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

AUTHOR: VASJA VEHOVAR

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European Commission
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Contact information
Address: Edificio Expo. c/ Inca Garcilaso, s/n. E-41092 Seville (Spain)
E-mail: jrc-ipts-secretariat@ec.europa.eu
Tel.: +34 954488318
Fax: +34 954488300

http://ipts.jrc.ec.europa.eu
http://www.jrc.ec.europa.eu

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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

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

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

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

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

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

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

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

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

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

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 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 eGovernment, 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 Slovenia

This report was produced by the University of Ljubljana, the consortium member from Slovenia, and it presents the results of the research on eLearning in Slovenia.

First, the report describes Slovenia'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 Estonia, 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).

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

APEK	Post and Electronic Communications Agency of the Republic of Slovenia
ARNES	Academic and Research Network of Slovenia
CMEPIUS	Centre for Mobility and European Education and Training Programmes
CMS	Course Management System
CORDRA	Content Object Repository and Registration Architecture
EB	Eurobarometer
ECDL	European Computer Driving Licence
ECTS	European Credit Transfer System
EDI	Electronic Data Interchange
EPICT	European Pedagogical ICT Licence
ETS	Educational Testing Service
EU	European Union
EU15	15 European countries (before ten new Member States joined the EU)
EU25	25 European countries (before Romania and Bulgaria joined the EU)
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
HE	Higher Education
IAEA	International Association for Educational Assessment
ICEG EC	International Centre for Economic Growth, European Centre
ICT	Information and Communications Technology
ILO	International Labour Organisation
IPTS	Institute of Prospective Technological Studies
ISCED	International Standard Classification of Education
ISDN	Integrated Services Digital Network
IT	Information Technology
LAN	Local Area Network
LCMS	Learning Content Management Systems
LFS	Labour Force Survey
LMS	Learning Management System
LP	Learning Platform
LRE	Learning Resource Exchange
LSS	Learning Support System
LTFE	Laboratory for Telecommunications at the Faculty of Electronic Engineering
MBA	Master of Business Administration
mGBL	mobile Game-Based Learning
MIRK	Society for Project and Research Work on the Internet
MLE	Managed Learning Environment
MST	Math, Science and Technology
NAPs/inclusion	National Action Plan on Social Inclusion
NATO	North Atlantic Treaty Organisation
NMS	New Member States
OECD	Organisation for Economic and Co-operation and Development
PHARE	Poland and Hungary: Assistance for Restructuring their Economies
PPP	Public Private Partnership
PPS	Purchasing Power Standard
RIS	Research on Internet in Slovenia
RO	Computer Literacy Programme
SCORM	Sharable Content Object Reference Model
SI	Slovenia

SIBIS	Statistical Indicators Benchmarking the Information Society
SMEs	Small- and medium-sized enterprises
SURS	Statistični urad Republike Slovenije (Statistical Office of the Republic of Slovenia)
UK	United Kingdom
US	United States
USA	United States of America
VLE	Virtual learning environment
WebCT	Web Course Tools
WLAN	Wireless local area network
ZTRPIZ	Law on basic development programmes in the field of education and science
" - "	Missing data (in tables, where certain data are not available)

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

Slovenia is one of the smallest EU25 countries with 2 million inhabitants. Its macroeconomic performance has been stable since 1993, with considerable GDP growth rates, reaching 6% in 2007 (Eurostat). This is gradually closing the GDP/per capita gap compared to the EU25 average. Slovenia's GDP/per capita reached 88% of the EU27 average in 2006 (Eurostat). This has been accompanied with the demographic changes of ageing population and of having one of the sharpest declines in birth rates in Europe.

Slovenians exhibit openness to neighbouring cultures, and also to ICT adoption and information society services. This also holds true for primary and secondary teachers and their willingness to use ICT in education (Empirica 2006). The population's proficiency in the English language is also one of the highest in the EU25. The education system, however, has not kept pace with the fast demographic, social and economic changes. While primary and secondary schools have fewer and fewer pupils, pre-school and post-secondary segments are rapidly expanding due to socio-economic changes. The share of GDP spent on public education is one of the largest (6%) in the EU27 (where the average is 5.1%, according to Eurostat (2004)). This is also true of private spending on education.

A high proportion of the population is involved in educational activities (of the active population, 82% in Slovenia, 44% in the EU15, and 31% in the EU10 in 2006). Enrolment in secondary and particularly in tertiary education is among the highest in the EU and more than 5% of the population are currently involved in some type of post-secondary education. Adult involvement in life-long learning is also well developed as 15% in Slovenia (11% in EU15 and only 5% on average in EU10) participated to organized training in 2006 (Eurostat). Also the involvement in informal learning was among the highest in the EU in 2005 (78% in Slovenia, 27% average in the EU10). (Eurostat, 2006)

In the mid 1990s, Slovenia was slightly above the EU15 average with respect to PC and Internet penetration, and other ICT indicators. However, these early developments were not upgraded with corresponding strategic governmental measures. As a consequence, a slowdown occurred in the late 1990s and Slovenia lost a historic opportunity to position itself as an advanced information society. Nonetheless, the general ICT infrastructure (e.g. Internet penetration, households with PC, broadband) is relatively good according to Eurostat surveys on ICT and is typically around the EU25 average (Eurostat, 2006).

Government documents on information society development have been traditionally very general, and the lack of an explicit strategic orientation was likely the key missing element for faster information society development. This also applies to eLearning. Only after the year 2000 there have been more ICT-related strategic activities (for example, the recently passed *si2010* national strategy for information society development). However, it is still unclear whether these documents will be effectively implemented.

Today, Slovenia is roughly around the EU average with respect to all basic ICT indicators. This is also true for ICT literacy. The younger segments (16-24) are particularly computer literate (Slovenia has the highest share of the “very competent” in EU25 according to Eurostat survey on ICT among households 2006). Employee training for ICT usage is well developed, as is specialised ICT training, which is provided on the commercial market. ICT is routinely used in general education and training within the business sector, the tertiary sector and also in all primary and secondary schools (at least PCs and overhead projectors). With respect to general educational communication infrastructure (i.e. Internet and broadband access for schools, LAN, websites etc.), Slovenia is one of the most advanced in the EU (Empirica, 2006). Furthermore, all schools have computer laboratories. However, the PC ratio per 100 pupils is relatively low, 8 in Slovenia, 12 in the EU15, and 7 in the EU10 (Empirica, 2006). This is also one of the causes for relatively low usage of ICT by teachers in the classroom and other educational usage of ICT in schools.

One third of primary and secondary schools have developed ICT-based materials and use ICT tools in learning approaches. In 2006, one third of tertiary education institutions reported using virtual learning environments and learning management systems (Vehovar & Pehan, 2006). Post-secondary education institutions seem to typically use ICT in the form of blended learning practices, combining ICT with face-to-face education. They report good results with respect to user satisfaction and to the knowledge obtained (DOBA, Faculty of Management - University of Primorska). Lots of on-line learning materials have been created, but the evaluation, archiving and availability of these materials are progressing very slowly. Both CD-ROM based commercial production and distribution of learning materials are very popular as well.

Among companies, one fifth of them report some vague forms of eLearning, most often related to ICT based materials on their internal system (e.g. Intranet). Only large companies (a handful of them) and some other large organisations use learning management systems. Nevertheless, the general measurement of eLearning usage in enterprises in the Eurostat survey shows very high values (40% of enterprises in Slovenia, 20% in the EU15) in 2006.

As the Slovenian educational system is predominantly public, the government plays a crucial role in financing eLearning activities. Most of the funding for primary and secondary education comes through the *school computerisation project*, which has experienced a relative decline since its peak in the mid 1990's. Most of this funding is spent on equipment and teacher education. In recent years, the EU has also become an increasingly important source of funding.

Important achievements include an educational network, which was established in the 1990's and can now count on almost 1,000 teachers who are able to train and inform other teachers at ICT seminars. These enthusiastic teachers have performed significant work on eLearning in an environment where ICT based learning approaches and materials in the school system are still not regulated in almost any respect (legal, reward, curriculum). There are also some learning platforms and content development tools developed by Slovenian companies both for local and even global markets.

The following factors have been the most important in shaping eLearning developments:

- The open economy, fast economic growth and corresponding competition among education providers and other eLearning suppliers,
- Traditional openness to information society services,
- Technological progress, which recently brought many open source applications, particularly the Moodle learning platform, which now prevails in Slovenia.

Due to its late introduction, eLearning is in a relatively early stage of development. Problems of economy of scale have prevented more usage in Slovenia, particularly in previous years, when friendly and cheap (or open source) tools were not yet available. User attitudes towards eLearning are mixed. On the one hand, informal learning on the Internet is expanding very rapidly. On the other hand, the general public does not perceive the education obtained via on-line course as being equivalent to a traditional education. Consequently, teaching in the virtual learning environment has not yet had any major impact on information society development. However, the elementary usage of ICT (PC, projector, Internet, etc.) has already become a routine in the teaching process at all levels.

eLearning offers a very promising opportunity for Slovenia to take full advantage of the comparative advantages of the country, which are: traditional openness to ICT, high enrolment in education activities, and the flexibility and smallness of the country and its educational system. The investment needed to establish an advanced national eLearning system would also be relatively small, particularly when compared to the potential outputs. The key policy objectives are suggested to be:

- Establish a competent body to coordinate eLearning activities,

- Increase ICT equipment in the school system,
- Provide and regulate a stimulating environment for all teachers, so that they actually start using and developing innovative ICT based approaches for learning.

However, the following challenges should be addressed with further research and development activities:

- The role and future of domestic ICT applications for learning, as it is difficult to compete with global developments. Especially Slovenian language experiences strong competition from English online materials and applications. This is particularly problematic because throughout history, Slovenian identity was largely preserved by the language, and is currently a subject of special protection.
- There is a contradiction that between high participation to educational activities, high motivation, good ICT infrastructure, good ICT literacy, and considerable educational investments on the one hand, and the increasing gap in eLearning usage in formal education on the other hand. This points to the lack of proper regulation and lack of proper strategic priorities. Thus, the acceptance and implementation of an ambitious national strategy for eLearning is the biggest challenge. Proper motivation, active promoting and more articulate justification of information society developments and needs are key challenges for future progress in this area.

INTRODUCTION

General data[13]

- **Population** (in 1,000): 2,002 inhabitants (2006)
- **Area:** 20,273 km^2
- **Capital:** Ljubljana
- **Language:** Slovenian; Italian and Hungarian in some areas
- **Currency:** euro since 1.1.2007
- **GDP at market prices:** €26,146.3 million (2004)
- **GDP per inhabitant in PPS (purchasing power standards):** €17,600 (2004)

Since its independence in 1991, Slovenia has successfully integrated into the international community and is becoming a rapidly developing and prosperous country. It joined the NATO in 2003, acquired full membership in the European Union in 2004, adopted the euro (€) in 2007 and will be holding the EU Presidency in 2008.

Slovenia's macroeconomic performance has been stable since 1993. We should note here, however, that the starting position in 1991 was radically better than for other East and Central European transition (i.e. ex-socialist) countries. In the period after the 2nd World War Slovenia (then within Yugoslavia) enjoyed open borders with Western countries. Its inhabitants could work in Austria, Germany, and Italy etc. Tourists and consumers were exchanged en masse in both directions. Companies co-operated with business partners from the developed world. These 1945-1991 developments were thus radically different to those in other ex-socialist European countries, where citizens could not freely travel abroad and companies were very limited in their co-operation with foreign businesses. Altogether, this openness had a noticeable impact on the economy, as well as on consumption, education, social structure and ICT adoption. Upon the country's independence in 1991, a considerable part of the economy was already in tune with global business standards. Correspondingly, the Slovenian real GDP per capita at that time was more than twice[14] that of the Czech Republic, which was the most developed of the other new EU Member States from East and Central Europe.

Unlike the liberal exchange of labour, tourists, consumers and goods, the capital market was closed until 1991 due to specific regulations. Even after attaining its independence in 1991 the country remained relatively closed to foreign direct investment (FDI[15]) while, on the other hand, the export/import of goods and services further increased and is currently approaching 60% of GDP.[16] Throughout the last 15 years economic development has been steadily progressing and Slovenia reached 63% of the EU15 average GDP per capita (PPS) in 1996, 75% in 2005, with a forecast of 78% of the EU15 average in 2007. If we express the latter figure as a comparison to the EU25 average, the forecasted percentage in 2007 is 84%.

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[13] Sources:
- Bulletin of Government Finance 3/2006 (http://www.gov.si/mf/angl/tekgib/bilten/bulletin_march_2006.pdf)
- Eurostat (http://epp.eurostat.cec.eu.int)
- Development Report 2005 (http://www.sigov.si/zmar/aprojekt/dr/05/dr2005.pdf) - IMAD

[14] Transition Economics, http://transitioneconomies.blogspot.com/2006/05/real-gdp-growth-in-ceecs.html. We should add that the differences in GDP per capita in PPP were smaller.

[15] The lowest share of FDI in GDP among the New Member States and also among the lowest in all the EU25, http://www.sigov.si/umar/aprojekt/dr/04/nti.pdf

[16] Slovenia in Figures 2006, Statistical Office of the Republic of Slovenia, http://www.stat.si/doc/pub/slo_figures_06.pdf

Annual GDP growth rates in the last few years have been slightly lower than in some other NMS. However, they have still been around 4%, or even 4.5% as in 2005 and 2006. They are thus well above the corresponding growth rates in the EU15 (around 2%).

Slovenian economic development has partially been driven by some large globally innovative companies, by a large number of specialised small enterprises integrated into the global market, by high export activities and also by the fast growth of domestic consumption, including intensive highway construction activity. The co-ordinated macroeconomic policies of the government and the Bank of Slovenia have also stabilised the growth of consumer prices. Inflation dropped to 2.5% in 2005. With that, one of the key criteria for introduction of the euro (€) was satisfied. In January 2007 Slovenia then joined the Eurozone as the first and so far the only new EU Member State.

The stable transition period was accompanied by relatively low unemployment (compared to the ten NMS and to the EU15). After a certain increase to 7.5% in the ILO unemployment rate in 1995, it is now steadily declining, reaching 5.6% in 2006.[17] To a considerable extent, however, the restructuring of industry – featuring troubles in labour-intensive industries – was compensated for by early retirements. As a consequence, Slovenia is now one of the leading EU countries with respect to the share of the non-active population aged 55 years or above, which will create a heavy burden on the pension system.[18]

In addition, there are some serious deficiencies: almost all international rankings regarding competitiveness, entrepreneurial climate and bureaucratic burden put Slovenia at the bottom or at least substantially lower than the majority of EU countries.[19] High over-regulation and corresponding low liberalisation, the state's dominance in many large corporations (telecom, gas, banking, insurance ...), one of the highest labour taxes in the EU, extremely low labour flexibility, a burden of high pensions (compared to salaries), low FDI and related obstacles to foreign businesses, disproportionally high social benefits, numerous monopolistic structures, administrative restriction on entrepreneurship etc. are very real problems. Some experts predict these deficiencies may soon create a serious slowdown in national economic development. Critics also warn that Slovenia's pre-transition comparative advantages, together with resources coming from the selling-off of the best national companies to foreigners, are rapidly diminishing and may be exhausted in a few years. According to this criticism the suboptimal regulations, slow liberalisation and lack of an ambitious development strategy may cause development stagnation in the very near future. Nevertheless, the recent GDP annual growth trends (estimate of 5.6% at the beginning of 2007) are still very favourable as are the projections for the next few years.

To further stimulate developments, the national Development Strategy was passed in 2005,[20] an ambitious document tuned towards liberalisation of the economy. However, its full implementation would require various unpopular liberal measures. As the attitudes of the general public are strongly oriented to solidarity, social protection and against any radical changes, the implementation of this strategy has taken a relatively mild form. Indirectly, this also affects eLearning, because the government stimulations (and corresponding political decision about national priorities) are the crucial elements for its expansion, at

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[17] Statistical Office of the Republic of Slovenia, December 2006, http://www.stat.si/novica_prikazi.aspx?id=588

[18] Sources:
- http://www.stat.si
- http://www.stat.si/doc/statinf/05-si-021-0601.pdf
- http://www.coe.int/t/e/social_cohesion/population/demographic_year_book/2001_Edition/Slovenia%202001.asp

[19] This is true of almost all international measurements, from the level of business administrative obstacles (http://www.doingbusiness.org), economic freedom (http://www.fraserinstitute.ca), conditions for the private sector (http://www.ifc.org/) trade administration obstacles (http://www.worldbank.org/) to general competitiveness (http://www.weforum.org).

[20] Slovenia's development strategy, adopted by the government in June 2005. Available at: http://www.gov.si/umar/aprojekt/asrs/ssd-new.pdf.

least in this early stage. The general lack of more radical priorities as regards the information society has thus been the key missing component also for eLearning developments in past ten years. It is true that after year 2000 all governments were continuously increasing the attention to information society issues; however, these changes were relatively moderate. It is thus not surprising that almost all experts and independent observers[21] agree that - due to the absence of corresponding strategic priority – more active information society development has been sacrificed for various other political or commercial interests.

Development of the population

For more than a decade the Slovenian population has oscillated around 2 million, reaching 2,008,516 habitants in July 2006. Of those, there are 95% Slovenian citizens (1,955,000), while the remaining 5 percent consists of foreigners living in Slovenia as permanent residents (29,000) and foreigners who are only temporary residents (24,000). In addition, around 40,000 Slovenian citizens temporarily live abroad.

Ethnic Slovenians represent the majority of the population – 83% according to the 2002 Census, where there were also almost 10% of nationally undeclared persons. The Italian community in the coastal region and the Hungarian community in the northeast are the two indigenous minorities (each with less than 10,000 inhabitants); their rights are safeguarded by the Constitution. Much larger are some other ethnic groups – particularly Croats, Serbs, Muslims (each above 1% of the population), but also Macedonians, Montenegrins, Albanians and many others. They came to Slovenia from ex-Yugoslavia mostly as economic migrants after the Second World War.

There is also an indigenous Slovenian minority living in Italy, Austria and Hungary that numbers in tens of thousands of people. Besides these historical minorities in the neighbouring countries, a huge economic emigration occurred at the beginning of the 20th century and after the 1st World War. Right after the 2nd World War there was also some political emigration. The main destinations were South America (particularly Argentina), along with the US and Western Europe. Cleveland has long been known as the city with the second largest number of Slovenians (behind Ljubljana, the capital). Between 250,000 and 400,000 Slovenians (depending on whether second and subsequent generations are counted) live outside their native country.

The slight increase in the population in the last few years has been the result of positive net migration. On the other hand, in 2004, only 17,961 children were born in Slovenia with minor changes in 2005 and 2006. On average, only around 9.0 children per 1,000 inhabitants have been born in the last few years, while at the same time around 9.5 per 1,000 inhabitants have died. The natural increase was thus negative. Despite that, in 2004 the total increase remained positive (0.7 per 1,000 population) because of 10,171 immigrants and only 8,269 emigrants. The majority of migrants were foreigners. In the last few decades Slovenia has had extremely little emigration among its citizens, which was particularly true in the years after independence (1991) and joining the EU (2004). Internal migrations are also every low: only 30,000 people (1.5% of the population) move within the country per year and even of those one-third moves within the same municipality. This low mobility may be in part explained by the high quality of life,[22] accompanied by one of the highest shares (84%[23]) of households that own their house or apartment. We should also add that, although farmers represent less than 5% of the active population, the majority of the population actually lives in rural areas, i.e. in settlements with less than 2,000 people.

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[21] We talk here about criticism of a wide spectrum, from ICT experts, academic researchers, journalists specialised in ICT to the members of professional associations, such as Slovenian Society Informatica.

[22] According to the *European Foundation for the Improvement of Living and Working Conditions*. http://www.uvi.si/eng/slovenia/publications/slovenia-news/2098/2121

[23] Real estate survey among households 2005, Stanovanjski sklad, http://www.stanovanjskisklad-rs.si/index.php?location=1_6_0_0_0,1_6_10_0_0

Slovenia was closely following the demographic trends seen in other European countries in the entire period following the 2nd World War. Thirty years ago, on average 63 live children were born per almost 1,000 women. In the last few years this number has decreased to only 35.6. The accompanying trend is the postponing of a first birth (the average woman's age upon her first birth was 27.5 years in 2004). At the beginning of the 1980s, when the population replacement rate dropped below its replacement level in the majority of European countries, this also occurred in Slovenia. However, since then the fertility rate (i.e. live childbirth per woman) has been further and continuously declining and reached a value of 1.25 in 2004; it was also at this level in 2005 and 2006. Slovenia is now, according to Eurostat figures, the country with the lowest fertility rate among the EU25 Member States. The accompanying trends are increasing divorce rates (there were 2,411 divorces and 6,885 marriages in 2004), an increasing number of children not born within an official marriage (8 053 out of 17,961 in 2004) and a considerable number of abortions,[24] which is otherwise rapidly decreasing[25] but is still relatively high (6,403 abortions in 2004).

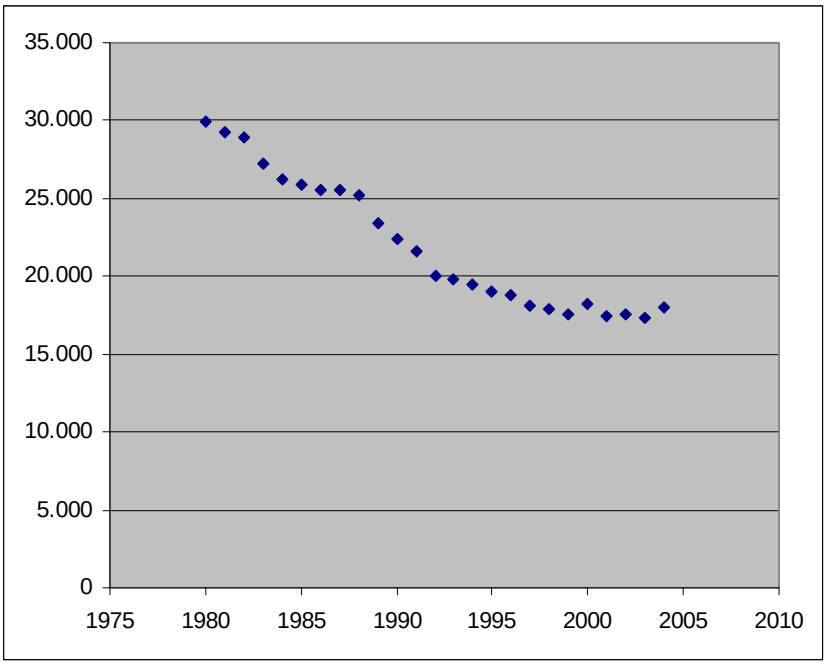

Figure 1: Number of births, 1980-2004, Source: Statistical Office of the Republic of Slovenia (2006).

In 2006, the secondary school graduate cohort (born in 1987), numbers 25,000 people, while the 1993-born cohort numbers 20,000 and the 2004 one just 17 thousand (Figure 1), which is also the number of births that has stabilised in the last few years. The ageing of the population is also very intensive: in 2004 the mean age of the population was 40.3 years. The ageing index (the ratio between the population aged 65 or more and the population younger than 15 years) increased in 2004 by almost 4 index points to reach 106.9. Life expectancy is also rapidly increasing (as in other developed countries) and reached 81.1 years

[24] With around 400 abortions per 1 000 births Slovenia is ahead of other NMS, but is considerably lagging behind old EU countries (around 200 per 1 000). Source: http://www.ivz.si/javne_datoteke/slike/1111-image049.gif.

[25] In 1995 there were 21 abortions per 1 000 women of fertility age, while in 2005 there were only 12. http://www.zveza-zeg.si/?id=4&lang=sl&page=1&record=23.

for women and 73.5 for men in 2004.[26] In the coming years ageing and low fertility rates will pose serious problems to the pension system, education system and labour market.

Major education indicators

The majority of pupils at primary and secondary education level[27] attend public-sector schools (99.4%), funded by the Ministry of Education. In part, primary schools are also financed by the municipalities (local self-governance system separated from the government structure). Private-sector schools, which are obliged to carry out state-approved programmes, are rare although they are also subsidised by the state (at least 85% of their budget). In 2006 there were 811 public primary schools and one private primary school (Waldorf). There were 138 public and five private secondary schools (4 Catholic and one Waldorf). Amongst the various forms of post-secondary education, there were 113 institutions (organisations); the prevailing ones are faculties from the three universities (Ljubljana, Maribor, Primorska[28]). Fifty-one of the 113 organisations are high vocational institutions. These include a few independent faculties and 24 private institutions. Below are some figures that illustrate the status of formal education in Slovenia.

Table 1: Educational attainment of the population aged 15 and above (%) (Source: Slovenia in Figures 2005, Statistical Office of the Republic of Slovenia, p. 24, Census data)[29]

Educational attainment	**1971**	**1981**	**1991**	**2002**
No schooling and incomplete primary school	30	26	18	7
Primary school	41	33	30	26
Upper secondary school	26	35	43	54
Tertiary education	3	6	9	13
Total	**100**	**100**	**100**	**100**

Table 2: Children, pupils and students enrolled in education programmes in selected years (Source: Ministry of Education and Sport,[30] 2006)

	1980/81	**1985/86**	**1990/91**	**1995/96**	**2000/01**	**2003/04***	**2004/05**	**2005/06**
Pre-school education	71,784	75,669	73,631	66,553	63,328	54,515	54,831	57,134
Basic education	217,806	225,789	225,640	193,914	181,594	177,535*	172,521	167,890
Secondary education	90,874	80,451	92,060	102,079	104,840	103,203	101,876	99,860
High vocational	/	/	/	/	4,760	11,099	12,621	14,246
Higher education**	27,707	29,601	33,565	45,951	82,812	87,205	91,229	92,204

* The beginning of the school year

** Excluding 6-12 months of graduation student status (‘*absolvent’*)

We can observe the following trends: a declining number of pupils in primary schools, the saturation of enrolment in secondary education, the rapid expansion of tertiary education enrolment (more than 60% of

[26] All data related to the population were taken from Statistical Yearbook 2006, available in English at http://www.stat.si/letopis/index_letopis_en.asp

[27] We will refer to this segment of upper secondary education simply as secondary education. It relates to ages 15-19 years and to ISCED level 3. The ISCED levels 1-2 will be referred to as primary, basic or primary school levels. http://www.mszs.si/eurydice/organ/isced.htm.

[28] Recently, in 2006, another university was formed, the University of Nova Gorica.

[29] http://www.stat.si/doc/pub/slo_figures_05.pdf

[30] Ministry of Education and Sport http://www.mss.gov.si/index.php?id=83L=1

the relevant age-group). However, a considerable lag still exists in the share of people with a tertiary education.

Table 3: Comparison of Slovenia, EU15, NMS (EU10) and EU25 with respect to selected indicators in education and training (Source: Eurostat and other European sources, details in corresponding footnotes)

	Slovenia	**EU15**	**NMS**	**EU25**
Population with completed secondary education[31]	80 %	66 %	84 %**	69 %
Population with tertiary education[32]	13 %	20 %	9 %	16 %
Public expenditure on education (% of GDP) [33]	6.02 %	5.2 %	5.42 %	5.2 %
Private expenditure on education (% of GDP) [34]	0.86 %	0.63 %	0.59 %	0.63 %

* Data not available for all NMS countries

** Data has been calculated: first absolute numbers for the specific variable for every NMS was calculated and upon this the NMS average was calculated.

Slovenia has high public expenditure on education: with more than 6% of GDP it surpasses the EU25 average significantly (lagging only behind Belgium, Sweden, Finland and Cyprus). For comparison, we can also observe the figures for the USA (6.3%) and Japan (3.5%). In addition, private household education spending is also among the highest in the EU25 exceeding 0.7% of GDP (EU25 - 0.38%) and is only lagging behind the UK.[35] Private household spending thus reached almost €140 million in 2002[36] (around €140 million) and has increased by 17% since 1997, in large part due to tertiary education spending which increased by a factor of 2.5.

The European Benchmark indicators for Education and Training are also very favourable for Slovenia (see the table below). In particular, we mention the lifelong learning indicators[37] where Slovenia (for the 25-65 age group) is also among the leading EU25 countries with respect to involvement in formal education (SI 7.6%, EU15% 4.7%, EU10 10.3%), non-formal education (SI 23.5%, EU15 27.4%, EU10 10.9%) and informal education (SI 78.1%, EU25 25%,[38] EU10 27.2%).

[31] Total population (%) aged 25-64 having completed at least upper secondary education in 2005. Source: Eurostat.

[32] Percentage of the population (16-74) with a completed tertiary education in 2001. Source: Eurostat.

[33] Total public expenditure on education as a percentage of GDP, for all levels of education combined, in 2003. Source: Eurostat.

[34] Expenditure on education institutions from private sources as a percentage of GDP, for all levels of education combined, in 2003. Source: Eurostat Chronos, accessed 1. December 2006.

[35] According to the EU study Private Household Spending on Education and Training (http://ec.europa.eu/education/doc/reports/doc/privatespending.pdf).

[36] Very similar are also the most recent figured for year 2003 (available in the beginning of 2007).

[37] Data from Statistical Annex, year 2005. Source Eurostat. Formal education refers to the educational activity that leads to officially recognised education level, non-formal education relates to other courses and training schemes, while informal education activities mean any other self-learning.

[38] This figure is taken from 2003 in "Lifelong learning in Europe, Statistics in focus, 2005/8", available http://epp.eurostat.ec.europa.eu/cache/ity_offpub/ks-nk-05-008/en/ks-nk-05-008-en.pdf.

Table 4: Comparison of Slovenia, EU15, NMS and EU25 regarding the five European benchmarks in the field of education and training[39] in percentages - % (see corresponding footnotes for details)

Five European Benchmarks	SI	EU15	NMS	EU25	Benchmark target 2010
Youth education attainment level[40]	91	75	89 ***	78	85
Low-achieving 15-year-olds in reading[41]	- *	- *	- *	20 *	15.5 **
Lifelong learning[42]	15	11	5 ***	10	12.5
MST graduates[43]	9	14	8	12	15% increase by 2010
Early school leavers[44]	5	17	8	15	10

* Data are not available for all countries because the corresponding survey was not conducted in all countries; the estimate for the EU25 is only based on 19 countries included in the Pisa Project 2003.

** The target is based on data for 19 participating countries; alternatively it is also established as decreasing the corresponding share in 2003 by 20% by 2010.

*** Data has been calculated: first absolute numbers for the specific variable for every NMS was calculated and upon this the NMS average was calculated.

To summarise, the above figures show that Slovenia is a not only a stable economy with low unemployment rates, but also a country with considerable investments in its education system and favourable EU educational benchmarks ranging from youth education attainment levels, early school leavers, lifelong learning through to enrolment levels in upper secondary and tertiary education. Among drawbacks we should expose the low share of tertiary education graduates in the general population, the low share of MST graduates, and relatively low level of training at work. In addition, general threats stem from a decrease in the number of births. This might strongly interfere with the entire education system, in particular because its regulation has not yet been adapted to the changed contemporary education environment.

General ICT usage indicators

In 1994-1998 Slovenia was one of the more advanced adopters of the Internet in Europe. The corresponding indicators show that it was positioned around or above the EU15 average according to host-count statistics,[45] the number of PCs per 100 habitants[46] and, in particular, with Internet penetration.[47,48] The explanatory factors of this phenomenon include high general interest in information society technologies: comparisons with the Eurobarometer EB 50.1 survey data in 1999 show that the percentage

[39] Progress towards the Lisbon objectives in education and training. Available on-line at http://ec.europa.eu/education/policies/2010/doc/progressreport06annexes.pdf , Annexes http://ec.europa.eu/education/policies/2010/doc/progressreport06.pdf

[40] European benchmark on upper secondary completion rate 'Youth education attainment level' – percentage of the population aged 20-24 having completed at least upper secondary education in 2005. Source: EU Labour Force Survey (LFS).

[41] European Benchmark 'Ratio of low-achieving 15-year-olds in reading literacy'. Source: Commission staff working document, Progress Towards the Lisbon Objectives in Education and Training, Report 2006. Slovenia was not included in the 2003 survey.

[42] European benchmark - Percentage of the adult population aged 25 to 64 participating in education and training in 2005. Source: Eurostat, EU Labour Force Survey.

[43] European benchmark – Tertiary graduates in MST (Math, Science and Technology) per 1 000 inhabitants aged 20-29 in 2003. Source: Commission staff working document, Progress Towards the Lisbon Objectives in Education and Training, Report 2006.

[44] European benchmark – Share of young people aged 18-24 with only a lower secondary education and not participating in further education in 2006. Source: Eurostat.

[45] In 1997 the host density per 100 000 habitants was 858 in Slovenia and 997 in the EU15 (Network Wizzard, http://www.isc.org.). Also similar are the results from RIPE (http://www.ripe.net), where we can observe that after 1997 the host density almost stagnated until 2001.

[46] Number of PC/100 habitants 1998: EU15 9.7, Slovenia 10.0, ITU Annual reports, http://www.itu.int.

[47] Number of Internet users/100 habitants 1998: EU15 25.0, Slovenia 25.1, ITU Annual reports, http://www.itu.int.

[48] SIBIS + 2003, http://www.ris.org/uploadi/editor/slovenia_cremonti.pdf.

of people interested in information society services was much higher in Slovenia than in the EU15, which was also confirmed in various other surveys (e.g. SIBIS[49]). Other factors were the active school informatisation policy in the 1990s (school computerisation project) and the public Internet access provider ARNES[50] which enabled convenient (i.e. free) public access for schooling and research population in the mid-1990s. These developments were accompanied with an early on-line public payment system (EDI application) for all companies. Information support for the administrative processes of the parliament and government was also developed very early on and was among the most advanced in Europe.

In the late 1990s, however, a certain slowdown in ICT developments appeared and the position of Slovenia slowly moved below the EU15 average relative to the majority of ICT benchmark indicators. Here are some reasons for this decline:

- The critics of the national telecom claim that the liberalisation and deregulation of the telecommunications market was extremely slow, which made certain services expensive or unavailable. In 2007, the national telecom and its subsidiary companies are still state-owned, the largest mobile operator (Mobitel) and the largest Internet service provider (SIOL).
- The critics of Slovenian information society developments (e.g. experts, critical journalists, opinion leaders) often refer to the sub-optimal government policy of the last 10 years, particularly in the 1999-2001 periods. At that time, the national priorities were not redefined and government institutions were not reorganised to follow the increased speed of information society developments. Besides slow deregulation and weak ICT stimulation measures for the business sector, the lack of content in the Slovenian language was especially critical. The slow development of governmental web sites, including G2B and G2C services, also contributed to the delay, combined with awkward developments of the business sector in key on-line shopping segments: music, books and groceries. Other minor issues can additionally illustrate the lack of a proactive policy: the removal of tax stimulation for household PC purchases in the late 1990s and the extremely restricted Internet domain registration.

Of course, the small market – and corresponding limitation on economies of scale – also presents considerable problems for the development of information society services. However, the high Internet penetration and widespread use of information society services in Estonia, which is a much smaller country (1.5 million inhabitants), demonstrates that this fact does not play significant role in determining the success of information society development.

The establishment of the Ministry of Information Society in 2001 was a formal attempt to focus more attention on information society issues. However, the Ministry did not have a key impact on the crucial changes needed for a leap in information society developments. Similarly, an independent telecommunication regulator (APEK) was established, which did bring many positive effects, despite severe criticism for not being enough strict when acting against the national telecom. Altogether, we can say that the development of the information society was never made a high national priority comparable for example with other top targets such as unemployment, road construction, farmer funds etc.

With respect to Internet penetration and the general usage of information society services Slovenia now behaves like a typical (median) EU25 country. This also holds true for a certain digital divide with respect to age, education, employment status and urban-rural factors, which is very similar as in other developed countries. The gap with respect to education has been particularly high (78% of Internet users in the population with more than 12 years of schooling, and only 31% in the population with 12 years of

[49] http://www.ris.org/uploadi/editor/slovenia_cremonti.pdf
[50] ARNES – Academic and Research Network of Slovenia, http://www.arnes.si

schooling or less in 2005) and has been stable in the last five years. Among specifics, we should expose the relatively low usage of on-line shopping (20% of Internet users, EU25 around 50%). Similarly, the share of eBanking users has been stagnating at a level of around 20% of Internet users for many years. We should add here that security and privacy concerns regarding ePurchasing and eBanking are well below the EU15 average and are thus not a reason for the limited development of these areas.

Table 5: Internet usage and access from households in European countries (2004, 2005) (source: Eurostat, 2005), in %

Internet in households		**Slovenia**	**EU15**	**NMS***
Share of individuals regularly using the Internet[51] (%)	2004	33	41	25
	2005	40	46	31
	2006	47	49	37
Share of households with Internet access (%)[52]	2004	47	45	23
	2005	48	53	27
	2006	54	54	36
Share of households with broadband connection (percentage of households with Internet access)[53]	2004	22	/	33
	2005	40	48	46
	2006	62	62	55

***** Weighted NMS average was calculated.

With respect to mobile phone expansion, Slovenia has one of the highest penetration rates in the EU25 (SIBIS 2003). Mobile phone usage achieved 85% penetration of the population aged 10 to 75 years.[54] On the other hand, at the end of 2006 there were 1.8 million mobile phone subscribers[55] (90 per 100 habitants), placing Slovenia above the EU25 average (87%).

ICT usage in the business sector seems to be in a slightly better position than among the general population. Enterprises in Slovenia are well-equipped, which can be confirmed in all available comparisons showing that, with respect to basic ICT (PC, Internet, websites, call centres). Slovenia is typically above the EU15 average. The eGovernment application services among business also demonstrate a favourable situation for Slovenian companies compared to the EU15 or the EU25. However, with more advanced applications (intranet, video, on-line purchase etc.) a certain lag appears compared to the EU25.

[51] Percentage of individuals who accessed the Internet, on average, at least once a week in 2004, 2005, 2006. This indicator covers all individuals aged 16 to 74 who accessed the Internet, on average, at least once a week, within the last three months before the survey. Source: Eurostat, Community survey on ICT usage in households/by individuals.

[52] Source: Eurostat, Community survey on ICT usage in households.

[53] Source: Eurostat, Community survey on ICT usage in households

[54] Source: Survey of ICT among households, Project RIS, 2006

[55] Statistical Office of the Republic of Slovenia, http://ris.org/index.php?fl=1&nt=9&p1=276&p2=285&p3=&id=336&sid=460

Table 6: Internet access in enterprises in Slovenia and the EU (source: Eurostat, 2005), in %

Internet in enterprises		Slovenia	EU15	NMS*
Share of enterprises with Internet access[56]	2004	93	90	84
	2005	96	92	87
	2006	96	94	90
Share of enterprises with broadband connection (of enterprises with Internet connection)[57]	2004	66	61	39
	2005	77	71	54
	2006	78	83	59
Share of enterprises using Intranet[58]	2004	42	35	26
	2005	27	35	29
	2006	27	36	28

***** Weighted NMS average was calculated.

To summarise, from the late 1980s until the late 1990s, Slovenia enjoyed rapid information society developments In large part, this was a consequence of its genuine openness to ICT, but also the result of some visionary projects in the public and private sectors such as the early establishment of the public internet provider ARNES, early and intensive school computerisation, an early public on-line payment system for companies etc. Some globally innovative and visible ICT companies from Slovenia contributed to these developments as well. However, these activities were not strategically co-ordinated but occurred more or less spontaneously in various segments of Slovenian society. As a consequence, with ICTs becoming ever more complex they would require advanced strategic co-ordination at the national level. In Slovenia in the late 1990s this had not been articulated enough so gradually the lack of strategic priorities has become visible and Slovenia has ceased to be among the leading EU countries in ICT indicators. It has slowly moved to the EU15 (slightly below) and the EU25 average. In particular, the development of eGovernment, eLearning and eHealth were suboptimal due to the lack of above-mentioned strategic orientation.

Since 2001 Slovenian governments have been much more conscious of the importance of ICT. This is in large part related to the interaction with various EU bodies. EU membership in 2004 – together with the pre-accession negotiations/preparations – brought with it a very important stimulus for information society developments, particularly in the area of regulations/legislation. Various strategies and policies have been launched in the last few years, some have had considerable positive effects. Within this context, the national[59] Information Society Development Strategy (*si2010*), accepted in 2007, is particularly important as it rectifies the absence of general strategic documents. However, even in this document the information

[56] Share of all enterprises, without financial sector (10 employed persons or more). Source: Eurostat, Community survey on ICT usage in enterprises.

[57] Share of all enterprises with Internet access, without financial sector (10 employed persons or more). Source: Eurostat, Community survey on ICT usage in enterprises

[58] Share of all enterprises, without financial sector (10 employed persons or more). Source: Eurostat, Community survey on ICT usage in enterprises.

[59] Directorate for the Information Society, February 2007, http://www.mvzt.gov.si/si/novinarsko_sredisce/novica/article/94/5369/?cHash=ee405eefc0

society's development is not clearly explicated as the highest national strategic target, although this could become one of the key comparable advantages of Slovenia.

Despite these suboptimal developments, we can still observe relatively favourable information society indicators. In 2006 the majority of the EU25 benchmarks put Slovenia roughly around the EU25 average, typically behind Estonia, but also ahead of 4 to 5 old EU15 Member States (most often these are Portugal, Greece, but also Italy, France and Spain).[60]

[60] See the recent Eurostat household ICT indicators aggregated at http://www.ris.org/index.php?fl=1&nt=9&sid=442.

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

I. 1 Description of the education and training system[61]

The Slovenian Constitution[62] (Article 57) states that primary education is compulsory and funded from public sources. Is also says that the state should provide an environment which guarantees the citizens' real options for education, as well as the freedom to select one's preferred education. The prevailing free and public form of formal education was already one of the advantages for the citizens retained from the previous (i.e. 'socialist') system before 1991 and has not yet substantially changed. Historically, however, Slovenia's education system belongs to the Austrian tradition[63] which is characterised by solid educational quality, albeit with rigid structures and by the teacher's strong hierarchical role. It is also important to note that throughout history Slovenia has preserved its identity through its culture and language, which has also resulted in some contemporary restrictions on the use of non-Slovenian languages in teaching.

Basic education is almost entirely funded from public budget. With some minor exceptions, secondary education is also financed from the government budget. Post-secondary education is also free, with some rare exceptions (e.g. some business schools). However, the latter only applies for regular enrolments within the quotas approved by the government. Approximately one-third of tertiary students who were not accepted (or did not apply due to work) for a regular study have to pay a tuition fee (roughly around €2 000 per year).

In Slovenia, the main official language is Slovenian, which is also true of the entire education system. By law the official language in a public education institution must be Slovenian. In bilingual areas, i.e. municipalities with Italian and Hungarian ethnic minorities, the Italian and Hungarian languages are respectively also official languages in some primary and/or secondary schools. In addition, there are two international primary schools (English and French) for foreigners. In primary schools foreign language courses start at the age of 10. In secondary education at least two foreign languages are compulsory for most programmes.

Table 7: Enrolment, graduates and teachers in Slovenian education in 2004/2005 (source: Statistical Office of the Republic of Slovenia)

	Pre-school education	Primary schools	Upper secondary education		
			Lower[64]	Technical[65]	General[66]
Pupils, students	57,134	171,358	20,258	39,215	39,105
Graduates	/	21,169	6,119	9,173	8,717
Teachers	7,115	15,022	12,552		

[61] Partial sources: http://www.mszs.si/eurydice/e_pub/slo_en_2000.pdf and Eurydice (Education Information Network in Europe – Socrates Programme, April 2005).
[62] Constitution of the Republic of Slovenia, Article 57, http://www.varuh-rs.si/index.php?id=113&L=0
[63] Details are in Annex 3 – section 3.4.1.
[64] Lower and middle vocational programmes
[65] Technical and professional programmes
[66] General education - general and professional gymnasiums

While the number of pupils in primary and secondary education has been steadily declining in the last 15 years, the number of students in tertiary education tripled from 35,000 in 1990 to more than 100,000 in 2005. With more than 5% of the population currently involved in some type of post-secondary education, Slovenia is among the leading countries in EU25 with respect to the share of students in the population. Although the total number of involved pupils/students changed dramatically, these rapid developments were not followed by the corresponding adoption of a regulatory system. On the other hand, the decrease in young generation cohorts – which already reached primary and secondary schools and will strongly hit the tertiary education segment in 2008-2011 with the birth cohorts 1989-1992 (see Figure 1 in the Introduction) – did not bring many changes in the structure of the primary and secondary school system. Changes in the networks of schools, number and structure of teachers etc. were only minor despite the generations shrinking from 29,000 newborns in 1980 to 19,000 in 2005. However, the primary school system still suffered considerable turbulences, particularly with respect to the moving of the system from 8 years to 9 years (with three triads), as well as due to the changes in the curriculum, splitting pupils into three teaching levels for mathematics and languages, and the introduction of optional courses. Permanent modifications in the entry criteria for secondary schools, in regulations for appointing head-teachers, as well as in the promotion, award system and salaries for teachers etc. have also contributed to a turbulent education environment. The strong teachers' trade union and political discussions about basic educational philosophy (including the role of religious education, which is currently excluded from public schools) have dictated the top education issues. More changes are expected, particularly with respect to private schools, salary system and enrolment criteria. Within this context, the role of ICT in education has never been among these most exposed educational issues.

Table 8: Enrolment, graduates and teachers in Slovenian education in 2004/2005 (source: Statistical Office of the Republic of Slovenia)

	Post-secondary vocational education	**Higher education**	
		professional higher and university programmes	**master's, specialist's, doctoral programmes**
Children, pupils and students	12,621	91,229	8,378
Graduates	1,829	11,608	1,451
Teachers	471	5,509	

As we can see the number of students in 2004/2005 was around 112,000. If we include the diploma preparation year ('*absolvent*') the number is 114,000 (66,000 full-time and 39,000 part-time undergraduate students). In the 2006/2007 more than 27 000 students enrolled in the first year (2006/2007) of higher education institutions. This exceeds the cohort of 19-year-olds because older generations also enrol and particularly because more than 20% of these numbers are students enrolling for the second time into the first year. (Each student has the right to repeat one time their enrolment in the first year of some tertiary public education institution.)

With the new government, the former *Ministry of Education, Science and Sport* was divided (at the beginning of 2005) into two new ministries: the **Ministry of Education and Sport** and the **Ministry of Higher Education, Science and Technology.** The *Ministry of Education and Sport* is responsible for the development of school education regulations, as well as for the allocation of funds, the implementation of laws and administrative decisions related to pre-primary, primary, secondary schools, as well as high vocational education. Local school councils play an important role in the process of administrative decentralisation in primary and secondary education. Local authorities are also responsible for the

administration and funding of pre-primary establishments and primary education establishments. The Ministry also outlines inspection procedures, while the **National Inspectorate for Education and Sport** (which comes under the authority of the Ministry of Education and Sport) actually performs the inspection. The Ministry – together with its related bodies – thus plays the key role in the regulating, funding, monitoring of the pre-school, primary and secondary education system, as well as in appointing principals. Local municipalities participate partially in the funding of primary schools and in appointing corresponding principals. The **Ministry of Higher Education, Science and Technology**, on the other hand, is responsible – among other domains – for the entire field of higher education. The key reason for this re-organisation was the need to integrate research and higher education activities. On the other hand, this somehow removes some higher education from the Ministry of Education and Sport, which is otherwise responsible for the national education system.

With respect to regional bodies we should mention that, due to the size of the country, regions have not yet been formally established in Slovenia. Currently, regions do not exist in the Constitution and thus have no formal role or bodies. However, this is now changing. A process is currently underway so as to change the Constitution and to formally accept the regions in the legal system. However, the regions presently have a very limited role in designing formal education in Slovenia, except for adult education and some independent regional post-secondary institutions. This is now slowly changing and the regions have an ever more important role in establishing faculties, which are also funded by local resources. The plans for the future explicitly stimulate regional education centres. It is true that these new faculties and universities are more open to implementing eLearning.

Another aspect where local levels have some impact is pre-school education and primary schools. Formally, it is local communities that are establishing these organisations, they participate in appointing the principals and in part they also provide funding for them. They have, however, no impact on the curriculum but they can – and often do – contribute to the ICT equipment of schools.

The Slovenian education system consists of the following basic segments: pre-school education, basic education (single structure of primary and lower secondary education), (upper) secondary education (vocational and technical education, secondary general education), high vocational education, and higher education. Other parts of the system include: adult education, music and dance education, special needs education, modified programmes and programmes in ethnically- and linguistically-mixed areas.[67]

A) Pre-school education

Pre-school education is not compulsory, but includes the majority of children of the corresponding age (61%). In principle, it can include children between the ages of 1 and 5 years. The curriculum is divided into two cycles (from 1 to 3 years and from 3 to 5 years). The curriculum promotes different types of programmes such as: day care, half-day care and short programmes. There is also the possibility of child-minders, pre-school education at home or occasional care of children in their homes. The Curriculum for Pre-school Institutions defines six areas of activities: movement, language, art, nature, society and mathematics. The parents have to participate with a considerable contribution so pre-school education is not free. Due to the increasing intensity of day-work of parents and due to changes in the family structure (i.e. the diminishing role of grandparents, single mothers), the capacities of public pre-school institutions are insufficient although the number of newborns has decreased. However, private pre-school childcare institutions still seem to be too expensive. Although foreseen by legislation (including partial funding), they are actually only a few. The pre-school enrolment is increasing, however, according to a 2005 report[68] it was for all age groups – e.g. 3-year (62%), 4-year (72%) and 5-year (78%) - significantly below

[67] Figure in Annex 3 – section 3.4.2 schematically demonstrates the formal education options for those aged 1-27.
[68] Key data on education in Europe 2005, http://digm.meb.gov.tr/belge/EU_KeyData_Eurydice_2005.pdf.

the EU25 averages (68%, 89%, 91%, respectively). The majority of pre-school institutions include computers in the activities of the children; however, this is not part of the compulsory curriculum. The latest RIS research among pre-school institutions from 2003 revealed that only 19% of them had no PCs for children.[69]

B) Primary education

The nine-year basic education typically starts at the age of 6 (sometimes 5) and is divided into 3 three-year cycles. Primary schools provide the compulsory and extended curriculum. The compulsory curriculum consists of compulsory subjects, electives, home-room periods and activity days (culture, science, sports and technology). The school system also includes educational assistance for children with special needs, remedial classes, additional classes, after-school care and other forms of care for pupils, interest activities and out-of-school classes. Successful completion of basic education in primary school enables pupils (typically at the age 15) to continue their education in their choice of secondary school. Computer education is a compulsory part of the curriculum in all primary schools.

C) Secondary education

Secondary education programmes vary in their content, duration and goals.

C1) General secondary education

The general 4-year secondary school basically prepares pupils for further studies. So-called gymnasium ('Gimnazija') programmes are divided into two groups: general and professional (technical). They end with an external final examination called the 'matura', similar to other countries, which qualifies students to enrol in any higher education programme. Those graduates who - for various reasons do not wish to go into higher education - may enter the labour market directly or they enter some secondary vocational programmes or courses.

C2) Secondary vocational education

The planning, programming and provision of vocational education are the joint responsibility of the social partners (employers and trade unions) and the government. The National Centre for Vocational Education and Training (http://www.cpi.si) plays an important role here. There are various options:

C2a) Short-term vocational programmes last a year and a half for pupils and apprentices who have completed their basic education, and two and a half years for those without a completed basic education. They all finish the school with a final examination. The certificate of the final examination enables students to enter the labour market or to the first year of other secondary vocational schools.

C2b) Pupils who have successfully completed primary school can also enrol in three-year secondary vocational programmes. Vocational education programmes are offered in the apprenticeship system or in the school-based system.

C2c) Secondary technical programmes, which last four years, end with a special technical final exam (the 'poklicna matura') qualifying the graduates for a specific labour market. It also qualifies them to enrol in a corresponding vertical higher education programmes (which are not university programmes). To enrol in university higher education programmes they must pass the general final exam ('matura'). In the last few years, more pupils finish the technical than the

[69] ICT in educational institutions, RIS 2003, http://www.ris.org/index.php?fl=2&lact=1&bid=57&parent=13&cat=75&p1=276&p2=285&id=288

general final exam. However, some faculties now allow pupils with the technical final exam to select only one or two additional subjects from the general final exam, which then qualifies them for enrolment in university programmes.

D) Post-secondary higher vocational education

The first higher vocational schools were established in 1996/97 and by 2005/2006 there were 46 organisations offering this type of education. Programmes are markedly practice-oriented and tightly connected with practice. Post-secondary higher vocational education lasts for two years ending with a specific diploma examination. A post-secondary high vocational diploma enables students to start work in specific occupations or to proceed to study at higher education institutions.

E) Higher education

Higher education includes:

E1) university studies, which typically last four years; the pre-requisite for enrolment is the general secondary school final exam – 'matura' – see C1 above)

E2) higher education studies, which are more practically-oriented, which last typically three years; here the technical final exam is sufficient ('technical matura' – se C2c above).

With some exception only university programme with diploma (i.e. BA or BSc) qualifies for two-year master's programmes (i.e. MA or MSc, but also an MBA).

PhD programmes can follow these master's – only the excellent students may omit the MA thesis and go directly to PhD - but they do not involve courses (only research work leading to a dissertation).

However, all of the above is only true of the existing pre-Bologna system, which still prevails. In 2004, amendments to the Higher Education Act were adopted according to the EU recommendations (i.e. Bologna reforms). The Act provides a standard three-level study structure. The first level relates to undergraduate studies (which are still separated to professional and university programmes), while the second (master's) and third (doctoral) levels to postgraduate studies. The duration of the first-level study programmes is limited in years (three to four years) and credit points (180 to 240 ECTS[70]). The second level covers the master's studies and encompasses from 60 to 120 ECTS requiring one or two years to complete. In sum, the first two levels always last five years and represent 300 ECTS. The third level is doctoral study and also lasts three years (180 credits), with one year (60 credits) of courses.

In 2005/2006 only a few faculties implemented the Bologna system for first-year students, so the first generations are in second year in 2006/2007. Full implementation has been postponed until 2015/16, which is the last year to graduate within the old programmes. Further changes are expected in higher education, predominantly in financing schemes for organisations, the government's role in managing public universities, the regulation of the status of researchers and high school teachers, stimulating the establishment of new – and particularly private – universities etc. Student status is also problematic, particularly their no-tuition right for regular involvement in public universities and their right to work on a tax-free basis through so-called Student Services. These all are very radical changes that lie ahead of the higher education sector.

[70] ECTS - European Credit Transfer System, standardised higher education credits point for workload related to a course or study programme.

F) Adult education

Adult education is characterised by considerable programme diversity. Schools and higher education institutions providing youth education also offer formal education courses for adults, adapting the organisation and programmes to their needs.

According to the Slovenian Institute for Adult Education in 2006 there were more than 300 institutions offering 6,000 different adult education courses, comprising on average 40 hours and involving 280,000 participants. A report on the supply of adult education in Slovenia in 2002/2003 indicates that the main providers are private education institutions (31.5%), followed by secondary schools 16.45%) and specific public institutions called 'Adult education centres' (12.3%). Various societies (5.5%), museums and galleries (3.9%) and general educational libraries (2.2%), which are increasingly incorporating adult education within their activities, are also involved.

A new law introducing a certification system was passed in 2000. It enables the assessment and verification of the vocation-related knowledge, skills and experience acquired from schools. It thus enables individuals to obtain a vocational qualification in ways other than through formal schooling. Candidates undergo a knowledge assessment procedure by a special commission to obtain a state-approved certificate attesting to their competence in performing certain vocational tasks. Vocational qualifications obtained in this way can be used by their holders to find a job or in further training.

The most traditional and well-known providers of adult education courses are the 'ljudske univerze' (adult education centre). More than 40 centres are active in Slovenia, carrying out the education of adults as their basic activity. The most popular are basic adult education, foreign languages, computer programmes, and work-related programmes on legal, financial and managerial topics.

The main barriers which keep adults from participating in lifelong learning in Slovenia are similar to those seen in other countries. For example, a lack of access to employer-provided training reduces the likelihood of participation, as does older age or unemployment. According to data issued by the Statistical Office of the Republic of Slovenia (2003), as much as two-thirds of the population did not take part in formal education or continuing education. Most of them stated a lack of interest as the reason for not participating. The second reason for not taking part is a lack of time, which is most frequent in the age groups 25-54, followed by health reasons, too busy with work and family responsibilities. Citizens mention the cost of education courses or difficulty in reaching places of education much less often.

The OECD study on the 'Literacy of Adults and their Participation in Education' by the Centre for Adult Education of Slovenia, (1998) found that 57% of all adult participants in education do so on their own initiative.[71] This finding indicates that most individuals need to be personally motivated in order to participate in lifelong learning. On the other hand, the overall rate of participation in lifelong learning is considerably above the EU15 and EU25 averages (see Table 4), while it seems that companies provide limited learning (compared to the EU).

G) Education for people with special needs

New legislation in the field of educating children with special needs was adopted in 2000. According to the new legislation, inclusion is the basic principle of educating children with special needs. Since 2001, different programmes have been developed together with compensation programmes for pupils to help

[71] We should add that this study also demonstrated considerable problems with generally literacy in Slovenia. (This type of literacy study is performed only every 10 years.)

them achieve standards of knowledge. Parallel to this, a process of reorganisation of institutions for children with special needs has started.

In addition to formal education, some specific actions also interfere in the education of this population segment. In 2003, for example, there was a project called Digital Literacy of handicapped people[72] in the framework of a campaign sponsored by Microsoft Slovenia. The handicapped people were asked about their needs for having a computer and the needs of further computer education. Among 33 applicants 26 handicapped people were selected to receive computers, an ISDN connection and education.

H) Modified programmes and programmes in ethnically- and linguistically-mixed areas

Education in areas where Slovenian nationals live together with members of the Italian or Hungarian minorities and which are classified as ethnically- and linguistically-mixed areas is part of the uniform education system. It is therefore upgraded and modified at the same time as the rest of the school system. To achieve parity in the development of ethnic minorities and the Slovenian nation, the organisation and education programmes for pre-school institutions and schools in ethnically-mixed areas have been adapted in the following fields: educational aims, timetables, syllabi, attainment target and examination syllabi, admission requirements, and programme implementation guidelines. In the future, eLearning may play an important role here if it becomes simpler to adapt digital educational contents from one language to another.

I.2 Place of eLearning in the education system

With respect to the status of ICT-related education into the education system we can summarise the following:

- We already mentioned that the majority of pre-school institutions were already introducing computer education, although this was not compulsory in the curriculum.
- In primary schools the computer education course is compulsory in the first triad. In addition, in the last triad (i.e. 7th, 8th and 9th years) there are three elective courses on ICT.[73]
- Computer education is also compulsory in the first year at four-year secondary schools (C1 and C2c above), while additional courses vary across the type of schools.[74]
- In tertiary education the institutions are autonomous when it comes to creating their syllabus. However, the majority of study programmes (except in the humanities) do include it as a separate course that is sometimes merged with methodology and statistics. In addition, there are eight faculties that provide specialised education in broader ICT areas, which lead to a diploma (BA) title with the explicit labelling of computer sciences or informatics (e.g. business informatics, social informatics, computer engineering etc.).

When we are talking about eLearning issues in the education system, we should also point out the PC/student ratio which is significantly below the EU25 average. As detailed in section II.4 there are 8 PCs per 100 pupils in elementary and secondary education (2006 data), while there are only 3.5 PCs per 100 students in tertiary education (2005 data). What is even more critical is the PC/teacher ratio in elementary

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[72] Source: Društvo za teorijo in kulturo hendikepa in Microsoft Slovenije (2003): Neodvisno življenje hendikepiranih, http://www.yhd-drustvo.si/slo/article.php?story=2003RacunalnikoOpismenjevanje, http://www.microsoft.com/slovenija/novinarji/hendikep/ucinki_projekta.mspx

[73] The three courses (each 70 hours) are: Text editors, Multimedia, Computer networks. Details at the National Institute for education, http://www.zrss.si/default.asp?link=predmet&tip=6&pID=24&rID=291

[74] The subject course labelled "Informatics" last 70 hours in all secondary schools, while in general ones (gymnasium) it may have to 210 hours of elective courses: 1. multimedia (70 hours), data analysis (35 hours), programming (35 hours), project management (70 hours). Details at the National Institute for education: http://www.zrss.si/default.asp?link=predmet&tip=6&pID=24&rID=291.

and secondary schools, which is much lower than the corresponding ratio in business and other public sectors (i.e. below 3 PCs per 10 teachers). Of course, it is also true that even existing equipments have not always been fully exploited. Teachers may attend ICT education courses just for the needs of their formal attendance and promotion and they not use ICT in the classroom. The regulation related to the inclusion of ICT as well as corresponding stimulations and rewards for teachers involved, are thus the key missing elements. Further investments in equipment and teacher training may thus not be fruitful so long as the entire education system, particularly its regulation, standards and reward component, does not incorporate eLearning as a constituent component.

With respect to the specific usage of virtual learning environments the situation is as follows:

- Tertiary educations: The comparable advantage of ICT-supported education is increasingly becoming a competitive advantage both for reputation and costs. Introduction of virtual learning environments is otherwise not state-regulated and is thus an autonomous decision of the tertiary education organisations. In year 2006 one-third of tertiary education organisations recognised eLearning as a strategic objective and had already adopted some forms of virtual learning environments, while one-tenth of those institutions already offer at least one fully supported course in a virtual learning environment, most typically in the form of blended learning using Moodle. The tertiary sector is also intensively involved in various EU eLearning projects (i.e. Leonardo da Vinci Programme, framework programmes etc). More details are in II.5.
- Primary and secondary education: The status of e-content as well as of teaching in virtual environments is not regulated. The developments thus basically rely on enthusiasm of the teachers. Currently around half of primary schools and three-quarters of secondary schools have at least some experience in forming websites for courses, while those with at least some experience teaching in virtual learning environment is reported by one-fifth of primary and one-third of secondary schools [75]. However, the regular involvement of virtual learning environment in the education process present roughly in around one-tenth of the schools. Mambo (Joomla!) and Moodle are the platforms in teachers' education schemes (A 20-hour Moodle course is included there) Institute for Education of Republic of Slovenia included Moodle and Mambo in official courses for teachers financed from public sources. School are also increasingly involved in international projects (e.g. eTwinning).
- With respect to developments in companies, we should first repeat that there are not many large organisations in Slovenia, where the critical mass would justify the early introduction of virtual learning platforms. We can summarize (details are in section II.4-6) that in 2005 around 15% of companies had already sent their employees to some on-line courses and around 1% of employees had experienced some type of formal on-line course, which were however predominantly related to ICT.[76] Roughly, one-fifth of all companies (the largest companies more intensively) report some on-line elements of internal education, i.e. using some Internet-related e-content. Similar shares were also reported by EDUPOOL research in 2006.[77] Very rarely we can found more ambitious and formal investment into companies' own virtual learning environment. In 2006 there were only around a dozen of largest companies, which developed such systems. However, it is also true that majority of large companies are already in the process of preparing or testing platforms and selecting the proper strategy for adopting an eLearning. It is estimated that in 2-3 years this market will mature enough and start to grow more significantly. Currently, the major areas of virtual learning environment implementation are thus the education institutions, particularly the post-secondary ones.

[75] Gerlič, Ivan (2005): Stanje in trendi uporabe informacijsko komunikacijske tehnologije (IKT) v slovenskih osnovnih šolah. http://www.pfmb.uni-mb.si/raziskave/os2005, Gerlič, Ivan (2006): Stanje in trendi uporabe informacijsko komunikacijske tehnologije (IKT) v slovenskih srednjih šolah. http://www.pfmb.uni-mb.si/raziskave/sr2005/

[76] RIS, 2006: V. Vehovar, R. Platinovšek: 'eLearning in companies', October 2005.

[77] http://www.edupool.si

On the supply side, there are less than ten specialised suppliers of tools and for *on-line learning* in 2006. In addition, only one among them (i.e. Nevron) makes the majority of its income from eLearning. And even this company makes the bulk of its income not from tools and solutions for *on-line learning* (what company aims to) but from selling (blended) learning education courses. In much more broader sense, if we include all providers of all types of educational services, in total 41 suppliers were identified in the area of on-line learning in 2006.[78] Specific on-line courses also started to increasingly appear in 2006 on some commercial websites. In practice, language courses and computer-related courses dominate in the area of personal usage. A relatively large education segment is also the adult education institution, which has started to offer digital content and on-line courses, although in a limited scope – as for now, only within 5%[79] of its programmes.

Of course, if we talk about training employees to use ICT, the market is much larger. There is an estimate from RIS 2002[80] of that two-thirds of large companies, one-third of medium and small ones and on tenth of companies with less than 5 employees have sent their employees to some specific courses related to ICT, More than 20,000 employees have thus attended this type of courses in one year.

I.3 ICT skills and attitudes towards ICT usage

The status of the ICT skills and the attitudes towards eLearning can be observed from various surveys. We outline below the key findings.

A) ICT literacy and skills

All RIS[81] research from 1996 on, including the SIBIS+ 2003[82] study, confirm that Slovenians are open to the adoption of new information society technologies. With respect to skills, the new generations education possess them to a sufficient extent; however, this is not true of older generations. A certain lack of education and skills thus exists in a considerable part of the active population, thereby presenting another challenge for eLearning. The structure of e-skills by age in Slovenia is presented in Figure 2.[83] As already mentioned in the introduction, the ICT indicators show that Slovenia is generally positioned at the average level of the EU25.[84]

[78] Arh, T., Kovačič, M., Blažič B., J. (2006): Analiza ponudbe stanja na področju e-izobraževanja v Sloveniji. Ljubljana: Institut Jožef Štefan.

[79] Zagmajster Margerita, (2006): "Pregled študija na daljavo na področju izobraževanja odraslih v Sloveniji", http://www.ris.org/uploadi/editor/1157473788pp.pdf

[80] http://www.ris.org/uploadi/editor/Uporaba.pdf

[81] Research on the Internet in Slovenia (http://ris.org).

[82] SIBIS+, 2003, http://www.ris.org/uploadi/editor/slovenia_cremonti.pdf.

[83] A more detailed table is in Annex 3 – section 3.2.

[84] For further international comparisons on computer and Internet skills, see Annex 3 – section 3.1.

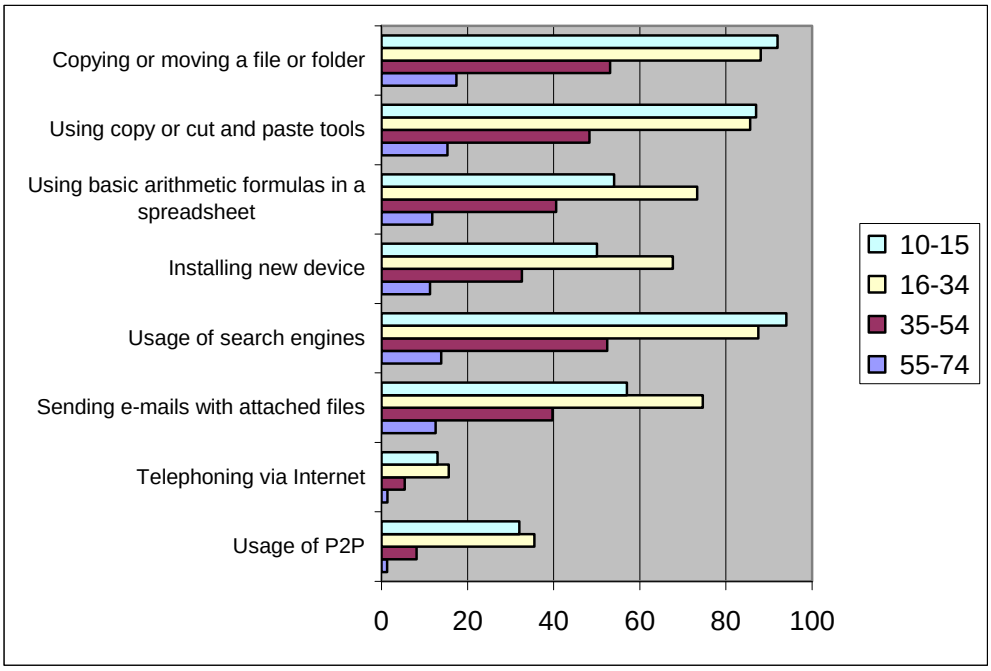

Figure 2: Structure of e-skills by age, Slovenia, 1st quarter 2006, Source: Statistical Office of Republic of Slovenia.

B) eLearning - attitudes in the general population (RIS 2005)

According to the RIS research from 2005,[85] the term eLearning is well known by 22% of respondents, while an additional 63% of respondents had already heard something about eLearning.[86] Here are the other key findings of this survey:

- the Internet users agreed about the importance of lifelong learning (mean=4.7 on a scale of 1-5) and they were also ready for extra education and training (4.4);
- the opinion that 'e-education is equivalent to traditional education' was not so strong (40% disagree). Similarly, the willingness to start eLearning did not score so highly (3.1 on a scale of 1 to 5); and
- among the Internet users[87] 27% of them knew eLearning while, among the Internet non-users,[88] only 7% of them knew it. 20% of the Internet users have already been educated through the Internet.

[85] RIS, 2004: V. Vehovar, D. Lesjak, D. Lavtar, V. Sulčič; 'eLearning', May, 2005.
[86] The key figures from this survey are presented in Annex 3 – section 3.2.
[87] Internet users are those who used the Internet at least once.
[88] Internet non-users are those who did not use the Internet even once.

II: OVERVIEW OF E-LEARNING IN SLOVENIA

II.1 Institutional structures and resources for eLearning

Here we first briefly overview the institutions that regulate or monitor eLearning and which are also the suppliers of eLearning.

A. Regulation and monitoring

A1. Regulation

The Ministry of Education and Sport is responsible for the development of school education policies, inspection procedures, the allocation of funds, the implementation of laws and administrative decisions relating to pre-primary, primary and secondary schools. It also provides resources for computerisation of the school system and has a strategic body for these activities.

On the other hand, the Ministry of Higher Education, Science and Technology regulates and finances the higher education sector, including the ICT aspects. In addition, the **Directorate for the Information Society** (the former Ministry for the Information Society) is now nested here and is responsible for regulation and strategies, including the Information Society strategy and eLearning strategy. This Ministry is also supervising the **ARNES**, the independent governmental institution that provides Internet network services for public organisations.

The National Education Institute (http://www.zrss.si) is the central governmental organisation, which carries the services needed for the operation of public education, from materials to the education of teachers. It works with approximately 300 kindergartens, 450 primary and 160 secondary schools. The Institute also has a section dealing with the so-called computerisation of education issues (which is different to the IT department that supports their administrative processes), which relates to the issues of school equipment, teacher education, tenders (e.g. eContent). However, in late 2006 no employee was allocated full-time to these specific issues, although they were technically covered.

The Centre of the Republic of Slovenia for Vocational Education and Training (http://ww.cpi.si) is another public institution that was founded in 1995 by the government and co-founded by the Chamber of Commerce and Industry of Slovenia and the Chamber of Craft of Slovenia. In accordance with the legal basis provided by the Organisation and Financing of Education Act (Official Gazette No. 12/96), the Centre performs research, developmental and advisory activities and is the focal point where the interests of the state and social partners in vocational and technical education converge, co-ordinate and connect. The Centre develops methodologies and prepares modern module-based educational programmes for short-term, secondary as well as post-secondary vocational education.

The **local authorities (i.e. municipalities)** are responsible for the administration of pre-primary establishments and basic education establishments. The local school councils play an important role in the process of administrative decentralisation and in the process of financing ICT developments.

A2. Monitoring

The monitoring of eLearning in Slovenia is not fully formalised. Routine administrative monitoring of educational activities is performed within the regular activities of the Ministry of Education and Sport, including the education inspection of the **National Inspectorate for Education and Sport**.

However, there is no specific administrative monitoring developed related to eLearning.

On the other hand, three different independent research centres perform regular and specific surveys, which provide specific monitoring in this area:

- The Statistical Office (SURS) performs various surveys related to education, including a block of questions related to eLearning in Eurostat ICT surveys among households and enterprises.[89]
- RIS research that has been monitoring eLearning since 1996 with surveys among schools, tertiary education institutions, teachers, enterprises and individuals. Altogether, 16 research studies have been conducted since 1996 (see the RIS.org home page[90]).
- Regular research among primary and secondary schools has been performed biannually by the Pedagogic Faculty at the University of Maribor since 1990.[91]
- The Pedagogic Institute performs specialised surveys on education, which sometimes also provide an insight into international comparisons with respect to eLearning issues. With respect to general achievements among Slovenian pupils based on these surveys, we can say that they Slovenia is typically around the average among the developed countries (very often these are most developed OECD countries), so we could conclude that Slovenian school systems generally provides quality and internationally comparable outputs. Further info about these surveys,[92] which are continuously repeated every few years, are available as follows:
    - TIMMS: survey among upper secondary school gradates (18 -19 years) in mathematics and physics. http://nces.ed.gov/timss/,
    - PISA: survey in reading, mathematics (15 years old), science, http://www.pisa.oecd.org,
    - PIRLS: survey: reading (9-10 years old), http://www.pisa.oecd.org,
    - SITES: survey of schools and teachers (not pupils) about the usage of ICTs, http://www.sites2006.net.[93]

B. eLearning suppliers

B1.Tertiary education organisations

Here we briefly present only a few most typical (among some 25) of institutions, which have already developed some forms of eLearning in the tertiary sector.

Doba (http://www.doba.si), the largest private education and training provider in Slovenia, started implementing on-line distance education in 2000/2001. On-line education at Doba is offered within its higher vocational programme for Business Secretary and Commercialist.[94] Both programmes are state-accredited programmes and after the completion graduates are awarded with a diploma, which is publicly recognised as a standard higher vocational diploma. The on-line study mode is offered at Doba's higher vocational programme parallel to its traditional, face-to-face study mode. In 2004/2005 there were 904 learners studying on-line which is 56% of all learners at Doba's vocational college. On-line learners are expected to have a computer and access to the Internet.

The study programmes (14 courses in each programme) are entirely delivered on-line using the platform ***WebCT***, face-to-face sessions are optional but learners have to do the exams at Doba's physical location. In order to enable learners' participation at the face-to-face sessions and to take the examination, Doba co-

[89] All these data are presented in Annex 3 – section 3.1.
[90] Details of the RIS eLearning reports are found at http://slovenia.ris.org/index.php?fl=0&p1=276&p2=285&p3=&id=288
[91] Annex 3- section 3.2.
[92] Results for Slovenia for past years are available on http://www.pei.si.
[93] The results from 2006 are not yet available, while 1999 results showed good position for Slovenia.
[94] Recently they also started with higher education programmes.

operates with six studs. The overall experience of Doba with eLearning is very positive. It has found that on-line learners learn more than students who attend classic study programmes. In addition, satisfaction with the study was also higher with the on-line learners.

The Laboratory for Telecommunications at the Faculty of Electronic Engineering, University of Ljubljana (http://www.LTFE.org) is one of the leading players in eLearning in Slovenia. It has developed its own virtual learning platform system called E-CHO, which was successfully implemented within the Faculty as well as in various other organisations from public (e.g. the Slovenian Army) to commercial organisations (e.g. the largest Slovenian bank, the largest mobile operator). As mentioned, it also co-ordinated a national project on Distance Learning in Slovenia. It is involved in various international projects in eLearning and it also supports the http://www.e-studij.net portal.[95]

The **Faculty of Economics (**http://www.ef.uni-lj.si**)** at the **University of Ljubljana** is the largest higher educational institution in Slovenia delivering whole degree/accredited distance education programme with more than 1,600 students enrolled. That programme is based on different types of study materials (printed materials as prevailing with elements of on-line delivery) and various study support services, which are available to the DE students (also by videoconferencing). As mentioned, the Faculty was an early adopter of Distance Learning through PHARE projects already a decade ago. Today, it provides on-line support for the majority of its courses, in particular those that are performed at various locations across the country. It uses its own software for blended learning.

The **Faculty of Management Koper** at the **University of Primorska** (http://www.fm-kp.si) is also one of the pioneers in applying on-line courses. It uses a blended learning approach for an increasing number of its courses but it also offers services and consultancy to other organisations. It uses the *Moodle* platform.

As mentioned, other faculties and tertiary education organisations in Slovenia – around one-third of 86 higher education institutions – also implement certain forms of eLearning at various levels.

B2. Adult education organisations

The high degree of complexity of adult education is reflected in the network of the numerous and diverse education and other institutions as well as education programmes. They implement eLearning to a very limited extent, mostly in the exploratory stage. As mentioned, there are around one thousand institutions providing various forms of adult education and one-third of them are major ones included in the catalogue. However, only 5% of these offer some elements of on-line course services.[96]

B3. Other commercial suppliers

A recent study[97] identified – besides tertiary education suppliers – 35 suppliers in Slovenia; including 12 suppliers of on-line courses with mentoring and seven without mentoring, 10 suppliers of LMS platforms and six suppliers of digital content. Let us briefly present some of the most typical of these:

NEVRON d.o.o,[98] Interactive solutions (http://www.nevron.si), is a small company whose mission is to encourage the evolution of user-friendly, simple and effective e-solutions in order to accelerate the growth of individuals and whole organisations with the aim of becoming a knowledge-based society. The

[95] http://lt.fe.uni-lj.si/project.asp

[96] Zagmajster Margerita, (2006): 'Pregled študija na daljavo na področju izobraževanja odraslih v Sloveniji', http://www.ris.org/uploadi/editor/1157473788pp.pdf

[97] Arh, T., Kovačič, M., Blažič B., J. (2006): Analiza ponudbe stanja na področju e-izobraževanja v Sloveniji. Ljubljana: Institut Jožef Štefan.

[98] http://www.nevron.si/index.php?option=content&task=view&id=107&Itemid=181

company provides on-line courses regarding IT and other topics, which are collected at a 'Virtual Academy' (from October 2004). In addition, it also provides on-line educational solutions for companies and stands as a leading commercial organisation in this area. It also creates its own content-builder platform, which is to be promoted through an international consortium at the EU level.

B2 d.o.o (http://www.b2.eu) is a member of the Microsoft partner programme and its basic activity is education in the ICT technology area. Its mission is to provide ICT-related education (e.g. courses on Excel), however, besides that it also provides on-line courses. It offered on-line courses within its own higher vocational training, it was involved in ECDL education and it runs the portal http://www.spletno-ucenje.com with on-line courses. It is also developing its own LMS platform, which is the leading commercial LMS system (*eCampus*) developed in Slovenia.[99]

Kragelj&Kragelj d.o.o (http://www.kadrovanje.com/) is a company specialising in advising companies on the development of their employees and in the area of education it is specialising on electronic education, i.e. Human Resource Management. Qualified people are preparing technology and learning contents for companies. Execution of the project is interdisciplinary: it co-operates with other Slovenian experts (Jozef Stefan Institute, KULT modelling studio, Qinteligence, d.o.o. …).

B4. Research organisations

There are some world leading scientific groups in artificial intelligence, machine learning, knowledge technologies, and open networks, particularly at the IJS (Institute Josef Stefan; http://www.ijs.si) and at the FRI (Faculty of Computer and Information Sciences; http://www.fri.uni-lj.si) at the University of Ljubljana.

In addition, specific research related to eLearning applications has emerged at various faculties which implement eLearning. This research usually deals with the implemental, pedagogical and financial aspects of eLearning.

Very limited applied research grants are given to research organisations by the government explicitly for eLearning research (i.e. a few hundred thousand euros annually). Predominantly, they are given to develop eLearning in a specific field (e.g. chemistry or in the military) or to develop strategic issues, as was the case in 2002 of a grant for developing distance-learning. On the other hand, larger laboratories in technical research institutions (the leading two were mentioned above, the IJS and the FRI) receive substantial research grants; however, eLearning is only of indirect relevance there.

We should add that the research organisations that are involved in any kind of eLearning research activities are also the key drivers, partners and initiators of eLearning projects (such as school computerisation, the RO project), as well as the eLearning policy. So the indirect effect of eLearning research is substantial, however, with respect to the direct production of eLearning products or services their role is relatively limited.

C. Resources and funding

The computerisation of schools (RO) is a central project for funding ICT-related educational activities in pre-school, primary and secondary educations and is related to the Ministry of Education and Sports. It has been undergoing various transformations in the almost two decades of its history. The total funds have thus varied, however, currently, the entire budget for all schools (below-tertiary education) can be estimated at around €12 million per year for computer equipments, software solutions, teachers' computer

[99] Further information on activities is found in Subchapter II.5.

training etc. Slightly more than half of this sum is provided by the Ministry, while other sources (local sources, own sources, EU sources…) contribute the remaining parts. This sum includes the full array of relevant costs, from the salaries of computer support staff to software and hardware for the school. The share of funds for the development of on-line courses, digital content and virtual environments is low and difficult to estimate, perhaps around a few percent of the above sum.

Other target funding from EU structural funds, such as the €7 million ECDL[100] project for 2005 and 2006 are partially supported by EU sources. There are other EU funds such as the €0.5 million annually for teachers' ICT education and the recent tender for almost €2 million for e-content developments in 2006 and 2007.

As an illustration we should also add here a more general figure that roughly 1% of total public education expenditures in Slovenia is allocated to ICT-related costs. This is also in line with the ICT share within total government spending on ICT, which is also around 1% of the total government budget (€8 billion). Total governmental ICT spending (relative to the budget) is among the largest in the EU25.[101]

We should also include among the public expenditures the public Internet access provider ARNES, which handles the free broadband access of the entire public school system (including kindergartens and universities), which is thus not a burden of the schools but a separate/additional budgetary aspect of the government (€4 million annually).

It is much more difficult to estimate the commercial eLearning market. If we limit ourselves to the development of tools for the virtual learning environment and for the production of on-line courses, we can estimate the number of persons working full-time in eLearning commercial providers, global vendors (e.g. IBM) and their local subcontractors and other organisations that offer eLearning services in the commercial market. Very roughly, this number does not exceed the equivalent of a few tens of person-years annually and the corresponding budget could thus not go much beyond €1-2 million.

In addition, we should include in the national eLearning expenditures the internal staff (particularly in eLearning units) in the organisations and faculties that works on their own eLearning projects. This may be a substantial segment, particularly among tertiary education institutions and within the few large corporations where eLearning units are established. Despite this, we are perhaps not talking about more than around few more tens of persons per year, which also does not surpass €1-2 million.

With respect to LMS and other tools and platforms related to virtual learning environments, the prices are increasingly low due to competition from the open source platforms. However, even the proprietor solutions (e.g. WebCT/Blackboard) offer more and more convenient prices, e.g. Doba reports a very low fee for the licence of USD 10 per year per student. However, even with this Doba is considering the open source platform. Moodle has become almost a standard platform in secondary schools. It is also used in the majority of universities and in many large corporations.

If we talk about the implementation of on-line courses, the prices vary with respect to the level of requirements of the client. Besides technology itself, which is getting cheaper and cheaper, the prices of implementation are basically determined by the amount of persons-month work for eLearning specialists and supporting ICT and designer staff. Annual costs for a professional do not exceed €4 000 monthly and are much lower for the technicians. Very rarely can the e-learning service provider afford an advanced ratio of 1:80 (80 hours for preparing 1 hour of on-line course), which was the case with ECDL.

[100] http://www.mddsz.gov.si/si/delovna_podrocja/trg_dela_in_zaposlovanje/phare_projekti/

[101] Analysis of the Slovenian IT sector, IDC 2006. IDC study for Chamber of Commerce and Industry of Slovenia, http://www.ris.org/index.php?fl=1&nt=9&sid=383

Of course, ICT education (e.g. EXCEL or Linux courses) is a much larger industry, which is not within the scope of the above estimates.

II.2 Strategies, policies, action plans and projects

II.2.1 eLearning status in governmental documents

An insight into the evolution of eLearning-related documents and description of general and past documents can be found in Annex 3 – 3.4.3.

The documents are the following:

a) Blue Paper on the Information Society (2000),

b) Strategy of the Republic of Slovenia for the Information Society (2003),

c) Joint Inclusion Memorandum (2003),

d) National Action Plan on Social Inclusion 2004-2006 (NAPs/inclusion),

e) Integrated Regional Strategies for the Information Society 2003,

f.) Single Programming Document 2004-2006 (Measure 2.3: Lifelong Learning),

g) Research project: Distance Learning in Slovenia (2002-2004),

h) Basic development programmes in the area of education and science 2003-2008.

II.2.2 The key current government activities

a) Slovenia's Development Strategy (2006)

The new government accepted a very ambitious strategy of national development. According to this strategy, GDP growth should radically exceed the growth rate in developed EU countries and also surpass the 5% benchmark annual growth rate so that by 2013 Slovenia would catch up to the EU25 average. Five key development targets were elaborated; the second one deals with knowledge-based society issues. Within this second target, some issues are directly related to education:

- include 55% of the generation in tertiary education,
- the liberalisation of tertiary education,
- increase public RD expenditures to 1% of GDP (currently 0.8%),
- the introduction of modern education programmes in all aspects,
- improvement of access to education,
- stimulation of lifelong education and acquiring of new skills.

Perhaps the most important specific target in this document is the statement that it is needed to '… *develop and launch distance learning at higher education institutions…'* and '… *ensure the necessary ICT equipment at schools*…'

Unfortunately, we found no explicit mention of eLearning nor did we find more measurable targets in this area.

Further implementation of this document, the recent Resolution of national development programmes[102] released in October 2006 for the period 2007-2023, specifies 34 target strategic projects above €50 million with a total amount of €24 billion. Among them, developments in information technologies are also

[102] Government of the republic of Slovenia: Resolution of national development projects form 2007 to 2023: http://www.slovenijajutri.gov.si/fileadmin/urednik/publikacije/061127_resolucija.pdf

foreseen, however, besides eGovernment and eHealth, which are actually included as explicit projects, the resolution does not explicitly include eLearning. However, the resolution does foresee €0.8 billion of investment in broadband Internet connections in rural areas. By 2020, all households should have at least 512 Kbit/s connections and 90% should have at least 2 Mbit/s connections. Optic fibre should be connected to 90% of households by 2020. In part, eLearning components are also hidden within the library and cultural heritage digitalisation project. The omission of eLearning in this document is a certain discouraging sign, however, it is also true that the eLearning investments are not of such a large size and can be introduced with other means.

b) The draft eLearning strategy (2006)

In 2006 a working group was formed at the Directorate for the Information Society, within the *Ministry of Higher Education, Science and Technology*. This shows that eLearning is a much broader issue related to the entire society and not only to public education services. The initial platform for this strategy was the EU recommendation starting with the i2010 initiative and the corresponding ambitious 7th framework programme (with almost one-third devoted to ICT) and the Competitiveness and Innovation Programme with €44b and €4b, respectively, in 2007-2013. Also important for conceptualising the eLearning strategies were the EU programmes eLearning,[103] eLearning Action Plan: Designing tomorrow's education,[104] e-Learning Initiative.[105]

The unofficial draft of the eLearning strategy[106] - first presented in 2006 - is very exhaustive and comprehensive. However, its status is still a 'working document' and in March 2007 it only underwent internal approval at the Ministry, but not yet at the government. Adoption of the Strategy was postponed until later in 2007 after a general Information Society Strategy (si2010) is passed by the National Assembly.

The strategy builds on the work we have already mentioned, the consortium research project 2002-2004 led by the Faculty of Electrical Engineering resulting in a comprehensive (291-page) platform for the eLearning strategy,[107] which has however remained only a specific research output as it was never formally discussed by governmental bodies.[108]

c) Action plan for informatisation of the school system (2006)

The *Board for informatisation of the school system* is a governmental body within the **Ministry of Education and Sport,** which outlines the strategy and action plans in this area. Over the past year it outlined and monitored school computerisation activities and had the leading role in the school informatisation project RO and its annual implementation.[109]

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[103] eLearning Programme: A programme for the effective integration of Information and Communication Technologies (ICT) in education and training systems in Europe (2004–2006). http://ec.europa.eu/education/programmes/elearning/programme_en.html

[104] eLearning Action Plan: http://europa.eu.int/eur-lex/en/com/cnc/2001/com2001_0172en01.pdf

[105] eEurope+ Action Plan http://europa.eu.int/information_society/eeurope/plus/doc/eEurope_june2001.pdf

[106] Preparation of the strategy was subcontracted to the company Nevron as the most profiled organisation in this field with its own global development product in eLearning. An additional group of 12 authors and experts was also formed to contribute and overview the work. Other national strategies were intensively studied in the process of writing, particularly those from the UK[106], and from Norway[106], Austria[106] and Ireland[106].

[107] Slovenian National eLearning Strategy, (2004) http://www.ltfe.org/crp/index.asp?namen=dokumenti

[108] The draft Strategy is summarised in more details in Annex 3 – section 3.4.5.

[109] The 2006 *Action plan for informatisation of the school system* underwent an internal evaluation at the Ministry is summarised in Annex 3 – section 3.4.6.

d) Information society strategy - si2010 (2007)

After the eLearning Strategy and Action Plan were formulated in 2006 (but not yet formally accepted) a draft of general Information Society Strategy was launched for public discussion at the beginning of 2007. It seems that first the si2010 will be accepted and then the Action Plan and eLearning Strategy will be merged into one strategic document later in 2007. Very generally the si2010 also touches on eLearning.[110]

II.2.3 eLearning Projects

a) E-content project tender for teacher education 2006

A public tender in 2006 was launched to stimulate ICT-supported education and seminars for teachers in primary and secondary education. The main goal is to attain e-contents, which exploit the possibilities of the Internet (interactivity, picture, sound, animation, video…) and introduce different didactic approaches. From a technical point of view the e-contents need to be provided with multimedia and interactive elements. The requirements also include regular maintenance and access to e-contents on the Internet, providing teachers with an introduction to e-contents and help. Slightly less than one million euros is allocated to this project per year in 2006 and 2007.[111]

b) Informatisation of the school system (continuous activities since the late 1980s)

At the end of the 1980s intensive activities had already started to stimulate ICT use in the school system. In 1993 the major milestone of the informatisation in schools was the formal initiative called the ***RO*** project (computer literacy for '**R***ačunalniško* **O***pismenjevanje*'). In part, the ambitions of these activities resemble those of the Tiger Leap project in Estonia. Throughout all these years the corresponding education ministry was responsible for informatisation of primary and secondary education and for increased support for Internet access. Besides the equipments, a training scheme for teachers was the core target of the project. In 1993, this was one of the most ambitious governmental projects and it brought roughly €4 million of extra funding for ICT investment in the (pre-tertiary) school system. However, certain stagnation was in the financing of educational ICT infrastructure when the project formally ended in 1998. This was also in line with the general decline in ICT-related speed of adoption in Slovenia, as discussed in the Introduction. Nevertheless, some forms of funding have remained until today. However, the more ambitious redesigns of the RO project proposed in 1999 and in 2003 were not accepted. The latter had foreseen a radical increase in investments, from €4 million to €40 million per year.

Currently, the *Board for informatisation of the school system* co-ordinates these activities and the new action plan was accepted in autumn 2006, which will merge with the eLearning strategy as mentioned above.

c) The improving digital literacy project is currently the largest project related to eLearning. Around 7 million euros were allocated by the Ministry of Labour, Family and Social Affairs and by EU structural funds in 2005 and 2006 for improving the digital literacy of the unemployed using (European Computer Driving Licence - ECDL) knowledge. The plans were to educate 25,000 unemployed people all over Slovenia. Regional partnerships were established for this. The project required that an eLearning component was included in the training, ECDL training is otherwise closely regulated by the ECDL European regulation and the main Slovenian partner is the Society Informatica (http://www.ecdl.si). ECDL education started in 2000 and by 2005 almost 2,000 certificates had been approved, along with almost 15,000 different exams. Some parts of the ECDL contents are also available for free on some portals. In total, 32 regional subcontractors were obliged to offer a blended learning option. Due to its size,

[110] Details are in Annex 3- section 3.4.7.

[111] Source: Tender for teacher education 2006: http://www.mss.gov.si/index.php?id=454&show_single=399, http://www.mss.gov.si/si/okroznice_razpisi_in_javna_narocila/javni_razpisi/?tx_t3javnirazpis_pi1%5Bshow_single%5D=721

this project represented one of the major drivers of eLearning developments, in particular due to the various indirect benefits that exist, from awareness to infrastructural developments. On the other side, the direct benefits were relatively limited and there were several problems with implementation.[112]

d) International eLearning projects

Slovenian schools are actively involved in the EU ***eLearning programme*** (2004-2006) http://www.elearningeuropa.info/), which has four components: increased digital literacy, eTwinning activities, horizontal activities and virtual universities. Recently in May 2006 more than 100 participants presented the results of a national eTwinning project at a special KONFeT conference organised by CMEPIUS (http://www.cmepius.si/). There are 100 Slovenian schools involved in the eTwinning project (http://www.etwinning.net/), which indirectly boosts the experiences and prospects of eLearning.

The universities on the other hand are increasingly involved in various EU programmes, from Leonardo to Framework programmes.

II.3 The legal framework supporting eLearning

So far, the government has only passed a few very general and strategic documents that specifically touch on eLearning. Unfortunately, neither the strategy nor its implementation has been accepted yet on the highest level of government. Formally, there is thus no binding document at the beginning of 2007 to regulate the role of eLearning in the education system.

Schools at all levels are thus left to themselves when it comes to setting standards, rewards and ways how to incorporate eLearning in their activities.

Of course, other general legislation applies here, from the usual Intellectual Property Rights and Consumer protection, to data security. This legislation is already harmonised with the EU. However, currently none of these interfere directly with the development of eLearning.

The regulations related to the formal role of eContent property rights for the contents developed with public funds, particularly within the primary and secondary school system, are essential and their complete absence has been one of the major bottlenecks for eLearning developments in Slovenia.

The using of copyrighted software or contents is usually governed by the copyright legislation. Large multinational corporations have protected their rights through the local BSA (Business Software Alliance) that closely co-operates with the court and has effectively eliminated the illegal use of software among organisations.

Safer Internet activities, (i.e. http://www.safe.si) are also important here, where children are taught not to carelessly use copyright materials. Such an approach contributes to the general awareness and necessary respect for the on-line intellectual rights of authors. On the other hand, mass use of peer-to-peer networks to exchange copyright multimedia contents creates a habit of exchanging everything entirely freely, which also leads to the problem of perceptions of copyright eLearning contents.

Potential difficulties are expected in use public sector, however, the fact that this area is not yet fully regulated has not caused many problems. Schools usually proceed as follows:

[112] See a notice at the largest on-line media about some shortcomings of the implementation: http://24ur.com/bin/article.php?article_id=3085109.

- If a teacher develops eLearning contents or services within paid hours, then this of course belongs to school which decides whether to make it public or not.
- If a teacher develops a product outside their paid hours, the schools usually identify its value in the early stage and in case of positive evaluation buy the application.

With respect to the EU documents Slovenia takes the following into account when defining the legal framework for eLearning:

- the Copenhagen declaration;
- the Bologna declaration;
- i2010 – A European Information Society for growth and employment;
- e-Learning – Designing tomorrow's education;
- i2010: Fostering European eLearning Content to Make Lisbon a Reality;
- The eLearning Action Plan, Designing Tomorrow's Education; and
- Education and Training 2010 Main policy initiatives.

II.4 Dedicated ICT infrastructures and applications

According to general ICT development data, Slovenia is positioned favourably with respect to general Internet infrastructure as well as for broadband access. In those aspects, particularly among companies, it is above the EU15 average (96% of companies have access to the Internet and 74% have a broadband connection). A similar situation is seen with the public school system, which is supported by the ARNES network.

National infrastructure

The national education infrastructure is provided by ARNES (the Academic and Research Network of Slovenia; http://www.arnes.si), which was established as an independent public institution in 1992. ARNES now provides broadband access to all schools, universities and research institutions. ARNES' costs are covered by the government budget so its services are free for all schools. The main task of ARNES is the development, operation and management of the communication and information network for education and research.

The basis for connectivity within Slovenia is the backbone, which is constructed by main routers (nodes of concentration) connected by leased lines. The ARNES network is composed of the ARNES backbone and all lines and routers at final destinations which are managed by ARNES. The nodes of concentration (NOC) are located in major towns in Slovenia. At present, 783 research and education institutions and libraries are connected to NOCs via leased lines, (own and leased) optical fibres, CATV networks and wireless connections. For leased lines and CATV networks, the capacity is between 64 kbit/s and 2 Mbit/s and for fibre optic or wireless it is 10 or 100 Mbit/s Ethernet. Altogether 100,000 individuals from 1,200 institutions (including 783 research and education ones) are connected to the ARNES network and use ARNES services in Slovenia.

ARNES has a 2x622 Mbit/s connection to the pan-European research network GEANT. ARNES also maintains its own WWW, FTP, WAIS, X.500, News, MBONE, IRC and Gopher servers. ARNES also manages the top-level domain (.si) for Slovenia and runs the top-level Domain Name Server. In addition, ARNES runs the SIX (Slovenian Internet Exchange) where all those Internet providers, which have their own international connectivity can peer between themselves. ARNES is a full national member of TERENA, a shareholder of DANTE, a member of CEENet and a member of RIPE.

ARNES is funded by the government, however, some of its services compete with those of commercial suppliers, there is an ongoing pressure from the commercial sector to move some of them away from ARNES to the market. Within this context, there was also a recent discussion about who would provide optic fibre access for all schools, and how. The final result of this discussion was a further delay to the start of these activities. We should also mention that – for some complex reasons, which ultimately reflect the absence of a clear strategic vision of an information society in Slovenia – there was also an unnecessary delay in broadband penetration among households.[113] For similar reasons, a delay is expected in providing optic fibre access for all households.

Companies

The state of ICT in Slovenian companies was studied with specialised RIS survey on **ICT in companies** conducted in 2005. The representative telephone survey[114] among companies (n=760) revealed that:

- in large and medium companies less than one-third of employees and in small and micro companies less than half of employees use computer equipment;
- Microsoft Windows is used by almost all Slovenian companies – i.e. Linux, Unix and DOS are represented especially in large companies;
- use of intranet increases with the size of companies – 70% of large companies use intranet and only 25% of micro companies;
- approximately 33% of companies are using educational materials and courses on the Internet and/or intranet;
- less than 30% of companies are using Open Source applications;
- approximately 25% of small, medium and large companies are using an Internet phone line and 10% of micro companies. These companies perform more than 10% of their national and 40% of international phone calls over the Internet;
- the percentage use of ISDN is highest for micro companies (58%), while 50% of largest companies prefer to use Centrex;
- systems for videoconferences are used by 40% of large companies, meanwhile those systems have not penetrated the smallest companies yet;
- around 80% of companies use e-mail, around 20% of companies use SMS, other electronic media are used less often.

There was also a special RIS 2005 survey related to eLearning among companies.[115] A representative sample of Slovenian companies answered questions related to interest in and applications of eLearning.

- The notion of eLearning is known by large companies, the percentage for medium companies is 66% and 51% for small companies. Only in micro companies is the term eLearning known by less than half (41%) of companies;
- The percentage of companies that sent their employees on some (i.e. any) sort of education course is for large companies 88%, medium 83%, small 71% and for micro 44%. Around one-fifth of companies have already used eLearning. eLearning is used the far most frequently for computer and informatics courses;
- In the last 12 months in total 9% of employees were engaged in some education activities and 10% of them were involved in eLearning programmes (2% in large and 28% in small). In total, around 1% of employees were educating themselves in a foreign country;

[113] See Table 5; Slovenia is catching up with the broadband among households only in 2006.
[114] RIS, 2005: V. Vehovar, R. Platinovšek: 'ICT in companies'. June 2005.
[115] RIS, 2006: V. Vehovar, R. Platinovšek: 'ELearning in companies'. October 2005.

- Around 43% of large companies and around 25% of medium, small and micro companies use certain forms of Internet eLearning and e-content;
- The companies which have already used eLearning to educate their employers report high satisfaction with this kind of education – 3.6 on a scale of 1 to 5.
- The interest in eLearning is three times higher compared with the actual use of eLearning. Above all, flexibility is the most attractive feature of eLearning.
- Here, we may add speculation as to why companies do not use eLearning more often when they have such a keen interest – there is a lack of a clear demonstration that eLearning is efficient, given its high costs.

We may add that according to the RIS2005 survey among large companies, almost half of them also use video tele-conferencing. However, this is still slightly below the levels seen in developed EU countries. This is also characteristic of Slovenian ICT development in companies – a lag appears only with advanced technologies.

Nevertheless, the above results paint a favourable picture and in general international comparisons (Eurostat ICT enterprise survey) also show a favourable situation with respect to ICT equipment among enterprises (see the Introduction). Access to the Internet is above the EU average and the same is true of PC usage. We can observe these figures in the Introduction.

In Annex 3 – section 3.1., particularly in Table 2, we can see that companies use eLearning much more extensively (42%) in Slovenia compared to the EU25 (23%). However, this result is very similar to the high position of Slovenia with respect to general informal eLearning on the Internet. When we look more narrowly at specialised virtual environment, the picture is very different. The companies, which use such systems are quite rare.

Tertiary education institutions

The RIS research[116] for the study year 2004/2005 indicated the following key findings on **ICT in tertiary education:**

- 94% of post-secondary education institutions had computer classrooms in 2004.
- Among all computers intended for students (4,000) there are 54% computers in computer classrooms, 18% in laboratories and workshops, 10% in libraries and reading clubs.
- In 2003 there were approximately 3,500 computers in all institutions: 61% computers in computer classrooms, 14% in libraries and reading clubs and 2% in laboratories and workshops.
- It is interesting to note that the majority of these institutions (35%) have limited access to some websites and formats, while administrative support was developed (e.g. exam registration, results and notification of exams, registration enrolment).
- The same survey also showed that less than 1/3 of all computers (13,000) at these institutions are intended for students and the rest are for employees. The year before the estimated number of computers was 10,000.
- The estimated number of computers per student was 5.5 computers/100 students if we consider only full-time undergraduate students, and 3.5 computers/100 students if we consider full-time, part-time undergraduate and postgraduate students. On the other side there are 1.4 computers/ per employee. The above figures relate to the ratio of the totals. Averaging across the institutions – due to better-equipped smaller schools – the ratio is 8 computers/100 students and 1.5 computers per employee.

[116] RIS 2004/2005: Vehovar V., Lesjak D., Sulčič V., Pehan V.: 'E-Learning in tertiary education'. May 2005

Primary and secondary schools

Various RIS surveys have addressed the issues of school infrastructure regularly since 1996. In addition, the Pedagogical Faculty at the University of Maribor has also performed biannual research on these subjects.[117] An EU comparable insight is provided by a recent survey on ICT use among schools conducted by Empirica in 2006[118] for the European Commission, Information Society and Media Research.[119]

Table 9: Use of computers in teaching and ICT-equipment in schools (Source: Empirica 2006[120]).

	Internet computers / 100 pupils[121]	Schools with own web page[122]	Schools with own LAN[123]
Cyprus	9	51	23
Czech	8	75	81
Estonia	7	87	72
Hungary	9	56	56
Lithuania	5	60	50
Latvia	5	41	54
Malta	10	63	60
Poland	6	68	56
Slovenia	8	96	88
Slovakia	6	65	72
NMS	6	67	60
EU15	11	62	54

The survey showed that, despite rapid expansion, Slovenia (67%) now clearly lags behind the EU25 (74%) average with respect to the share of teachers that used computers in the classroom in the past 12 months. The gap is even wider with respect to the number of PCs with an Internet connection per 100 pupils (Slovenia 7.6, EU25 9.9). On the other hand, it was also confirmed by this survey that the general educational infrastructure of the schools is still favourable, as Slovenia is far above the EU25 with respect to schools with broadband access, websites, e-mail accounts for teachers, LANs, computer laboratories, libraries with Internet connections etc.

II.5 eLearning services

A detailed biannual survey from December 2005 to January 2006 about ICT use in **primary schools** (Gerlič 2006[124]) revealed that many teachers within a considerable share of schools (20-30%) have already developed some e-contents and performed some distance learning.[125] Similar is true of electronic communication with pupils and exchanging of material with pupils. On the other side, group work in a

[117] Detailed results of these surveys are found in Annex 3 section 3.2.
[118] http://ec.europa.eu/information_society/eeurope/i2010/docs/studies/final_report_3.pdf - Empirica Gessellshaft für Kommunikations - und Technologieforschung (2006): Benchmarking Access and Use of ICT in European Schools.
[119] Pan-European survey: More than 2/3 of the EU's schools benefit from high-speed Internet access http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/06/1285&format=HTML&aged=0&language=EN&guiLanguage=en
[120] Data from the report 'Benchmarking Access and Use of ICT in European Schools 2006' elaborated by Empirica Gessellshaft für Kommunikations- und Technologieforschung.
[121] The total number of Internet-connected computers per 100 pupils.
[122] Percentage of schools with their own home page or website.
[123] Percentage of schools with their own LAN.
[124] http://www.pfmb.uni-mb.si/raziskave/os2005/7II.htm, ICT among primary schools.
[125] Details of this survey are found in Annex 3 – section 3.2.

computer laboratory using the Internet is applied – at least by some teachers – in the majority of schools. The same surveys revealed that in almost all schools teachers routinely suggest URL addresses to students.

The survey was also performed among **secondary** schools, where eLearning activities are much more expanded, the majority of schools already have at least some teachers who have developed certain e-contents and performed some distance learning (Gerlič 2006[126]).

On the other side, it is estimated by experts (in the 2006 interviews) that in total there are only around 50 teachers (not schools) who have already experimented with the implementation of LMS (mostly Moodle), so that they have created some applications in virtual learning environment. Regular usage is even smaller and restricted only to a handful of teachers. Another estimate by the experts is that roughly less than 1% of teachers (i.e. 300) put on-line materials on the Web for pupils.

Informatics clearly dominates as an eLearning subject, followed by geography, physics, chemistry and other science/technical subjects. Recently, however, on-line courses have also been rapidly expanding to include language courses.

This same survey in both levels of schools also revealed that the schools are extremely enthusiastic about future uses of various detailed aspects of on-line learning components, from special didactics for tutors to the advanced use of videoconferencing. The readiness of Slovenian teachers to incorporate eLearning in their teaching practice was also revealed in the abovementioned *Empirica* survey (Slovenia is 3rd in EU).[127]

There is traditional and well elaborated ICT-related education of teachers in Slovenia. Around 20 000 primary and 10,000 secondary teachers receive regular training (most often 16-25 hours per a course), which covers 70% of them. There is a variety of ICT-related courses funded by government and EU funds: Schools and teachers pay only symbolic price. There were also some specialise courses with the Manhattan and Moodle open source systems for teachers offered by the National Education Institute. The formal evaluation of the results of this training is missing.

Within the National Education Institute, the special website http://info.edus.si integrates ICT-related education activities for teachers. There, various on-line curses can be accessed and database of didactic software with around 250 entries can be accessed.[128] Special seminars also exist for e-tutors[129] as well as for Moodle users. The activities also started to re-establish the *Slovenian educational network* Website, including on-line catalogue of all e-contents and digital materials.[130] Within these activities, special workgroups were established for various areas. Specifically, four development groups have been formed:

- a group for CMS, which evaluated various CMS and recommends Mambo (Joomla!) as a CMS and Moodle as a platform to schools,
- a group for the evaluation of e-content teaching materials and will elaborate standards and elements for assessments of e-contents,
- a group for the informatisation of primary schools,

[126] http://www.pfmb.uni-mb.si/raziskave/sr2005/7.htm, ICT among primary schools (see the details in Annex 3 – section 3.2.)
[127] Due to its informativeness, we have included it in Annex 3 – section 3.3.
[128] The database includes various entries, from teachers' products to various shareware and open code products, however, majority of entries are CD ROM supply from commercial providers. http://194.249.61.136/info/index.php?option=com_content&task=view&id=155&Itemid=157
[129] http://info.edus.si/sem_zrss/course/category.php?id=13
[130] Website http://sio.edus.si/ was abandoned with active in maintenance early 2000's; current catalogue on this Website has thousands of entries of various quality and levels, and is in general in poor status. The upgrades of the working group for evaluation of and meta data description is relatively slow.

- a group for new ICT services in education.

In the **tertiary education** sector, the majority of courses are already documented on the Web, with a considerable share (70%) of them changing through the study year. However, only in a minor part – less than a quarter – do they also offer student interaction (RIS2005 survey) on these home pages.

The recognition of the strategic role of eLearning is strongest in the business/economy field and in medicine/health (although the corresponding practice in this area is not at the same level), followed by natural sciences/engineering and the social sciences. The humanities lag behind considerably. Similar is the extent of eLearning applications across these fields, where the business/economy further stands out.

Various faculties were involved in eLearning programmes, e.g. Leonardo, where they developed some programmes with other EU institutions.

The RIS research on eLearning among higher education institutions in 2006[131] indicates that higher education institutions progressed well with respect to ICT usage and eLearning compared with the previous year. Here are the key findings:

- 58% of institutions have established websites that are regularly updated with content information on courses, schedule, informing about changes during the semester (last year 52%) and more than quarter (26%) of courses have websites where students can also take part (last year 20%). Around 12% of courses involve a virtual learning environment (Moodle dominates). 10 institutions have at least one study programme which is entirely integrated into eLearning; usually this is performed as a blended learning option.[132]
- 29.4% of institutions use an on-line courses application in at least one class, 28.2% of institutions have at least one on-line study programme;
- Approximately 1/3 of the institutions strongly agree that they want more national co-ordination (33%) and more information about eLearning (26%).
- More than a quarter (30%) of the institutions has already replaced direct meetings with students (lectures and exercise) with education and training in an electronic form.
- When asked about the frequency of discussing eLearning issues at the weekly meeting of the faculty dean, 7% of the institutions reported that this issue has not been raised yet, while 20% discuss it at least once a month.

The comparisons of data from the last three consecutive annual RIS surveys among higher education institutions show that the expansion of eLearning activities is growing by some 20-30% per year (in terms of the number of courses in a virtual learning environment and the number of students involved). However, the majority of these activities started in early 2000, except for the Faculty of Economics and the Faculty of Electric Engineering of the University of Ljubljana, which started in the late 1990s. The general implementation of some virtual learning platforms is even rarer; there are only few organisations that provide a unified platform for virtual collaboration on the level of the whole organisation. This is no doubt a considerable lagging behind developed countries, which have report much more often about implementation of some platform (e.g. BlackBoard).

With respect to commercial services, we should mention the aggregated on-line catalogues of on-line courses such as http://Spletna-akademija.com run by Nevron, where professional on-line courses are offered in various areas from management to languages, which are currently the best-selling product. A

[131] RIS, 2005: V. Vehovar, V. Pehan, D. Lesjak, V. Sulčič: 'ELearning in higher education institutions.' January 2006.
[132] Lesjak, D., Sulčič V., Trunk Širca, N., Vehovar, In.: Information and communication technology in tertiary education institutions in Slovenia a prerequisite for eLearning; 2004.

similar portal is ***Spletno učenje*** (http://www.spletno-ucenje.com) run by the B2 company, the leading LMS solution provider with its own platform (eCampus) offering ICT-related courses. Another supply of on-line courses involves ***Edupool*** (http://www.edupool.si/) and the portal ***Nauči se*** (http://www.nauci.se),which focuses on cheap courses and instructions (a few €) for school-going generations; they plan to offer hundreds of short courses such as the Pitagora theorem. Another company **B4Contact** specialising in technology, web communications and co-operation recently introduced a free portal, which offers courses on Microsoft Office 2003, Windows SharePoint Services 2.0, Microsoft Windows XP and Adobe Illustrator. It also offers a free alternative method of preparation for the ECDL exam. There are, of course, many others, which sell various global commercial LMS platforms, including those of large multinational companies (e.g. IBM, Microsoft) customised to clients' needs.

In **companies**, according to the RIS2005 survey around 1% of all employees have already experienced some form of eLearning and around 40% of companies have provided some forms of on-line materials for internal education. Around 33% of those companies said that among the on-line courses their employees predominantly attended ICT-related courses, followed by marketing (13%) accounting (10%), management (8%), legislation and taxes (6%), and languages 4%.

A special study about eLearning among adult education institutions in 2006[133] showed that around 1 000 organisations offer some type of adult education in Slovenia and one-third (323) of them – including all the major suppliers – is included in the database of the Adult Learning Centre (http://www.acs.si/pregled), providing around 6 000 educational programmes. Of those 323, only 23 (7%) used eLearning. However, in that study eLearning was narrowed to ICT-supported distance learning services with two-way communication and with the active role of the education institution. Those 23 organisations provided 110 educational programmes, which is less than 2% of the total of 6 000. Of those 110 programmes 54% had a public educational certificate. Language and computer-content courses strongly dominate. Of course, by far the largest project in this area is the ECDL project described below. At this point we can only mention pilot projects from some areas (e.g. in Postojna[134]) that seek to intensify the implementation of eLearning in adult education.

The **improving digital literacy project** was recently (in 2005 and 2006) the largest single activity related to eLearning and was introducing on-line courses about ECDL, which has been described in II.2.3 c.

The RIS 2005 survey of the general population revealed that in the four weeks preceding the survey 23% of respondents aged 10-75 were involved in some formalised education activities, 16% of respondents were involved in education activities organised within a company for employers and 21% of respondents in other education and self-educational activities (altogether 44% of respondents aged 10 to 75 were involved in some type of learning) with the aim to prepare for their future professional, business career. Among all those respondents who had been educated in some ways in the preceding four weeks – the majority of them used information or some materials over the Internet (68%), but they also used a CD-ROM (43%) and an internal computer system of their organisation – intranet (26%). Audio (10%) and video (12%) are used more rarely. The same survey revealed that among one-tenth of the target population who had already participated in some formal on-line course, 25% used only English, 37% only Slovenian, while 39% used took courses in both languages.

Within this context, we should also mention the following issues related to the current status of eLearning:

[133] Zagmajster Margerita (2006). Pregled študija na daljavo na področju izobraževanja odraslih v Sloveniji, http://www.ris.org/uploadi/editor/1157473788pp.pdf

[134] http://www.lu-postojna.si/lu-postojna/projekti/e_ucenje.html

- Pedagogical science has already elaborated basic didactic strategies for eLearning. However, as mentioned, although working groups exist within the National Institute for Education, no formal rules have been yet accepted for e-content and on-line courses in the formal education system.
- A serious limiting factor for business application in Slovenia is the economy of the scale, which does not allow expensively elaborated on-line educational applications. This is especially true of subjects and topics that change very often.
- With respect to contents, the elaborated on-line courses are very rarely publicly available because they are expensive to develop. The on-line courses in formal education are of course available only to the segment they were designed for (students, pupils and teachers) with password protection. However, we found some free courses at http://www.spletna-akademija.com/, within the abovementioned ECDL education; however, these basically serve more as teasers for further involvement.
- on-line learning application for specific populations are very rare. We found a free on-line course for ECDL 4 in the Italian language at the portal http://eucenje.spin.si. With respect to other specific groups, there were some government-funded research projects developed for deaf segments (led by Dr. Matjaž Debevec), however, not many specific applications have emerged.

With respect to LMS, despite relatively limited competition among commercial products in Slovenian language, the prices are driven low due to the competition from capable open source platforms. We mentioned previously on many occasions that Moodle has almost become de facto standard platform in public education. It is also used in many businesses. If we talk about the implementation of on-line educational courses, the prices vary with respect to the level of requirements of the client. Besides the technology itself, which is getting cheaper and cheaper, the prices of implementation are determined by the amount of persons-month work for an eLearning specialist and the supporting ICT and designer staff. Annual costs of a professional do not exceed €4,000 monthly and are much lower for the technicians.

If we speak about standardised courses that can be bought on-line, the prices start from a few euros (e.g. instruction-type pieces of on-line courses), to 20-30 euros for a typical CD-ROM educational content and to 250 euros for a typical three-month blended learning language course (with some live tutorials) and around 700 euros for a typical one-month course on management, which includes 12-16 hours of on-line help and a one-day live workshop of 8 hours.

II.6 Specific issues and solutions

We can find implemented virtual learning environments in only a handful of the largest corporations such as the national telecom, the largest bank and so on. Another area involves some large governmental institutions (e.g. Ministry of Defence) and education organisations (primary, secondary, tertiary, adult).

The organisations often implement the Slovenian Virtual Learning Environment Platform ECHO and the eCampus of the B2 company, however, for all segments Moodle is becoming an increasingly popular platform, along with the open-source LMS platform and partially also Dokeos, both translated into Slovenian. There are only a few exceptions using global commercial platforms (e.g. WebCT, Sitos, CLIX, IBM).

The first Slovenian LMS software EcHO was developed at the Faculty of Electronic Engineering (University of Ljubljana), which is also being commercially exploited. The LMS tool 'ELEUM' is also being developed at the University of Maribor as an upgrade and extension of its central administration system. Other than that, it seems only one Slovenian commercial LMS solution has been developed in the business sector – the *eCampus* of B2, which encompasses LMS, LCMS and content-creation aspects. The eCampus solution is already installed in various private companies, along with some tertiary education and adult education institutions. Altogether, there were around 30 installations in 2006, mostly in

education organisations.

There is another Slovenian product related to virtual learning environments – an open source e-learning content development tool '*EasyCoBu* – easy content builder', which has been developed for the global market by the abovementioned Nevron company and focuses only on the user-friendly building of eContent and does not cover any learning management or process aspects.

In a certain sense, there thus exists a market for these platforms and there are already examples of companies which have switched between solutions, e.g. from ECHO to IBM, or from WebCT to Moodle. Currently, the trend can be observed of abandoning proprietor solutions and replacing them with open sources.

Of course, we have to separate these professional software solutions for creating on-line courses from the specific on-line courses offered by ICT suppliers. Very often global companies such as IBM, Cisco and Microsoft etc. offer their own courses to educate their clients about their products.

As mentioned, in the public sector the prevailing system used in schools and faculties is currently Moodle while some major governmental organisations (i.e. the Ministry of Defence) have also used the ECHO platform. All these platforms are well elaborated and they all support the SCORM[135] standard.

Nevertheless, lots of companies and institutions have developed their own specific systems, often involving some primitive types of learning content management systems, which can handle the creation and distribution of eContent for their needs. However, these systems are not in a position, for example, to allow the elaborated tracking of individual users or to match some international eLearning standards. Most often these are some adaptations of standard CMS – Content management systems – (e.g. Mambo) or their own CMS developments.

In any case, all key players agree that the technology itself is no longer the crucial or limiting factor for eLearning but this in fact involves the question of the organisation, motivation and strategic orientation of a certain organisation. The awareness of various aspects of knowledge management, learning organisation as well as long-term cost optimisation are the most important factors here that stimulate the introduction of eLearning.

However, it is obvious that the small nation and small market are very unfavourable to the development of professional LMS solutions and the related tools for the needs of a specific company or school. We can thus expect that the full implementation of eLearning for the internal needs of companies' employees will only occur slowly in large companies and in large public sector organisations.

II.7 Acceptance and usage of eLearning services

In this chapter we will briefly overview the usage of eLearning among individual users, companies and in schools.

[135] **Sharable Content Object Reference Model** (**SCORM**) is a collection of standards and specifications for web-based *e-learning*. It defines communications between client-side contents and a host system called the run-time environment (commonly a function of a learning management system). SCORM also defines how contents may be packaged into a transferable ZIP file, web-based e-learning.. SCORM also defines how content may be packaged into a transferable ZIP file.

A) Companies

The Eurostat Community Survey on the use of ICT in Enterprises 2005[136] demonstrated that almost half (42%) of large companies in Slovenia practice some forms of on-line education[137] On average, Slovenian companies with 10 and more employees are thus radically above the EU15 average (21%) in using on-line material and on-line courses, at least when it is defined in such a very broad and vague meaning ("percentage of enterprises using e-learning applications for the training and education of their employees"). Given the lack of standardised data on eLearning we must, naturally, use these figures with caution. However, these rare EU25 comparisons are still valuable.[138]

In the RIS2005 survey on eLearning among companies the question of *whether the employees of the company have already attended some eLearning (i.e. on-line) course* showed that around 15% of large (250+ employees) and around 10% of medium (50-250 employees) companies reported a certain use of eLearning for their own internal needs, while among companies with less than five employees this was much rarer (3%). The majority of these companies used their own eLearning programmes or their own on-line educational materials, followed by attending to externally purchased on-line courses. Slovenian courses and foreign eLearning courses were roughly approximately equally represented.

Generally, the employees and companies are satisfied with their eLearning services according to the RIS2005 survey on eLearning. However, some results – e.g. the survey among IBM employees – showed that workers actually prefer live lectures and classic teaching compared to on-line courses. On the other hand, eLearning providers, particularly the faculties, show evidence that satisfaction – and particularly knowledge (i.e. measured at exams) – radically increased with the implementation of eLearning.

B) Users

Within the EU25, Slovenian Internet users report that in the last three months 32% of them 'used the Internet for formal educational activities' (EU25 average 16%). Of course, this is simply the percentage of respondents who agreed with the statement, which actually measures a subjective perception of educational activities on the Web. Slightly lower, at the level of the EU25 average, is use of the Internet in work-related education. Similarly, the 2005 results[139] show that the share *of computer-based learners* in Slovenia (30%) in the 25-65 age group is well above the EU10 (11%). The same differences exist in the share of *participants studying by making use of educational broadcasting*[140] (Slovenia 68%, EU10 15%).[141]

[136] Eurostat (2005): Panorama of the Information Society in Europe.
[137] A detailed table on this is in included in Annex 3 – section 3.1.
[138] More details are given in Annex 3(Table 2)
[139] Statistical Annex, Table 13.
[140] Statistical Annex, Table 12
[141] More details of these results are in Annex 3 – section 3.1 and in general Statistical Annex.

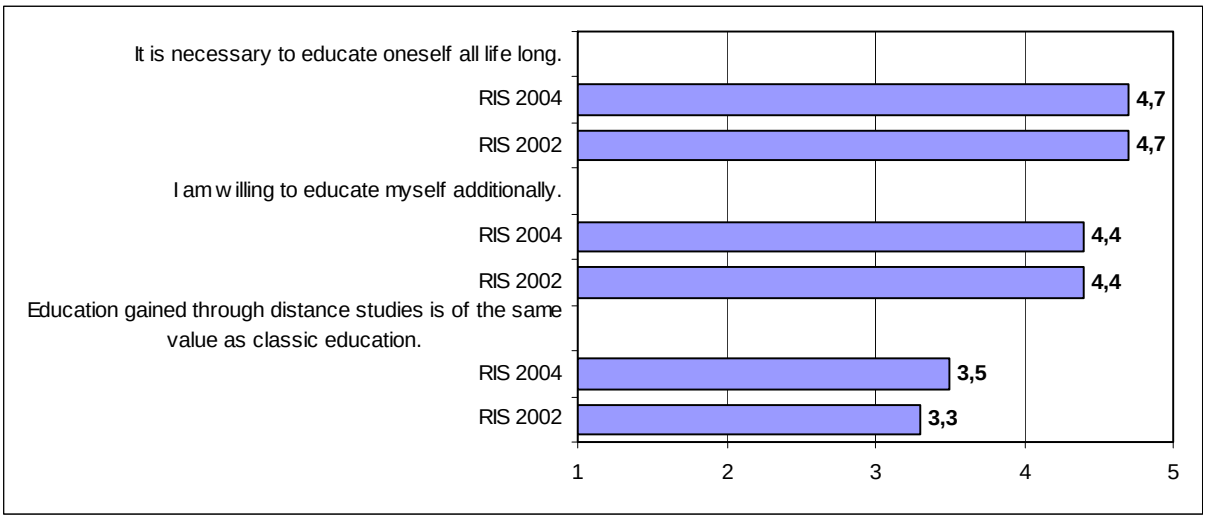

Figure 3: Agreement with the statements among Internet users that already heard of the term eLearning- mean values of responses on 1-5 scale (RIS – December 2004, n=401; RIS – June 2002, n=266)

With respect to the attitudes to and perceptions of eLearning we have already mentioned some results in Section I.3. In addition, here we present some additional key findings in the above table. We can observe that the awareness of lifelong learning is stable and high (4.7 on a 1-5 scale), which is also true for the willingness to educate oneself (4.4), while the perception of eLearning compared to traditional learning is increasing (3.3→3.5).

C) Students

The positive perception of eLearning by the students has already been mentioned. Students spontaneously complain if there are no materials for corresponding courses available on-line. On this basis, the competition between courses as well as the competition among programmes and schools will gradually lead to the growing introduction of eLearning elements in educational programmes.

There is some evidence that some types of students prefer when the courses are given on-line in a form of "blended" learning (i.e. with a limited number of live sessions) compared to the classical one (i.e. the experience of Doba, Faculty of Management Koper). However, this perhaps cannot be generalised for all other areas and segments. The optimal balance between on-line and off-line teaching must take into account the costs, knowledge attained and satisfaction, which is very complex to evaluate particularly because of the various content and other differences.

Some specifics about the use of eLearning among schools can be identified through a special survey from 2006 conducted among primary and secondary schools. All schools were surveyed in this project. The research revealed that more than half the primary schools (52.6%) claimed that at least some teachers had already formed certain web contents for courses. The corresponding percentages for videoconferencing and distance learning are much lower, however they are not negligible (16% and 12%, respectively). Around 12% of the schools thus report at least some practice with distance learning, while only 0.3% (i.e. one or two schools) report it as occurring very often. Regular use is much rarer. The situation in secondary schools is considerably better (Table 12).

Table 10: Types of eLearning used for pedagogical work in primary schools – the percentage (%) of schools reporting corresponding practice (%) (Survey among the schools 2006[142])

Types of eLearning	Very often	Often	Somehow often	Rarely	Never
Forming websites for courses	1	2.5	7.3	36.5	52.6
Publishing content on the Internet	0.5	2.8	7.9	41.8	46.9
Developing of e-content by teachers	0	0.8	1.3	23.5	74.4
Use of e-content by pupils	0.3	3.8	13.6	40.8	41.5
Communication via e-mail	0.8	4.1	16.5	54.6	24.2
Use of attachment with learning contents	0.5	3.3	12.5	47.1	36.6
Verifying knowledge through e-tests	4.5	5.1	12.4	33.8	44.2
Searching on the Internet	12.1	40.1	31.7	13.1	3
Group working with computers	2.1	8.2	19	36.8	33.9
Use of videoconferences	0.3	1.3	3.6	10.8	84.1
Partial programmes for distance learning	0.3	2.3	4.1	14.7	78.7
Full programmes for distance learning	0.3	1.3	2.6	7.5	88.4

Table 11: Types of eLearning used for pedagogical work in secondary schools – the percentage (%) of schools reporting corresponding usage (%) (Survey among the schools 2006[143])

Types of eLearning	Very often	Often	Somehow often	Rarely	Never
Forming websites for courses	1.8	7.1	14.2	49.6	27.4
Publishing content on the Internet	0.9	8.9	18.8	50.9	20.5
Developing of e-content by teachers.	0	2.7	7.1	38.4	51.8
Use of e-content by pupils	0	4.5	14.5	46.4	34.5
Communication via e-mail	2.6	6.1	31.6	47.4	12.3
Use of attachment with learning contents	0	6.4	29.1	40.9	23.6
Verifying knowledge through e-tests	3.6	7.1	19.6	37.5	32.1
Searching on the Internet	16.8	37.2	32.7	11.5	1.8
Group working with computers	3.6	12.5	25.9	38.4	19.6
Use of videoconferences	1.8	3.6	5.4	16.2	73.0
Partial programmes for distance learning	1.8	1.8	5.5	20.2	70.6
Full programmes for distance learning	0.9	1.9	3.7	11.1	82.4

Another estimate made by experts says that roughly around 20-30% of schools actually use computer laboratories not only for ICT courses but also for introducing eLearning and computer to other substantial subjects/courses. Most frequently, this is informatics but we often also encounter geography, physics, chemistry and recently increasingly often languages. Here, we may repeat that almost all schools in Slovenia have computer labs and their own website, however, it is unclear to what extent they use it for on-line teaching contents.

With respect to international comparisons we have already mentioned (in II.4 and II.5) the research performed in 2006[144] for the European Commission, Information Society and Media Research.[145] Let us now observe some other key data with respect to the use of eLearning.

[142] Gerlič, Ivan (2005): Stanje in trendi uporabe informacijsko komunikacijske tehnologije (IKT) v slovenskih osnovnih šolah. http://www.pfmb.uni-mb.si/raziskave/os2005/

[143] Gerlič, Ivan (2005): Stanje in trendi uporabe informacijsko komunikacijske tehnologije (IKT) v slovenskih osnovnih šolah. http://www.pfmb.uni-mb.si/raziskave/os2005/

[144] http://ec.europa.eu/information_society/eeurope/i2010/docs/studies/final_report_3.pdf - Empirica Gessellshaft für Kommunikations- und Technologieforschung (2006): Benchmarking Access and Use of ICT in European Schools.

Table 12: ICT usage in the classroom in EU25 schools (%) (Empirica, 2006)[146]

	Teachers who use		Use of computers n teaching[147]	Structure of the computer class usage		
	on-line material from established sources[148]	material on the School's network and database[149]		To present/ demonstrate[150]	In more than 50 % of lessons[151]	By pupils in class[152]
Cyprus	80	54	99	68	11	51
Czech	40	80	100	71	18	74
Estonia	87	65	99	51	16	52
Hungary	55	45	97	41	27	36
Lithuania	77	61	97	56	17	47
Latvia	75	60	98	34	5	33
Malta	80	26	100	66	18	65
Poland	65	42	95	55	24	53
Slovenia	54	52	100	63	12	60
Slovakia	72	72	99	66	16	66
NMS	62	53	97	56	21	54
EU15	76	65	99	65	16	69

From the table above and from Sections II.4 and II.5[153] we can confirm that Slovenian teachers demonstrate a high general level of ICT usage and are also very eager to expand this level. On the other hand, ICT usage in the classroom is lagging behind considerably due to inadequate equipment and the lack of corresponding stimulation.

II.8 Impacts of eLearning developments

Obviously, eLearning is intensively represented in Slovenia – although in its early developments – in all sectors of education. The process of change has thus already started, albeit it is predominantly still in the pioneering stage where basically enthusiast, visionary businesses and early adopters are developing/using specific eLearning services. However, on the other hand, surprisingly high share of Internet users already report various eLearning activities. This can indicate that informal learning on the Internet is rapidly becoming an extremely important educational activity. The high Internet penetration rate (e.g. above 85% among secondary school generations) and in companies, together with the growing broadband presence among households, create considerable potential for eLearning. The major impact of these early developments is thus to prepare readiness and demand on one side, as well the necessary pressure for the regulation and supply sides.

It is thus perhaps too early to fully demonstrate the competitive advantages of the institutions applying eLearning approaches and to substantially discuss their impacts. However, this will eventually be demonstrated in the near future.

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[145] Pan-European survey: More than 2/3 of the EU's schools benefit from high-speed Internet access http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/06/1285&format=HTML&aged=0&language=EN&guiLanguage=en

[146] Data from the report 'Benchmarking Access and Use of ICT in European Schools 2006' elaborated by Empirica Gessellshaft für Kommunikations- und Technologieforschung.

[147] Percentage of the use of computers for teaching in schools (in the last 12 months).

[148] Percentage of teachers who use existing on-line material from established educational sources.

[149] Percentage of teachers who use material that is available on the school's computer network or database.

[150] Percentage of teachers who have used a computer in class to present or demonstrate among those who use computers in class.

[151] Percentage of teachers who use a computer in more than 50% of their lessons among those who use computers in class.

[152] Percentage of teachers whose pupils use a computer in class.

[153] As well as from other sources in Annex 3.

Except for the large ECDL-related EU-funded programme, other eLearning activities have been conducted on too small a scale to have any major impacts on the entire education sector.

Similarly, it is very difficult to estimate the role of eLearning on the digital divide in Slovenia (it is even unclear whether this role is positive or negative), on the role on Slovenian information society developments or on achieving the Lisbon strategy targets.

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

III.1 Current main achievements and shortcomings

In Slovenia eLearning is closely linked with the general educational environment, which is characterised by solid educational quality,[154] rigid institutional structures, a strong hierarchical role of the teacher and the special status of the Slovenian language. Indirectly, the general (political) environment is also linked to educational developments, particularly aspects related to the country's smallness, as well as its active exchange with Western countries after World War II (unlike other NMS countries) and its independence in 1991 (the first time in the history of Slovenians). These have all stimulated an openness to global trends, to neighbouring cultures (Slavic, Roman, German) and indirectly contributed to the openness to new technologies. The stable macroeconomic development seen in the last 15 years is also an important factor as it has been accompanied by high GDP growth rates, albeit also with the increasing ageing of the population and rapidly falling birth rates.

The education system has not followed these fast demographic, social and economic changes of the last 15 years. While primary and secondary schools have less and less pupils (due to the demographic trends), pre-school and post-secondary segments are rapidly expanding due to specific socio-economic changes. Nevertheless, the share of educational expenditure (private and public) in GDP has remained stable and is still among the largest in the EU25, while regulation of the education system awaits many important changes.

Due to some very specific circumstances, in the 1990s Slovenia was slightly above the EU15 average with respect to the key ICT indicators. However, the driving factors of this were not commercial ones, nor were these early developments upgraded with corresponding strategic governmental measures. As a consequence, a certain slowdown occurred in the late 1990s and Slovenia lost the historic opportunity to position itself as an advanced information society. Today, Slovenia hovers roughly around the EU25 average with respect to ICT indicators, which is also true of ICT literacy, ICT usage and ICT education.

Government documents related to information society developments have usually been very general and not binding over the last 15 years. The lack of an explicit strategic orientation was thus the key-missing element in information society developments, including eLearning. It was not before 2000 that we could observe more ICT-related strategic activities, however, it is still unclear whether these will all be truly implemented.

The tools supporting virtual learning environments, with their first global peak expansion around 2000, were introduced into Slovenia with a considerable delay. The main reason for this was the smallness of the country so there were not many large organisations, which could benefit from these complex solutions, nor has the government taken corresponding measures for their extensive implantation in schools. The use of virtual learning environments was thus limited to some visionary tertiary education organisations, to enthusiastic teachers in primary and secondary schools and to a few pioneering commercial companies that specialised in LMS tools. Only in the last few years has the supply of open source virtual learning environments, particularly Moodle, and the emerging global eContents noticeably enhanced the use of many educational services.

Within this general context described above, in this chapter we summarise and integrate the major achievements and shortcomings of eLearning developments outlined in the previous chapters. First, we summarise the most important achievements and shortcomings related to the current status of eLearning.

[154] As outlined in II.1.A2 international comparisons put the performances of Slovenian pupils/students into the median of developed countries.

A. General issues and indirect relevance	
Major achievements	**Major shortcomings**
- solid public education system, - stable economic developments, - relatively high (compared to EU25) ICT usage and computer literacy, - high informal learning levels over the Internet; among the highest n EU25, - considerable spending of GDP on education, among the largest in EU25, - early computer literacy project activities (RO) provided a strong core network of experts for continuous ICT training of teachers from early 1990s, - good Internet infrastructure for public education institutions; share of schools with broadband is among the leading in EU25, - recent government activities in drafting, preparing and accepting general si2010 national strategy on information society developments.	- general delay in modernisation and further regulations of the educational system, - lack of strategic priority to information society developments, - absence of an ambitious and binding eLearning strategy and related absence of a competent operative body with enough professional staff to implement the strategy, - deficiency of other ambitious government initiatives in the area of ICT and information society, - decline in intensity of the computer literacy project activities (RO) from late 1990s on and corresponding lagging in PC equipments for schools, - lack of faster and more ambitious implementation of the optic fibre for all schools, but also for the households.

With respect to the eLearning usage we can identify the following achievements and short comings.

B. eLearning usage	
Major achievements	**Major shortcomings**
Pre-schools: ICT-related activities are implemented in the majority of organisations.	The curriculum is not compulsory. Lack of equipments.
Primary and secondary schools: Computer education is de facto compulsory. Good ICT network infrastructure. Share of schools with broadband is among the highest in EU25. Considerable segment of schools has advanced implementation of ICT. Teachers are motivated to apply ICT in teaching. Good network for ICT education of teachers.	Computer literacy competencies for pupils are not formalised. No compulsory subject. Teachers are not properly motivated for applying ICT in teaching. The on-line content is not formalised nor rewarded. On-line content is not systematically evaluated. The status of ICT personal in schools is not formalised. Lack of equipments. The school network website is not maintained.
Tertiary education: This is the leading sector for the implementation of on-line education, particularly the small universities.	The largest university lags considerably in strategic and practical implementation. Status of on-line courses is not regulated. Organisations lack national coordination.
Lifelong learning: In general well developed. Large EU funds for ECDL for blended learning, considerable indirect benefits	Relatively limited number of on-line applications. The ECDL project was not optimally exploited; direct benefits were limited.
Companies: Informal on-line learning and the Intranets with certain on-line materials are well in use. Recent increase in the supply of on-line courses.	The use of virtual learning environments is only present in a few large companies; the demand is otherwise low. There is small number of specialised on-line suppliers.

The specific achievements and shortcomings related to eLearning are summarised below.

eLearning specifics	
Major achievement	**Major shortcomings**
eLearning services and functions: - Internet is used as a learning tool by 68% of persons involved in any kind of learning in past month (which is almost half of the population 10-75). CD-ROMs are also widely produced, marketed and used (43% of these persons). - The business sector often uses DVDs and particularly the internal network (e.g. Intranet) to distribute documents and learning materials. - the share of Internet users (16-74 years) using the Internet for informal education is the highest in the EU; similar is true also for the use of virtual libraries.	- Interactive educational services in an on-line virtual environment are very rare, - Delays in on-line curses educational supply on the Internet; it appeared more substantially only in last two years, - Very few. LMS were developed by Slovenian organisations. - Very few other LMS were fully translated into Slovenian language. - Public catalogue of eContent materials is poorly updated.
eLearning services content - English language knowledge is among the highest in the EU (56% of the population[155]), so the majority of e-learners report using English materials - Foreign language courses dominate in supply among on-line courses, what is the sign that also the substantial areas (and not only ICT educational courses) are becoming of interest. - Large number of learning applications (mostly CD-ROMs) has been produced by commercial providers and by teachers.	- Almost all interactive courses in a virtual learning environment are closed or commercial. - Free and demonstration/promotion courses are very rare, at least the high quality ones. - Full ECDL courses are available only commercially. - The supply of the digital content and learning software is not evaluated and sorted.
eLearning service interactivity - The majority of learning material on CD-ROMs have achieved a friendly interactivity - Majority of virtual learning environments rely on professional tools (e.g. Moodle), which enable interaction. - ICT support (i.e. PPT or Internet projectors) are routinely used at all level of education system,	- The majority of eLearning is limited to the interaction of the eLearner with the eLearning materials. - On-line courses are often reduced to postings of PDF materials and forum discussion. Due to costs savings, the level of interaction with the content is limited. - Only in some rare (predominantly university environment) courses do eLearners interact among themselves.

[155] Languages in the EU, 2005. http://ec.europa.eu/public_opinion/archives/ebs/ebs_237.en.pdf.

Advantages and shortcomings given above can be identified with three following major challenges for future developments in eLearning:

- ***Technological challenge: Production of local tools for the virtual learning environment***. It is unclear if there is a market for developing 'local' tools in this segment. In the 1990s and earlier these tools (e.g. LMS) used to be very expensive and very complicated to apply. They were also expensive to create from scratch and risky to update and develop. This is also true of the first Slovenian LMS platform E-CHO, which now faces complex problems of including new components and increasing the usability features. Nowadays, however, commercial solutions are increasingly cheaper, powerful and friendly. Open-source solutions are also expanding, which all contributes to the wider accessibility of tools such as Moodle or Dokeos. On the other hand, own solutions clearly enable much greater flexibility to suit clients' needs.
- ***Language challenge: the Slovenian language as a compulsory learning (and eLearning) language:*** The Slovenian language is a very sensitive political and cultural issue, especially for a nation which has survived more than a thousand years without its own state and has identified and established itself with its culture and language. Full liberalisation may thus face serious obstacles in the regulation of the officially allowed teaching language. It is also very true that currently users strongly prefer Slovenian as a learning language and Slovenian is also the compulsory language in education. However, the future directions are somewhat very difficult to predict because the country's growing English proficiency and supply of global materials in the English language may produce very different trends.
- ***Policy challenge: The level of support from the government:*** The level of actual government support for further eLearning developments is on one side relatively unclear while, on the other hand, it is essential. It thus presents the biggest challenge to future development in this area. Within this context, a number of other minor aspects exist ranging from the effects of potential legal regulations related to privacy, security through to copyright issues, which may have complex consequences. Within this context, another short-term challenge appears with Slovenia's EU presidency in 2008, which will bring an opportunity to expose the importance of information society issues, including those of eLearning. A related i2010 conference will also be held in Slovenia in 2008 and the hosts will be able to have some influence on structuring the event[156] according to specific needs. This is both a very rare and valuable opportunity and a challenge to put some specific eLearning related issues on the EU agenda.

III.2 Factors behind the existing developments

III.2.1 Economic factors: macro- and microeconomic environments

The macroeconomic environment was relatively favourable in Slovenia compared to the EU25. GDP growth rates were high and the forecasted growth rates are foreseen to be even higher. The favourable economic environment has also stimulating effects on the long-term planning of education (at the company level and national). Educational and research activities, which are often the first to be cut in times of restrictions and economic depression, are thus continuously expanding. Prosperous economic development also provides the opportunity for the government to expand its services to citizens.

The liberalisation of the economy and global competition are further boosting the importance of knowledge and also the importance of education. Indirectly, this also exposes the comparable advantages of eLearning.

[156] Here, one interesting imitative was to declare the entire country of Slovenia as a Living Lab (http://www.livinglabs-europe.com) because it is small enough to serve as an environment for ICT related social experiments in communication, learning etc.

The increased unification of the EU economy, as well as labour and education market additionally contributed to the increased eLearning awareness and competition. For example, the surveys already indicated the enrolment of Slovenians in Open University programmes.

On the other hand, the country's small direct foreign investments still limit the indirect impact of the eLearning expansion via large multinational companies.

The lack of economies of scale due to the country's smallness appears to be a very strong factor limiting eLearning usage as well as eLearning supply. Within the given level of eLearning tools and costs, only those organisations with a large enough audience can benefit. However, this is relatively rare in a small country.

III.2.2 Legal factor: regulation at national and EU levels

Currently, no legislation is in place specifically for eLearning, partially because the related problems have not yet arisen. Similarly, no major problems have so far emerged with respect to eContent legislation (i.e. copyright, security). These legal issues thus have not appeared as a major obstacle to the expansion of eLearning. Nevertheless, we should add here that the general regulation of privacy, security and copyright has of course already been harmonised with the EU legislation.

On the other hand, the specific regulations related to property rights for eContent, which is developed with public funds (e.g. primary and secondary schools) is much more relevant and problematic. Even more important is the education legislation that indirectly affects eLearning, i.e. the teacher certification, monitoring and promotion. Currently, for example, only participation at educational ICT seminars counts for teachers' promotion (which also includes salary increase) and not the actual implementation of ICT in the classroom. Similarly, the regulation of promotion-related education for public sector workers also represents a certain limitation on the more intensive expansion of eLearning.

Nevertheless, the most important legal aspect indirectly related to eLearning is the absence of more elaborated rules for digital content status (e.g. standards, costs of production, rewards, copyright, the relationship with traditional teaching etc.) in the curriculum at all levels of formal education.

III.2.3 Policy factor

We have already extensively discussed the importance of pro-active government policy. All eLearning experts and stakeholders in Slovenia also reflected a very clear need for a more active eLearning strategy at the national level, accompanied with consequential increase of funds and activities to stimulate the developments and co-operation. This includes the strategic documents, increased funds, as well as the establishment of an organisational entity responsible for the development and co-ordination of eLearning activity at the national level.

All in all, we can clearly state that the policy factor has actually been the strongest determinant of eLearning development in the past few years. In particular, political decisions about support for the school computerisation project (RO) have been some of the key measures determining the level of eLearning developments in the last 15 years.

III.2.4 Technological factors

The technological infrastructure in Slovenian households, as well as in companies, is relatively well developed (around EU25 average), including school infrastructure (above EU25 average, except for PC density). However, eLearning in the school system still needs further steps: the full introduction of wireless Internet, the increase in teachers' equipments and, in particular, the increase in the number of PCs (or some other corresponding devices) for participating student/pupils. Optic cables are also needed for all

school institutions, otherwise their absence will represent a growing barrier to modern eLearning with a lots of multimedia content. Software, on the other hand, is not so much a decisive factor for the implementation of virtual learning environment anymore (due to user-friendly open source solutions), but the related organisation, motivation and strategic issues are the key potential drawbacks.

The long-term destiny of the few domestic LMSs, created by Slovenian organisations, might be unclear, because advanced and complex tools are very expensive to develop and even more expensive to maintain. However, they have so far been very prosperous in past years because they were accompanied by local professional support, which can be fully tailored to clients' needs. The latter is very often the key deficiency of open-source solutions in general (e.g. Microsoft vs. Linux).

III.2.5 Socio-cultural factors

Slovenians are open to adopting new information society technologies. This is true of their interest in specific information society services, which is well above that of the EU25. This also applies to the high level of interest of teachers to apply ICT in teaching.[157] Again the corresponding indicators show that Slovenia stands well above the EU15 in terms of their motivation. This is no doubt a very specific national advantage, which has not been fully exploited in the past years.

With respect to computer literacy skills, the new generations, which enrolled in primary, secondary and tertiary education in the last 10 years, possess sufficient of them,[158] however, this is not true for older generations. Nevertheless, the overall international comparisons show that ICT skills are relatively well developed compared to the EU25.

Among other socio-cultural factors we may include the abovementioned inclination towards the authoritarian role of the teacher and the passiveness of students, whereby pupils and students rarely dare ask questions. These may have contradictive effects on the adoption of eLearning where not live meeting would be provided.

Another crucial cultural specific is the perception of the importance of the national language and its very specific historical role. A formal restriction may arise in terms of using foreign language eLearning materials.

III. 2.6 Regional specificities and regional factors

Although a small country, regional differences (from language dialects to economic developments) are surprisingly high in Slovenia. The vast majority of Slovenians is born and educated in the same region, where they also work and die. As we already mentioned in the Introduction, the mobility (i.e. moving) within the country is extremely low; people typically remain their entire life within the same municipality. Mobility between regions is thus almost negligible, except for migration to the central region around the capital (Ljubljana). In principle, this specific may increase the potential of eLearning, as well as the centralisation of education supply and eLearning production. It may also reduce the need for local educational staff. In a small country where almost all regional centres can be reached within a two-hour drive from the capital, tutors can easily commute to the teaching locations. These regional characteristics may thus stimulate eLearning and its centralised developments so that the regions may become only passive recipients of the eLearning products and services developed from one centre.

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[157] The certain lagging in teachers usage of ICT in the classroom in Slovenia can be attributed to the lack of corresponding support, stimulations, equipments and awards.

[158] We may add here the finding from recent Eurostat survey on ICT 2006, that Slovenians in age group 16-24 year were the most computer literate among all EU25 countries. http://www.ris.org/index.php?fl=1&nt=9&sid=409.

On the other hand, these regional specifics can also stimulate innovative regional centres, which are either focused on educating local students, or, may also develop some highly specialised education programmes or services, which are of national (or even international) interest. It seems that this latter tendency prevailed in recent years, as eLearning was most radically implemented outside the capital (and its central region) and outside the largest university, the University of Ljubljana. This tendency is expected to further expand in the very near future as the regions will very soon receive a formal status. So far the regions are not a formal and legal entity so they have a very limited role in public affairs, including education.

III.2.7 Demography

Slovenia faces the largest decline in the fertility rate in the entire EU. The generations have shrunk radically, from 30,000 in 1980 to almost 17,000 in 2005. The process is much more dramatic than in the majority of EU countries. This will put considerable pressure to reorganise and restructure the education system (e.g. relatively too large spending in primary schools), which may also provide an opportunity for its modernisation, including increased usage of eLearning.

An increasing segment of the population 65+ presents another very specific challenge for eLearning applications, which has not been tackled yet. The potential driver here is the design of specific eLearning services adapted to this population segment, including the integration of eLearning in services related to ambient living for the elderly population.

Another issue linked to demographics is the size of the potential audience in the Slovenian language. This was perhaps the key problem of past eLearning developments, but the corresponding costs and complications will perhaps shrink in the future due to technological progress in eLearning technology.

III.3 Drivers and barriers for future eLearning in Slovenia

With drivers we understand the forces that will stimulate the development of eLearning in Slovenia, while barriers are related to the facts, institutions, regulations and activities etc. that will pose obstacles to the optimal development of eLearning. Both drivers and barriers are based on the above analysis of the factors, which compose the drivers.

III.3.1 Drivers

- ***Quality of the education system and its relative autonomy***. A stable and solid education system exists which provides pupils and students with international comparable knowledge. On the other side, it also leaves the school and teachers with enough autonomy for their innovative roles. Although recently the government measures were not very stimulating for the implementation of eLearning, a surprisingly large number of schools and teachers autonomously have developed remarkable achievements in eLearning. The school system thus gives enough room and flexibility for school principals and for teachers' enthusiasm so they can internally relocate some funds and develop eLearning applications (given that there is not enough formal institutional support). This is closely related to the next driver.

- ***Openness to ICT services and openness to learning.*** There is a specific openness to implementing new information society services, which we already elaborated in previous subsections. This holds for the general population and in particular for young generations, as well as for teachers in the public education system. This can be confirmed in various international comparisons, as well as in benchmark indicators related to informal eLearning practice among Internet users in households and companies. Although these may not be reflected in the expanded use of virtual learning environments, it indicates that there are numerous informal on-line (educational) materials and that Slovenian users access them intensively. The recent RIS 2006 September survey shows that 70% of Internet users actually use the Internet for informal self-education (aside from formal on-line

courses). The extremely high general involvement in lifelong education activities (well above the EU25 average) also supports this as a very important future driver for eLearning development. Similarly, this is reflected in the high enrolment levels of young generations in the secondary and tertiary sectors (among the highest in the EU). Together with the considerable progress of adult learning and continuous education, these all indicate an understanding of the importance of education as well as the habit of permanent educating. This clearly represents a strong pull for the introduction of eLearning services.

- ***Solid technological and human resources infrastructure***. A good national ICT infrastructure exists for the education sector. The schools are provided with the (broadband) Internet by the public Internet access provider, which is financed separately by the government. Within this context, we should also mention the relatively high ICT penetration of PCs, Internet and broadband among households and companies (above the EU25 average). Within this context, we should also mention the network of ICT-experienced teachers, which has grown since the school informatisation project from 1993. Around 800 to 1 000 teachers have already been involved in lecturing to other teachers at ICT seminars in the past years. They represent the core infrastructure of the next wave of eLearning expansion.

- ***Available financial resources***. The existence of the high and stable national education expenditures and high private household education spending could become important drivers because it is much easier to reallocate the expenses than to ask for extra budget funding. In addition, target funding from EU structural funds, such as the €7 million ECDL project supported by EU sources, may play a very important role in eLearning developments. Such projects extend the eLearning opportunities to spin-off companies supplying various services, as well as to the recipients, the citizens, who get familiar with the elements of eLearning. In the future, even more EU structural funds will be available for education. In addition, the prosperous economic growth in recent years (as well as that forecasted for the future) also enables funding for learning developments at all levels, from companies to the national budget.

- ***Pro-active policy measures***. The EU policy is a very strong driver of eLearning development, because it pushes towards modernisation, it provides models for the strategy, produces regular benchmarks and is removing numerous barriers which would otherwise remain for much longer. This is a very valuable and effective driver for removing unnecessary local obstacles and barriers. However, it still cannot replace the original and ambitious national strategy. Of course, it is also not a comparative advantage within the group of EU countries. The complementary and ambitious national strategy, which is outlined in some recent governmental documents could become the central driver of further eLearning developments in Slovenia.

- ***Flexibility of a small country***. The smallness of the country is a basis of a very specific advantage. Large and complex systems (such as education ones) can be changed relatively easily or at least much easier in small than in large countries. ICT permanently requires a radical restructuring, transformation and re-engineering of the entire education system and, within this context, Slovenia has the advantage of a highly computerised public sector, register-oriented public administration ICT support, centralised governmental informatics and a specialised public Internet service provider. Although being very complex, the education system does not require huge inputs for organisational changes not for investments. For example, buying a brand new notebook for every pupil at primary and secondary level in Slovenia would perhaps require less than €100 million. On the other hand, the informatisation and centralisation of the education and administration system enable considerable flexibility when changes are introduced.

III.3.2 Barriers

- ***Weak persuasion and lobbying to politicians and public.*** One of the main problems related to information society developments in Slovenia is the fact that this is a long-term activity, with few immediate results that can be shown to the public or to the voters. In addition, as mentioned, there has existed a permanent lack of an autonomous push – as well as a vision – towards the information society from politics and politicians. Unfortunately, the critical public and civil society pressures were not articulated enough either. The number of commercial subjects with direct benefits for ICT developments is also very limited, particularly because ICT hardware and software are supplied by foreign multinational companies. As a consequence, the stakeholders of information society developments are quite diversified, scattered and without formal organisation or formal networking. Specific formal attempts (e.g. the Forum for the information society, Slovenian Informatica society) failed due to this and other reasons. As a consequence, the corresponding lobbying potential at the government level is relatively weak – particularly when it has to compete with lobbies related to roads, railways, energy, farmers, the military and various monopolistic corporations. Therefore, despite the interests and motivation of the general population regarding information society services[159] these interests are not articulated politically nor throughout civil society. When national priorities are negotiated and the national budget is allocated, general information society developments thus typically remain at a relatively low level of priorities. Even when this lobbying potential exists, unfortunately, its interests (e.g. those of ICT companies for hardware, software, telecommunications…) do not necessary match the long-term national benefits in information society or eLearning developments. Of course, articulating the precise vision of the information society is particularly demanding because we cannot talk about some dramatic lagging in this area for Slovenia, but we are talking about reaching potentials and developing one of its key comparative strategic advantages. The long history of various information society initiatives which all failed to be implemented together with the general political attitude to the information society fully supports this concern. Very often the persons who are knowledgeable and capable to influence and bring about some changes are in some conflict among themselves (i.e. conflicting views about some minor information society development issues exist), or, they have some of their own specific business interests and involvements, which prevents them being fully operational in terms of setting and lobbying for national priorities in the area of information society. This drawback is strongly related to the next one.

- ***Prolongation of the declarative–only type policy support for eLearning.*** A general lack of a long-term strategic support for development of the information society has existed in Slovenia since the Internet's expansion in the mid-1990s, which is also indirectly related to eLearning. We have already demonstrated this lack as an important barrier in the above and previous sections. As the commercial sector is not at all a driving force of eLearning developments in Slovenia, the public education sector should take the lead, at least in this stage of eLearning development. Despite some promising documents a serious danger exists that this trend will continue. As a consequence, the following may also continue:
    - a lack of corresponding funding;
    - insufficient national co-ordination;
    - a lack of equipment in the public education sector,[160]

[159] Respondents in a RIS survey 2006 gave the information society developments same or higher priority as to complete the road construction. http://www.ris.org/index.php?fl=1&nt=9&sid=448

[160] There exists a certain paradox: contrary to the good network infrastructure there is a considerable lack of PCs in Slovenia. This shortfall is seen in primary and especially in secondary schools which are not subsidised by local communities. In particular, this is true of teachers who are equipped with PCs at a rate below the average of Slovenian employees. A considerable lack also exists in tertiary education. The deficiency of PCs is also stated as the major barrier in all surveys of teachers and head teachers. The EU comparisons also show that the Slovenian school system is under-equipped with PCs.

- a lack of proper motivation among stakeholders (e.g. teachers); and
- a lack of monitoring.

As a further outcome of the above aspects, it is then also unclear whether even the existing resources have been allocated optimally.[161] As a consequence, there is also the lack of the promotion and understating of eLearning and one aspect of this is set out below.

- ***Formal value of the education obtained on-line.*** Low perception of the *formal* value of the Internet distance learning option among the general population, i.e. the perception of the typical Slovenian is that this education is not equal to the classical one. Consequently, they are less willing to formally enrol (and pay) compared to the classical one.

- ***Economy of the scale problem in a small learning audience***. There are very high costs per user/student for creating eLearning contents in the Slovenian language. Only some rare courses can afford the high professional ratio (e.g. 1:80) of eLearning course preparation hours. The number of large companies – another important potential segment for professional eLearning applications – is also extremely small. Consequently, a specific threat exists from foreign global eLearning content providers who are increasingly appearing in the Slovenian eLearning market: their cheap and high quality eLearning contents compete and destimulate development by locals who cannot afford enough resources for elaborated and comparable applications.

- ***Low flexibility of the general population.*** The traditional reticence of Slovenians is also a specific albeit indirect barrier to faster eLearning development. The extremely low share of the population that is prepared to move, low job mobility, low student mobility, limited educational and job exchange within the EU are all specific but serious indirect disadvantages (also for modern learning) in an environment of increased global flexibility.

- ***Low educated older generations.*** There is a very general education structure (due to slow developments in the past) in the adult population, which becomes obvious if we observe the low share of the total population with a completed tertiary education. For example, this share is only 13% in the age group 40-44 years (EU25 21%).[162] Less educated segments are more difficult to enrol or become motivated for eLearning, which reduces the potential audience and potential eLearning market as well as the overall capabilities for eLearning to become a generally accepted mode of learning.

However, as mentioned, the related problem of the optimal absorption of technology is also very serious or even more important. The accompanying substantial, organisational, legal and management measures are always very crucial for the successful implementation of any ICT and may represent an even more serious problem than the lack of hardware.

[161] The absence of a more formal and more systematic evaluation of past eLearning activities thus exists, i.e. no study dealt with the problem, whether resources were disproportional devoted to the infrastructure and too little to the establishment of regulations for educational materials or to the system for the optimal stimulation of teachers to involve e-contents and – in particular – towards the strengthening and expansion of the staff who co-ordinate these activities at the national level. Teachers are not awarded and promoted for their active use of available ICT and real eLearning implementation, but predominantly for (passively) attending ICT courses and some other formal activities.

[162] Key Data on Education in Europe, Eurydice/Eurostat, p. 314.

CHAPTER IV: ANALYSIS OF POLICY OPTIONS

IV.1 The most important policy objectives in Slovenia

When talking about the possible policy options for eLearning, first, the key strategic issue should be first specified. Let us again recall the key eLearning targets from the key governmental documents. They are all very ambitious, although (unfortunately) not very precisely defined:

- According to the National Development Strategy accepted in 2005 is very ambitious the general economic goal is to surpass the EU25 average with respect to GDP per capita by 2013 (currently at 80% of the EU25 average) and to move among the leading EU countries. Another accompanying target is to become a leading knowledge-based society.[163]
- The draft Information Society strategy from the beginning of 2007 has a target to become one of the most advanced society in applying eLearning by 2013.[164]
- Similarly ambitious is the recent draft eLearning strategy which states that by 2013 Slovenia should establish one of the '*most efficient national education systems, which will be fully supported by modern ICT*'(Draft eLearning Strategy, 2006). Similar is also the action plan for the informatisation of schools from the Board for School Informatisation within the Ministry of Education and Sport.

On the other hand, we can face the reality and recall the key findings of recent EU25 comparisons of eLearning developments,[165] which clearly show that the negative trends detected in previous years have been linearly prolonged in 2006. There now exists a considerable lagging of Slovenia behind the EU25 with respect to the PC/100 pupil's ratio (SI 7.6, EU25 9.9) and also with respect to the share of teachers using ICT (SI 67%, EU25 74%) in the classroom. Of course, we should not neglect some positive findings from these comparisons; however the advantages are mostly related only to general ICT issues such as the high informal usage of learning, convenient Internet infrastructure for the schools and good general Internet usage among households and companies. Similarly, the general readiness of the teachers is also relatively high. On the other hand the lagging relates to eLearning specific aspects. Given the above-described gap between declared target on one side and existing trends on the other, the basic strategic dilemma of further eLearning developments in Slovenia can be structured into three scenarios, based on the strength of the government support.

1. **Scenario 1: The current situation and trends simply continue.** No binding eLearning strategy is accepted in this scenario, or, even if accepted, it will remain only at the declarative level, with very minor effects, without substantial consequences and with no radical impact on eLearning developments. Only the compulsory EU directives will be implemented, but not any other recommendations related to eLearning (which is also the key difference from Scenario 2). In such a case, we can expect that in the commercial sector eLearning will be moderately growing, together with general economic developments and - according to the growing global trends of eLearning - will be increasingly implemented with some lag in commercial organisations and enterprises. On the other hand, the public education system will continue to preserve the existing minimal level of developments, with the existing or only a slightly increased level of governmental resources devoted to eLearning, without any major breakthrough with respect funding, institutionalisation, formalisation and national co-ordination of eLearning related activities. As a consequence, the lagging of eLearning implementation in the education system compared to the EU25 countries will continue and the corresponding benchmarks of eLearning developments for the Slovenian school system will further deteriorate.

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[163] The target is to '… *develop and launch distance learning at higher education institutions…'* and '… *ensure the necessary ICT equipment at schools*…'(National development Strategy, 2005)

[164] Slovenia should '*... establish an efficient and fully ICT supported national system of education…and become a synonym for one of the most successful societies based on knowledge, perpetual innovation and fast development. … There should be no syllabus, course and participants without a full support of ICT.*' (Draft: Information Society Strategy, 2007).

2. **Scenario 2: EU recommendations are accepted and implemented**. Apart from the adoption of EU recommendations[166] in this area, no other radical measures from the government side are accepted. Very limited and gradual adoptions of the education system are made in this scenario and the funding is only moderately increased. With this, Slovenia will passively follow the EU trends, recommendations and directives. Slovenia will thus basically repeat the solutions and measures implemented in other EU countries. Nevertheless, within this scenario the EU resolutions, strategies and documents will be followed very seriously and they will be also properly implemented. Specifically, some of the most exposed current drawbacks – which would otherwise continue to deteriorate (as in Scenario 1) - will be removed, such as the low level of PC equipment in schools, the low share of teachers using ICT, the lack of a formalised role of eLearning in the curriculum and the absence of coordination and professional support to eLearning implementation. Together with convenient economic developments, within this scenario Slovenia will roughly put eLearning developments (which are now considerably lagging in some key aspects) onto the general position of its ICT developments when compared to EU25. With some oscillations, this general position is the position of a median EU25 country, which moves around the EU25 average in most of the benchmarks.

3. **Scenario 3: eLearning becomes an essential component of national development.** Such an ambitious strategy would fully implement the formally outlined strategic targets for Slovenia to become one of the leading eLearning societies. This would take into account all specific national advantages and develop all its potentials. The most optimal and proactive measures will be thus undertaken in this scenario. Operationally, the targets would be to join the leading EU25 countries according to key eLearning benchmarks (Pupil/PC ratio, teacher/PC ration, share of teachers using ICT in the classroom, the share of courses with on-line contents, compulsory ICT education at all levels, the share of the ICT literate population …) This would, of course, require various radical actions - including increased funds and organisational and management changes – what should be based on clear and measurable targets.

The first option is not very realistic because it is very unlikely that any Slovenian government could afford to continue with a clear and directly measurable lagging (as observed in the 2006 ***Empirica*** survey). In addition, ambitious strategic documents were recently accepted with respect to eLearning or they are in preparation. Similarly, the consensus about at least the minimal resources and activities needed for eLearning expansion should not be very difficult to achieve since this (eLearning) is nevertheless an important and appealing national priority. However, this is still the default scenario which may occur if nothing radical changes.

The second option is perhaps the most likely to occur. Despite this, in the remainder of this chapter we outline the policy measures that fit into the third and most optimistic scenario. The third scenario is also perhaps the closest to the already accepted policy objectives. However, past experience with this type of ambitious goals related to the information society suggest a great deal of caution, in particular, because, continuous delays were accompanying the preparation and acceptance of the current eLearning strategy. We should also recall that 2008 is an election year, plus the year of the Slovenian presidency of the EU. All of this reduces the chances that a truly ambitious eLearning strategy will be implemented immediately. Despite this, as mentioned, based on the analysis of the potential, factors, drivers, barriers and challenges noted in previous chapters in the next few subsections we outline the policy actions needed for the most ambitious strategic goals of the third scenario.

Here we should also clearly state that these policy actions are not in conflict with the following documents:

- policy recommendations of EU documents related to eLearning;
- recommendations of the European eLearning Industry Group (ELIG); and

[166] The key EU documents are listed in section II.3.

- policy actions from the si2010 and draft strategy of eLearning in Slovenia.

In addition, all the above documents (or groups of documents) are complementary to each other and not contradicting among themselves. We could also say that the policy recommendations in the following section basically stay within the framework outlined also in the above documents. It would be unrealistic and very surprising if some large discrepancies would exist. However, the added value of our policy recommendations of the following subsection is as follows:

- we build the recommendations on the analysis from previous chapters, particularly on the analysis of the potential for eLearning in Slovenia;
- we propose some additional specifics and sometimes also alternative measures; and
- we structure the key policy actions which are of the highest priority.

IV.2 Suggested policy measures

To achieve the most ambitious targets related to the above-mentioned third scenario, some radical measures must be undertaken. We of course only outline here the most important directions of potential policy activities.

A) Plan of the policy measures should include the following components:

- When preparing the detailed policy measures it is prudent to formally involve experts from selected developed countries (with advanced eLearning developments), particularly from the Nordic countries (but also from Austria, which has had a similar education history). It would also be especially useful to keep them involved in monitoring, supervision and evaluation. In addition to bringing in competence, this would also eliminate the potential for conflicts of interest among eLearning stakeholders from Slovenia, which might be very problematic in a small country where domestic experts might be biased due to a certain involvement in particular activities that may conflict with the optimal fulfilment of the public interest. There is no doubt that there is a certain lack of independent experts in Slovenia.
- It is necessary to first clarify and define the responsibilities; governance, management, organisation, controls and institutions involved in the broad area of implementation of the new measures and provide optimal integration of these efforts. Annual action plans should be monitored and elaborated in measurable components. EU25 benchmarks must be monitored permanently.
- A central body has to be established, which will coordinate the implementation activities in entire environment. Most conveniently, this role could perform the existing National Education Institute, which have already served in the implementation of the earlier waves of school computerisation. As eLearning is not a separate educational activity but intersects with all other educational aspects, it is reasonable to allocate this role to the National Education Institute, which already covers all professional aspects of public education in pre-primary, primary and secondary education (see the section II.1.A). The main objection to this solution is that the old rigid structure and hierarchy of this institute may present an obstacle to the new, flexible and dynamic field of eLearning.
- Besides central national co-ordination, a complementary network of a private-public partnership should be established to provide all kinds of services to schools, from hardware, software to various eLearning services.
- The following aspects should be also elaborated in greater detail:
    - a centralised information system that would track pupils, provide competence and integrate teachers, learners, educational materials and other resources; and

- the integration of activities in formal education – which is the core of the policy measures here –with corresponding measures in other areas, ranging from the stimulation of eLearning in adult education to various promotional activities.

B) Institutional measures

- The public sector schools have to formalise (financially and legally) the role and position of the people responsible for informatics.
- The ICT support for administrative processes in schools should be expanded in a short-term prospective. School administrative usage of the Internet is very poor, which is also true for administration of national-level aspects.
- Various other indirect measures should be directed to stimulation of the general environment, which would increase eLearning. This may include a broad array of tax stimulations for ICT purchases and eLearning education and training through to increased work flexibility and training schemes.

C) Regulation and legal aspects

- Formalise the role of digital content in the public education curriculum, including technological standards, rewards system for authors (teachers), documentation, archiving, evaluation, on-line availability access and its position in the curriculum. Clearly define minimal standards to use and produce on-line materials in public schools paid by taxpayers' money.
- Regulate (i.e. enforce) the on-line availability of schoolbooks of all types despite the commercial interests of the publishing lobby.
- Regulate copyright issues – define the owner of certain eLearning content produced by a certain teacher and whether they are obliged to share it. Extend the ICT education of teachers to include more responsibility, i.e. specify the expected eLearning output of teachers (e-licence, expected usage standards, minimal extent of ICT use in classrooms etc).
- Regulate the issues of replacing live teaching of the curriculum with eLearning at all levels.
- Specify clearly the ICT competences (some standards may be considered, e.g. ECDL) of the pupils/students of each level, from the pre-school to the tertiary level; with this the ICT education will also become compulsory at levels where it is still optional (pre-school, primary, tertiary).
- To optimise the processes, corresponding research and monitoring should be established. In addition, full advantage should be taken of individual modelling. Within this context it is very important to stimulate research in this area by removing the existing strict privacy regulations from the pupil/student records data. In particular, this may apply to the analysis of data related to the educational life cycle of pupils (e.g. primary school→secondary school effectiveness), which as for now cannot be merged even for research purposes.
- The evaluation procedures should be formalised and systematically foreseen in each approved project. Perhaps at this stage it would be also good to clarify which past efforts in this area were effective and which were not. Were the investments in infrastructure in fact too large given the relatively small efforts to change the flexibility of the teaching curricula and the rewarding of teachers? Should instead more efforts be made for the promotion of eLearning practice? An independent formal evaluation of past actions is needed.
- The issue of front-runner applications needs to be elaborated more explicitly. It is more efficient to concentrate first on one subject, one course, or one school and fully elaborate and promote the positive effect of eLearning, instead of too many dispersed activities.

- More formal and informal promotional activities should be undertaken by all eLearning stakeholders, from lobbying activities to public relations strategies, including media exposure of eLearning problems. During the past decade the information society development efforts in general – despite their clear and huge potential national benefits given the small investments – were in large part inefficient because in government and parliament procedures they did not receive enough political support. This can also be largely attributed to the insufficient aggressive promotion of information society issues.

D) Funding

Here we only roughly outline the funding consequences, whereby we rely on calculations from previous proposals (school computerisation, draft eLearning strategy). Implementation will require a considerable increase in resources; however, in the overall total of the national aggregates these are still relatively minor. With respect to the budget of the Ministry of Education and Sport (II.1.C), we talk roughly about doubling the corresponding public and EU resources per year to around € 40 million[167] for the broad area of eLearning in the pre-tertiary education (more precisely, school informatisation activities). Given that public education spending is 6% of GDP (which is almost € 200 million of GDP) we talk here about a sum, which is roughly around 2% of the current public investments in education.

Given the indirect consequences and national importance of enhanced education this is a relatively small amount. Just for comparison, this sum also roughly equals the spending needed for a few tens of kilometres of a highway or a few military aircraft.

The sources should come from EU structural funds while the budget increase should be minimal. Instead, the restructuring could bring substantial gains. Given that the schooling generations are rapidly shrinking, eLearning resources may be provided through a reallocation of education funds. It is thus very important to provide an accompanying strategy for the reallocation of education resources to eLearning from the existing educational activities that should have become redundant (e.g. too many school-classes with too few pupils, redundant schools and redundant teachers) due to the decline in generations. Without that, it would be difficult to justify additional budget funds specifically for eLearning, in particular because it is obvious that Slovenian public funds, as well as the country's households, are already paying some of the largest contributions in the world (as a share of GDP) to the education system.

Of course, with respect to equipment international tenders would be needed to select the suppliers.

Within the budget allocations three aspects are particularly important:

- The financing of the core co-ordinating staff of around 30 people, which is below € 2 million.
- The condition *sine qua non* of any development is to provide every teacher with a PC or notebook, which is only feasible with co-operation with local communities and the business sector. We are talking here about 30,000 teachers, which would require – in total, together with existing funding – around € 3 million annually, which is a manageable target.
- The policy in this area should be targeted to achieve within at least two years the ratio of 15 PCs per 100 pupils (from the existing 8 per 100). Of course, a feasibility study should be carried out as to whether the absorption potential of the education system is sufficient. After this benchmark is achieved, the ratio should be further increased to 25 PCs per 100 pupils in the next two years. Alternatively, the next wave of computerisation in schools may be targeted at providing each pupil with a notebook or tablet PC. This is in fact a very important requirement for eLearning development in the future, which was routinely provided in many public secondary schools almost

[167] This also follows the 2003 proposal of the school informatisation project (see Section II.2.3b)

ten years ago (e.g. Singapore). Flexible implementation policies concerning these goals should be used such to stimulate private purchases through corresponding measures related to family taxes; and subsidised loans for PC purchases should be provided to parents, pupils and students. Annually, this investment would be worth roughly € 5-10 million.

- A strategic solution should also be immediately taken to start providing all schools with optic cables and wireless LAN. The around one thousand schools is in fact not a large number to equip, which could be performed in a few years' time.

V: MAJOR R&D CHALLENGES FOR E-LEARNING

The research and development challenges are closely linked to the main general challenges of eLearning in Slovenia. The most exposed eLearning challenges are related to: (1) future technical trends and advances in eLearning tools, together with corresponding pedagogical and cost model developments; (2) the future role and use of the Slovenian language, including trends and quality of automated translation, and (3) the priority Slovenian government puts on information society services.

A) Challenges in technology

Slovenia, although an early adopter of the Internet in the 1990s, has developed neither a considerable segment of dotcom companies nor a strong Internet industry sector. As mentioned, the initial start up was basically due to the few innovative solutions in the public sector rather than those in the commercial one. The lack of a stronger business initiative was also one of the reasons for a certain decline in Internet expansion seen in the late 1990s. With respect to the Internet industry and Internet services, Slovenia was thus a mere receiver of new solutions. For this very reason the global turbulence in the Internet and in the ICT industry early this century 2000s did not touch Slovenia. Similar was true for the early eLearning developments – Slovenia was not part of the early hype about eLearning and one of the main reasons for this is related to the smallness of the country and its language. This predominantly includes the smallness of the potential education audience where the intensive implementation of eLearning in virtual learning environments was simply too expensive. When the global eLearning expansion reached its first early peak and enthusiasm around year 2000, there were thus very little eLearning applications in Slovenia and there were also no recession after the peak had gone. However, after year 2000 the awareness and applications of eLearning slowly but persistently increased, although it appears at lower level compared to more developed countries (at least if we speak about the very formal introduction of education in virtual learning environments). We can thus foresee the stable and gradual growth of eLearning in Slovenia in the coming years, similar to the growth seen in other developed countries, which survived the abovementioned decline a few years ago. The anticipated developments of eLearning and its standards are expected to bring favourable consequences for a small country.

However, the technology also globalises the eLearning market and presents a certain ***threat*** for the future of eLearning developments in s small country with a specific language. The development of well elaborated eLearning contents, which needs a large-scale audience to recover the costs, will still be in the domain of large suppliers. If we again draw a parallel with computer games, where local production cannot compete – because local market cannot provide enough development resources – with the global products, a similar destiny may await the increased share of eLearning services. The local eContent may thus lose out when competing against global suppliers. This is particularly critical for tertiary education where creating the eContent updated with the most recent research findings is only possible for a large-scale supplier.

The corresponding challenges:

- Develop a cost model for the development and exploitation of the tools related to ICT supported learning, predominantly the on-line distance learning and blended learning courses. The research should answer the question of what is the overall cost-benefit of implementing eLearning.
- Technological and related psychological and socio-economic barriers involved in ICT supported learning should be studied, so that they can be removed and properly addressed.
- Usability research should be performed among various platforms, so that users would obtain clear information about the benefits and drawbacks of a certain tool.
- Research should be stimulated towards the pilot development of innovative tools and solutions for creating digital content and on-line courses.

B) R&D language challenges

Technological improvement will also bring changes to the role of the Slovenian language in eLearning. Technological improvements will positively contribute to the development of eLearning in Slovenia because the main barrier, the small potential eLearning audience, will become much less restrictive. However, on the other hand the smallness of the country with its specific language nevertheless remains a serious ***threat*** to eLearning developments due to the high cost of creating contents for small audiences. It is somewhat unclear to what extent the global eLearning content supply can actually present a ***threat*** to national production. We already mentioned computer games, where local products are losing the market battle completely. We should recall that currently 29% of 10-13 olds play computer games daily, and 36% of them play weekly. In the 14-16 year segment the structure is even more intensive: 41% daily and 23% weekly. A similar trend may also occur in the segment of eLearning products and services.

The corresponding challenges:

- Developing advanced tools for the automatic intelligent translation of digital contents into the Slovenian language.
- Stimulating research into speech recognition of the Slovenian language.
- Studying the role (pedagogical and technological aspects) of computer games in the English language learning as a stimulus for the smoother introduction of digital learning content to youngsters. What are the potential disadvantages?
- Research about the increased efficiency of English language teaching. Is the current teaching approach to English optimal? Does it include and upgrade the experience of pupils with spontaneous contacts with English from TV and video games? How can the English language be learned more effectively with the usage of this media?
- A profound study of the role of a small language in a globalised world. Research should answer questions related to the optimal strategy for the language protection of small nations. What would be the effects if English were to become an official language?

***C*) R&D challenges in policy**

In general in EU, national governments have much more important role in eLearning developments compared to, for example, the US. Many EU countries have even organised special bodies or agencies to handle this issue (e.g. France, Sweden, Spain), which is also foreseen in the planned in some variant of eLearning strategy for Slovenia. Of course, political decisions also pose a major ***threat*** to future eLearning developments. As mentioned, promising strategies and action plans might only remain on the declarative level and thus share a similar destiny to all past documents in the area of the information society. The main danger is not that Slovenia will further lag in eLearning developments. With a relatively small extension of the existing efforts it will relatively easy to remain somewhere around the EU25 average. The main challenge here is whether it will lose – perhaps its last – opportunity to join the top eLearning societies and thus explore the comparable national advantages in this area (openness to ICT, smallness and flexibility, relatively good ICT infrastructure).

The corresponding challenges:

- Comparative research of eLearning strategies – but also the other governmental strategies - in developed countries. Which measures best fits the national specifics?
- Perceptions and the importance of privacy and security issues should be studied, so that the position of public eContent can be properly defined. Do users care a lot about privacy when eLearning is used, or not?

- The position and the role of Slovenia in the EU should be studied, including an analysis of past decisions and behaviour, as well as public relations issues. The results could help in deciding whether a strategic goal of Slovenia would include systematically profiling itself as knowledge and learning (eLearning) country.
- Projections should be made about the demographic scenarios and corresponding resources needed for the education system. Based on these scenarios, various options should be developed for the positioning of the eLearning in the education system.
- Research into the barriers, which exist in the general population towards the increased usage of eLearning, as well as lifelong learning. Similarly, the barriers among companies need to be studied. Are the barriers due to the costs involved, a lack of information, a lack of proper supply, or due to certain prejudices?
- Finally, research should be directed at the optimal governance of the eLearning system. What are currently the best procedures to shape an optimal strategy among all stakeholders? What is the optimal form of such a strategy? What is the best way to create, monitor and conduct the annual action plans?

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Abstract

In 2005, IPTS launched a project which aimed to assess the developments in eGovernment, 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, Slovenia.

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 eGovernment, 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.