisations and deadlines (2003-2005). The financing of the national Information Society action plan for 2003 was not clear, financing for 2004-2005 needed to be adopted in the National strategy for Information Society by the Government before the end of 2003. Further details are included in the Annex. The document was not evaluated after the adoption of the MINERVA Action Plan for Information Society.

II.2.4. Current projects including eLearning

The most significant eLearning projects in non-commercial sector were initiated and provided mainly by these institutions:

- universities,
- State Institute of Information and Prognoses on Education,
- non-Government organizations,
- private sector.

In private sector we find the following companies being significant in providing trainings through eLearning:

- CISCO Slovakia s.r.o. – eLearning on ICT topics (certified courses) only,[34]
- EL&T, s.r.o., Bratislava – different kind of eLearning topics,
- ELFA s.r.o. – different kinds of eLearning topics,[35]
- Novitech Partner a.s. – project TeleDom – different kinds of eLearning topics (management, marketing, finance, project management).[36]

[34] http://www.cisco.com/global/SK/learn_events/index.shtml
[35] http://www.elfa.sk

As of May 2007, 67 accredited organizations providing ECDL trainings[37] were registered in Slovakia.

CNAP (CISCO Networking Academy Program)
Cisco Systems started its program of cooperation with the academic community at Stanford University in the USA in 1997. In January 2001, the Memorandum of Cooperation was signed by the Ministry of Education of the Slovak Republic and Cisco Systems and has been in force since. It can be regarded as one of the Ministry of Education's most important activities in the field of eLearning. The project is very popular among students, secondary schools, universities and the private sector (ICT companies mainly). The project also offers excellent possibilities for secondary and tertiary education students as well as employed people to be trained in high-tech IT by eLearning methods.

INFOVEK Project (within the State Institute of Information and Prognoses on Education)
For primary schools, a specific eLearning project called "e-Ekonomia" (e-Economics) was prepared. The project supplements basic economic education of children (aged 12+). A specific portal[38] for practical daily use by teachers was developed and several local initiatives or projects financed mainly by EU funds were implemented, e.g. eLearning system at Gymnasium in Michalovce[39] - (partially aimed at primary school students in the field of ICT, foreign languages and chemistry – the project is further being implemented during the period March 2006 – November 2007). The INFOVEK project is one of the most effective projects managed by public administration in the area of eLearning.

For secondary schools, specific projects were implemented by several secondary schools and a specific portal for practical daily use by teachers was developed. Starting in September 2003, specific eLearning courses in economics (called "e-Economy") were opened for a limited number of secondary school students (60 courses during 2003-2006 – the total of approx. 3 000 students were trained from all regions of Slovakia; successfully completed by approx. 70% of students) taught via a special portal INVESTLAND[40] managed by the State Institute of Information and Prognoses on Education and the association Junior Achievement Slovensko. The eLearning course e-Ekonómia (eEconomics) consisted of eight modules (what is economics – demand, supply, market and market price - business – financing of enterprises – money and financial institutions – role of Government – economic stability – international relations), each module being followed by an electronic test that had to be successfully completed in order to start with the next module. One course lasted for 10 weeks. There are also few local initiatives or projects supported mainly by EU funds, e.g. eLearning systems operated at Gymnasium in Michalovce focused on teachers and student in the field of ICT, foreign languages and chemistry during the period March 2006 – November 2007.

eLearning projects implemented by universities
During 2005-2006, the majority of universities have actively worked on the implementation of eLearning for their own students and successfully developed eLearning portals (e.g. University of Matej Bel in Banska Bystrica,[41] SPU Nitra, STU Bratislava[42] and UKF Nitra[43]). STU Bratislava has also drafted an eLearning Action Plan.

DIGISTUR Project[44] (Digitalni Sturovci Project)
The project is a successor of the INFOVEK project idea. It is trying to involve the majority of schools participating in the INFOVEK project in wider ICT training activities for citizens in the whole territory of Slovakia. This project also belongs to the most effective projects managed by public administration in the area of eLearning.

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36 http://www.teledom.sk/kurzy.php?lang=en&akcia=zoznam&elear=1
37 http://ecdl.informatika.sk/ecdl/testovacie_centra-centra.html
38 http://e-ekonomia.infovek.sk/
39 http://elearning.gphmi.sk
40 http://www.investland.sk
41 http://elearn.umb.sk/
42 Moodle KIRP FCHPT or www.kirp.chtf.stuba.sk/moodle/
43 Moodle FPV or Moodle KI FPV
44 http://digistur.infovek.sk/

ECDL[45]

The initial objective of the former Slovak Government was to make all civil servants pass the tests until the end of 2008. From January 2007 on, there will no longer be compulsory ECDL (European Computer Driving Licence) tests for civil servants in Slovakia. In other words it means that the decision to take part in ECDL training for civil servants should be on a voluntary basis. The opponents of the current decision criticise the arguments of the present Government, fearing a massive denial of ECDL courses. SKK 160 million were allocated for the initial project, with the approval of the European Social Fund to co-finance. The arguments in favour of the current decision say that most of the civil servants are already computer literate and that there would be preselected companies to make a profit from those courses.

DILBAC project

The DILBAC project began in October 2004 and finished in September 2006. The project was financed by the European Union under the Leonardo da Vinci Program. The aim of the project was preparation of eLearning modules in the area of banking and accounting in the four participating countries. Cooperation between the academic institutions and institutions from practice laid a realistic basis for meeting project objectives. The beneficiaries of offered courses were students and interested people from practice. The interim outputs included:

- survey of eLearning needs in banks and enterprises,
- elaboration of curricula that take into account working needs and the creation of education modules,
- command of eLearning methodology,
- the establishment of a virtual library under the DILBAC project.

Tomorrow is Today

The Slovak Telekom eLearning project "eLearning – Tomorrow is Today" won the 6th annual competition Slovak HR Oscar[46] in 2006. The aim of the project was to create a learning system to enable coherent learning management. It was focused on supporting strategic tasks and corporate objectives in the times of transformation.

VUDU eLearning Project[47] (Virtual University of Drama Art)

Since September 2006, the Theatre Science Department at the Drama Faculty of the Academy of Music and Dramatic Arts (VŠMU) in Bratislava has implemented its initial eLearning project in collaboration with the European Cultural Society, drawing a grant from the European Social Fund. For theatre science and drama students, five courses dealing with the world and Slovak theatre of the 20th century were organised. The eLearning Courses in the form of learning texts, assignments, tests and visual materials were distributed via the Internet.

School for Young Rescuers

Since September 2005, the Rescue Team Slovakia civic association, focusing mainly on voluntary rescue services, has been carrying out the learning project "School for Young Rescuers". This pre-emptive eLearning project was designed to enable all pupils, students and even adults – teachers, parents, ordinary citizens – to acquire and renew their knowledge in the area of prevention, health- and lifesaving, first aid and emergency aid. Several eLearning courses were realized to date, all of them being systematically divided into units covering child injury prevention, traffic education, first aid, health- and lifesaving in dangerous situations and the survival in such instances.

DIVES Program

The civic association The House of Europe, prepared for the period of March 2005-March 2007 the DIVES Program (Distance Learning Via Internet). It should have contributed to eliminating

[45] http://ecdl.informatika.sk/ecdl/index.html
[46] http://www.inet.sk/clanok/3436/elearningove-riesenie-v-slovak-telekom-od-kontis-ziskalo-hr-oscara
[47] http://www.vudu.sk/ciel.html

discrimination and inequality in the labour market. It was designed for secondary school and university graduates, mothers on maternity leave, the long-term unemployed, people over the age of 50, employees of non-profit organisations as well as for disabled people. The courses were free of charge. Their purpose was to find a job. Project participants had a choice of nine courses. The most favourite course was the English language course, since many consider it as the best start to get a better job. Other favourite courses were project management, regional policy and EU structural funds. Participants can also choose to attend entrepreneurial, self-Government and public administration, civil society, community development courses as well as volunteering or international political development courses. All nine courses received the accreditation from the Ministry of Education. Successful course graduates received a certificate.

Internet for Education[48]
The project has started in June 2006. It is based on the MINERVA Action Plan for Information Society aiming to support the wider usage of broadband by the young generation in Slovakia. The project offers the possibility to receive a 2-year limited financial subsidy from the state (approx. 8 EUR per month) for the establishment of a new broadband connection at home. Up to 40 thousand young people (aged 15-25, in October 2006 the age limit was cancelled) can participate, 5 thousand people in each of 8 Slovak regions. Broadband access should be faster than 512 kbps/256 kbps. The integral part of this project also rests on eLearning in that it supports education of project beneficiaries in foreign languages and ICT skills.

Some private organizations also started to provide free of charge eLearning courses mainly on ICT topics, e.g. EDUEXPERT[49] project.

II.2.5. Impacts of eLearning initiatives, projects and tools

The list of above-mentioned projects is not exhaustive; however, these projects were presented in this report because of the speed of their implementation, innovative character or because of their originality. Every successful eLearning activity has a positive impact on society as it brings the possibility to test new ways of teaching and training.

With regard to the primary education level, not many projects took place, and so all new eLearning activities are very important. Still, the most important from those realized was the project e-Ekonomia. There are more projects implemented on the secondary education level. Besides individual eLearning activities conducted by respective schools, students from secondary schools already participate in the CNAP project.

Self-Governments in Bratislava and other regions of Western Slovakia, where the unemployment rate is rather low, will be forced to increase teachers' salaries further from their own resources. Also at the university level, human resources development and management are absent. Some academics describe it as a result of "academic freedom", others would welcome improvement in this area. Preparation of all teachers for eLearning utilisation is essential, systematic training modules focused on special teaching needs at different educational levels should thus be strongly supported by well targeted Government action.

The most favourable situation in eLearning is at universities. Again, each project has its own importance for respective department or faculty, but it is more valuable (for faculties, departments and students, too) if the eLearning system has been managed and implemented by the top-down system within each university. So far, this has only been the case of University of Zilina and PJ Safarik University in Kosice. Also, different training institutions have already started implementing eLearning during the educational process. In the area of lifelong learning the number of people participating in

[48] http://www.ipv.gov.sk
[49] http://www.eduexpert.sk/

trainings always depends on the attractiveness of the course topic. When choosing training, people with a higher level of digital literacy look for new topics, while the general population is interested in eLearning to improve its ICT skills or to study foreign languages.

II. 3. The legal framework supporting eLearning applications

Currently, eLearning is not specifically mentioned in the valid Slovak legislation. The reason is that valid legislation regulating education and training issues in Slovakia is very old. It cannot adequately respond to the latest trends implemented in Europe or in OECD countries. The oldest legislation in this area is the Schooling Act (adopted in 1984), the legislation on further (continuous) education was adopted in 1997 and the legislation on higher education in 2002. In addition to this, there is no legislation for lifelong learning – the general principles of the new legislation should be discussed on the Government level in the second half of 2007.

The important legislation influencing application of eLearning in educational and training areas in Slovakia is as follows:

- Schooling Act (primary and secondary education),
- Higher Education Act (universities),
- Act on Further (continuous) Education (training and lifelong learning).

Other supporting legislation related to the implementation of eLearning is as follows:

- Act on Civil Service (training of civil servants),
- Act on Employment (training of the employed/unemployed),
- Copyright Act (protection of intellectual property rights),
- Personal Data Protection Act,
- Electronic Communications Act (infrastructure).

II.3.1. Valid legislation from an eLearning perspective

Slovak Constitution (1993)
The Constitution of the Slovak Republic guarantees access to education to every citizen. The educational system under valid legislation includes the following levels of education:

- pre-primary education,
- primary and lower secondary education,
- secondary general and vocational/technical education,
- tertiary education,
- education of adults.

eLearning concept is a subject for discussion and should be an integral part of all the above mentioned education levels except pre-primary education.

Schooling Act No. 29/1984 Coll.
The content of Slovakia's primary and secondary education system is regulated by the Schooling Act of 1984 that was thoroughly amended 17 times. Over the past 15 years, though, even the amended law has become a hindrance to the efforts to innovate the country's educational system. The legislation fails to reflect the latest trends in the educational system.

eLearning is not specifically included in this legislation. Some barriers negatively influencing modern teaching methods can be identified as follows:

- Art. 39 defines that curricula should be approved by the Ministry of Education,

- Art. 39a obliges also other ministries (related to education matters) to have their curricula approved by the Ministry of Education,

Both mentioned articles make it quite problematic to introduce flexible modern approaches, such as eLearning in the education process.

- Art. 40 specifically mentions only textbooks and teaching texts as documents that can be used for education and it is the ministry who regularly issues the list of textbooks and teaching texts; the legislation also allows using "other" textbooks and teaching texts for education – but many teachers are not sure whether eLearning can be accepted here without the official approval by the Ministry (note: the adoption of the National eLearning Strategy is still missing in Slovakia).

Higher Education Act No. 131/2002 Coll.

The Higher Education Act regulates all aspects of the higher education system. The content and educational methods of higher education are fully liberalised – the Ministry has the power to make regulation mainly through the Higher Education Council (for more details see chapter II.1.1.). This Act has already been amended 13 times. eLearning is not specifically included in this legislation. No barriers negatively influencing modern teaching methods are indicated. Autonomy of higher education institutions in use of teaching methods is reflected in quite a big number of institutions involved in eLearning activities (see II.2).

Act No. 386/1997 Coll. on Further (continuous) Education

The Act on Further education considers further education as part of the education system of the Slovak Republic and of lifelong education (Art. 1 sections 1 and 3).

This Act has already been amended twice. The legislation allows training institutions to offer both accredited and non-accredited training courses. Training institutions are automatically primary and secondary schools and also universities. Private training institutions can also be established. The accreditation of training institutions is compulsory in the case of (a) training of civil servants, (b) adults seeking to complete their primary or secondary education, (c) the funding of training from the state budget or (d) the completion of training by an accredited certificate. This law has enabled educational institutions to provide continuing training and, most importantly, it has contributed to the growth of part time studies at universities. Nevertheless, a tripartite body has been appointed for drawing up a new concept of this law focusing on the formation of a supportive framework for the implementation of the concept of lifelong learning. Continuing education is defined in this law as that part of lifelong education which (a) enables every individual to update, widen and deepen his/her education, (b) retrain or satisfy one's needs, or (c) enables one to prepare for entering some educational level within the structure of the school system. The recognition of non-formal or informal education as a level of education is not considered at the moment, there are no legislative conditions created for such recognition. eLearning is not specifically included in this legislation. No barriers negatively influencing modern teaching methods were identified.

Act No. 312/2001 Coll. on Civil Service

The Act on Civil Service stipulates legal relations in the performance of civil service. The performance of the civil servant arises from their rights and duties and of the duties related to the respective position. Training policy and its implementation and financing was assigned to the former Civil Service Office (until May 2006); this power has currently been transferred to the Ministry of Social Affairs, Labour and Family. The training of civil servants should be provided only under the valid education and training legislation (Schooling Act and Act on Further (continuous) Education). eLearning is not specifically included in this legislation. No legislative barriers negatively influencing modern teaching methods such as eLearning are indicated in this legislation.

Act No. 387/1996 Coll. on Employment
Act on Employment deals with the further education of the unemployed or employees in companies in terms of re-training provided/organised/financed through local Labour Offices. Training for employed or unemployed people should be provided under the valid education and training legislation (Schooling Act and Act on Further (continuous) education).

Copyright Act (618/2003 Coll.)
This legislation reflects all EU requirements in the area of copyright under the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty which amend the international protection of objects of protection and holders of rights under the Bern Convention and the Rome Convention with respect to the development of new digital technologies, in particular with respect to the Internet. The Slovak Republic ratified the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty on 14 January 2000. No legislative barriers negatively influencing modern teaching methods (eLearning) are indicated in this legislation.

Personal Data Protection Act
This legislation reflects the principles set in the EU's Data Protection Directive (95/46/EC). Under this Act, individuals can access and correct personal information held by public and private bodies. The Act is enforced by the Office for Personal Data Protection. First amendment of this Act was adopted by the Parliament in February 2005 and came into force on 1 May 2005. The amendment fully transposes the EU Personal Data Protection Regulation of 29 September 2003 into the Slovak legislation. In October 2005 the Slovak Government has appointed the first Personal Data Protection Inspector. No legislative barriers negatively influencing modern teaching methods (eLearning) are indicated in this legislation.

Electronic Communications Act (No.610/2003 Coll.)
The Act on Electronic Communications, which entered into force only on 1 January 2004, transposes into Slovak Law the EU's New Regulatory Framework for electronic communications: Directive No. 2002/58/EC on Privacy and Electronic Communication, Authorisation Directive No. 2002/20/EC, Access Directive No. 2002/19/EC, Universal Service Directive No. 2002/22/EC and Framework Directive No. 2002/21/EC. After criticism of the European Commission of the insufficient degree of adoption of valid EU legislation three amendments to this Act were adopted during 2004-2006. No legislative barriers negatively influencing modern teaching methods (eLearning) are indicated in this legislation.

II.3.2. New legislation in preparation from an eLearning perspective

New Schooling Act (Act on Education and Training)
The former Government discussed the legislative intention of the new Schooling Act in 2003. The original schedule agreed by the Government required the Ministry of Education to submit the bill to the cabinet by the end of 2004. In 2005, the legislation was adopted by the Government after extensive discussion, but the bill was not finally adopted by the Parliament in 2005. The draft legislation also included instruments supporting easier eLearning implementation in the primary and secondary education system. The new Government (after the general election in June 2006) declared that the new education legislation should be its high priority. The concept introducing the philosophy of the new law should be put forward to the Government level in August 2007 and the new bill should be prepared for approval by the Government in December 2007.

New Act on Lifelong Learning
It should be the first specific legislation supporting lifelong learning in Slovakia. After the general election (June 2006), the new Minister of Education announced that the improvement of legislation for education and lifelong learning would be one of his priority for the near future. He set up a special committee – the Council for Higher Education and Lifelong Learning. In December 2006, the Ministry of Education adopted the National Strategy for Lifelong Learning. Further details have not been

presented yet. The concept introducing the philosophy of the new law should be deliberated at the Government level in March 2007 and the new bill should be prepared for approval by the Government in September 2007.

New amendment to the existing Higher Education Act
In October 2006 the new Minister of Education set up a special committee – the Council for Higher Education and Lifelong Learning, which has already started to prepare a new amendment to the Act No. 131/2002 Coll. on Higher Education. Further details have not been presented yet. The new bill should be prepared for approval by the Government in March 2007.

New Act on Youth
In December 2006, the new Minister of Education announced new legislation on youth which should transpose the European Council Directive 2004/114/EC into the Slovak law system. Further details have not been presented yet. The concept introducing the philosophy of the new law should be approved at the Government level in August 2007 and the new bill should be prepared for approval by the Government in December 2007.

New Act on Financial Support to Municipalities for the training of youth
In December 2006, the new Minister of Education announced that new legislation on state financial support to municipalities for the training of youth should support close cooperation between municipalities and youth organisations. Further details have not been presented yet. The concept introducing the philosophy of the new law should be approved at the Government level in the first quarter of 2008 and the new bill should be prepared for approval by the Government in the first quarter of 2008.

II.4. Dedicated ICT infrastructures and applications

II.4.1. Public available Internet infrastructure and services for citizens and business sector

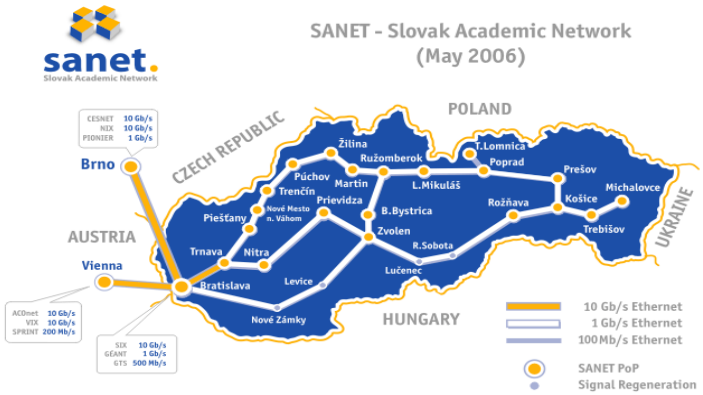
ADSL services and Internet access via CATV networks were launched in Slovakia in 2003. In June 2006, Internet user penetration (Table 12) was 37.4 per 100 inhabitants (76.3% of the EU15 average), but broadband penetration reached only 2.56 per 100 inhabitants (only 16.5% of the EU15 average). Slovak households considerably lag behind EU households in the use of information technology (IT). According to the European Commission's Eurobarometer poll 2006 about the prevalence of ICT in households, only 5% of Slovak households had broadband Internet access (21.7% of the EU25 average), compared to the European average of 23 percent. This situation reflects the postponed liberalisation of telecommunication services and the infrastructure in Slovakia. Full liberalisation was planned to take place in January 2003, but the real signs of competition have been apparent only since June 2006. Internet development in Slovakia is significantly lagging behind the EU15 as well as EU25 trend. At the end of 2006, only 65.7% of the population living in 797 municipalities (27.2% of total number of municipalities) had access to ADSL services – mainly in urban areas (100% of cities) followed by suburban areas (53.1% of the total number of suburban municipalities) and finally rural areas (17.5% of the total number of rural municipalities). Broadband Internet access via CATV networks was provided in 36 municipalities (including 18 municipalities within Bratislava-City and Kosice-City) – majority in urban areas (20 municipalities, 30.7% of the total number of cities) followed by suburban area (13 municipalities, 2% of the total number of suburban municipalities) but only in 3 municipalities in rural areas (0.13% of the total number of rural municipalities). There is real expectation that in 2007, the majority of Internet users in Slovakia shall already use broadband access. Broadband access is an important technical aspect and one of the most significant pre-requisites for the usage of eLearning online services.

II.4.2. Internet infrastructure and services for the academic sector (SANET project)

SANET (Slovak Academic Network) provides a high-quality broadband infrastructure (mainly for academic institutions and universities in Slovakia, including the majority of student dormitories), which is a significant pre-condition for the wide usage of eLearning. In accordance with the situation

in Europe, the SANET2 project has the ambition to gradually connect workplaces outside the education system, primarily libraries under the Ministry of Culture, research workplaces in other sectors, important hospitals, environmental monitoring facilities and other institutions which will adhere to the principles stipulated for using the network. The coordinator and designer of the SANET2 project is the association of the users of the Slovak academic network SANET, which was established by the Government of the Slovak Republic by its resolution No. 383/2001 to create the SANET II high-speed communication infrastructure to ensure interconnection with European communication networks and connect university centres to this infrastructure.

Figure 5: SANET network topology - 2006



Source: SANET (2006)

The SANET network is built within the framework of the SANET2 project and presently covers 23 towns. The network infrastructure is based on leased dark fibres, which are terminated in Cisco Catalyst gigabit Ethernet switches. The building of the SANET network was done in two phases. The first one started in July 2001 and finished in February 2002 when the southern path (Kosice - Bratislava) was completed. In August 2002 the topology was extended to Vienna (Austria). The second phase started in March 2002 and was finished in January 2003. At this time all the main nodes of SANET network topology are fully functional. The SANET Network is configured as two rings providing full redundancy with a maximum delay of 5ms. In the near future the project management plans to connect other Slovak towns to its optical infrastructure and upgrade the backbone speed to 10 Gbps. Currently, the project is in the process of establishing a direct optical connection from Bratislava to Brno in the Czech Republic through leased dark fibre. The national connectivity is provided through the Ethernet link leading into Slovak Peering Centre SIX located in the Computer Centre of the Slovak Technical University (CVT STU) in Bratislava. Its speed is 1Gbps. The foreign connectivity is provided through leased dark fibre with a total length of 104 km to the ACOnet node in Vienna. The project has used the same Ethernet technology as is used on the SANET backbone without any optical signal regenerator. The SANET node in Vienna has two connections. One of them is to the Austrian Peering Centre - VIX at a speed of 1Gbps and the second one is to the SPRINT network at a speed of 100 Mbps. Foreign connectivity is also provided through two links in Bratislava. One is connected to the Slovak node of the GTS network at the speed of 200 Mbps. The second one leads to the Slovak node of the GEANT network with the speed of 2.5 Gbps. At present, SANET uses 400 Mbps of this capacity. The current topology of the SANET network is shown in Figure 5.

II.4.3. Internet infrastructure and services for primary and secondary schools (INFOVEK project)

The INFOVEK project was initiated in 1998 by a civic association without direct ties to the Government. The aim was to provide all primary and secondary schools within four to five years with computer classrooms of about ten computers and an Internet connection in each. There are training

programs being organised for INFOVEK teachers and a centralised purchasing of hardware for the selected schools. One of the four pillars of this project is to equip every primary and secondary school (public, church or private) in Slovakia with a multimedia classroom with high quality Internet access.

During previous years, some positive activities ensuring better access to the Internet were started by the private sector. The Slovak Telekom initiative for primary and secondary schools lowered the density of pupils per one computer from 120 to 30 and provided a broadband Internet connection for all primary and secondary schools during 2004.

II.4.4. Internet infrastructure and services for state administration (GOVNET project)

GOVNET is the Government Network project that has started in 1995 as the backbone for intranet and Internet access of Government institutions. Based on the tender "Data circuits transfer capacity upgrade for the Government in Slovakia", the company SWAN completed the last data circuit for the Slovak Government on 20 December 2002. The GOVNET infrastructure is based on the interconnection of more than 60 connection points within one VPN. The connection was made using FWA technology and the metropolitan optic infrastructure with 2 MB capacity of connection points. The solution is built on the SWAN infrastructure with the minimum transfer capacity of 2 Mbps. Currently it is several times faster compared to previous solutions. The Government is also considering the possibility of using the electronic infrastructure (fibre optic infrastructure) provided by companies with state-owned shares (railways, electricity, gas, oil distribution companies).

The Audit of ICT in public administration in 2005 found 95% coverage of central institutions by IT, 91% Internet connectivity and 70% connectivity to LAN networks. Further significant information derived from the monitoring of 247 information systems in central institutions is as follows: (a) 51% of civil servants use paper-based and 49% electronic data entry (82% of those data is entered manually), (b) 57% is not connected to other information systems, (c) 45% of networks are related to internal management, 24% intended for performing public administration tasks and 31% for providing eServices, (d) 7 out of 20 central public administration institutions had projects under implementation related to ICT, mostly aimed at the provision of eServices.

Internet access is very slowly implemented in public administration at the local self-Government level. The Association of Slovak Cities and Municipalities (ZMOS) has informed that only 30% of municipalities in Slovakia had access to the Internet by the end 2004 and only a half of municipalities was connected to the Internet in 2005. The ICT skills of civil servants at municipalities are generally very poor. Another research indicates that only 470 municipalities (16% of the total number of municipalities) had their own websites in January 2006. All these figures[50] are important for better understanding that ICT and Internet usage development also in public administration (especially in municipalities) is slow.

II.4.5. eLearning systems

In Slovakia, the majority of schools and training institutions implementing eLearning are using LMS (Learning management system). These are products that offer automated support for learning processes:

- tools to create electronic e-courses,
- tools to create a so called “virtual class” (members of the class from different cities, connected via the Internet, “meet” at a particular time in a fictitious virtual classroom),
- learning management tools (timetables, information on tutorials, courses, exams, deadlines to submit individual projects, etc.),
- the transfer of learning materials to the student, a list of reference literature, a list of websites to deepen and broaden the scope of the subject studied,

[50] ISSS 2006 Conference, Hradec Kralove, Czech Republic: Porovnání využití IT ve VS v zemích Vyšegradské čtyřky http://www.isss.cz/archiv/2006/download/prezentace/svoboda_druga.ppt

- systems to secure feedback between the student and the tutor,
- panels where users can comment on the course content, learning materials and receive evaluations (in case they can communicate),
- records and archives of student activities and learning outcomes,
- diplomas, certificates, acknowledgements,
- tools to enable off-line study.

University portals integrate using of the international eLearning standards with other university processes and thus create an interface to on-line resources. Some of the well-known representatives of eLearning environments are as follows:

- WebCT (LMS),
- MOODLE,
- eDoceo,
- iTutor (LCMS – a Czech product),
- NetOp School (a product of the Danish company Danware Data A/S),
- uLern
- Novitech learning portal (support for course management and training activities).

All the above mentioned environments are user-friendly, because they are easy to use with any operation system (hereafter OS) and can be applied in an Intra-/Internet search engine environment. The benefit of iTutor, eDoceo and uLern systems, compared to WebCT and MOODLE (initially designed for Anglo-Saxon educational systems) lies in the fact that they were created in an environment close to ours (especially uLern, which was created in Slovakia). Their learning support and tools for students' collaboration fit our conditions. According to some evaluations[51], there's a high share of university portals with the number of end users around 20-50% of all students. These portals can be fully operational in less than two years.

The following specific LMS systems are used in Slovakia:

- LMS EKP (Enterprise Knowledge Platform)
- LMS MOODLE (Modular Object-oriented Dynamic Learning Environment)
- LMS Claroline
- LMS Eden
- LMS eDoceo

[51] e.g. Gartner

Table 24: Survey of eLearning systems frequently used in Slovakia

Education level	LMS system	Licensed by	Typical users	Selected implementation
Primary schools	ClassServer	Microsoft	schools	Pilot projects managed by INFOVEK (e.g. e-Economy)
Secondary schools	ClassServer	Microsoft	Secondary schools	Pilot projects managed by INFOVEK (e.g. e-Economy)
	MOODLE	OSI platform	Secondary schools	EU projects • Gymnasium in Michalovce • Secondary Vocational Electrotechnical School, Michalovce
	Claroline	OSI platform	Secondary schools	
	CNAP	CISCO	Secondary schools	Since 1999 regular ICT courses by CNAP initiative for technical oriented schools or gymnasia
	eDoceo	Trask solution	Secondary schools	ECDL courses (several project already implemented)
	NetOp School	Danware Data A/S	Secondary schools	In preparation
Universities	MOODLE	OSI platform	universities	Only in University of Zilina and in University PJS Kosice implemented across all faculties
	MOODLE	OSI platform	universities	Many applications, but not implemented by all faculties/departments – selected examples: STU Bratislava, UKM Nitra, SPU Nitra, UMB Banska Bystrica, UK Bratislava, University of Economics Bratislava, etc.
	uLern	I.C.T.	universities	TU Kosice
	CNAP	CISCO	Many types of users	All technical oriented universities
Training institutions	CNAP	CISCO	universities	Since 1999 regular ICT courses by CNAP initiative for technically oriented schools or gymnasias.
	TeleDom	Novitech	Business sector	Mainly ICT courses.
	Enterprise Knowledge Platform	Dupres Consulting	different types of training institutions.	Specific eLearning courses via local daughter company - e-learnmedia s.r.o.
	others	Several institutions	training institutions	Different kinds of online courses, e.g. Academy of Education, Verlag Dashofer, etc.
Trainings at workplace	iTutor	Kontis	Business sector	Slovak Telekom, T-Mobile Slovakia, METRO Cash&Carry Slovakia
	eDoceo	Trask solution	Many types of users	Training institutions and big companies
	Enterprise Knowledge Platform	Dupres Consulting	Business sector	e.g. saving companies
	Lotus LMS	IBM	different	
	Ilearning	Oracle	different	
	EDEN	Rentel	different	
	uLern	I.C.T.	NGOs	specific NGO projects
	others	Several institutions	different	Many different projects.

LMS EKP (Enterprise Knowledge Platform) is a product of Dupres Consulting SR partner company and its E-learnmedia division. It communicates successfully with courses created by electronic content suppliers from the Czech Republic and Slovakia, specifically Gopas, Kontis and Zebra. Among the developing tools for on-line courses management, EKP fully supports courses created e.g. in Macromedia Authorware, Macromedia FLASH with the AICC/SCORM support and tools such as ToolBook II Assistant and Instructor.

LMS MOODLE (Modular Object-oriented Dynamic Learning Environment) is an Open Source system, i.e. a freeware designed to create Internet courses. As it is being developed by a worldwide community of programmers, new and enhanced versions appear quickly. It is also used to support various forms of attendance studies, offering different course formats to full-time students (a weekly

format) and to distance studies (due to diverse learning management – a thematic plan reflecting various types of consultations). It even fits as a free alternative to commercial eLearning systems.

LMS Claroline is a course-oriented system of virtual university. Its indisputable benefit lies in its simplicity and the speed of updating courses.

LMS Eden is a Czech alternative to Learning Space – a system widespread in the academic environment. The system has a separate part for course management that can be done only via Lotus Notes client, which requires additional training.

LMS eDoceo software designed by the Trask Solution company. It is an application that runs only with a web server and an MS Access, MySQL, MS SQL server, Oracle or DB2 type relational database. It is independent from an OS platform used (Windows, Linux).

Private sector in Slovakia uses the following technologies with high or medium expected benefits:

- SES (Smart Enterprise Suites),
- eLearning suites,
- Course management systems.

SES (**Smart Enterprise Suites**) combines portal convergence, content management and collaboration support in one integrated product. These applications have reached top expectations and will become fully developed in 2 to 5 years. Platforms such as *IBM Lotus Learning Space* offer business solutions for employees' further education. Some systems, e.g. the Tutor, can be purchased, rented or outsourced. The technologies used, such as *MS SQL Server*, *MSDE*, *Oracle* and *MTS***,** enable to distribute systems according to the increasing needs of a business organisation, as well as to integrate them with standards and other systems used by the customer, e.g. SAP R/3, etc. **eLearning suites** is an integrated product with four key elements: LMS, LCMS, virtual classroom and professional services. **Course management systems** are designed for on-line management and interaction of eLearning courses. A huge benefit of such applications is expected. The system manages more than 50% of end-users and needs less than two years to become fully mature. A survey of frequently used LMS systems in Slovakia is in Table 25.

II.4.6. eLearning actors

Main eLearning actors in primary education

The most active institutions using eLearning in the training of relevant target group are as follows:

- State Institute of Information and Prognoses on Education,
- CNAP (CISCO Networking Academy Program),
- primary schools.

State Institute of Information and Prognoses on Education is a budgetary organization directly subordinated to the Ministry of Education. The Institute is the coordinator of the INFOVEK project. The INFOVEK (in English it means "Info-Age") is focused on teachers and children in primary and secondary education in Slovakia.

CNAP (CISCO Networking Academy Program)
Cisco Systems started its program of cooperation with the academic community at Stanford University in the USA in 1997. In 1999, the Faculty of Electro technology and Informatics[52] at Technical University in Kosice, at which the **Centre of eLearning Technologies** was established, became the first regional institution in the Slovak and Czech Republics to join CNAP. In January 2001, the Memorandum of Cooperation was signed by the Ministry of Education of the Slovak Republic and Cisco Systems and has been in force since. It can be regarded as one of the Ministry of Education's most important activities in the field of eLearning.

Main eLearning actors in secondary education
The most active institutions using eLearning in the training of relevant target groups are as follows:

- State Institute of Information and Prognoses on Education
- CNAP (CISCO Networking Academy Program)
- secondary schools (mainly gymnasia and technical secondary schools)

Main eLearning actors in tertiary education
In general, the most advanced institutions in connection with eLearning usage in its different forms in Slovakia are faculties of universities or universities oriented towards technology and natural sciences. Social sciences and humanities lag behind in eLearning and use of ICT as such. The most active institutions using eLearning in the training of relevant target groups are as follows:

- Technical University in Kosice,
- Slovak Technical University in Bratislava,
- University of Zilina,
- Comenius University in Bratislava,
- University of Pavol Jozef Safarik in Kosice,
- University of Presov,
- University of Matej Bel in Banska Bystrica,
- University of Trnava,
- Trencin University of Alexander Dubcek,
- University of Economics in Bratislava,
- Technical University in Zvolen.

Technical University in Kosice
In 1999, the Faculty of Electrotechnology and Informatics at Technical University in Kosice was the first regional institution in the Slovak and Czech Republics to join CNAP. The Centre of ELearning Technologies was established there, aiming to support the implementation of CNAP activities in Slovakia.

Slovak Technical University in Bratislava
Slovak Technical University is the oldest technical university in Slovakia. It has two specific faculties focused on ICT. In 2001, Slovak Technical University in Bratislava established a specific Institute of Lifelong Learning (ICV), which currently focuses especially on the promotion of eLearning.

University of Zilina
University of Zilina was, already in former Czecho-Slovakia the only specialised university in the field of telecommunication and transport. The eLearning program at the University of Zilina offers multimedia WBT courses for full-time students who study their lessons according respective study plans. To share eLearning materials with other students a special portal named eKurzy (eCourses) was prepared. The eKurzy portal is primarily intended for students and employees at the University of

[52] FEI TU, see http://www.tuke.sk

Zilina but can be used by all Internet users upon registration. eLearning implementation was prepared on the global level – eLearning was implemented by all existing faculties.[53]

Main eLearning actors in training institutions
The most active institutions using eLearning in the training of relevant target groups are as follows:

- CNAP (CISCO Networking Academy Program),
- Institute of Lifelong Learning (ICV) of Slovak Technical University in Bratislava,
- Academy of Education (Akademia vzdelavania),
- Slovak Society for Computer Science (civic association) – ECDL trainings coordinator and methodology centre in Slovakia.

Institute of Lifelong Learning (ICV) of Slovak Technical University in Bratislava
The Institute of Lifelong Learning (ICV) of Slovak Technical University in Bratislava was founded in 2001 following the merger of several already existing departments, with the aim of promoting the development of lifelong learning in technical areas at the university level. ICV comprises the following departments: Centre of Further Education, Centre of Intensive Education, Local Centre of Distance Education, Language Centre, French Centre and Centre of Senior Citizen Education. In 2003, more than three thousand participants were enrolled in ICV courses and programs. ICV uses up-to-date teaching technologies. Distance study is promoted and developed especially by ICV Local Centre of Distance Education, established within the framework of the PHARE project 'Transnational Cooperation in Distance Education'. The Centre of Intensive Education (CIV) was established in 2001 by the transformation of the National Centre of Distance Education, and it presently focuses especially on the promotion of eLearning.

Academy of Education (Akademia vzdelavania)
The Academy of Education represents an independent, non-profit civil corporation with the main focus on life-long learning that would lead to attaining, expanding and preserving expert, cultural and social knowledge. The Academy of Education constitutes the oldest and largest institution specializing in adult education in Slovakia. Almost 200 experts and 3 000 Slovak and foreign lecturers organise and run education programs at 41 local branches all over Slovakia. 6 198 educational courses were organised for 89 644 participants in 2005 in many areas.[54]

Slovak Society for Computer Science
Slovak Society for Computer Science is a civic association. It is the national ECDL training coordinator and methodology centre in Slovakia.

Main eLearning actors in the business sector
The most active business companies using eLearning in the training of their own employees based on reports in the media are as follows:

- Slovnaft (oil company – MOL subsidiary company),
- Slovak Telekom and T-Mobile (Deutsche Telekom group),
- Orange Slovakia (Orange group – mobile operator),
- Matador Puchov (tyre manufacturer),
- ESET (Slovak private SW company – antivirus software producer well known worldwide),
- banks (mainly with foreign capital) - e.g. Slovenska sporitelna (Erste Bank group),
- a few alternative telecom operators,
- national and regional energy distribution companies (e.g. SPP – monopoly gas distributor).

[53] see http://vzdelavanie.utc.sk/vzdelavanie/
[54] see http://www.aveducation.sk/onas.php?id=68

The majority of the mentioned companies employed a huge number of employees, and eLearning is perceived, besides other reasons, also as a cost-effective and time-saving solution within the implementation of trainings.

Main eLearning actors in public administration
Government plans to use eLearning as an important training method in trainings of unemployed people and physically disadvantaged people (by calls for Specific Structural Fund Operational Programs – in the areas of Human Resources, Training, and Education). Usage of eLearning is limited by low digital literacy currently reachable by the mentioned target groups. eLearning courses for the unemployed and disadvantaged are managed by local Labour Offices located in each district.

Another area of eLearning in public administration is related to civil servants. The most active public administration institutions using eLearning in the form of several pilot projects (training of civil servants, mainly through ECDL courses) during the period 2005-2006 are these:

- Ministry of Transport, Posts and Telecommunications,
- Virtual Academy (The self-Government region of Bratislava),
- former Civil Service Office (abolished in June 2006).

Ministry of Transport, Posts and Telecommunications was first public institution where civil servants were trained in pilot ECDL courses in 2005.

Virtual Academy (The self-Government region of Bratislava)
The self-Government region of Bratislava and the Senec-Pezinok Regional Development Agency decided to participate in the project with the aim of securing systematic and effective development of human resources in the public sector. One of the project's targets is to increase digital literacy of the public sector and to strengthen e-Government development through providing the possibility to gain practical IT skills to the employers of public management of the Bratislava Regional Self-Government by using new educational forms based on eLearning.

II.5. eLearning services

Blended learning has been used in the Slovak education system for a few decades already. Teachers on all educational levels used projectors, tape recorders or gramophones for teaching. Public TV regularly broadcasted specific programs for primary and secondary schools already during the 80ties. Schools could specifically arrange the classroom and equip it with TV set(s) so that their students could watch these TV programs. This progressive learning possibility was limited in its practical use, mainly because of space and logistic problems (only few classrooms were equipped with TV sets; reorganisation of the timetable was needed) and because the VCR technology was not available to schools at that time. Later, during the 90ties, the VCR technology became a standard supporting technology for teaching in the majority of schools and training institutions.

eLearning services based on modern ICT could be discussed, in general, as off-line eLearning services (students don't need an active internet connection; students receive materials on floppy disks, CDs or DVDs) or as on-line eLearning (it requires a workstation connected to the Inter-/Intranet; learning materials are distributed via communication networks). On-line eLearning is carried out in two ways - synchronous[55] or asynchronous[56] form. The asynchronous form is more flexible (it can, for example, have a structure of correspondence courses, e-mails, discussion groups or web pages). Although eLearning sets higher demands on computer skills and knowledge of students, it also offers alternative solutions in education.

[55] All users can communicate from different places, but only in a particular period of time - via computer conferences, interactive video communication, or chats, or learning can be carried out as a traditional classroom lesson.

[56] Students need not to be connected at the same time, at the same place, they do not study at the same moment, and they can choose when to access learning materials.

Many tertiary (and also few secondary) schools in Slovakia have created eLearning websites to offer necessary services, thus covering e-portal access; i.e. they include access to the following types of environments:

a) LMS (Learning management system) – systems to manage studies,
b) LCMS (Learning content management system) – storage systems to manage university eLearning content using indexes, search, messages and information sharing as well as access to multimedia instruments.

The situation concerning the concrete usage of systems providing learning services by LMS is different in each education level in Slovakia. Some systems are usually quite expensive and schools do not normally have enough resources to buy and run such a system. Moreover, educational resources appropriate for individual school levels are a problem, too. There is no centralised activity focusing on the development of databases of such resources freely accessible, especially for lower level schools. The situation is similar in the public administration area.

The state of affairs in Slovakia is fairly good regarding the latest trend over access of schools to broadband Internet (see Statistical Annex, Table 23) at all education levels, but at primary and secondary schools there is still further development needed. It means they can better use this highly valuable source of information in eLearning processes.

In primary and secondary education, the Slovak Ministry of Education and regional authorities are already involved in the public-private partnership projects focused on ICT implementation to schools in collaboration with the companies Telenor Slovakia and GTS Nextra through pilot projects (as part of the INFOVEK project or the EUNIS-SK project). However, these activities are still not sufficient and other complementary technologies must be implemented in order to provide access to multimedia applications supporting learning. eLearning can solve this situation and it also offers a whole scale of applications and processes for learning content distribution via Inter-/Intra-/Extranet audio and video technologies, satellite broadcasts, etc. It does not replace traditional classrooms, but it complements it and thus increases the quality of education.

In December 2006, the Ministry of Education decided to purchase another 400 multimedia sets in order to improve Internet availability at primary and secondary schools. It plans to purchase it for €2.2m in short list procurement. The Ministry will finance the purchase by using EU funds and its own resources. Technology should be delivered during the second half of 2007. Each set should contain a Tablet PC, data-video projector, portable interactive computer blackboard, Ethernet equipment using power lines and a WiFi router. Each school that will obtain this multimedia set is eligible to get training for its teachers for free.

eLearning courses are currently an integral part of education or training systems only at universities,[57] few private training institutes and in large companies (mainly foreign-owned). Several universities already use eLearning courses as a regular tool for students in selected areas.[58]

Some training institutions started to provide eLearning courses, e.g. City University Bratislava (business programs), Transfer Slovakia (management, marketing, engineering), Academia Istropolitana Nova (postgraduate studies in economics, architecture, environmental policy, European studies, English language), Akademia vzdelavania (foreign languages, professional and hobby courses), Verlag Dashofer (IT skills, practical economic courses). There are also several private training institutions that are rapidly increasing their selection of eLearning courses (approx. 20-25% of their training products[59]). Some eLearning products are free of charge (mainly foreign language

[57] e.g. UMB University http://www.student.umb.sk/index.php,

[58] e.g. Catholic University Ruzomberok - http://elearning.ku.sk/moodle/ or University of Economics Bratislava - http://elearning.euba.sk/ or Slovak Agriculture University Nitra - http://www.fem.uniag.sk/moodle/

[59] e.g. Verlag Dashofer Bratislava (information from a personal interview made in October 2006) – more info available also at http://www.dashofer.sk/ponuka.asp?tr=onc

courses[60]). Few universities have established lifelong training centres, which also provide eLearning training for specific disadvantaged social groups (e.g. the project PROINTEGRA[61]).

CNAP is the only program in Slovakia to offer accredited training exclusively by means of eLearning. It is provided in collaboration with the Slovak Ministry of Education at selected secondary schools and universities. The aim of CNAP is to create an initiative for a line-up of representatives of public and private institutions to foster the development of eLearning educational activities, especially at the academic level. It also aims to foster the creation of support and favourable conditions for the use of progressive ICT in educational processes in Slovakia. Currently, there are 15 learning modules running, not only in the computer networks area, but also in other IT sectors. Besides CNAP there is currently no university in Slovakia to offer accredited education only by means of eLearning.

The private sector (mainly large companies such as commercial banks, significant telecom infrastructure operators and IT companies) is already in the process of implementation of eLearning as an internal training tool following their own experience from similar business entities (parent companies) abroad. Public administration, primary and secondary schools and SMEs are the sectors with the lowest level of eLearning implementation when compared to the total number of people in relevant target groups.

Increased participation of the private sector in Slovak eLearning is limited, except for huge multinational corporations (banks, telecom operators, etc.), e.g. Slovak Telekom implemented the HR and eLearning management system iTutor[62] for approx. 4 400 employees during 2005, Slovnaft (MOL group) and other large Slovak companies already regularly use the eLearning product Instructor[63] for health-care, first aid and fire protection courses for their own employees. Large syndicates utilise all the advantages of eLearning to manage educational activities of their own employees; as the information often repeats, they distribute it to large territories. eLearning resources and tools used with the help of the Internet can fully satisfy these needs.

SMEs do not pay appropriate attention to providing learning for their employees. A similar situation is in the education system and public administration. Small enterprises mostly lack enough resources to develop their own solutions to satisfy their needs, as it obviously would not be cost-effective, but nowadays there are eLearning products available practically for any business activity. It is only a question of price and quality of such services.

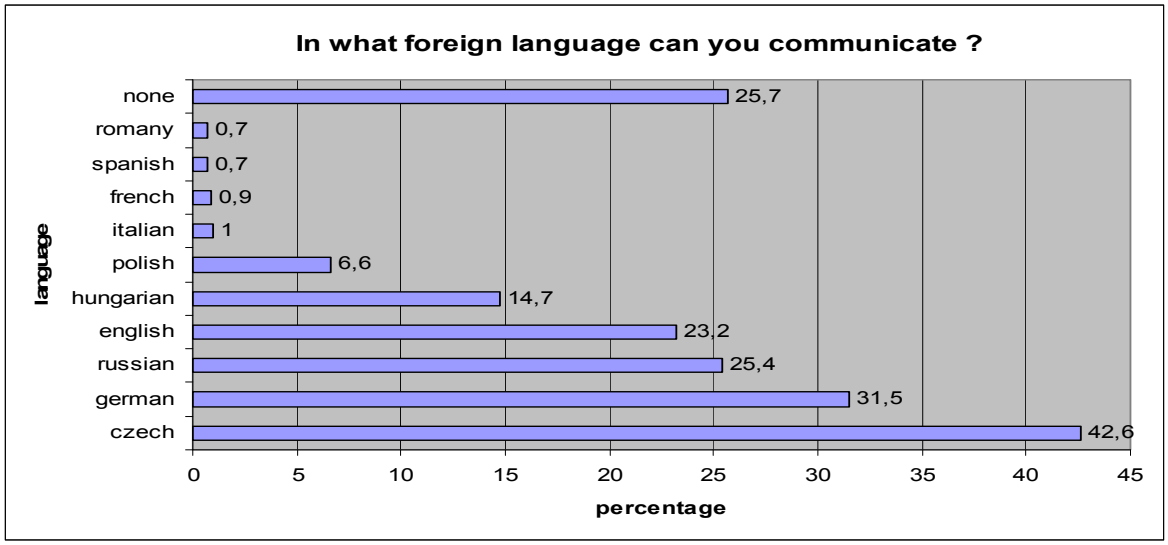
State administrations and regional self-Governments have a relatively good level of ICT implementation in their own institutions. Some state administration organisations (e.g. eJustice[64] project – which included also eLearning courses for all judges; organised by the Ministry of Justice during 2004-2006) or regional self-Government offices (e.g. eLearning project managed by the regional self-Government in the region of Zilina[65]) also implemented and/or prepared further eLearning courses for their own employees. eLearning started to be an important training method for civil servants, mainly thanks to ECDL trainings. Individual Governmental organizations prepared training activities through their human resources departments in close cooperation with the former Civil Service Office. The activities aimed at the usage of eLearning tools. Due to the lack of human resources the local Government level has more complicated situation in preparing and delivering eLearning activities than it is the case with the central level. But some initiative project activities were already found on the local level, e.g. eLearning portal Municipalia.[66]

An inadequate offer of domestic eLearning services in Slovakia can be overcome by foreign products, where the most limiting factor remains generally insufficient language skills of their potential users.

60 e.g. http://www.e-academy.sk/index.php
61 http://www.prointegra.sk
62 http://www.inet.sk/clanok/3436/elearningove-riesenie-v-slovak-telekom-od-kontis-ziskalo-hr-oscara
63 http://www.bozpo.sk/firma/
64 http://www.itapa.sk/data/att/87_prezentacia.pdf
65 http://www.elearning.zilina.net
66 http://www.municipalia.sk/sk/Default.aspx?CatID=83

However, there are exceptions in Slovakia where language does not represent a barrier in the use of foreign eLearning products. It is the case of the Czech and Hungarian language. During former Czechoslovakia both Czech and Slovak languages were commonly used in daily communication by the majority of the population – at least on TV, radio or in newspapers. Quite a substantial group of people speaks Hungarian in Slovakia, because they belong to the largest minority living in Slovakia (see Introduction). The Slovak Hungarians frequently use the educational system of Hungary, so it does not pose a problem for them to use Hungarian eLearning products, too. The situation is different with Czech language. The offer of eLearning products in Czech language is wider than in Slovak. In case of using the Czech language there are currently no barriers to its everyday use by citizens older than 15 (Chart 8). Nevertheless, the question is what the prospects of using/understanding Czech will be in the future in connections with the age groups currently younger than 20. They haven't had that many opportunities to use Czech language. On the other hand, younger generations, unlike older ones, can acquire better proficiency in English, which is the most commonly used language, and which, to a higher extent, allows them to use foreign eLearning products written in English (Chart 8). Some people in Slovakia already use eLearning courses available on the Internet, usually free of charge, e.g. a Czech ECDL portal[67] supported by the Czech Ministry of Informatics, while in Slovakia no such training is provided free of charge.

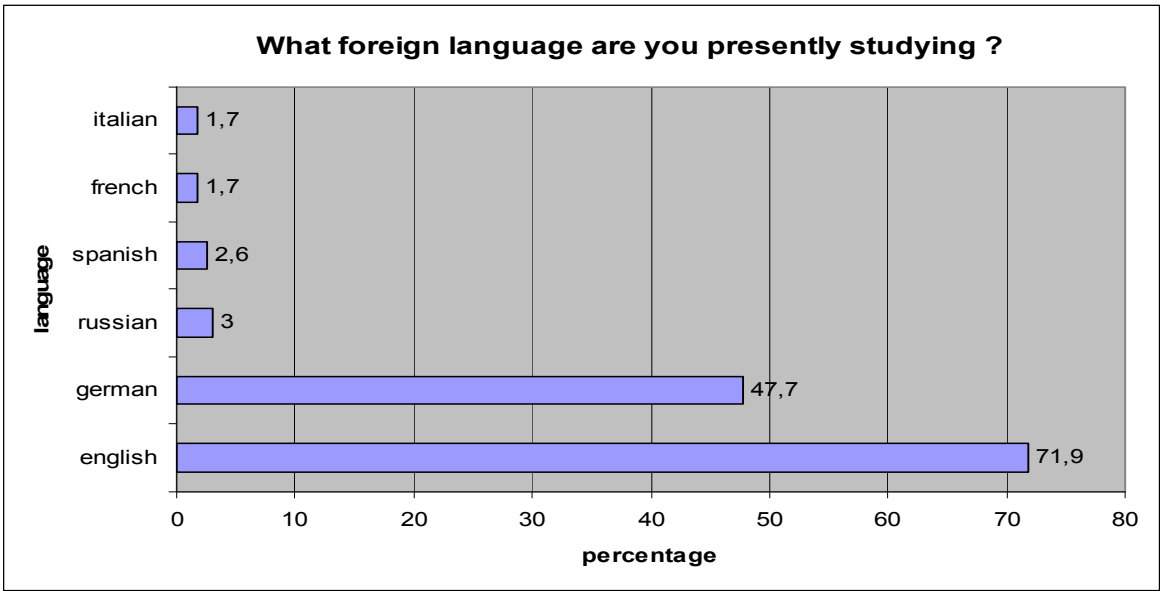
Chart 5: Use of foreign language by Slovak citizens (aged 15+)



Source: TNS SK face-to-face poll 1.017 respondents (July 2006)

[67] http://82.208.50.193/

Chart 6: Actual foreign language learning by Slovak citizens (aged 15+)



Source: TNS SK face-to-face poll 1.017 respondents (July 2006)

Due to minimal experience with eLearning in Slovakia at the present, the cost-effectiveness of eLearning courses can be discussed only with few organisations (some ministries, regional Governments or bigger private companies).

II.6. Specific issues and solutions

At present, the implementation of eLearning in Slovakia is significantly characterised by use of different LMS systems. A Survey of frequently used LMS systems in Slovakia is presented in Table 25.

Latest modern technologies like VRVS and EVO (in a testing phase) systems are operating through the existing SANET broadband infrastructure. Educational video/TV channels for universities are in preparation. Videoconference services as specific multimedia eLearning services are already regularly[68] provided for universities and research centres (mainly for the Slovak Academy of Sciences) on request. Specific projects focused on latest eLearning technologies have already been implemented (e.g. Castle[69] project). Some services have become standard services (the eLearning supply exists but the demand is not ready for large-scale use) – e.g. online video lectures for medicine students (cooperation between the Jessenius Faculty of Medicine in Martin and specialised hospitals, regular videoconference meetings between the Slovak Academy of Sciences in Kosice and CERN/Geneva, Switzerland), or for highly specialised medical centres in the area of burns and heart and lung diseases.

As far as informal learning for the general public is concerned, there are also some eLearning activities, such as the Slovak origin digital library project[70] or eLearning projects prepared by several NGOs. The Slovak origin digital library project called the Golden Fund (Zlaty fond) is being implemented by the Slovak Academy of Science together with the Slovak National Library, University Library Bratislava, Library of the blind and the SME daily.

[68] schedule of videoconferences - see http://vk.upjs.sk/kalendar/index.php?lang=eng
[69] e-Castle project (SANET), see also http://www.jfmed.uniba.sk/workshop/prezentacie/kohut/kohut.ppt#1
[70] see http://zlatyfond.sme.sk/dokument/o-projekte/

Several databases of eLearning courses provided by training institutions are available[71]. The following institutions are the most active in the area of lifelong learning, also making use of eLearning courses: ICV STU Bratislava, Technical University Zvolen and Technical University Kosice.

II.7. The acceptance and use of eLearning services

In Slovakia, there is no problem with the use of ICT by students, IT teachers, academics, employees in IT or telecom companies and young civil servants (Table 19). All other target groups have generally limited acceptance to the daily use of ICT. There is also a significant trend regarding older people: they face bigger problems when using ICT. Existing individual ICT skills increase individual ability to use eLearning.

Table 25: Use of PC and the Internet in Education (Slovakia 2001-2005)

Use of PCs in education	2001	2002	2003	2004	2005
% of teachers that have access to PC for teaching	28.69	33.46	39.88	54.02	71.94
% of students that have access to PC for studies	20	25	40	97	98
% of teachers that use PC for teaching	20	25	33	49	67
% of students that use PC for studies	18	23	38	95	96

Table 25: Use of PC and the Internet in Education (Slovakia 2001-2005) (cont.)

Use of the Internet in education	2001	2002	2003	2004	2005
% of teachers that have access to the Internet for teaching	25	30	35	50	60
% of students that have access to the Internet for studies	15	20	35	90	93
% of teachers that use the Internet for teaching	20	25	30	45	55
% of students that use the Internet for studies	13	18	33	88	90

Sources: Collected data from Infovek, Statistical Office, interviews with the most significant eLearning players, Internet research (monitoring of the Slovak press[72] during the period 2004-2006)

There is no official data about the demand for eLearning services by different target groups in Slovakia, but the current status of digital literacy (Table 19) can lead to the conclusion that the real demand is very small. Such a conclusion can be radically different only in the case of specific groups like students, teachers and highly educated people with fair personal ICT skills. In Tables 26 - 28, the development of PC and Internet use by students and teachers is presented. There is a gradual significant increase in both indicators in the above-mentioned target groups. An important result of such comparison is also a general trend seen in developed countries that students have much better personal ICT skills than their teachers. This fact dramatically increases pressure on teachers and the variability of their teaching methods.

Table 26: Computer penetration rates per 100 students and teachers (Slovakia 2001-2005)

Computer penetration rates per 100 students and teachers for different types of educational institutions; use for teaching and studying purposes	2001	2002	2003	2004	2005
Primary education (%)	0.84	1.05	1.32	3.41	3.66
secondary education (%)	1.47	1.85	2.04	5.70	6.15
tertiary education (%)	21.12	15.08	14.89	13.93	13.29
training institutions (%)	5	7	9	12	15

Sources: Collected data from Infovek, Statistical Office and interviews with the most significant eLearning players, Internet research (monitoring of the Slovak press)

[71] see e.g. http://www.kurzy.sk/en/menu/search?form=8 or http://search20.centrum.sk/s-5906000-odborne-kurzy?region=82

[72] e.g. ITAPA monitoring 2004-6 (http://www.itapa.sk/index.php?ID=41)

International comparison with EU15, EU25 and EU10 shows that in many indicators Slovak teachers are on the EU10 average level. A positive difference can be observed mainly in the use of materials available on the School's computer network and database. A higher negative percentage than the EU10 average were indicated in the percentage of teachers stating as a reason for not using computers in class the lack of adequate content/material or the lack of adequate computer skills. For more details see Table 28.

Table 27: Teachers using ICT (2006)

Percentage of teachers	**SK**	**EU15**	**EU25**	**EU10**
with no or close to no user experience	13	7	7	8
with novice ICT skills	3	11	11	13
with good ICT skills	30	12	42	41
who use existing online materials from established educational sources	72	76	74	62
who use materials available on the school's computer network and database	72	65	63	53
who use other learning material using computers in class	15	8	9	11
Percentage of teachers who or whose pupils use	**SK**	**EU15**	**EU25**	**EU10**
a computer in class	66	69	66	54
a computer in 5% of all lessons	17	19	19	15
a computer in 11 to 24% of lessons	21	22	22	22
a computer in 25 to 50% of lessons	28	20	20	24

Table 27: Teachers using ICT (2006) (cont.)

Percentage of teachers who have used a computer in the last 12 months	**SK**	**EU15**	**EU25**	**EU10**
to prepare lessons	80	89	89	90
in class	70	77	74	61
in class to present or demonstrate	66	65	63	56
Percentage of teachers stating as a reason for not using computers in class	**SK**	**EU15**	**EU25**	**EU10**
Lack of computers	49	49	49	49
Subject does not lend itself to being taught via computers	22	24	24	25
Lack of adequate content/material	32	22	20	17
Lack of adequate skills of teachers	22	27	23	10

Source: Benchmarking Access and Use of ICT in European Schools, 2006

Positive trends during the 2004-2005 period were indicated in the use of eLearning applications by Slovak enterprises for the purpose of training and education of their employees. International comparison (Table 29) with EU15 and EU10 shows that the business sector developed very progressively in connection with the total percentage of enterprises comparable even to the EU15 average, and there was also a perspective development in the category of enterprises with the internet access.

Table 28: Percentage of enterprises using eLearning applications for training and education of employees (2004-5)

Percentage of enterprises using e-Learning applications for training and education of employees	**year**	**SK**	**EU15**	**EU10**
Percentage of enterprises	**2004**	27	18	27
	2005	39	20	21.6
	2005/2004	+44.4%	+11.1%	-20%
Percentage of enterprises with Internet access	**2004**	39	20	32.5
	2005	42	21	25.4
	2005/2004	+7.7%	+5.0%	-21.8%

Source: Eurostat, 2005

II.8. The impact of eLearning developments

At present, in Slovakia the main positive impact of eLearning on the education system can be seen only in tertiary education, which is characterised by the highest level of eLearning projects already implemented. A gradual positive impact can be observed also in training at workplace by big companies and in the lifelong learning system provided by universities.

eLearning is gradually included in strategic Governmental documents (National Lisbon Strategy, education-related documents, etc.) as a significant and promising tool for the further development of education systems in Slovakia for all target groups. Generally, available statistical data indicates that the supply of eLearning in Slovakia is currently not well developed. Potential demand seems to exist, although there is no statistical data available which could demonstrate its extent. Currently, most interest seems to be in courses that are internationally certified.

Universities, some private education institutions and large enterprises (mainly with foreign investments) are the most active in the development of eLearning services in Slovakia. Public administration, primary and secondary schools and SMEs are still lagging behind. However, universities fall behind in eLearning content management, since human resources in this area require heavy funding, which cannot be covered by grants and state subsidies in many cases.

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

III.1. Summary of the current state and trends of eLearning developments

The following chapter assesses a current state and trends in eLearning on the national level as well as in international comparisons. The analysis is conducted based on the statistical data from international sources and data available for Slovakia (Statistical Annex).

Both for the current state and for trends, we first discuss Slovakia's strengths in comparison with the EU15 average, then in comparison with the NMS average and then in terms of national developments. This is always complemented by looking at Slovakia's weaknesses in comparison with the EU15 average, then in comparison with the NMS average and then in terms of national developments.

III.1.1. eLearning - current state

Statistical comparison and detailed comments of the current state of eLearning in Slovakia are included in Annex. The following **positive features** were observed in Slovakia in the area of eLearning:

In primary education:

- blended learning is regularly used for many years,
- INFOVEK activities (coordination, trainings for teachers and students) were developed,
- specific eLearning pilot projects are being implemented,
- private initiatives like a Slovak Telekom project supported higher computer penetration at primary schools.

In secondary education:

- blended learning is regularly used for many years,
- INFOVEK activities (coordination, trainings for teachers and students) were well developed,
- private initiatives like a Slovak Telekom or CNAP project support higher computer penetration and ICT skills at secondary schools,
- specific eLearning products (e-Economy) are available, several secondary school projects were implemented (Gymnasium in Michalovce - ICT, foreign languages and chemistry).

In higher education:

- multimedia technology and eLearning courses are regularly used in universities,
- SANET activities created technological infrastructure support for eLearning services,
- Since 1997 there has been CNAP (Cisco Networking Academy Program) implemented,
- Several specific university eLearning projects were implemented (e.g. VUDU project).

In training at the workplace:

- multimedia technology is regularly used,
- eLearning for trainings at the workplace are regularly implemented by big companies (Slovak Telekom, banks, etc.),
- few domestic eLearning products on CDs, DVDs and Internet designed for training and education can be used in the training of specific target groups,
- CNAP (Cisco Networking Academy Program) training are available,
- eLearning started to be an important training method for civil servants, several eLearning projects were implemented by central state administration institutions (eJustice, ECDL),

- Several eLearning projects organised by regional self-Government administrations were already implemented (e.g. a regional self-Government eLearning project for the region of Zilina, a specialised Virtual Academy project prepared by the regional self-Government for the region of Bratislava),
- Specific international cooperative eLearning projects (e.g. DILBAC – the banking sector in cooperation with universities).

In Life-long learning:

- the national life-long learning strategy was adopted by the Ministry of Education (December 2006),
- the National Centre of Distance Education was established in 1996,
- several universities have established lifelong training centres,
- multimedia technology is regularly used at training centres,
- Government initiatives, such as the DIGISTUR Project, support development of ICT literacy by citizens,
- CNAP (Cisco Networking Academy Program) training are available,
- the structure of eLearning products on CDs and DVDs for education and training is well developed (mainly foreign products, e.g. Czech eLearning products on CDs and DVDs can be also used by at least 42% of Slovak citizens aged 15+),
- few domestic eLearning products on CDs, DVDs and Internet designed for training and education can be used in the training of specific target groups (lifelong learning, at home),
- several educational institutions started to provide eLearning courses, e.g.: City University Bratislava (business programs), Transfer Slovakia (management, marketing, engineering), Academia Istropolitana Nova (postgraduate studies in economics, architecture, environmental policy, European studies, English language), Akademia vzdelavania (language, professional and spare time courses), Verlag Dashofer (IT skills, practical economy courses),
- few free of charge English training eLearning courses are available,
- the Government supports eLearning as an important method for the training of unemployed people and specifically disabled groups of people (SOP 2007-2013),
- several NGO eLearning projects (e.g. School for Young Rescuers, DIVES project) were already implemented.

In Slovakia in the area of eLearning the following **negative features** were observed:

In the general level of education:

- the information society framework is lagging behind the EU level (institutional, legal, financing matters),
- there is absence of the National eLearning Strategy, eLearning coordination at the national level (Government), and database of existing eLearning products designed for education and training.

In primary education:

- new legislation has not been adopted (Schooling Act),
- multimedia technology is not used by 70% of schools,
- broadband Internet access was not used by 65% of schools (2005),
- underestimated financing of primary schools (without private initiatives, such as the Slovak Telekom 2004 initiative, the situation would be much worse concerning the number of PCs and Internet connection for primary schools).

In secondary education:

- new legislation has not been adopted (Schooling Act),
- multimedia technology is not used by 45% of schools,
- broadband Internet access was not used by 5% of schools (2005),
- inadequate financing of secondary schools (without private initiatives, such as the Slovak Telekom 2004 initiative, the situation would be much worse concerning the number of PCs and Internet connection for secondary schools).

In higher education:

- inadequate financing of universities that causes the absence of modern/expensive latest eLearning systems at the majority of universities,
- generally poor skills in eLearning content development at universities.

In training at the workplace:

- poor implementation of eLearning by SMEs.

In Life-long learning:

- insufficient legislation for life-long learning,
- an inadequate portfolio of domestic eLearning products designed for training and education on CDs, DVDs and Internet are available.

III.1.2. eLearning - trends

A statistical comparison and detailed comments of trends in eLearning are included in Annex. The following **positive trends** were observed in Slovakia in the area of eLearning within the last few years:

In general level of education:

- the blended learning has been regularly used for many years,
- financing from EU funds was available also for eLearning.

In primary education:

- INFOVEK activities (coordination, trainings for teachers and students) were developed by several pilot projects,
- private initiatives (e.g. Slovak Telekom) improving computer penetration of schools created a potential for further development of eLearning,

In secondary education:

- INFOVEK activities (coordination, trainings for teachers and students) and specific secondary school projects were developed,
- new(er) multimedia technology available at the majority of schools,
- private initiatives (e.g. Slovak Telekom, CNAP) in computer and broadband Internet penetration of schools already supported potential development of eLearning.

In higher education:

- Multimedia technology is regularly used for teaching,
- SANET activities in technology infrastructure and several specific university eLearning projects significantly supported eLearning development.

In training at the workplace:

- Multimedia technology is regularly used for teaching in big companies,
- pilot eLearning projects at regional self-Government and state administration levels were implemented.

In Life-long learning:

- a coordination structure for distance education has been established and cooperation among lifelong training centres has developed,
- Multimedia technology is regularly used for teaching,
- several education centres started to provide eLearning courses,
- rapid foreign language skills development by youth creates a great potential for use of foreign eLearning products,
- growing usage of eLearning products on CDs, DVDs and Internet for training and education of specific target groups of people.
- several NGO eLearning projects are being implemented.

During the last few years **negative trends** in the area of eLearning are characterised mainly by the following facts:

In general level of education:

- the information society framework is lagging behind the EU level (institutional, legal, financing matters),
- there is absence of the National eLearning Strategy, eLearning coordination at national level (Government), and database of existing eLearning products designed for education and training,
- existing eLearning activities are very fragmented,
- ICT literacy at the general level is less developed than the EU15, EU25 average.

In primary education:

- minimal development in the new legislation has been observed (Schooling Act),
- slow development in the use of multimedia technology has been observed.

In secondary education:

- minimal development in the new legislation has been observed (Schooling Act),
- poor development of multimedia and broadband internet penetration in vocational training institutions.

In higher education:

- poor financial motivation for young academics to stay at universities to teach or deal with eLearning implementation,
- Content eLearning development was relatively poorly developed at the general level.

In training at the workplace:

- ECDL will not be compulsory for civil servants (from 2007 on),
- There is minimal development of eLearning projects and coordination for municipalities,
- poor development of GOVNET activities in eLearning has been observed.

In life-long learning:

- minimal development in the new legislation for life-long learning has been observed,
- slow development of domestic eLearning products on CDs, DVDs and Internet designed for training and education has been observed.

Table 29: Achievements and shortcomings in eLearning in Slovakia

eLearning	**MAIN ACHIEVEMENTS**	**MAIN SHORTCOMINGS**
areas covered	• Availability of CDs, DVDs, Video cassettes and Multimedia for eLearning in the market • LMS systems are frequently used • SES (Smart Enterprise Suites) are available	• Level of multimedia technology used at primary and secondary schools • Digital literacy is low • Low LCMS systems usage
content	Availability of following services in Slovak market: • foreign language courses in eLearning form (some free of charge) • natural science (physics, chemistry, etc.) • health-care trainings and fire protection at workplace trainings • IT topics (ECDL, CNAP) • specific topics taught by universities or training institutions in eLearning from	• Insufficient offer of topics for education and training of adults, the unemployed and specific target groups • free eLearning courses usually prove only basic skills and knowledge
interactivity	Availability of following services in Slovak market: • products for self-education • distance learning	• uniform access with same standard and quality for all participants without special features for gifted students

Table 29: Achievements and shortcomings in eLearning in Slovakia (cont.)

eLearning	**MAIN ACHIEVEMENTS**	**MAIN SHORTCOMINGS**
usage in different target groups	Availability of services for • employed people (large companies) • students (higher education and lifelong training) • business sector	Unsatisfactory usage of eLearning by • the unemployed • inactive population • SMEs • majority of primary and secondary schools
ICT infrastructure for eLearning	• multimedia technology is regularly used at universities and training centres • computer access rates for enterprises are high • computer penetration in training institutions is very high • increasing purchases of new PCs and especially branded PCs • SANET infrastructure for universities is at place • Solid broadband penetration for training institutions	• percentage of primary school teachers using PCs for education still low • computer penetration rates for primary and secondary schools still low • multimedia technology not used by 70% of primary and secondary schools • computer access rates for households still low • broadband penetration at primary and secondary schools still low • household broadband penetration still very low (compared to EU15, EU25 average)

III.2. Factors behind the existing developments

III.2.1. Economic factors

Recent macro-economic developments support dynamic growth and flexible market for all relevant actors in eLearning in Slovakia.

A general macroeconomic situation and economic growth lead to gradual increases in the purchasing power of both households and enterprises. In comparison to other European countries, the prices of ICT products (particularly computers) and services (especially Internet connection) are still relatively high when compared to the purchasing power, e.g. in July 2004 the maximum price for 1 Mbps broadband access was regulated by the French Government[73] at €18 (and 2 Mbps at €20), while in Slovakia the cheapest publicly available 2 Mbps access was still offered for €31 in January 2007.

Unemployment remains one of the Slovakia's most serious economic and social burdens. People without work among youth and minorities are of special concern, since workers under 29 years account for nearly half of the total unemployed population. Roma people, who constitute an estimated 5-10 percent of Slovakia's total population, are affected by unemployment rates as high as 90 percent in some areas. For many years Slovakia had the highest or one of the highest unemployment rates within EU25. Statistical data indicate that the majority of unemployed people do not use eLearning services.

III.2.2. Legal factors

Modern legislation already adopted (e.g. Higher Education Act in 2002) has allowed for rapid development of eLearning in higher education. Universities belong now to the most attractive users and providers in the field of education, using eLearning tools for their students and academic staff. Under the current legislation (Act on further/continuous education), several universities have already created their own distance learning and/or lifelong learning centres where they provide eLearning based on their practical experience in using eLearning for educating full-time university students. Other private training institutions also provide specific eLearning courses. eLearning providers are under the valid legislation obliged to receive accreditation for eLearning products if they want to deliver accredited education.

The existing eLearning development in higher education can also be positive inspiration also for a future Government legislative initiative aimed at preparing new legislation for primary and secondary schools (Schooling Act). It is specifically the area of primary and secondary education where the development of eLearning documentation (curricula) is very much requested by teachers, because the current teaching process is based on historical, well developed didactic and methodology documentation, which, however, does not take into account digital development and/or e-learning. New legislation and a new teaching reform are essential.

III.2.3. Policy factors

The national adoption of Information Society policy took place a few years later than in the other EU25 member states. The delay directly negatively influenced eLearning activities. A new schooling reform has been under preparation for many years (several versions of the new Schooling Act were prepared but not adopted by previous Governments).

Slow developments in the implementation of the Information Society policy at the central Government level in Slovakia in the past stimulated the private sector and civil society actors to initiate several own activities in eLearning. Public-private partnerships (e.g. CNAP and Slovak Telekom) or other NGOs projects focusing on education and training for all target groups (incl. the unemployed and the employed, the elderly, underachieving students, inactive people) have achieved many positive results. NGOs have started to play an important role in eLearning especially in areas where relevant Government activities have been missing (e.g. SANET and INFOVEK).

[73] ITAPA Information Society monitor (July 2004), see also http://www.itapa.sk/index.php?ID=265

III.2.4. Ethical factors

No specific ethical factors have been noted by experts interviewed. A relevant legal framework is already adopted in Slovakia (Copyright Act, Personal Data Protection Act).

III.2.5. Technological factors

The SANET[74] infrastructure for the university level is highly developed both in terms of quality and quantity (comparable to other foreign academic networks). The infrastructure is prepared for using the latest online eLearning products (including high-definition television). Several pilot modern eLearning technologies have already been tested (VRVS, EVO) – some of them have become standard services (see also chapter II.6). Universities are the most active players in providing online eLearning services in Slovakia. Different eLearning technologies are used - LMS based on the Open Source platform has been implemented by many universities.

Generally in Slovakia the Internet and broadband penetration is still very low compared to the EU25 level. The digital divide at regional level (mainly Presov and Banska Bystrica regions) and in specific target groups (the unemployed, the disabled, seniors, low-income families) is still persisting. The poor Internet and broadband penetration results in the minimal use of eLearning in terms of informal learning.

III.2.6. Socio-cultural factors

Slovakia traditionally belongs to the countries with a well developed educational system. But current teaching methods employed in primary and secondary education are based on conservative principles and already do not reflect modern supporting technologies. The legislation in force requires teachers to follow existing didactic and methodological documentation. eLearning is not implemented in the existing didactic and methodology documentation. A new schooling reform is still only in preparation.

Slovakia is relatively a small market, and many eLearning products are available in foreign languages. While there is generally a weaker offer of eLearning products in Slovak language on one hand, a good command (or comprehension) of Czech language by many people in Slovakia provides a good opportunity for eLearning offered in foreign languages (e.g. Czech and English languages) on the other hand. At the same time, the Hungarian minority is the Slovakia's biggest minority, so there is a large group of people able to use eLearning products in the Hungarian language.

III.2.7. Regional factors

EU funding is primarily focused on supporting less developed regions, helping to overcome regional disparities. Universities, schools, public administration authorities and enterprises located in such regions have already started to prepare specific eLearning activities and projects to be funded by the EU funds (a Lisbon Strategy priority).

Relatively slow development of the broadband infrastructure in suburban and mainly in rural areas creates problems of digital divide, which is also closely connected to the usage of eLearning as an informal learning tool.

Unemployment has an important regional dimension. From the regional perspective the regions with the highest unemployment rate are those of Banska Bystrica, Kosice, Presov and Nitra. On other hand, these regions have a sizable potential for the development and implementation of eLearning services for specific target groups.

III.2.8. Demographic factors

Typically the younger generation is much more familiar with ICT than older people. The young generation is able to bring new visions, dynamics, inspiration, and is able to use all kinds of ICT areas.

[74] SANET and eLearning, see also http://www.jfmed.uniba.sk/workshop/

eLearning is an area of ICT where a positive impact regarding the usage of modern technologies can be expected immediately upon creating a critical mass. The young generation and its rapid acquisition of ICT skills can create inspiration for specific target groups, such as physically disabled and socially disadvantaged citizens, inactive people, groups living in endangered regions and unemployed people. These are all target groups at which eLearning activities can be successfully aimed, thus developing crucial skills for their future employment or integration into the society.

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

III.3.1. Analysis of drivers

Inspirational and innovative leaders

Broadband infrastructure for the academic sector including all universities is solidly developed in Slovakia. The SANET project ranks among the best projects in terms of the Slovak eLearning infrastructure. It plays a key role in the high usage levels of eLearning services by universities in comparison with all other education and training institutions in Slovakia. INFOVEK project activities are among the most promising elements through which eLearning at primary and secondary schools can develop significantly in the future. While Government activities in the Information Society framework (including eLearning) have been insufficient, several eLearning activities with a wider impact and positive results have been prepared and implemented by NGOs (SANET, INFOVEK) or by public-private partnership projects (e.g. CNAP or the Slovak Telekom initiative for primary and secondary schools in 2004).

Macro-economic and global ICT development

The existing positive macroeconomic trends have already supported positive ICT development. All eLearning players can in the near future benefit from such developments. Digital literacy can also develop more rapidly and improve the ability to use eLearning services by the majority of citizens including the groups usually lagging behind in eLearning (mainly the unemployed, the disabled and the elderly).

Personal eDiscovery

For rapid development of eLearning it is also necessary - especially for specific target groups - to individually accept and discover the potential and impact ICT might have on their personality. “ICT-positive” groups like teachers, students, universities or IT companies can already provide inspiration in practical ICT usage on a daily basis for different kinds of specific target groups.

Effective funding and coordination

As with other eServices, EU structural funds for available for the 2007-2013 programming period will play a key role in supporting the development of eLearning. However, there is a potential threat that the use of funds will not be sufficiently coordinated and will lead only to fragmented improvements, which could result in duplicity and waste. Existing eLearning leaders/experts should be consulted in connection with the preparation of new programs or projects on the national level.

III.3.2. Analysis of barriers

Information Society lagging behind EU-average

The inefficient Information Society framework (institutional level, policy, actions) in Slovakia during the last 10-12 years has resulted in slow ICT development (but the expected future trend is positive) in the most important Information Society indicators compared with the EU15 or NMS average. The absence of synergy between the State Information Society Policy and the State Telecommunication Policy has also been present and caused contradictions in the practical implementation in some periods (e.g. insufficient regulation of former monopoly prices for the Internet vs. a declarative vision to ensure the cheaper, fast and secure Internet). In addition, due to these developments eLearning has not been a subject for discussion by the Government or the general public.

Passive public administration

In the area of eLearning the Government is still passive and none of the necessary strategic documents have been adopted (National Strategy for eLearning, Schooling Act). In addition, the Government has failed to stimulate public awareness of eLearning opportunities (e.g. key central Government institutions do not use eLearning on a regular basis in areas such as compulsory courses for employees, in health-care first aid and fire protection certification). The recent Government decision to cancel compulsory ECDL testing for civil servants only further underlines the predictable negative trend in this area. Former Governments have also lacked transparency in publicly sensitive areas such as Microsoft versus Open Source usage in state administration, or the contradiction between desired improvements in the telecom development presented in Governmental telecom policy documents versus the postponed liberalisation in the electronic communication sector. Government activities have also been significantly absent at primary and secondary schools. Future eLearning use on a wide level requires radical changes in relevant legislation (new Schooling Act), improvement in financing of primary and secondary education and creation of infrastructure support for schools similar to the existing SANET support for universities (because prices remain high due to the delayed telecom liberalisation). ICT developments have been slow in public administration at the municipal level – mainly in small villages. Civil servants in local municipalities should be trained in ICT, too. As soon as the digital literacy of civil servants from local Governments increases, eLearning products may enjoy wider usage by local Governments.

Digital divide

The existence of the digital divide poses a serious problem for wider adoption of eLearning. In Slovakia the digital divide can be seen at the regional level (urban – rural areas) and among specific target groups. The ageing of population requires the Government to take action focused on improvement of ICT skills in all disadvantaged groups of population. The existing high unemployment rate creates a potential for a number of people to be included in eLearning activities. But in practice the number of unemployed in eLearning programs will have to be limited due to the very low level of digital literacy among the majority of these people. In spite of positive macroeconomic developments during the past few years, the purchasing power of Slovak citizens is still much lower than the EU25 level.

Regional disparities

There are multiple factors affecting the creation and preservation of regional disparities in Slovakia. Among the most important factors relating to eLearning are: foreign direct investment, slow development of small and medium-size enterprises, innovation potential and qualifications, broadband Internet infrastructure and lesser activities of regional institutions regulating/promoting regional development.

EU structural funds absorption

Experience with the current structural funds programming period has shown that due to the limited capacity of public administration the focus was to use the available funds to the fullest possible extent without proper assessment of the quality of projects supported and their potential effects. In 2006 the Ministry of Education publicly announced that it needed to hire about 200 new employees to ensure effective planning and use of EU structural funding in the educational sector. Availability of significant amounts of funding for eLearning development therefore does not guarantee the availability of effective projects. In some situations the focus on obtaining and spending this type of funding can lead to multiple, overlapping projects with limited desired effects.

IV: ANALYSIS OF POLICY OPTIONS

The information society is not a goal but an instrument to develop knowledge-based society. Flexible learning represents a new philosophy of education with the focus on students. Electronic forms of education provide quick access to the information required. Thus the point of departure should be a new system of education and possibilities to attend trainings and courses via Internet services (eLearning). Although eLearning sets higher demands on computer skills and knowledge of students, it also offers alternative solutions in education.

The importance of eLearning should not be overestimated – one should rather search for efficient forms of its use. It is necessary to implement eLearning very sensitively, so that it turns out to be a useful tool. Availability of teaching resources is another principal question. It would be therefore essential to concentrate on creating the valuable teaching resources with multimedia elements and elaborating generally accessible archives of these resources. Under the teaching resources one understands the materials with multimedia elements, but also copies of video presentations, conferences, etc., which would subsequently be accessible via streaming technologies. Even, for example, live online broadcasts of videoconferences, virtual teaching infrastructures with interactive elements, distant access to laboratory equipment via Internet, various simulation environments should be considered as the teaching resources.

Internet availability is a pre-condition to develop eLearning services. In Slovakia there have been only recently some considerably positive developments in this area. However, the significance of a massive need for educating wider population in order to gain basic Internet skills is often being "overvalued", because people already acquire those skills "naturally". One "Internet literate"member of the family (e.g. a university student, or older pupil) is enough to naturally share the skills with other family members (i.e. it's highly probable the whole family learns how to use the Internet).

Inadequate domestic eLearning services offered in Slovakia can be overcome by products in foreign languages – here the most limiting factor is generally insufficient language skills required for foreign eLearning. As already described in Chapter II.5 due to the history of Slovakia there is quite a substantial group of people able to speak Czech and Hungarian while the knowledge of English is improving especially in the group of younger generation. This helps people in Slovakia to utilize not only Slovak but also foreign eLearning products.

IV.1. The most important policy objectives in Slovakia

In Slovakia, the most important policy objectives in eLearning are as follows:

- modern educational systems also for primary and secondary educational levels,
- flexible and effective training activities for all strata of population,
- practical lifelong learning implementation.

The Government should also ensure and use its legislative and financial instruments more efficiently in order to:

- ensure broadband Internet availability to all levels of society as well as to all country regions,
- motivate more efficient use of eLearning by educational institutions,
- foster lifelong learning of employees as a constant part of the important strategic decision-making process in the business sector (mainly by SMEs).

IV.2. Suggested policy measures

IV.2.1. Policy measures related to education and training system

The key mechanisms which are clearly related to necessary Government actions aiming at supporting further development of eLearning in Slovakia are as follows:

- Prepare and implement new legislation (mainly by new Lifelong Learning Act, new Schooling Act),
- Prepare and implement National eLearning Strategy, National/Regional/Local eLearning action plans,
- Improve broadband and multimedia infrastructure for primary and secondary school,
- Improve computer literacy of citizens and especially that of disadvantaged target groups.

The new legislation needs to be adjusted to define eLearning as an integral form of education.

The Government should foster the development of eLearning services mainly through consistent implementation of concepts already existing in this area (Information Strategy, National Broadband Strategy). The deficiency in the coordination of projects to support eLearning and the absence of the common use of former eLearning projects results have negative effects on the eLearning development in Slovakia. The Government provides funding, but the financial resources are distributed to many projects, each with fairly low funding, and the outcomes of such projects are used only by the project managers themselves without any real impact on wider society. Projects aimed at creating the content of multimedia should be carried out by teams of specialists in the relevant area and should be disseminated to be used for teaching countrywide, or their English translations could even be offered abroad. The coordination of eLearning activities must be guaranteed by the Government. The Government should also provide sufficient promotion, so that eLearning would not be perceived only as a trendy word to be included in all educational strategies, but it should rather support the implementation of eLearning in the process of efficient transformation of the Slovak educational system.

Before the implementation of eLearning processes at primary and secondary schools, specific supported training in the ICT field for the majority of teachers should take place. The INFOVEK project already provided such basic training for more than 80% of teachers. Multimedia technology has been already implemented at approx. 30% of primary and secondary schools, and hopefully the present Government will continue in this trend in the near future. For the majority of teachers at the university level, specific pedagogical training approaches utilizing the possibilities of new technologies (incl. eLearning) are essential.

For planning of eLearning at university levels the implementation of systematic approach from the very beginning should be strongly recommended, aimed also at possible utilisation of the developed eLearning activity not only by a specific department or faculty, but by the university as a whole. Such approach can save not only financial resources of the relevant university but also human resources required for the eLearning system implementation. In a short period it also creates positive multiplication effects by establishing similar and modern educational methods at university levels, not only in close technology-related faculties/departments that are often much more familiar and enthusiastic about eLearning, but also in other less technologically oriented faculties/departments. The described approach was successfully implemented at University of Zilina in 2003. Currently, its students are generally very familiar with LMS systems, they greatly accept it, and due to this approach even other than technological majors, i.e. majors dealing with management, economy or transport, became more attractive to students. At this university more than 200 courses are provided by eLearning, covering approximately 30% of the total of students at all faculties.

Well developed LMS eLearning systems give university managers (different access by the different level of management) a chance for immediate, permanent or ad-hoc control of the current status and quality of teaching processes in all eLearning subjects of study. In many cases such control, after the eLearning LMS system has been implemented, is not necessary - due to self-regulation and self-control by all teachers, who understand the potential of such control mechanisms - to permanently keep "teacher performance" at a high quality level. Many LMS systems are flexible and user-friendly also for teachers who have only basic computer skills.

Regarding the education of general public, the Government should prepare a general and systematic support of digital literacy and availability of free ICT courses on public administration portals. Thus the opportunity of affordable courses can help to overcome initial fear and insufficient self-confidence. Specific eLearning target groups such as the unemployed and the handicapped, requires a specific approach from the Government.

IV.2.2. Policy measures related to institutional framework

The current status of eLearning usage and expected quick and effective action by the Government should lead to the establishment of a permanent national eLearning committee as a sector policy advisory committee to the Minister of Education. This committee should consist of national experts representing all levels of the existing educational system who already have long-term personal experience with eLearning. The committee should be established under clear and transparent principles defined in the legislation.

Clear and effective network of guarantors of the eLearning implementation in primary, secondary, tertiary education and lifelong learning should be defined by the legislation. The INFOVEK project (State Institute of Information and Prognoses on Education), SANET and GOVNET should be transformed into legal forms which would provide them with more legal powers in coordination, control and decision-making processes regarding the eLearning implementation than they have now. The Government should create support for inclusion of regional, but mainly local self-Governments into eLearning processes available for civil servants. The institutional framework and areas of responsibility should then be divided as follows:

- INFOVEK for eLearning in primary and secondary education systems,
- SANET for eLearning in tertiary education system,
- GOVNET for eLearning in public administration (including self-Governments).

IV.2.3. Policy measures related to legal and regulatory questions

There is a necessity for the creation of a central database of eLearning projects and products already existing in the Slovak educational system, which have been up to now supported by means of public funds (state budget or EU funds). The central database of eLearning products should be publicly available, and it should serve as a tool for further acceleration of utilization of existing eLearning experience and products in the educational system. It can also serve as an eLearning knowledge database. The eLearning products included in such a database should be easily accessible by all educational institutions in Slovakia. Principles of creation, responsibility, rights and obligations of all relevant institutions related to such database should be defined by law.

For wider involvement of eLearning in the distance form of education at universities, lifelong learning institutions or at other levels of the educational system for physically disadvantaged people, it is necessary to prepare and adopt an eAuthentication regime. Such legislation and its implementation could solve the problem with certification procedure during exams. It is very important to solve this problem on legal bases as it will allow preparing more possibilities for education based on ICT solutions for specific target groups. Wider use of distance education via ICT would be welcome also by other groups of users (e.g. inactive women/men with small children at home), because it creates a more comfortable possibility of studying. The eAuthentication regime should employ the latest

technology solutions applying principles of current testing/certification procedures in the educational process in a new e-environment.

The quality of eLearning is still not a well-defined issue. Therefore the existence of rules and standards for eLearning products defined at least at the EU level would enable potential users to distinguish between particular products by their certified characteristics. This topic also requires discussion on the national level. Moreover, a system of accreditation and certification not only for schools but also for commercial products would be useful. Besides, some other relevant EU projects (like eUser) already define and underline that mechanisms for quality assurance, accreditation, certification and other related aspects of adult education need to be implemented. Consequently, people would be more motivated to participate in eLearning courses if there would be a chance to obtain certified education. Concurrently, certain certification or accreditation of courses would help employers with easier assessment of knowledge and skills of job applicants in a variety of fields.

IV.2.4. Policy measures related to fiscal questions

In the area of primary and secondary schools in Slovakia, it has been a long-lasting question of how to prepare a new modern, effective and permanently valuable educational system in the new age of information. The system should apply all necessary requirements for quality in the teaching of pupils, but it should be also widely supported and accepted by the general public (mainly parents of pupils) and it should be attractive for teachers too. Modern teaching methods are heavily supported by extensive eLearning implementation. Significant improvement in primary and secondary education systems is an essential issue for the near future in Slovakia. New Schooling reform should reflect the principles of Slovakia's Lisbon strategy and be supported by state budgetary policy. Ideas, developments and valid results of eLearning, delivered thanks to the SANET project, should be materialised in the solutions for further improvement of broadband access for primary and secondary schools.

In the education of specific target groups (such as the unemployed), the Ministry of Social Affairs, Labour and Family in cooperation with the Ministry of Education should start to support re-qualification ICT courses programs by a eLearning course (or a set of more structured courses), which would entail high primary investment, but much lower variable future costs. Relevant Government agencies should find sector policy solutions to how wide accreditation of eLearning products in Slovakia can be extended.

There is yet another policy challenge for public administration - to create higher motivation for teachers, because in the long run, inadequate remuneration of teachers is considered as one of the most serious problems of Slovakia's education. Its most negative implications include the unfavourable age structure of the teaching staff, the overwhelming dominance of female teachers over their male colleagues and the exodus of highly competent teachers in all age categories to more rewarding professions. Another step towards increasing attractiveness of the teaching profession for young teachers was approving a transfer of funds from the National Property Fund into the Loan Fund for Young Pedagogues, which is administered by the Students' Loan Fund. A desirable result of these measures is a moderate improvement in the social status of teachers and attractiveness of the teaching profession, particularly in poorer regions of Slovakia.

With the focus on attempts to minimise digital divide problem in Slovakia, quick implementation of all relevant topics, which had already been discussed at the EU level through former EU initiatives (eEurope/eEurope+; although the majority of them has not been implemented in Slovakia yet) would be essential. It will be necessary to re-open the question of how specific target groups can be supported in easier acquisition of cost-effective broadband access. This topic should be directly related to the budgetary state policy. The Government, which is responsible for postponed liberalisation of the telecom sector in Slovakia and its negative impact on broadband penetration and higher prices, should find financial solutions to minimise the negative impact of previous trends on the most disadvantaged social groups.

IV.2.5. Policy measures related to infrastructure and technology questions

Currently, the most sensitive problem of eLearning use at primary and secondary schools is still the low computer, Internet and broadband penetration. The Government should discuss the issue of preparing and implementing permanent broadband infrastructure access for primary and secondary schools under adequate quality and quantity parameters and at affordable prices. Ideas, developments and valid results regarding eLearning issues of the SANET project should provide similar solutions also for primary and secondary schools.

Another measure by which the state could spur the development of eLearning services and the use of ICT in general is the support of Open Source software usage at primary and secondary schools, at universities as well as at public administration institutions. The advantages of the Open Source software, besides its free acquisition, are especially in its flexibility and adjustability according to specific requirements that can be taken into account.

For the legal acceptance of eAuthentication it is essential to discuss also technological aspects of the eAuthentication system used in eLearning. It requires implementation of the latest technological solutions aiming for the application of principles of current testing/certification procedures in learning processes in a new e-environment. Besides legal problems, finding a technological solution for the eAuthentication, applied in the learning regime by personal e-cards that can generally be used in eGovernment G2C regime, is very important for wider participation of physically disadvantaged people in education. Pupils and students in the learning regime and adults in the lifelong training regime on one hand, and all relevant education and training institutions on the other, shall benefit from the eAuthentication too.

IV.2.6. Suggestions for practical implementation of recommended policy measures by public administration in Slovakia

Competencies of actors in the area of education and training at various levels of government (central state administration, regional self-Governments, local self-Governments) provided by valid legislation create different possibilities of how to set effective policy measures. The three levels of public administration in the country and the EU level should work together to meet technical, social, economic, security and institutional challenges for the development of eLearning services in Slovakia. For all levels of education and training the Ministry of Education plays the key role as a policy maker. Regional and local self-Governments have administrative, managerial and coordination competences for controlling primary and secondary schools (Table 31 and Table 32).

In order to further develop eLearning in the primary education system in Slovakia (see Table 31) there is a critical need to adopt new modern legislation (Schooling Act), National Strategy for eLearning and Action plan for eLearning with adequate financial resources. Practical implementation and general methodology should be provided for by the INFOVEK project (Institute of Information and Prognoses on Education). National Action Plan should be focused on pilot projects, regional and local Action Plans should support wide implementation of eLearning in regional and local schools. Regional and local public-private partnership projects in eLearning and broadband access should be fostered. Effective regional, local and cross-border coordination is necessary.

Table 30: Action Matrix for eLearning development in primary educational system in Slovakia

PRIMARY EDUCATION SYSTEM	EU level	Central Government	Regional Governments	Local Governments
Strategy	EU eLearning strategy EU eLearning Action plan	National Strategy for eLearning National Action Plan for eLearning	Regional Action Plans for eLearning (for relevant schools managed by regional Governments)	Local Action Plans for eLearning (for relevant schools managed by local Governments)
Implementation stage	Specific EU eLearning Programs (focused on specific EU pilot projects only)	eLearning Coordination for Regional Governments Controlling	eLearning Coordination for schools (managed by regional Governments) Controlling	eLearning Coordination for schools (managed by regional Governments) Project management support for schools (if required by schools)
Financing	Specific EU eLearning Programs funding	National Pilot eLearning Projects Programs Schemes eLearning Projects implemented within National Strategic Reference Framework Program (2007-2013)	Regional Financing Schemes Regional public-private partnership projects of eLearning projects Local public-private partnership for broadband projects (broadband access of relevant schools) Controlling	Local public-private partnership of eLearning projects Local public-private partnership for broadband projects (broadband access of relevant schools)
Legislation		New Schooling Act National methodology support for eLearning	Regional methodology support for eLearning	
Regulation		General Decree for eLearning Accreditation procedures	Regional tender procedures for schools (managed by regional Governments)	Local tender procedures for schools (managed by local Governments)
Institutional framework		National Coordinator (INFOVEK)	Coordination with regional infrastructure players	Coordination with local infrastructure players
Infrastructure and technology		National cooperation between INFOVEK and infrastructure operators operating on national level International and national coordination for schools (if required by schools)	Regional cooperation with infrastructure operators operating on regional level Cross-border coordination on regional level for schools (if required by schools)	Local cooperation with infrastructure operators operated on local level Cross-border coordination on local level for schools (if required by schools)

The similar principles valid also for further eLearning development in the secondary education system in Slovakia (see Table 32). It is also necessary to adopt as soon as possible modern legislation in this area (Schooling Act), National Strategy for eLearning and Action plan for eLearning with adequate financial resources. Practical implementation and general methodology should be provided for by the INFOVEK project (Institute of Information and Prognoses on Education). National Action Plan should be also focused on pilot projects, regional and local Action Plans should support wide implementation of eLearning in regional and local schools. Regional and local public-private partnership projects in eLearning and broadband access should be required. Effective regional, local and cross-border coordination is necessary. Transfer of know-how from the university level to primary and secondary education is essential in the eLearning area.

Table 31: Action matrix for eLearning development in secondary educational system in Slovakia

SECONDARY EDUCATION SYSTEM	EU level	Central Government	Regional Governments	Local Governments
Strategy	EU eLearning strategy EU eLearning Action plan	National Strategy for eLearning National Action Plan for eLearning	Regional Action Plans for eLearning (for relevant schools managed by regional Governments)	Local Action Plans for eLearning (for relevant schools managed by local Governments)
Implementation stage	Specific EU eLearning Programs (focused on specific EU pilot projects only)	eLearning Coordination for Regional Governments Controlling	eLearning Coordination for schools (managed by regional Governments) Controlling	eLearning Coordination for schools (managed by regional Governments) Project management support for schools (if required by schools)
Legislation		New Schooling Act National methodology support for eLearning	Regional methodology support for eLearning	
Regulation		General Decree for eLearning Accreditation procedures	Regional tender procedures for schools (managed by regional Governments)	Local tender procedures (for schools managed by local Governments)
Financing	Specific EU eLearning Programs funding	National Pilot eLearning Projects Program Schemes eLearning Projects implemented within National Strategic Reference Framework Program (2007-2013)	Regional Financing Schemes Regional public-private partnership projects of eLearning projects Local public-private partnership for broadband projects (broadband access of relevant schools) Controlling	Local public-private partnership of eLearning projects Local public-private partnership for broadband projects (broadband access of relevant schools)
Institutional framework		National Coordinator (INFOVEK)	Coordination with regional infrastructure players	Coordination with local infrastructure players

Table 31: Action matrix for eLearning development in secondary educational system in Slovakia (cont.)

SECONDARY EDUCATION SYSTEM	EU level	Central Government	Regional Governments	Local Governments
Infrastructure and technology		National cooperation between INFOVEK and infrastructure operators operating on national level International and national coordination for schools (if required by schools)	Regional cooperation with infrastructure operators operating on regional level Cross-border coordination on regional level for schools (if required by schools)	Local cooperation with infrastructure operators operating on local level Cross-border coordination on local level for schools (if required by schools)

In the area of higher education (see Table 33), regional self-Governments and local self-Governments can play an important role as eLearning coordinators in the cases of cooperation between relevant primary and/or secondary schools and universities. Also close cooperation between SANET and INFOVEK and infrastructure operators operating on the national level is required.

Table 32: Action matrix for eLearning development in higher educational system in Slovakia

HIGHER EDUCATION SYSTEM	EU level	Central Government	Regional Governments	Local Governments
Strategy	EU eLearning strategy EU eLearning Action plan	National Strategy for eLearning National Action Plan for eLearning		
Implementation stage	Specific EU eLearning Programs (focused on specific EU pilot projects only)	eLearning Coordination for Regional Governments Controlling	eLearning Coordination between university and secondary schools eLearning Coordination between university and primary schools (managed by regional Governments)	eLearning Coordination between university and primary schools (managed by local Governments)
Legislation		Act on Higher Education (amendment if it is required by National eLearning Strategy) National methodology support for eLearning		

Table 32: Action matrix for eLearning development in higher educational system in Slovakia (cont.)

HIGHER EDUCATION SYSTEM	EU level	Central Government	Regional Governments	Local Governments
Regulation		General Decree for eLearning Accreditation procedures	eLearning Coordination between universities and secondary schools eLearning Coordination between primary schools (managed by regional Governments)	eLearning Coordination between universities and primary schools (managed by local Governments)
Infrastructure and technology		National cooperation between SANET and INFOVEK and infrastructure operators operating on national level International and national coordination for schools (if required by university)	Regional cooperation with infrastructure operators operating on regional level Cross-border coordination on regional level for schools (if required by universities or schools)	Local cooperation with infrastructure operators operating on local level Cross-border coordination on local level for schools (if required by universities or schools)
Financing	Specific EU eLearning Programs funding	National Pilot eLearning Projects Programs Schemes eLearning Projects implemented within National Strategic Reference Framework Program (2007-2013)	Regional Financing Schemes supporting eLearning cooperation between universities and secondary schools Regional Financing Schemes supporting eLearning cooperation between universities and primary schools (managed by regional Governments) Regional public-private partnership projects of eLearning projects Local public-private partnership for broadband projects (broadband access of relevant schools)	Local Financing Schemes supporting eLearning cooperation between universities and primary schools (managed by local Governments) Local public-private partnership of eLearning projects Local public-private partnership for broadband projects (broadband access of relevant schools)

In lifelong learning it is the Ministry of Labour, Social Affairs and Family (state social and employment policy) together with its local Offices of Labour, Social Affairs and Family located in each district of the Slovak Republic that play a central role - besides the Ministry of Education (Table 35). They should help regional self-Governments and local self-Governments to act as eLearning coordinators in the cases of cooperation between relevant accredited training institutions providing accredited eLearning courses within the scope of training activities organised, managed and financed by the State Social Policy and State Employment Policy. Furthermore, it is essential to secure transfer of know-how in the eLearning area from the university level to accredited training institutions providing eLearning courses within the scope of training activities organised, managed and financed by the State Social Policy and State Employment Policy and also cooperation with relevant primary

and secondary schools located in the same municipality or nearby (Table 34).

Table 33: Action matrix for eLearning development in lifelong learning system in Slovakia

LIFELONG LEARNING SYSTEM	EU level	Central Government	Regional Governments	Local Governments + local Social and Labour Offices
Strategy	EU eLearning strategy EU eLearning Action plan	National Strategy for eLearning National Action Plan for eLearning National Strategy for lifelong learning	Regional eLearning policy for lifelong learning (incl. eLearning target groups) Regional eLearning Action Plan	Local eLearning policy for lifelong learning (incl. eLearning target groups) Local eLearning Action Plan
Implementation stage	Specific EU eLearning Programs (focused on specific EU pilot projects only)	eLearning Coordination for accredited training institution (incl. also state social and employment policy responsibilities) Controlling	eLearning Coordination for regional education organizations (if required by institutes)	eLearning Coordination for local education organizations (if required by institutes)
Legislation		New Act on Lifelong Learning National methodology support for eLearning	Regional eLearning methodology	Local eLearning methodology
Financing	Specific EU eLearning Programs funding	National Pilot eLearning Projects Programs Schemes eLearning Projects implemented within National Strategic Reference Framework Program (2007-2013) State Social Policy Program Schemes State Employment Policy Program Schemes	Regional Financing Schemes supporting eLearning cooperation between accredited training institutions and secondary schools Regional Financing Schemes supporting eLearning cooperation between accredited training institutions and primary schools (managed by regional Governments) Regional public-private partnership projects of eLearning projects for accredited training institutions Local public-private partnership for broadband projects (broadband access of accredited training institutions) Private financial resources (large enterprises and SMEs)	Regional Financing Schemes supporting eLearning cooperation between accredited training institutions and primary schools (managed by local Governments) Local public-private partnership projects of eLearning projects for accredited training institutions Local public-private partnership for broadband projects (broadband access of accredited training institutions) Private financial resources (large enterprises and SMEs)

Table 33: Action matrix for eLearning development in lifelong learning system in Slovakia (cont.)

LIFELONG LEARNING SYSTEM (cont.)	EU level	Central Government	Regional Governments	Local Governments + local Social and Labour Offices
Regulation		General Decree for eLearning Accreditation procedures	Regional tender procedures	Local tender procedures
Infrastructure and technology			Regional cooperation with infrastructure operators operating on regional level for accredited training institutions (if required by institution) Cross-border coordination on regional level for schools (if required by training institution)	Local cooperation with infrastructure operators operating on local level for accredited training institutions (if required by institution) Cross-border coordination on local level for accredited training institutions (if required by training institution)
Institutional framework		National Coordinator (it should be decided between SANET or National eLearning Committee for lifelong learning)		

V: MAJOR R&D CHALLENGES FOR E-LEARNING

In Slovakia, different sectors have seen differing levels of implementation of eLearning services. The present chapter reviews future R&D challenges expected in Slovakia based on information collected by the author and interviews with experts.

A serious problem needs to be resolved in terms of legal, technological and educational issues for children aged less than 15 years. At present, young people spend more time on the Internet than watching television. They are exposed to a variety of content, including pornography and according to statistics in some EU member states as many as one in three children participating in discussion forums have been the subject of sexual advances.

In a number of aspects of eLearning, the challenges for Slovakia are shared with other EU member states. One of the advantages in areas where Slovakia is a laggard is the opportunity for policy learning from countries, which have advanced further and addressed similar challenges over recent years.

V.1. Technological and non-technological developments and challenges

V.1.1. Technological developments and challenges

Off-line eLearning is already generally implemented in all types of education or trainings. However, **more extensive implementation should be a key priority in primary and secondary education** and in **trainings for civil servants** (mainly at the local level) **and specific target groups** (unemployed, handicapped people). Research work is required to identify the needs and prepare both basic training in this area for teachers and trainers as well as advanced training tailored to their specific needs.

In Slovakia, more attention should be paid to the development of **basic ICT skills** (digital literacy) for citizens in general as well as for specific groups including civil servants and groups at risk of finding themselves on the wrong side of the digital divide (the unemployed, people with disabilities, employed people not working with IT, older people). With changing technologies and modes of their use, it is important to pay attention in research to both identifying needs and appropriate means of improving ICT skills. With increasing digital literacy of citizens it will be easier to prepare flexible trainings or re-education of specific target groups by relevant public administration organisations (Labour Offices, public administration on all levels) or employers in the private sector.

The following areas need to be tackled in the near future to respond to technological challenges in the field of eLearning:

- **metadata concept** should be developed for creation of (a) central eLearning database for wide usage by primary and secondary schools and with direct open access by primary and secondary schools with specific methodology support for teachers should be involved and (b) digital libraries for different levels of education systems,
- **interoperability of eLearning systems** must be introduced (it should increase effectiveness and balanced eLearning usage by primary and secondary schools in all regions aiming to provide unified educational quality everywhere),
- **user-friendly technology accessibility for physically disabled people** should be introduced aiming to ensure better and more flexible individual education or trainings.

V.1.2. Non-technological challenges

It would be essential to concentrate on creating **valuable teaching resources with multimedia elements** and on elaborating generally **accessible archives of these resources**. The teaching resources should embrace materials with multimedia elements, but also copies of video presentations, conferences, etc., which are subsequently accessible via streaming technologies. Furthermore, the teaching resources should include inter alia live on-line broadcasts of videoconferences, virtual teaching infrastructures with interactive elements and distant access to laboratory equipment via Internet or various simulation environments.

Here are other topics, which need to be addressed in order to facilitate eLearning development in Slovakia:

- improvement in **digital rights management** (ensuring practical implementation for primary and secondary schools and methodology support for tertiary education or lifelong learning),
- **eLearning content** creation and management (ensuring practical implementation for primary and secondary schools and methodology support for tertiary education or lifelong learning),
- study of **optimal teaching methods** for pupils of different ages in primary education, for different kind of secondary education regimes (gymnasia, vocational schools), for different kinds of study topics aiming at increasing effective use of the existing SANET infrastructure potential in tertiary education and optimal training methods for different kinds of specific target groups (the unemployed, the disabled, the elderly) within state social and employment policy,
- development of **eLearning documentations** (curricula) and didactic and methodology focusing on effective eLearning incorporation into teaching methods in primary and secondary schools (**eDidactic and eMethodology problems)**,
- **eLearning management for Municipality level** should be put in place (it should increase effectiveness and balanced eLearning usage by local, regional and central public administration institutions in all regions aiming to ensure high-trained civil servants),
- improvement of **higher education of new teachers** implementing new eLearning approaches,[75]
- preparation of an **eLearning awareness campaign** for all relevant targeted groups in society.

V.2. Financing issues and challenges

Relatively high primary investment into the implementation of eLearning (e.g. learning management system) remains an important challenge for schools, universities and many small and medium size enterprises.

In off-line eLearning in primary and secondary education necessary improvement in computer, multimedia and broadband penetration is still essential for the next few years. New systematic approach trying to prepare quality broadband infrastructure for primary and secondary schools also **needs further substantial investments**. At the same time **financial resources** should be allocated **for further ICT training of teachers**. On the **public administration** level new approach in lifelong training should result in financing ICT courses at least for civil servants. Improvement of digital literacy in specific target groups within the state social and employment policy framework should be backed by adequate **budgetary support**.

In eLearning online it is necessary to prepare financial resources equal to what has been already invested in ICT development. Besides more finances allocated from the state budget or from active and effective drawing of EU Structural Funds, there are also other solutions such as **public-private**

[75] http://www.edi.fmph.uniba.sk/tmp/asset_cache/link/0000017361/04-Elearning_v_priprave_buducich_ucitelov.pdf

partnership frameworks and wide use of eLearning based on Open Standard platform (GNL). The mix of all the above mentioned alternatives seems to be the best solution to deal with an immense need for investments into ICT.

V.3. Privacy, identity and security aspects

V.3.1. Privacy aspects and challenges

In Slovakia, the privacy regime is regulated mainly by Personal Data Protection Act and by the Antispam Act. Privacy problems in usage of eLearning are the same as privacy problems in Internet usage in general, because online eLearning is the learning based on the Internet. For users older than 15 years (15 years is the age when a citizen starts to be legally responsible in Slovakia) the existing regulatory regime could ensure standard protection, legal rights and legal obligations. **For pupils and students at primary and secondary schools** should be prepared a **specific topic** focused **on legal protection against potential illegal activities provided via the Internet** with the purpose of better education and protection as well as being ready for the safe use of internet services for self-study or learning.

Currently in Slovakia there exists only a single Slovak portal dealing with issues of protecting children in online communication (Safety Resource Centre from Microsoft[76]). According to the interviewed experts, more Government actions to improve awareness in this area are needed in order to minimise the risk of future incidents that would reduce public trust.

In Slovakia, in primary and secondary education it is quite common that children have higher computer literacy than their parents and teachers. **Parents and teachers need to be informed how to protect the children from illegal and harmful content** on the Internet – at home but also at school. In this field several interventions at the Government level should be launched. For example **specific compulsory teaching topics for primary and secondary schools** included as a standard and regular information regime for youth, which should be focused on personal behaviour on the Internet aiming to protect children against child pornography and paedophilia. Further legal measures could be also helpful, for instance adopting a **Children's Online Privacy Protection Act in Slovakia**. It is also strongly recommended to employ only **off-line eLearning content in education of children aged less than 10 years**. More active public awareness formed and supported on the Government level should help to create an adequate public environment to protect the young generation against illegal and harmful content on the Internet.

V.3.2. Identity aspects and challenges

For wider involvement of eLearning in distance education at universities, lifelong learning institutions or in other levels of education system working with disabled people it is necessary to **prepare and adopt** a comprehensive **eAuthentication regime**. Such legislation and its implementation could solve the problem with certification procedures during exams. It is very important to solve this problem on a legal basis as it will enable to arrange more opportunities for education based on ICT solutions for specific target groups.

V.3.3. Security aspects and challenges

In Slovakia, the security regime in eLearning based on the Internet is regulated mainly by the Electronic Communications Act, by the Personal Data Protection Act and by the Antispam Act. For the time being, the present legal framework seems to provide enough security for eLearning applications, according to the experts interviewed. However, with the new requirements for further eLearning application in primary and secondary schools, the problems of **security of central eLearning metadatabases and local eLearning databases** including personal identity of pupils and students can be identified as a challenge for further R&D.

[76] see http://www.msn.sk/security/family/

LIST OF REFERENCES

1	Academy of Education Bratislava, 2006	Training programs and courses (online)
2	Academy of Education Bratislava, 2006	search (web, interviews)
3	Catholic University Ruzomberok , 2006	eLearning portal
4	CISCO Corp. 2006, 2006	business sector: CISCO : CNAP (Cisco Network Academic Program)
5	Dashofer Verlag Bratislava 2006	eLearning portal (individual interviews)
6	Divadelna fakulta VŠMU Bratislava 2006	Project VUDU
7	Druga, P. , Svoboda, J.(ISSS 2006 Conference, Hradec Kralove, Czech Republic)	Porovnání využití IT ve VS v zemích Vyšegradské čtyřky (presentation)
8	Empirica	Gesellschaft fur Kommunikations- und Technologieforschung mbH. 2003.
9	European Commission 2006:	EUROPEAN ELECTRONIC COMMUNICATIONS REGULATION AND MARKETS 2005 (11TH REPORT)
10	European Commission DG Education and Culture, 2006:	Detailed Analysis of Progress Towards the Lisbon Objectives in Education and Training, 2006 Report
11	European Commission, 2006:	PROGRESS TOWARDS THE LISBON OBJECTIVES IN EDUCATION AND TRAINING
12	EUROSTAT 2006	statistics (web)
13.	House of Europe (NGO)	DIVES program
14	IBM/Pricewaterhouse Coopers 2002-2004	4 Monitoring reports for the European Commission (2001-2003)
15	IMINERVA 2005-6	search (web, interviews)
16	INFOSTAT web (2003)	INFOSEM 2006 (conference documentation)
17	Infovek 2007	search (web, interviews)
18	Institut pre verejne otazky (Institute of Public Affairs) 1998	Slovakia - A Global Report on the State of Society (1997)
19	Institut pre verejne otazky (Institute of Public Affairs), 1999	Slovakia - A Global Report on the State of Society (1998-9)
20	Institut pre verejne otazky (Institute of Public Affairs), 2000	Slovakia - A Global Report on the State of Society (2000)
21	Institut pre verejne otazky (Institute of Public Affairs), 2001	Slovakia - A Global Report on the State of Society (2001)
22	Institut pre verejne otazky (Institute of Public Affairs), 2002	Slovakia - A Global Report on the State of Society (2002)
23	Institut pre verejne otazky (Institute of Public Affairs), 2003	Slovakia - A Global Report on the State of Society (2003)
24	Institut pre verejne otazky (Institute of Public Affairs), 2004	Slovakia - A Global Report on the State of Society (2004)
25	Institut pre verejne otazky (Institute of Public Affairs), 2005	Slovakia - A Global Report on the State of Society (2005)
26	Institut pre verejne otazky (Institute of Public Affairs), 2007	Slovakia - A Global Report on the State of Society (2006)
27	ITAPA 2007	Knowledge Economy monitor (2004-2007)

28	ITAPA 2007	knowledge database for Information Society and knowledge economy (online)
29	ITAPA 2007	eGovernment monitor (2004-2007)
30	ITAPA 2006	eGovernment Conferences documentations (2002-2006)
31	ITAPA 2007	Information Society monitor (2004-2007)
32	Komisia Európskych spoločenstiev, 2005:	Pracovný dokument personálu komisie k európskemu kvalifikačnému rámcu pre celoživotné vzdelávanie
33	MINERVA project 2006	search (web, interviews)
34	Ministerstvo skolstva 2006	National Strategy for Lifelong Learning (2006)
35	Ministerstvo školstva SR, Bratislava, apríl 2005	Správa o vzdelávacej politike (Národná správa o napĺňaní cieľov pracovného programu Európskej komisie Vzdelávanie a odborná príprava 2010)
36	Ministerstvo školstva SR, Európska komisia, 2001:	Memorandum o celoživotnom vzdelávaní, Konzultačný proces,
37	Ministry of Construction and Region Development, 2003	National Development Plan (2003)
38	Ministry of Construction and Region Development, 2003-2006	Sector Operational Program for Human Resources (2003)
39	Ministry of Construction and Region Development, 2003-2006	National Strategic Reference Framework (adopted in December 2006) for SF programming 2007-2013
40	Ministry of Education 2002-6	web search (strategic documents)
41	Ministry of Finance 2005	Strategy of Competitiveness until 2010 (National Lisbon Strategy)
42	Ministry of Social Affairs and Family 2005	Action Plan for Education and Employment of the National Lisbon Strategy (July 2005)
43	Ministry of Social Affairs and Family 2005	The MINERVA Action Plan for Education and Employment
44	Ministry of Social Affairs, Labour and Family (2005)	web search (state social and employment policy)
45	Ministry of Transport, Posts and Telecommunications 2005	Action Plan for Information Society of the National Lisbon Strategy (July 2005)
46	Ministry of Transport, Posts and Telecommunications 2005	National Information Society Action Plan (2004)
47	Ministry of Transport, Posts and Telecommunications 2005	Internet for Education
48	National Bank of Slovakia	DILBAC project
49	NETIES project	NETIES project - statistics 2004-6
50	OECD, 2005:	Education at a Glance, 2005
51	OECD. 2005.	OECD Broadband Statistics [online]
52	Rescue Team Slovakia (NGO)	NGO: - School for Young Rescuers
53	SANET	e-Castle project
54	SANET 2006	SANET web search, interviews
55	SANET Association	SANET project
56	Self-Government region of Bratislava	Public Administration: Virtual Academy
57	SIBIS 2003	Statistics(2001-3) online
58	Sirak, M.; Salner, A.; Druga, P., IPTS, Sevilla, Spain, 2004:	Factors and Impacts in the Information Society – A Prospective Analysis in the Candidate Countries: Report on Slovakia

59	Slovak Government 2006	Government Manifesto (August 2006)
60	Slovak Ministry of Transport, Posts and Telecommunications 2000-6	web search (state telecommunication policy 1995 - 2006)
61	Slovak Spectator – February 6, 2006	Slovakia is educated
62	Slovak Spectator, October 2005:	Digital literacy low in Slovakia
63	Slovak Statistical Office	SLOVDATA system
64	Slovak Telekom a.s.	business sector: Slovak Telekom: eLearning – Tomorrow is Today
65	Slovenska informaticka spolocnost	ECDL training
66	SME daily	Digital Library Portal
67	SME daily, Dec.15, 2006 :	Vynikajúce skúsenosti s eLearningom má Katedra divadelnej vedy VŠMU
68	SME daily, Sept.13, 2005:	Slováci úspešní na olympiáde
69	SME, October 2005:	Počítač používa v SR pravidelne 31,6% občanov, Internet 20,5%
70	SME, October 2005:	Počítač používa v SR pravidelne 31,6% občanov, Internet 20,5%
71	Statisticky urad, 1996-2006	Statistical yearbook of the Slovak Republic 1995 - 2005
72	TNS Factum Slovakia	public available results of research (2004-6)
73	TNS SK	face-to-face poll 1.017 respondents (July 2006)
74	UMB University	eLearning portal
75	UNESCO 2006	web search (statistics 2000-2004)
76	University of Zilina	eLearning portal (testing access)
77	Ústav informacií a prognóz školstva (Institute of Information and Prognoses on Education)	INFOVEK project (statistics, documents, reports)
78	Ústav informacií a prognóz školstva (Institute of Information and Prognoses on Education)	DIGISTUR Project (Digitalni Sturovci Project)
79	Zbierka zakonov (Legal Journal Slovakia)	Schooling Act
80	Zbierka zakonov (Legal Journal Slovakia)	Higher Education Act
81	Zbierka zakonov (Legal Journal Slovakia)	Act on Further (continuous) Education
82	Zbierka zakonov (Legal Journal Slovakia)	Act on Civil Service
83	Zbierka zakonov (Legal Journal Slovakia)	Act on Employment
84	Zbierka zakonov (Legal Journal Slovakia)	Copyright Act
85	Zbierka zakonov (Legal Journal Slovakia)	Personal Data Protection Act
86	Zbierka zakonov (Legal Journal Slovakia)	Electronic Communications Act

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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, Slovakia.

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.

The mission of the JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union. Close to the policy-making process, it serves the common interest of the Member States, while being independent of special interests, whether private or national.