# *e*-LEARNING
practices

Russia

VOLUME: I

Editor: **Prof. Dr. Ugur DEMIRAY**

**CASES ON CHALLENGES FACING E-LEARNING
AND NATIONAL DEVELOPMENT:
Institutional Studies and Practices**

VOLUME: I

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As an active academic researcher, his research articles are published in the National and International referred Journals in the area of Open and Distance Education. He is one of the reviewers for Indian Journal of Open Learning (IJOL) and Kakatiya Journal of Distance Education (KJDE). He contributed chapters to books and Associate Editor to a book on "*Distance Education in Andhra Pradesh: Policies, Practices, Perspectives*". He participated in National and International Seminars and attended many Workshops. He also organised and coordinated more than 50 Orientation Programmes for the Academic Counselors and Functionaries for ensuring quality support services to the learners. He has been actively involved in the activities of professional organisations in the field of Distance Education and Public Administration as a Life Member in Indian Distance Education Association (IDEA) and New Public Administration Society of India (NEPASI) and as a Secretary of Indian Distance Education Association (2006-07). Academically he had many distinctions like University First Rank in M. A. Public Administration, Awarded Junior Research Fellowship and Best Research Paper Award.

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eLEARNING IN ALGERIA
Experiences On E-Learning in
Algerian Universities
Mahieddine DJOUDI
XLIM-SIC Lab. & IRMA Research Group,
University of Poitiers, FRANCE**...…......….............….......……...……….1-31**

Learning requirements are increasing in Algeria because of
population explosion and the policy of democratization of
education. An estimated several thousand teachers in the deficit
for the coming years in Algerian universities. If you look at
training trainers who is supposed to take over shows that the
number of positions available each year is still below that
required to meet the demands of coaching in Algerian
universities. Despite almost annual opening of new universities,
overload students remains a problem for managers of these
establishments. Add to this the insufficiency of teachers in some
specialties where demand is high and spread over the vast

territory of Algeria. E-learning presents an alternative then the more it brings benefits in terms of educational and economic consequences. Indeed with the e-learning problems of housing, food and transportation for students will no longer arise. Secondly Algeria can not afford to remain on the margins of technological innovations.

Chapter-2

eLEARNING IN ARMENIA
Has Established The Pioneering Usage Of "hhh" Technology
Vardan MKRTTCHIAN
All Armenian Internet University,

The chapter presents the development of "hhh" technology in eLearning in Armenia. All People Internet University (called "hhh") education technology is a patented software tool that allows rapid creation of interactive simulations and modelling in Distance and Online Educations systems. The main features of these new capabilities, new issues and challenges in same private universities are presented.

Chapter-3

eLEARNING IN BELARUS
Vladimir DOUNAEV, Independent Expert
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Maryia DAVIDOUSKAIA

This chapter is dedicated to the history and present state of e-learning in Belarus - the only European country not participating in the Bologna process. The authors analyze the low efficiency of governmental programs of e-learning in secondary schools and political obstacles to the spread of distance learning and the designing networked learning environment in higher education.

Chapter-4

eLEARNING IN BULGARIA

The goal of this chapter is to present the recent challenges and conditions in Bulgaria for involvement and efficient use of e-learning in different forms, types, modes and levels of education.

The chapter gives an overall picture of the Bulgarian educational system, taking into account the current political priorities and the most significant concrete measures, accelerating the ongoing reform in different sectors of the educational domain. It captures in brief the government requirements for implementation of distance learning in the higher education institutions. Some good practices, applied by non-governmental organizations and private educational companies, are outlined. Two case studies demonstrate the experience of two Bulgarian universities in the field of e-learning which Bulgaria faces in the field of e-learning in the dawn of the millennium, are pointed out.

Chapter-5

eLEARNING IN EGYPT

This chapter summarizes the current situation of using the e-learning technologies in Egypt. Higher education in Egypt faces many challenges such as high student numbers, financing of education, governance and management of the education system, and quality assurance. In this manner, the National E-learning Center (NELC) was established, Egyptian E-learning University (EELU) established 2008 to provide e-learning nationally, regionally, and internationally.

And this is one of the Information and Communication Technology Project (ICTP) outcomes, to serve as a technical unit within the Supreme Council of Universities to promote and support the development of e-learning in Egypt by improving the development of the e-learning content.

Chapter-6

In this chapter evolvement of the Estonian e-Learning Development Centre (Estonian Information Technology Foundation) will be analyzed during its five years of operation. Attention will be paid to processes that were the drivers behind the formation of the Estonian e-Learning Development Centre and contributed to its sustainability.

Chapter-7

e-Learning has been a strategically significant focus of development in the Finnish education system. In particular, ICT skills and deployment have been emphasized in the National Board of Education's strategies since the beginning of 1990.

Other administrative bodies have also gradually recognized ICT utilization as a significant skills area and in various development strategies and ventures e-learning has been seen as a pivotal

method to promote skill development and innovation. In this chapter, e-learning strategies and their implementation in different educational sectors are described from the perspective of life-long learning. Current Finnish e-learning best practices and development areas are also introduced.

Chapter-8

eLEARNING IN GREECE
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The following chapter is an effort to describe the development of eLearning in Greece. In the first part we describe the Greek educational system in general. The second part deals with distance education in Greece. Later on we address the issue of development of Information and Communication Technologies and infrastructure in Greece. eLearning Research, Lifelong Learning, Adult Training, Intercultural Education and Future Strategy are also addressed as major parts of the eLearning sector in the Greek educational system.

Chapter-9

eLEARNING IN HUNGARY
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Géza BOGNÁR, Deputy Rector,

The restructuration of Hungarian legislation yielded to restructuring of companies-ownership and to important changes in Hungarian higher education in the early 90 years of the past century. Accordingly the higher education market was liberalized. Due to technological development, eLearning applications entered to the everyday practice of universities since

year 2000. For the time being mainly private-owned universities are using the eLearning technology. This is the way by means of which more services can be offered to students, accordingly it is expected that more candidates will choose universities having eLearning facilities. This chapter discusses development of the elearning in Hungary for the Millennium.

Chapter-10

eLEARNING IN IRAN-I
A Breakthrough to ICT-Based Initiatives
In An Educational System
Davoud MASOUMI

In this contribution, an overview of Iranian educational system in general and higher learning/education in particular is presented over the last hundreds years. We mainly aim to give a brief account of the country's rapidly expanding ICT-based initiatives in the light of its actual realities, progress and difficulties by looking at the following areas: the social and historical situation in Iran, Educational system, Higher education, Distance education and particularly Virtual Institutions in Iran.

Chapter-11

eLEARNING IN IRAN-II
Ahmad KHANMESAN

This chapter reviews the efforts made to integrate ICT in the Iranian educational system and addresses the issues related to e-learning in pre-tertiary and higher education. The development of ICT in Iran began at the beginning of the millennium with a plan called TAKFA. Although the ICT infrastructures have developed considerably in the last decade and the number of internet users increased, the e-readiness of Iran is not at the proper level; Iran rank in e-readiness is 68 (out of 70 countries) with the average score of 3.4 (out of 10). It shows Iran should

Although many initiatives have taken into account to integrate ICT in educational system, such as developing ICT departments, increasing the bandwidth of the universities, developing a scientific network, national network of schools equipping schools to computer centers, etc., there are still some challenges on the way of e-learning in Iran, such as the lack of an official domestic guidelines and standards, an adequate governmental supervision, low bandwidth, high price of connectivity, etc.

For optimum use of ICT capacities for e-learning in Iran, cultural, political, and technical and policy issues should be taken into consideration.

Chapter-12

Empowering distance education's is crucial for Iraq after decades of traditional learning. Iraq needs new models of education facilitated by educational technology. Some of the most promising new educational approaches are being developed through e-learning and virtual schools. This is an exciting, creative and transforming era for students, teachers, administrators, policymakers and parents. It's time for Iraqi higher education entities to keep abreast of this quite revolution.

This Conceptual and roadmap paper, presented at the Iraqi Higher Education conference to be held in Kurdistan/Iraq, on December 2007, tries to promote the Iraqi Higher Education entities, via utilizing distance learning or education eLearning strategy considerations.

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Chapter-13

eLEARNING IN ISRAEL
A Case Study of Technology in
Distance Higher Education:
The Open University of Israel
Yoav YAIR

This chapter describes the transition from traditional, on-campus delivery to technology-based higher education in Israel. It reviews the higher education arena in the country and offers an updated and concentrated summary with special focus on distance education as is practiced at the Open University of Israel. Various aspects of technology usage and e-learning models are described, including collaborative learning, on-line video and OCW. The review draws from the vast experience gained in over a decade of e-learning experimentation and model-development and is based on user-experience surveys and faculty interviews.

Chapter-14

eLEARNING IN JORDAN
Challenges Facing e-Learning in the New Millennium
Mosleh AL-ADHAILEH

Many challenges have taken place in the ever-growing and mobile society and today's constant and rapidly changing technology and resource. The explosion of web-based technologies and internet provides a new trend for educational systems to introduce new teaching and learning environments. In response to the fast development in Information and Communication Technologies (ICT), e-learning was adopted by many universities around the globe as a way of improving and supporting their teaching-learning activities and making education accessible for all society members. Hashemite

Kingdome of Jordan took e-learning initiative in its vision since 1998, and progressed rapidly since that time. Infrastructure has been upgraded for this purpose. Issues related to adopting and supporting e-learning such as training, e-course development for both K-12 education and higher education has been progressed.

This Chapter describes the issues and barriers associated with integrating e-learning into Jordan educational system. We discussed Jordan successful e-learning experience and case studies including infrastructure, ICT integration, attentions, training, readiness and awareness, and challenges facing e-learning in Jordan.

Chapter-15

eLEARNING IN KAZAKHSTAN
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National Center of Informatization, KAZAKHSTAN
Almira TAZHIGULOVA
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Yelena ARTYKBAYEVA

In the Republic of Kazakhstan held a large-scale informatization of education is held in the following areas: regulatory support, info-communication software, software, content and staffing. E-learning has had wide development at the expense of electronic textbooks which are considered as applied programs of interaction of subjects of educational process.

Electronic textbooks are developed for high school practically in all subjects and on all classes in the Kazakh and Russian languages; their translation into English is planned. In electronic textbooks integration of pedagogical and information-communication technologies are provided. Efficiency of e-training depends also on the level of readiness of teachers, therefore in Kazakhstan training courses are held for teachers on use of electronic textbooks, network technologies, and interactive boards in educational process.

Chapter-16

eLEARNING IN KYRGYZTAN
E-Learning and ICT Development
In The Republic of Kyrgyztan
Carlos MACHADO

This chapter documents on the research study conducted in the Kyrgyz Republic. The implementation of learning technologies in developing countries is as much a journey as a destination. Our case study focuses on two specific phases in this journey: planning and implementation. Initial planning and carefully analysis of implementation, with attention to the challenges for teaching staff and students, can mean the difference between success and failure. The adoption of new technologies in a country with a long Soviet legacy, and a characteristic Central Asian culture based on oral tradition, defies indeed economics. The evolution of telecommunications, in general, and ICTs applied to education, in particular, in the Kyrgyz Republic is on the rise as official statistics show. However, it is not technological but economic resources that pose more problems (CAICT, 2005). This is especially the case of more isolated and distant regions like Karakol. From own research, we came to observe some of the differences in terms of resources between a university located in the capital and another located in the far-east of the country.

Chapter-17

eLEARNING IN LATVIA
Dimensions of E-Learning Education in Latvia
Boriss F. MISNEVS

The chapter contains brief description of Latvian education system and the findings of a study institutional corporations and

the emphasis in the study is on the implications of increasing use of Information and Telecommunication Technologies (ICTs) for The chapter discusses the bilingual situation presented in Latvia and related problems regarding e-training courses development as well. Because of this, Latvian society must consider their entire policy towards bilingualism in the educational system. Brief information is sent about the current financial model for Latvian education. Then topic on the contribution and the situation of distance education in Latvia follows. Starting with historical facts the chapter cover also current state of e-learning activities in Latvia.

This overview contains the description of e-learning education framework in Latvia including computers and Internet usage in education. Most resent policy measures at national level are discussed and medium term plans 2007-2013 are evaluated. National or International e-learning content suppliers, e-learning Technology Suppliers, e-learning service suppliers are briefly discussed. Then an attempt is made to estimate the Latvian e-learning market size and its characteristics. After all the applications of e-learning in Latvia educational system by study levels is observed. At the end of the chapter an author's forecast for e-learning education as a future of Latvia is represented.

Chapter-18

This chapter is set to trace the development of e-learning in schools and higher educational contexts in Lebanon utilizing information obtained from policy papers, national reports, journal articles, and national statistics. In addition, three case studies are presented as examples of e-learning development in higher education. As the topic of e-learning continues to attract

the attention of practitioners, policymakers and researchers, this chapter attempts to make an incremental contribution to e-learning experiences from a Lebanese context-dependent perspective.

Chapter-19

This chapter contains the general information about Lithuania: country description, overview of economical and financial issues, description of education system in Lithuania, case study. The chapter presents the overview of eLearning in Lithuania and the special attention paid on experience in eLearning field at the department of Construction Economics and Property Management of the Faculty of Civil Engineering of Vilnius Gediminas Technical University (VGTU).

Chapter-20

The chapter is aimed to examine the emergence and growth of e-learning, i.e., the application of information and communication technology (ICT) in formal education (i.e., primary, secondary and vocational education) in Lithuania. The chapter concentrates primarily on ICT policy and practice (incl. content and services, teacher training for ICT, and participation in international R&D projects), research findings and case studies of e-learning in Lithuanian primary, secondary and vocational education system.

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Chapter-21

eLEARNING IN MACEDONIA
Bekim FETAJI
Majlinda FETAJI
South East European University, Republic of MACEDONIA**..........** **485-516**

> The focus of the analyses is elearning in Macedonia focusing on
> the developed strategy and analyses of the insights gained from a
> case study of particular distance education application in South
> East European University, Macedonia. The analyses covers the
> impact of ICT on University's mission in achieving multicultural
> and multilingual education within Macedonia and the context of
> the Balkans, but also in a wider European and global context. A
> number of issues related to such an impact and specific context
> of the University, and the developed strategy as well as analyses
> of its applications as case study. The implemented strategy and
> solution as well as experiences gained in the process led to a
> number of important results as outcomes and recommendations
> for similar initiatives.

Chapter-22

eLEARNING IN MOLDOVA
E-Learning and ICT Development
in Education In The Republic of Moldova
Tudor BRAGARU, State University of Moldova, MOLDOVA
Conțiu SOITU, Al.I. Cuza University, ROMANIA**..........………...** **517-547**

> This chapter is devoted to the existing educational system in one
> of the 15 former Soviet republics: Moldavian SSR, nowadays
> Republic of Moldova that has gained its independence in 1991.
> More than 4 years ago a reform of the Moldavian educational

system has started. It was oriented to European values and aimed to the innovational training and teaching methods adoption. A proper ICT integration in the technological teaching process, however, did not take place yet. The implementation of the new forms of the distance learning based on e-Learning is experiencing an evident slowdown. This chapter discusses the penetration and application of ICT in Moldova in whole and in educational institutions, as well as some problems related to education informatization.

Chapter-23

eLEARNING IN MOROCCO
Developments and Issues in Morocco
Rachida AJHOUN, Université Mohamed V-Souissi, MOROCCO

This chapter presents an overview on the strategy and actions undertaken by Morocco to achieve the introduction of the use of ICT in education and training. The case studies discussed shed light on the situation of e-learning in Morocco which is defined as: "the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services, as well as exchanges and distance collaboration". These studies show both the different approaches adopted by those in charge of the training in order to benefit from numerous advantages of e-learning and other difficulties encountered in its implementation. Following these studies, a synthesis is presented on the reflexion conducted by decision makers and those in charge for training to identify new measures to address the obstacles that hinder the emergence of e-learning culture in Morocco.

Chapter-24

eLEARNING IN NORWAY
Torstein REKKEDAL

Norway was the first country in the world to introduce specific legislation on distance education when the *Act on correspondence schools* was passed in 1948. As one of the richest, according to GPD per capita and most developed countries in the world, it is no surprise that Norway has a highly developed technological infrastructure for distance education, online learning and e-learning. The government has over the last 15 years taken a number of initiatives to develop ICT competence among teachers and students on all educational levels. By establishing the *Norwegian Opening Universities*, a national body for distance education in higher education the government has clearly defined a strategy for development of online higher education that supports the development of dual-mode solutions rather than establishing a single-mode distance education university. Norway's leading position concerning e-learning was demonstrated in the *Megatrend-project*, that in 2007 found four Norwegian institutions among the 26 identified European 'mega-providers of e-learning.

Chapter-25

E-Learning has introduced new approaches of instructional delivery where the roles of teacher and student have significantly changed. The case in Oman shows that the introduction of these approaches needs to keep pace with the demands of the times, but only the actual needs arising from social and educational context of Oman. Attention should be given to the socio-cultural understanding of teacher-student relationship in open technology-enriched learning contexts. Omani educational institutions continue to review their policies and provision of e-Learning, considering technological alternatives for resolving some of the pressing issues posed by the actual needs. There is a need for coordination at the national level to create strategies and

mechanisms and controls that ensure the quality of e-Learning institutions and outputs

Chapter-26

eLEARNING IN PALESTINE
Mohammad A. MIKKI, Islamic University of Gaza, PALESTINE

No doubt that globalization and rapid changes occurring in the world have thrown its impact on education and human endeavors. Both training and education are considered as a lifelong experience for workforce cross the world. Palestine, in fact, is part of the sweeping globalization and transformation, regardless of its difficult political context and might be because of it. Palestine opened itself up to many international interventions and programs. Hence e-learning is needed and the documentation on e-learning is also needed. There is a very big need for this chapter about the Palestinian environment as it is achieving two goals. The first goal is to provide information data that sheds light on what is going on in Palestine regarding e-learning. This goal will clarify how information technology, e-learning programs, electronic libraries, twining programs, international courses, worldwide research initiatives, electronic homepages, and other tools of communications, are developed in Palestinian schools and universities. The second goal is to explore challenges and obstacles faced and institutions' strategies of coping with these challenges as well as the national policy to develop learning at this particular context.

Chapter-27

eLEARNING IN POLAND

The chapter contains information about Poland, Polish educational system, using ICT in education and state of development eLearning for Poland distance education system in the Millennium.

Chapter-28

This chapter focuses on the use of ICT in Romanian education system, presenting the relevant programmes, projects and initiatives, and using research data from several reports released in the last years. Being aware that innovation related to the use of ICT in the education system is still at the beginning, we tried to bring forward the landmarks of the early stages this transformation, convinced that time will settle practices and theories which would put strength on the development of students' key-competencies. In our opinion, the new technologies are an invitation and an opportunity for teachers and for education decision-makers to think deeper about education practice, to re-invent and to discover the real Pedagogy. First steps are already done in Romania, but many more are still to be developed, aligned with international experiences and initiatives, and adapted to the local context.

Chapter-29

In the first decade of the 21st century, worldwide, the tremendous increase in the amount of available information and the spreading of the e-learning was possible through the enhancement of the access to computers and to Internet. This fact indicates a reality that became more and more stringent and that cannot be ignored. These challenges were integrated into national programs and were supported by general actions. E-

learning became a common place and a widely spread educational tool. The present chapter tries to offer a snapshot of this very dynamic component of the Romanian educational reality.

Chapter-30

eLEARNING IN RUSSIA
Sergey POZDNYAKOV
Saint-Petersburg State Electrotechnical University, RUSSIA
Serge RUKSHIN

The article is devoted to the history of distance learning development and to the current state of e-learning in Russia. A new classification of distance learning development stages is proposed by the authors. Authors highlight three stages of this educational form's development, comparing it with the stages of political, social, and economic changes in the country. In the second part, the analysis of the basic directions of development of e-learning is presented; each direction is explained by the most typical examples. Chapter is beginning with brief information about Russia and a structure of the present education system.

Chapter-31

eLEARNING IN SAUDI ARABIA
Hend S. AL-KHALIFA

Saudi Arabia as one of the largest Islamic countries in the world with the largest reserves of petroleum, has radically improved its educational system as a result of comprehensive development programs. General and Higher education is experiencing capacity issues which lead to the need to adopt distance education as an instructional strategy. The following chapter describes the country, its tertiary education system and current developments in distance education and eLearning.

Chapter-32

eLearning and distance learning facilities are important for regular students but also for employed people (important support for lifelong learning). eLearning can contribute to the development of the Educational System in the West Balkan region, and have a high social importance with direct impact on the creation of new job opportunities. Quality and capacities of educational institutions must be significantly improved from elementary schools to doctoral studies. The need for modernized and ICT supported learning processes, adapted to specific local education system needs, is evident in Serbia today. Implementation of eLearning as a support to education represents the opportunity for everybody to have the access to educational materials. It will enable equal opportunities for all population segments, to continue with their education. In this chapter different educational issues and aspects in Serbia today are discussed. Current state-of-the-art and further necessary steps are pointed out and suggested.

Chapter-33

The purpose of this chapter is to provide a view of the eLearning's state in the Slovak republic and possible implications for policy and practice. The chapter does not seek to

inform on a technical level, it assumes knowledge of terminology definitions, theories, research findings and case studies of eLearning and offers a view of the driving forces for eLearning, a historical context for its development in the Slovak republic. First, the chapter introduces the general data about Slovakia, such as history, geography, people, educational system and its priorities, the role of distance education in the country, ICT and the role played by eLearning in it. Drivers and barriers for them in Slovakia are assessed.

Chapter-34

eLEARNING IN SLOVENIA
Tomaz AMON

The author wants to point out in this chapter that Slovenia as a small country with nice, still well preserved nature needs to develop especially intensively its knowledge pool because it has no important natural resources like coal, gas etc. but it has already well educated people who need to stay update with their knowledge also in the future and of course the young generations need to obtain the best education possible. As it will be shown later on, the funding for education in Slovenia is sometimes more intensive, sometimes less intensive and especially in less intensive periods the e-learning becomes even more important since online or computer (internet) aided learning is the cheapest and most "democratic" learning. I grew up in times before computers and so I feel the revolutional importance of improvement the computer-aided learning offers now.

Chapter-35

eLEARNING IN SWEDEN
Susanne KJÄLLANDER
Stockholm University, Stockholm, SWEDEN
Eva Edman STÅLBRANDT,

Sweden is viewed as a high-tech country with a top rank in e-readiness. It is recognized as a country of high speed in adopting new technology. Since long ago Sweden is known as world leading in educational ICT. All Swedish schools have had computers and Internet for many years. As Sweden is decentralized, differences are vast between different municipalities and schools. Sweden has no national e-strategy for schools. A current key challenge is how to transform e-learning from individual initiative to university culture. Another challenge is the teachers' and academic staff's lack of ICT skills and knowledge. Pupils and students are often more knowledgeable than their teachers. Swedish educational ICT discussions are to be considered as quite mature and therefore this chapter can make a contribution to countries where ICT is being introduced in the educational system.

Chapter-36

eLEARNING IN SYRIA
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Consultant to Arab Open University
North America, SYRIA**..............……………………..……...……877-909**

The Information Age, the digital knowledge, the knowledge society, knowledge economies and cyber schooling have by the beginning of Third Millennium intensified in speed, working space, quality content, and human concerns. They are now looked upon as a measurement index for locating the ranks of nation states on the ladder of current world civilization. While developing countries (DCs) in general spent the second half of the twentieth century in consuming what the industrial nations are producing in the fields of information and communication technologies, they (the DCs) launched very recently however, several pursuits in this decisive sphere, not as much in the industries of ICT but rather in their applications to business, management, production, education, recreation, and more. In fact, Syrian Virtual University (SVU) is the first to none until this date in Arab Middle East. SVU has fame in on-line education, and attracts students from all over the world. As such, this chapter endures the purpose of the current book in

providing a real picture of Syrian applications of ICT into education, thus clarifying Syria ICT status comparable to other nation state world wide.

Chapter-37

eLEARNING IN TAJIKISTAN
E-Learning and ICT Development in Education
Carlos MACHADO
International Project Manager, BELGIUM
Khurshed I. TESHAEV

In a country once devastated by a civil war during the mid-90s as it was Tajikistan, a new economy and new challenges have been brought through the beginning of the twenty-first century. As Tajikistan steadily recovers from economic and social collapse, government, civil society, and the private sector are all looking for ways to accelerate development. One of the avenues for recovery has been put in Information Communities Technologies (ICTs) and the benefits expected from them. In the present chapter, we concentrate on the efforts sustained in Tajikistan to introduce and spread the use of ICTs in the classroom in particular and in education in general. Although the wide spread of new technologies is a relevant issue at educational policy level, however, main challenges and resource constraints abound. These in turn are hindering the maintenance of a steady pace of technological development in the country. We describe, hereunder, the current status of ICT development and elearning in Tajikistan.

Chapter-38

eLEARNING IN TUNUSIA
E-Learning Challenges in the Millennium,Tunisia
Zeineb DEYMI GHERIANI
Higher Institute of Languages in Gabes, TUNISIA
Ali Hechemi. RADDAOUI

The purpose of this paper is to provide a general overview of the e-learning situation in Tunisia and a peek into specific e-learning initiatives conducted by both authors. Many support institutions have been put in place to oversee and assist with Tunisia's e-learning agenda: the Tunisian Internet Agency (ATI), Virtual University of Tunisia (UVT), the Tunisian Association for the Promotion of e-Learning (APREV), the Tunisian Association for Digital Solidarity, among others.

With better technological provision, access to these courses increased dramatically. Over and beyond the need for technology and training, the following conclusions stand out.

Chapter-39

eLEARNING IN TURKEY: Past, Present and Future

eLearning offers many opportunities for individuals and institutions all over the world. Individuals can access to education they need almost anytime and anywhere they are ready to. Institutions are able to provide more cost-effective training to their employees.

Not only globally but also in every country e-learning market is growing fast. The Turkish e-learning market is especially showing a significant growth in higher education and corporate settings.

This chapter intends to draw a big picture about the Turkish e-learning market. It mainly focuses on past and present status of e-learning implementations and examines how the institutions have been going through a transition to be able to reach 'e-learners'.

Having an insight about the status of e-learning market in Turkey can be very beneficial for the entrepreneurial accessions to this market and also for the future collaboration opportunities.

Chapter-40

E-learning in Ukraine is in the focus of both academic research and educational practice. It is considered as a vital element of educational innovations, an important component of modern education and a bridge to e-society. One can observe both grassroots activities of the teachers looking for technologies to increase students' motivation, learning efficiency and depth of understanding, and institutional efforts to support and upgrade teachers' competencies in information and learning technologies. At the same time, research area covers models and methods for learner's assessment, control and support, intelligent technologies for innovative interfaces, knowledge representation and processing, decision-making and problem-solving. This chapter describes socio-economic conditions, educational landscape and technological infrastructure that constitute an environment for e-learning development and deployment in Ukraine. It demonstrates some results, progress and prospects for e-learning, as well as research potential for collaborative projects and cross-cultural educational studies.

Chapter-41

The learning process has been a passive process for so long. However, with the advent of ICT in recent years has a direct impact on such a process. Online learning was introduced and implemented by western universities.

The United Arab Emirates is no different from other nations that benefited from the ICT in the education sector. Since the formation of the federal government, one of the targets was to improve the education and to implement the latest technologies within such a sector as well others. In this chapter we aim to show the evolution process that education in the UAE went through. The plans that were adopted in order to make the UAE as a hub for higher education in the region are also presented. The chapter reflects the background of the UAE anthropologically and educationally. We try to show the implementation and usage of ICT in higher education and its relevance to the government's long term plans. Two cases are presented, showing the implementation of ICT and the encouragement of online teaching at two important universities of the UAE. Issues associated with implementing and using of ICT in the delivery of online teaching is also presented.

Chapter-42

eLEARNING IN UZBKISTAN
Botir USMONOV
Moscow State University in Tashkent, UZBEKISTAN**..…....……1029-1073**

Advantages brought by development and expansion of information and communication technologies are more and more realized in the world today. Their revolutionary impact spread on state body's activities, civil society institutions, economic and social spheres, science and education, culture and people's life style. Uzbekistan is not aside of those processes, it participates more and more actively in formation of global information society. The long-term strategy of social and economic development of Uzbekistan is also oriented to information society, create and realize of prerequisites and conditions of its formation.

Those strategies allow Uzbekistan to integrate into the world economic. To implement those strategies; a number of legislative and regulatory acts were adopted. In particular, Decree of the President of Uzbekistan #3080 dated 30 May 2002 determined objectives of development and implementation of information and communication technologies. Also in accordance with this Decree started development of computerization and information and communication technologies, the customs and tax privileges have been set, measures on stimulation of entrepreneurship have been determined.

The Last Words

Foreword

e-LEARNING IN PRACTICE:
Covering Thirty-Nine Countries

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Editor-in-Chief of Asian Journal of Distance Education

e-Learning has developed greatly as the method of first choice for distance education and we are seeing a convergence between distance and conventional face-to-face education -due to moves by conventional education providers. Conventional universities and schools throughout the world are pro-actively adopting distance learning technologies not only to reach the unreached providing wider openness and access but notably as augmentation for their current on-campus students. The use of computers in education can be classified into four types; - computer-assisted instruction (CAI), computer-managed instruction (CMI), computer-based multimedia (CBM), and computer-mediated communication (CMC). The fourth CMC involves computer-to-computer transactions including email, is sometimes referred to as online learning, and is commonly referred to as 'e-learning' (Kawachi, 2005 ; Kawachi 2008a).

Under e-learning, educational interactivity can be among the institution(s), tutor(s), and student(s), for both academic purposes as storage, delivery and retrieval of content, and non-academic purposes as administration and counselling support. Library resources support services are the most common CMI use of computers. Asynchronous emailing appears to be the most common CMC use. In highly developed centres of excellence such as in Hong Kong, Japan, or Korea, synchronous text-chat is common, and this occasionally becomes multimedia with the addition of digital graphics and even video transmissions along with plain text. In rural developing countries, computers have widely entered into classrooms in the past few years, though as recently as two years ago, for example in India, schools were despondent with their computers in the room and no educational interactivity taking place.

One reason why more educationally effective use cannot be made of these computers in the classrooms is the lack of regional infrastructure- such as no internet provision and inadequate or unreliable connectivity (regarding telephonic transmission rate or very low bandwidth) -preventing the use of multimedia and e-learning. These difficulties in connectivity and infrastructure- seen in many of the countries reviewed in this book - could be circumvented by the use of CD-hybrids.

e-Learning is generally taken to mean learning that has utilized electronic means of information and knowledge management in a wide sense, and social constructivist learning through computer-mediated communications in a virtual space in a narrow sense. E-learning is a relatively new term, and derives from the development of alliances and consortia consisting of corporate businesses and education providers emerging at around 1995 (Jegede, 2001, p.75). This development has occurred through the internet and has brought internationalization through sharing of knowledge. It has also brought globalization and different cultures into juxtaposition, and into superimposition. Now conventional face-to-face institutions are opting to utilize e-learning and open learning values in the classroom.

Many countries including most reviewed in this book generally hold onto an apprentice model and experiential learning through a cooperative process. Even with e-learning technology, the apprentice model is still employed. Internationalization through e-learning has brought the two processes of collaborative learning and cooperative learning into the same forum. In many of these countries, the social economics has meant a student who is busy e-learning is more isolated from his or her surrounding culture, than a student for example in London where the surroundings may be all high technology, conducive, motivating, encouraging and accepting of a person engaging e-learning. In rural developing countries, it is easy to imagine that the student is not only physically alone but psychologically and emotionally as well -without social infrastructure supporting e-learning. Thus, computers and multimedia are not simply instruments for the student but provide a total environment for learning. The reader is referred to Kawachi (2005) for comparative review of e-learning in Bangladesh, (mainland) China, Hong Kong (China), India, Indonesia, Iran, Japan, Korea, Malaysia, Pakistan, the Philippines, Singapore, Sri Lanka, Thailand, and Vietnam. That review also discusses in detail the need for e-learning scaffolds and different pacing provided through e-learning. These topics and gender, old age learning, group size and others are not dealt with in detail by many of the country

reviews in this book, so readers will find that there are areas or trends that need further exploration.

This book reviews e-learning in thirty-nine countries. A close reading shows that there are clusters of some common trends and challenges which could be addressed regionally through satellite or optical cable. This book provides an excellent need analysis that should be useful for funding agencies and global organizations such as UNESCO and the World Bank. The thirty-nine countries are geographically in two wide swaths from North to South down the eastern side of Europe, and then from West to East across northern Africa into Central Asia. The countries include from northern to southern Europe (on the eastern side) Norway, Sweden, Finland, Estonia, Latvia, Lithuania, Belarus, Poland, Ukraine, Slovakia, Moldova, Hungary, Slovenia, Romania, Serbia, Bulgaria, Macedonia, Turkey, and Greece. Then from north-western Africa across to the Middle East, up through to Central Asia, the countries are Morocco, Algeria, Tunisia, Egypt, Israel, Palestine, Lebanon, Jordan, Syria, Iraq, Saudi Arabia, United Arab Emirates, Oman, Iran, Armenia, Uzbekistan, Kazakhstan, Kyrgyzstan, Tajikistan, and Russia. The countries basically surround Western Europe.

These chapters give a lot of background information on each region, and then describe the education systems that current exist. Within these systems, e-learning is covered alongside conventional and distance education. Naturally the countries have various levels of e-learning infrastructure and practice. When arranged geographically, some trends can be seen from one country to another, throughout several countries in most cases. These trends are likely the outcome of the sociopolitical development in the regions. Superimposed now on top of these sociopolitical trends, we can now see individual identities emerging and national characteristics of e-learning in practice. This review examines the individual countries, then the regional groups, and finally draws some critical insights from the overall meta-analysis.

In previous published work (Kawachi, 2008b, pp. 609-610), the need for international cooperation was noted concerning sharing resources.

> *"After reviewing all these Papers in English and a brief look at the others not in English, some points do seem to be noteworthy; for instance all 22 literature references cited in the Paper in Portuguese from Brazil are references to books and articles in only Portuguese.*

This should give us something to consider deeply - along the lines that there is more to global distance education than the Anglo-American perspective. ...

Even in one's native language, reading research is often a complex and deeply puzzling task at most times, and in a second or third language the expressed nuances are very likely to be overlooked. We should note therefore that we need to build research teams that bring in speakers of different native language to somehow increase coverage of the issues, not yet globally perhaps, but beyond the Anglo-American view of distance education."

Here, the Editors have collected papers from 39 countries to provide a rich resource -all in English. While a few sentences can be sourced to Wikipedia, each paper overall has offered to the rest of the world in English valuable insights. The Paper on e-learning in Russia, for example, cites 18 references and all of these are references to the literature in Russian. All 20 references - except one to a UNESCO report in English- are non-English in the Paper on e-learning in Kazakhstan. This clearly demonstrates the great achievement of the editors in producing an open resource for sharing with the world. In the fast evolving internet age perhaps we should expect links to fail, and researchers need the coping strategies to re-source many of the reference links given in this collection.

In many regions (and in some cases whole countries), there is inadequate infrastructure and such poverty that students cannot afford to have internet access at home. Even in the most advanced Western countries broadband is not universal, so poorer regions should develop coping strategies at a slower pace within their means. One important aspect of e-learning is learning to manage with what resources you have available: living within one's means.

Spender (2002, p. 25) characterizes e-learning as education being a commodity, rather than as a right; that e-learning is for all, rather than with controlled entry; e-learning and skilling is a lifestyle, rather than a qualification; e-learning occurs at any time, any place, any pace, rather than as a scheduled activity; e-learning is making information, rather than taking in content; e-learning is demonstration of performance, rather than memory testing; and e-learning is collaborative. According to Spender's definition, e-learning does not generally take place in many of the countries reviewed in

this book, notably the developing countries in which e-learning is used for administrative purposes or cooperative -but not collaborative- learning.

Comparative Infrastructure for e-Learning in Selected Countries :

Latvia

While teacher in primary and secondary schools are computer illiterate, Latvia has the highest penetration of work-place e-learning in Europe.

Lithuania

In the past five years, many young adults have emigrated, so e-learning is now focusing on older adults at work - mostly re-training that can help the students in full-time employment get vertical and horizontal job mobility. In similar fashion, in-service teacher education and training also use work-place e-learning.

Belarus

Despite a relatively young educational system, government disinterest to support e-learning and more than half the population speaking Russian have led to the current status here of most students relying on Russia for e-learning resources, with only 1% of students officially studying at a distance in the country. The very limited educational e-resources produced within the system are basically just digitized print versions. Accordingly teacher training is not keeping pace with advances in e-learning technologies and methodologies.

Macedonia

In the general population, Macedonia has a relatively high penetration (30%) of internet access at home. This rises to 60% for students and those who have graduated from college. Unfortunately, only 5% of the old aged persons and housewives had internet at home. Thus while e-learning is recognized for institution-based education, e-learning is not used for community-based lifelong learning. The researchers as authors here remain steadfast in their conviction that e-learning should and will remain within the university function. This does not bode well for open community-based lifelong learning. Moreover there is little awareness among conventional university teachers of how to teach online both in practice and in theory.

Palestine

Palestine has the single-mode distance-education Al-Quds Open University with 500 full-time and 1500 part-time teaching faculty serving 60,000

students (60% women). With international aid assistance in training, school teachers and universities work collaboratively in e-learning networks with counterparts in Britain, Belgium, France, Italy, Spain, Egypt, Jordan, Lebanon and Syria.

Kazakhstan
Teachers are generally too poor to be able to afford their own computer at home, while many parents are buying internet access for students at home, creating an ironic digital divide where the students are more computer literate than the teachers.

Russia
Being geographically the largest country in the world, the teachers in distance education are faced with many challenges and little time to develop e-learning resources using modern learning technologies. As a result, e-learning resources are of poor outdated quality and limited in quantity.

Comparative e-Learning Among Regional Countries:
e-Learning can be analyzed with respect to technical vocational education and training and at-work learning. Such learning can represent the sub-region's readiness to engage and profit with e-business including use of the internet for business. Together with e-business opportunities, e-learning is correlated with lifelong learning. This involves adult education for literacy in poor regions and sociocultural participation in regions with high literacy. In the developed countries therefore, e-learning can be associated with their sociocultural participation: the extent to which the population engage community cultural and traditional events.

The Scandinavian countries are well known as highly developed for e-learning (EIU, 2009), with Norway moving up from 11th last year to 4th position in the world (after Denmark 2009 1st, 2008 5th), Sweden moving up from 3rd to 2nd position, and Finland at 10th. They are thus well positioned for e-business and sociocultural participation.

In central Eastern Europe, Estonia and Latvia are the two leading countries for e-learning (the Czech Republic is among these leaders but not reviewed here). In the Middle East, Israel is the leading country for e-learning, followed by the UAE.

The overall e-readiness of the thirty-nine countries where data are available are given here as position (1~70) among the top 70 countries in the world (EIU, 2009) ;- Norway 4, Sweden 2, Finland 10, Estonia 24, Latvia 37, Lithuania 32, Belarus (data missing; estimated 41), Poland 39, Ukraine 62, Slovakia 36, Moldova, Hungary 35, Slovenia 29, Romania 48, Serbia, Bulgaria 47, Macedonia, Turkey 43, Greece 33, Morocco, Algeria 67, Tunisia, Egypt 57, Israel 27, Palestine, Lebanon, Jordan 50, Syria, Iraq, Saudi Arabia 51, United Arab Emirates 34, Oman, Iran 68, Armenia, Uzbekistan, Kazakhstan 69, Kyrgyzstan, Tajikistan, and Russia 59.

There is a close correlation between their global ranking and geographic location, suggesting that regional development could be provided to clusters of countries. The brief summaries given above for selected countries illustrate the regional trends across several countries in geographic clusters.

In many aspects, most reports from developing countries are predictable. For example, "one of the obstacles … is the delay and slow pace of equipping public schools with computer laboratories and internet access. Another obstacle is the lack of qualified teachers … [And] the greatest obstacle will be how to use the ICT in teaching in such a way as to make technology an effective tool that aids students in learning, both in school and at home, and not just in locating information but also in answering questions, choosing relevant information, and constructing knowledge through individual and group efforts. …[While in universities] the outcome of implementing ICT on students' learning is still unclear due to the distinct paucity of evaluation and assessment studies on ICT use in teaching and learning" (cited from the Conclusion, Lebanon).

It seems clearer after reading these country chapters that more cooperation is needed among countries to help each other free through simply communicating. Following this – and growing out from this – should be collaboration that tackles the questions and challenges that countries face in common within a region. With the internet, many poor believe that the simple answer is money.

This is not foreseeable and anyway is not likely to succeed in practice. Getting hardware is not going to resolve the issues. e-Learning involves conversations and openness, with reflection on own practice and own ideas. In this sense, many developing regions are indeed poor.

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BIODATA and CONTACT ADDRESSES

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Paul Kawachi is Professor of Instructional Design, at the Open University of China (formerly the China Central Radio & TV University, and which has about 3,000,000 active enrolled students). He is a Fellow of the Royal Society of Arts, a Fellow of the British Institute of English Language Teaching, and a Fellow of the Asian Society of Open and Distance Education. He holds a doctorate in education, three master's degrees and several teaching diplomas with distinction. He has English internationally accredited licences for multimedia teaching, and English language teaching, and for teaching other teachers at all levels either face-to-face or online. He has recently graduated (July 2007) in Advanced Technologies for Education from the University of West Georgia, with Grade A distinctions in all modules. Earlier he has graduated from the UK Open University, Institute of Educational Technology, with a Master's in Open and Distance Education, and won the Gold Medal for his research from the Asian Association of Open Universities. He is Editor of the Asian Journal of Distance Education, and on the Editorial Board of many others. He is a Founding Member of the International Society for the Scholarship of Teaching and Learning, and elected Board Director of International Professors for volunteer teaching in developing countries. His research interests are in third-generation instructional design and how this facilitates lifelong learning, teacher professional development, cognitive learning theories especially lifelong learning and adult learning theories, educational psychology, and learning technologies especially when applied across cultures. He does international consultancy on curriculum design, applying learning technologies and e-learning. He is widely published in books and leading international journals. He is a Board Member of the Asian Association of Open Universities AAOU, and a Member of the International Council for Open and Distance Education ICDE.

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Preliminary Words

Prof. Dr. Ugur DEMIRAY,
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E-Learning offers many opportunities for individuals and institutions all over the world. Individuals can access to education they need almost anytime and anywhere they are ready to. Institutions are able to provide more cost-effective training to their employees.

E-learning context is very important. It is common to find educators who perceive e-learning as internet-only education that encourages a static and content-focused series of text pages on screen. Others envisage the shallow and random online messages that are typical of a social real-time chat session, and wonder how that type of communication could add any value to academic discourse. Some may have experienced e-learning done poorly, and extrapolate their experience into a negative impression of all e-learning.

While e-learning started in the early 1970s with mainframe computing, it really didn't take off until the advent of CD-ROMs and the World Wide Web. Multimedia CD-ROMs in the early 1990s allowed us to develop programs that had color, action, and interactivity. These were a major advance over text on monochrome screens that characterized educational computing in the 1980s.

The invention of the World Wide Web in the early 1990s introduced the ability Access resources from anywhere in the world through Universal Resource Locators (URLs). But the Web was a step backwards in terms of animation and interactivity because of the slowness of computers, modems and the network at the time it was introduced. It is only now that the capabilities of networked computers are catching up to the level necessary to produce the quality of e-learning that was possible using CD-ROMs. (Woodill, p. 9)

The new learning landscape is a multichannel learning environment that can be seen as a "complex adaptive system". For the most part, this environment is "self organizing" and because of that it is difficult to exactly predict how it is all going to turn out in the next five years. But, there is no question that a

major shift is taking place -a turn from instructor centric curricula towards learner centric searching for relevant resources of learning as need.

The shift is from instructor controlled classroom learning and instructor controlled e-learning to a mix of approaches that includes instructor control when appropriate (for specific certifications, for example) along with many different channels of resources and requirements from which learners can choose and explore.

Emerging e-learning will not be simply mixed with "face-to-face" learning to form blended learning. Rather, all learning will be multichannel learning. The "e" in e-learning will gradually disappear, as electronic support for learning by any means becomes invisible and taken-for-granted (Norman, 1999, quoted from Woodill, p. 16.).

E-learning continues to evolve with new delivery methods – to PDA or mobile phone (called MLearning) and via blogs, wikis, Podcasts, and easier-to-use tools.

There is also a trend seen in the transition from training to learning that leverages the power of the Internet to go beyond eLearning through knowledge management, competency management, and performance support and to HR processes like performance management, talent management, succession planning, and hiring. Web 2.0 (and e-learning 2.0) technologies are driven by collaboration. It's the next phase of eLearning (Clarey, p.29).

Today's learning and education technology is developing with overwhelmingly what we guess for tomorrow. In those days eLearning technology application changed its structure by combining via new discussion technologies such as mLearning, tLearning and uLearning. Developed chart below, show us the latest trends of technology which, education institutions should have to adopt their education or material producing strategies according to newest technologies indicated in chart.
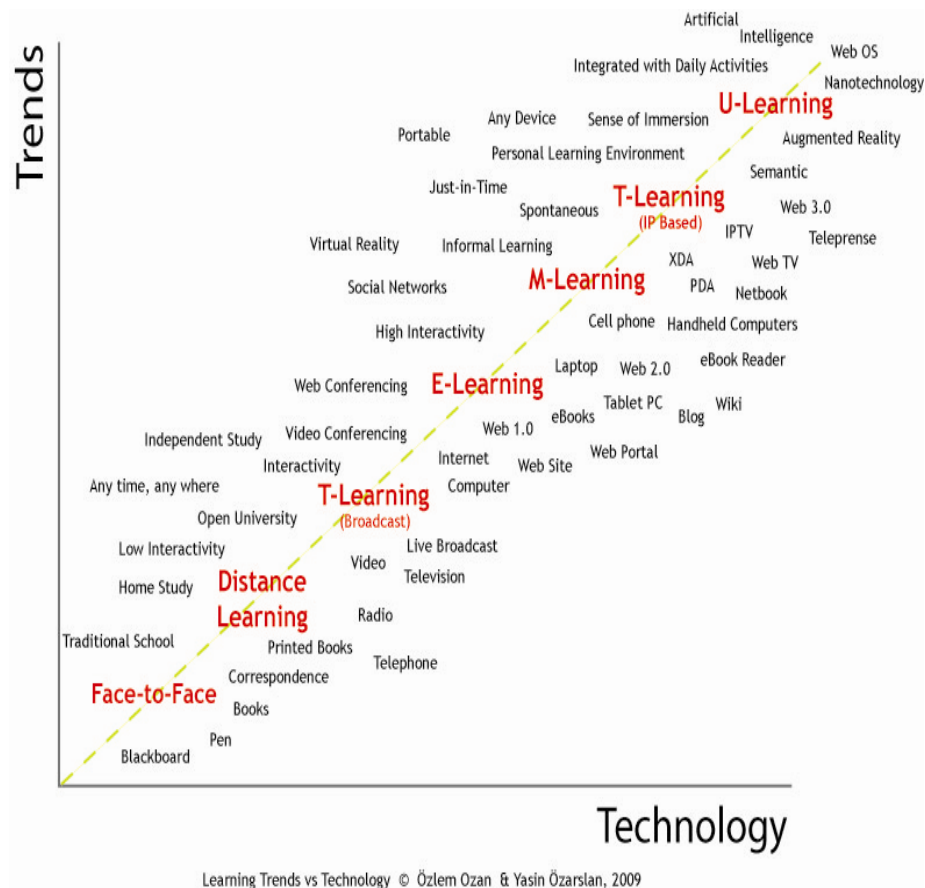
Learning Trends vs Technology © Özlem Ozan & Yasin Özarslan, 2009

Source: Yamamoto, G. T., Ozan, O & Demiray, U. (2010).

Consequently, Yang & Yuen indicate that learning has been dramatically influenced by information and communication technology. There is no doubt that information and communication technology keeps bringing excitement in to learning and communication. Multimedia on the internet, telecommunications, wireless applications, mobile devices, social network software, Web 2.0 etc are radically redefining the way people obtain information and the way to learn (Yang & Yuen 2010, xxiv)

Policymakers, international organizations, higher education institutions and researchers in the field of education agree that Information and Communication Technologies (ICT) have the potential to stimulate international collaboration, to create flexible learning paths and to open the

borders of the university. Throughout the last decade, numerous initiatives have been set up to experiment with the establishment of ICT-enhanced activities, under various frameworks and to varying degrees of success. The higher education area is a very complex world with a diverse list of providers; these include traditional universities, distance education providers, public and private institutions, associations and consortia. (Schreurs, p. 7, Preface)

Western and East Asian nations are increasingly embracing e-learning in education and training, both within their classrooms and in distance education. E-transformation has been much slower in the education systems of the Eastern Europe, Nordic, Turkic, Middle East, Arab and North African countries. It is therefore considered timely to conduct an inquiry into the ways and extent of e-learning in these countries, the factors driving and constraining such developments, and how progress might be further encouraged. Searching the literature, it is possible to find reports, accounts, research findings and conference presentations on e-learning in these countries but many of these are in languages other than English. This book will feature studies in English language developed in collaboration with colleagues in these various countries and so will be a first and of international significance. It will be so conceived and so written as to be useful to policy-makers, managers, practitioners and researchers.

The book will examine the emergence and growth of e-learning. The use of the 'e' prefix indicates the application of information and communication technology (ICT) in government, finance, and all forms of socio-economic and community development.

This book will take all of these into account, plus the roll-out of technology, but will concentrate primarily on definitions, theories, research findings and case studies of e-learning in formal education and specifically in higher education.

Many of the institutions in the countries to be reviewed also make extensive use of traditional teaching and methods and media, so this book will not only consider e-learning and mobile or m-learning in isolation but in blended or mixed-mode learning, both in classroom environments and in distance education. It will examine and discuss at:

- How and why ICT is working its way into learning in the various countries, its potential, and how its integration and broader use may be promoted.
- The constraints on e-learning development.
- The benefits and cost benefits of e-learning.
- Internet penetration and usage rates
- Government initiatives to promote ICT literacy and the use of e-learning in education and training.
- The extent and nature of e-learning and blended learning provision.
- The cultural and pedagogical implications of e-learning.
- The policy-making and organizational dimensions of e-learning

To obtain authors for this study, the editors conducted contact with colleagues known to be interested in, knowledgeable about, and experienced in applications of e-learning in the following countries: Armenia, Algeria, Belarus, Bulgaria, Egypt, Estonia, Finland, Greece, Jordan, Hungary, Iraq, Iran I-II, Israel, Kazakhstan, Kyrgyzstan, Latvia, Lebanon, Lithuania I-II, Macedonia, Moldova, Morocco, Norway, Oman, Palestine, Poland, Romania I-II, Russia, Saudi Arabia, Serbia, Slovakia, Slovenia, Sweden, Syria, Tajikistan, Tunisia, Turkey, Ukraine, United Arab Emirates and Uzbekistan. Some of the countries are participated with two chapters such as Iran, Lithuania and Romania

This eBook is designed and presented in two volumes. The fist volume consists of the country cases of Armenia, Algeria, Belarus, Bulgaria, Egypt, Estonia, Finland, Greece, Jordan, Hungary, Iraq, Iran, Israel, Kazakhstan, Kyrgyzstan, Latvia, Lebanon and Lithuania. The second volume gives a place to the country cases of Macedonia, Moldova, Morocco Norway, Oman, Palestine, Poland, Romania, Russia, Saudi Arabia, Serbia, Slovakia, Slovenia, Sweden, Syria, Tajikistan, Tunisia, Turkey, Ukraine, United Arab Emirates and Uzbekistan.

As being all we editors wish to thank all of those involved in the collection, without whose support, the project could not have been satisfactory completed. The work of this magnitude and significance is not possible without the support, efforts and time of many persons. At the outset, as we editors we would like to thank all of the authors for their excellent contributions. Trough your efforts, we have been able to produce this valuable resource. It has been an exciting experience working with colleagues from across the world.

We also, take this opportunity to thank those colleagues who devoted time in developing and submitting their proposal but later on could not join our team such as Azerbaijan, Iceland, Denmark, Libya, Turkmenistan and etc. We hope and believe to join with them in other studies in due course.

And also, my thanks go to my dear colleagues Dr. Ramesh C. SHARMA and Sanjaya MISHRA from IGNOU-India, Dr Paul KAWACHI, from Open University of China, Dr Colin LATCHEM from Australia who consultant and writer in distance education. He works mainly in Australia and the Asia-Pacific and Dr Tapio VARIS, Professor, UNESCO Chair in global e-learning, Vocational Education with particular reference to Global Learning Environments University of Tampere, Faculty of Education Finland and for their highly motivating me, to start to this book project at the beginning of February-March 2009 for giving and sharing their very valuable academic support and experiences.

As well as providing articles for his chapter, most of the authors are supported us to start to this project. So, we are particularly grateful to the authors for their excellent contributions in this crucial and growing area of research, helped to promote interest in project. Hereby, I would like to declare the names and affiliations of my authors here but they are more than 70 authors from 39 different countries and from more tan 40 universities and 14 institutions with company for all 42 chapters. But, you will see their names and a brief biodata and full contact addresses at the end of chapters with their photos also.

The book starts with my dear colleagues Emeritus Prof. Dr. Tony BATES and Prof. Dr. Paul KAWACHI's forewords. Dr Bates currently he is Chair of the International Experts Panel for the Open University of Portugal and President and CEO of Tony Bates Associates Ltd.

Dr. KAWACHI who is Professor of Educational Technology, teaching in the School of Foreign Languages and researching at the Institute of Distance Education at Open University of China, he is also Fellow of the Royal Society of Art- FRSA, and editor of The Asian Journal of Distance Education. And then book carries on with the country cases which are given in aphetically in order in spite of sectional or regional positions of the countries. The book ends with my dear colleague Prof. Dr Tapio VARIS's evaluation under the Last Words Section.

In this way we would like express our gratitude to Professor Paul KAWACHI, Tony Bates and professor Tapio VARIS once more for accepting to write a Foreword and The Last Words for this study. This has been mammoth task, but one which we have found most rewarding.

Initially, this book was thought to be published as an eBook. Then it was decided to get it published through by IGI Global Publishing. At the last phase of signing contract with IGI Global we denounced an agreement for the some serial reasons; mainly publishing date was September 2010. Once more my thanks go to all the authors for their understanding.

We have been demanding much information from them every now and then; they have been very gracious in accommodating me on every step. Due to their efforts and willingness, we were able to bring this eBook within the tight schedule. And also its printed version will be published as soon as possible. Moreover, we are still thinking republish, expanded and revised version for different regions of the world in due course.

Hope to raffish readings…

January 20, 2010
Lead Editor Ugur DEMIRAY
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CHAPTER-1

eLEARNING IN ALGERIA
Experiences On E-Learning in
Algerian Universities

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ABSTRACT

Learning requirements are increasing in Algeria because of population explosion and the policy of democratization of education. An estimated several thousand teachers in the deficit for the coming years in Algerian universities. If you look at training trainers who is supposed to take over shows that the number of positions available each year is still below that required to meet the demands of coaching in Algerian universities. Despite almost annual opening of new universities, overload students remains a problem for managers of these establishments. Add to this the insufficiency of teachers in some specialties where demand is high and spread over the vast territory of Algeria. E-learning presents an alternative then the more it brings benefits in terms of educational and economic consequences. Indeed with the e-learning problems of housing, food and transportation for students will no longer arise. Secondly Algeria can not afford to remain on the margins of technological innovations.

COUNTRY

Algeria (People's Democratic Republic of Algeria) is located in north-western Africa, bordering the Mediterranean Sea between Morocco and Tunisia. Algeria has an area of almost 2.4 million square kilometers, more than four-fifths of which is desert. Algeria is the tenth largest country in the world and the second largest in Africa (after Sudan). Algeria shares borders with Morocco, Mali, Libya, Tunisia, Niger, Mauritania, and Western Sahara. Algeria's northern border stretches along the southern edge of the Mediterranean Sea from Tunisia in the east to Morocco in the west (Elabweb, 2009). (See figure 1.)

As of July 2009, Algeria's population was estimated to total 34.2 million. The population was growing at an annual rate of 1.2 percent. More than 90 percent of the country's population is concentrated along the Mediterranean coast, which constitutes only 12 percent of the country's land area. Therefore, the overall population density of 14.2 people per square kilometer is deceptive. About 59 percent of Algeria's population is urban. Drought conditions have led to an internal migration of farmers and herdsmen to the cities to seek other employment. High unemployment encourages emigration. In 2009 Algeria's net migration rate was estimated at –0.29 migrants per 1,000 people.

In 2009 population distribution by age was as follows: 0–14 years, 25.4 percent; 15–64 years, 69.5 percent; and 65 years and older, 5.1 percent. As this distribution indicates, Algeria has a very young population, which poses a challenge for the labour market and the education system. According to the World Health Organization, life expectancy in 2009 was 74.02 years (72.35 years for men and 75.77 years for women).

Figure 1.
A map of Algeria
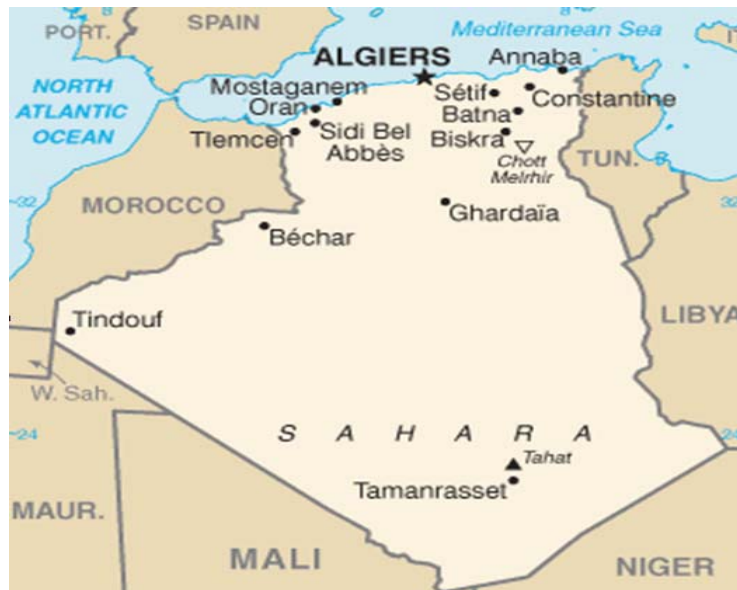
Source: CIA 2009

In 2009 the birth rate was estimated at 16.9 per 1,000 people, and the death rate was estimated at 4.64 per 1,000 people. The infant mortality rate was 28.78 per 1,000 live births, and the fertility rate was 1.86 children born per woman. The official language is Arabic. French is the language of business, and Tamazight is also spoken (CIA, 2009). (Elabweb, 2009)

HIGHER EDUCATION

Higher education is provided by universities, specialized institutes, national institutes of higher education, and teacher training institutes, which fall under the responsibility of the Ministry of Higher Education and Scientific Research, as well as by institutes run by other ministries. The specific degrees awarded are determined by the field of study, not the institution. The Ministry of Higher Education approves the curriculum, which is standardized for each field of study. Universities in Algeria have gone through a reform of bringing the composition of degrees into accordance with international standard called LMD: 3 years bachelor (Licence), 2 years Master and 3 years Doctorate.

It is hoped that the new system will make program offerings from Algerian universities more compatible with those around the world, thereby increasing the international mobility of Algerian faculty and students. In addition, the reforms are aimed at increasing student flexibility in choosing and transferring courses and credits; making the system more efficient as relates to the time it takes for students to graduate; increasing lifelong learning opportunities; and increasing institutional autonomy while producing learning outcomes more attuned to the needs of the labour market.

Educational reform has focused on teacher training, reforming curricula and general reorganization of the sector. It has strengthened initial training for new teachers and set up a national training and refresher programme for working teachers and a range of measures to improve their status. Curricula have been revised, notably for language teaching, textbook content and the criteria used for choosing between the different disciplines. Science has been emphasized and Information and Communication Technologies (ICT) is being introduced as a teaching tool and a means of access to knowledge. Algeria has 34 universities, 12 university centers, and 21 high schools (CIA 2009; Elabweb 2009; Attieh, 2003; Hamdy 2007).

Educational research has received considerable support from the Algerian government. The MHESR directs much of the research and oversees formal

agreements of collaboration with the individual universities and other higher education establishments to develop and carry out projects. Some research units deal with pedagogy, curricular material and textbook development, teacher and faculty training, supervision, and testing and evaluation for the purpose of improving the efficacy of internal structures and practices. However, the government's support of research activities appears more rhetorical than substantive when one examines faculty participation in research. Despite the ministry's emphasis on the significance of research for faculty rank, salary promotion, and development, it has adopted the long-time practice of automatic faculty promotion based on years of service, thus fostering apathy and disregard for the importance of research. Algeria has been producing students without any, or with meager, research skills, even though the country remains in dire need of academic, empirical and scientific experimentation to revitalize its weak domestic industry, improve productivity, and match its strong economic performance of the 1970s (Aman Attieh, 2003), (UNESCO, 2004),.

Webometrics (Webometrics, 2009) places Algerian universities low in world rankings, University of Sidi Belabbes comes out national best, no. 4116 in the world, with University of Tlemcen, Tlemcen national second, being no. 4143 in the world (see Table 1).

ICT IN ALGERIA

In Algeria, the integration of ICT at the level of the university is relatively recent. Therefore, there's certain awkwardness in handling this new issue. The double problem which emerges is: First, the training of trainers as to their aptitude to handle the new technologies and adopt the adequate pedagogies. Second, the question of the readiness of the Algerian learners: to what extent are they ready and able to adopt new learning strategies involving the use of computer and internet?

ICT Policy
The implementation and management of Algerian national ICT policy has been mandated to the Ministry of Posts, Information Technology and Communications (MPTIC). The first important policy drafted was in 2000 with the creation of the regulatory authority for post and telecommunications (ARPT), and the split of Algeria Posts and Telecommunications into two companies, one of them becoming the incumbent telecom operator Algeria Telecom (AT). The ARPT is in charge of regulating postal services and the telecommunications sector. This includes promoting competition in the latter.

It is also responsible for the procedures for the allocation of operating licences and defines the rules on pricing for the services provided to the public. It ensures that the licence conditions are implemented and that the telecommunications infrastructure is shared. In 2005, the MPTIC was assisted by a United States of America (USA)-funded project, the Internews

Table 1.
Algerian Universities in African Top 100 (Elabweb 2009)

Algerian Rank	African Rank	UNIVERSITIES	World Rank
1	23	University of Sidi Belabbes	4,116
2	24	University of Tlemcen	4,143
3	47	University of Batna	5,548
4	62	University of Constantine	6,766
5	65	University Houari Boumediene	7,008
6	70	University of Mostaganem	7,205
7	76	University of Algiers	7,849
8	86	University of Bejaia	8,376
9	91	University of Boumerdes	8,727
10	96	ESI School (ex INI)	8.960
11	98	University USTO Oran	9,004

Network Global Internet Policy Initiative (GIPI). This project aimed to assist policy and regulatory actions needed to address the identified constraints on access to and use of the internet in Algeria..

At that time, the MPTIC and ARPT had been focusing on important policy and regulatory decisions aimed at liberalising the telecommunications sector in order to expand internet access.

In addition to the MPTIC and ARPT, the Ministry of Higher Education has also played an important role in the ICT field, especially through the Scientific and Technical Information Research Centre (CERIST), which functioned as the only internet service provider (ISP) before market liberalisation (UNESCO, 2004), (World Bank, 2007).

Internet

Algeria first gained Internet connectivity in 1994 under the auspices of the CERIST, which by law remained the country's sole ISP until 1998. On August 5, 1998, decree no. 98-257 opened Internet service provision to other providers, but private entry into the market proceeded slowly.

Two years later, law no. 2000-03 created the MPTIC, which included the Internet regulatory agency Algeria Telecom. Algeria Telecom launched the ISP Djaweb in 2001 to extend service beyond universities and research centers.

Today, Algeria Telecom lists twenty-six ISP partners operating in the country, including CERIST. CERIST continues to develop the academic, non commercial Internet under the influence of the state and has created nodes in Algiers, Oran, Constantine, and Ouargla.

The MPTIC has expressed its desire to promote the Internet as a source of investment and job creation.18 Though Internet penetration has increased dramatically over the past few years, jumping from approximately 1,500 in 1999 to nearly 850,000 in 2006, this still represents only 2.6 percent of the population.

The government has supported programs that allow users to access the Internet on a "pay-as-you-go" basis, without requiring a monthly subscription. Although most ISPs offer broadband, ADSL, or satellite plans, the prices of these services remain prohibitively high for many Algerians.

Consequently, most Algerian Internet users rely on dialup connections and cybercafés for access (Elabweb 2009 & World Bank, 2007).

ICT INIATIVES FOR ELEARING:
University of Continuing Education

Algerian University of Continuing Education (UFC) was established in May of 1990. The structure of UFC includes a master dean or rector, a vice rector in charge of pedagogy, a vice rector in charge of communications, a computer science center and an administrator. UFC operates 10 learning centers in the central region of Algeria, 13 in the western region, 16 in the eastern region, and 14 in the southern region. UFC has four guiding missions:

- to prepare senior high school students for the national university entrance exams;
- to provide undergraduate evening studies for high school graduate;
- to offer courses for university graduate students providing them with modern tools for the new economy; and
- to offer specialized courses for professional continuous education. UFC students can follow studies in technical languages, science, business, and management.

Courses are also taught in the fields of computer science, electronics, biological analysis and industrial chemistry. In addition, there is a specialization in the field of education.

During the academic year 2001/2002, UFC had 56, 842 students, of which 8,236 were studying via distance education.

During that time period, the university had 2400 lecturers, of which 12% had doctorate degrees, 68% masters degrees, and 20% undergraduate degrees.

UFC has many foreign partners in the distance education work it undertakes. These partners include; Group A6 (France); the National Center of Distance Education (France); M. I. T. (USA); ROBOTEL (Canada); the Open University El Quods (Jordan); the University of Jean Moulin (France); and the Avicenna Virtual University (Djoudi, 2009).

Academic and Research Network
The Algerian Academic and Research Network (ARN) is a national project financed by the government of Algeria. The project has been initiated in 1994. The network is being set up by the CERIST on three phases:

- Selection and connection of regional nodes: this phase consists in defining POPs (point of Presence) in each region of the country, connecting these points through communication lines, buying and installing routing and server equipment.
- Connection of regional centers and universities to the POPs: this phase consists in selecting research and academic institutions in each region and connecting them to the regional node.
- Connection of the regional nodes to the main central node which is connected to international networks and development of services and information servers.

7

Figure 2.
Academic and Research Network
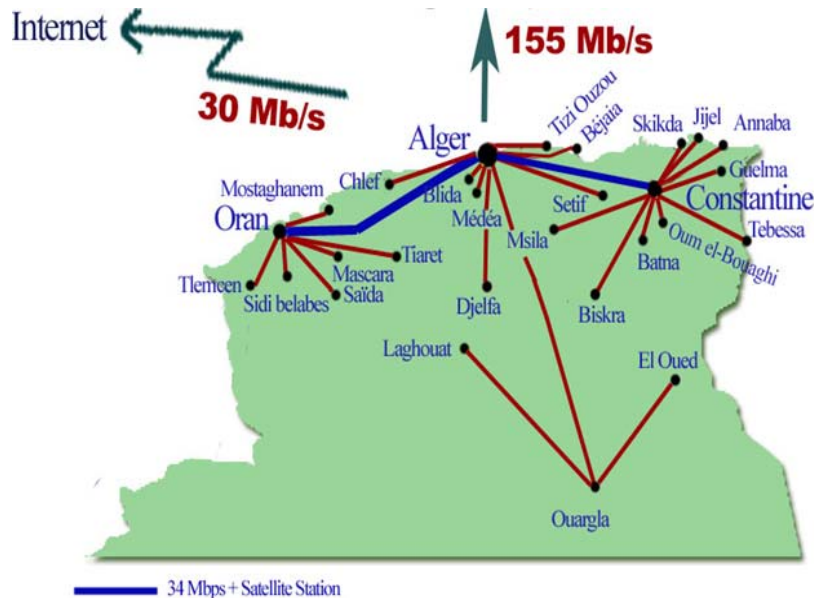
ARN connects all the established universities and research centers. This network includes 25 universities, 10 university centers, 11 high institutes and engineering schools, 12 research centers, 11 others scientific institutions (See figure 2).

Ousratic

Within the framework of the process of building the Algerian information society and of the recommendations of the e-Commission, chaired by the Chief of the Government and installed in April2004, the Minister of Post and Information and Communication Technologies announced operation OUSRATIC in July 2005. OUSRATIC plays on the terms 'ousra', meaning 'family' and 'TIC', an acronym for information and communication technologies (ICT). Together, they form the word 'Ousratic', which translates to 'your family.' The stated aim of operation OUSRATIC is 'one PC per household.' The Ousratic initiative aims to increase the penetration of computers in households by offering people loans for their purchase. The government has also lowered the value added tax (VAT) on computers from 17% to 7%. Operation OUSRATIC consists of putting on the market five million PCs between the end of 2005 and 2010, which makes a total of one million PCs per year. The new market created by this project will have a

value of more than USD 4 billion. Each family will be able to buy a PC thanks to the conditions put in place. Nine million schoolboys, high-school pupils and students will take part in shaping the success of this operation and the good use of PCs (World Bank, 2007).

E-Algeria 2013
The MPTIC ministry recently revealed a new strategic plan for developing ICTs in the country. The e-Algeria 2013 initiative is supposed to accelerate ICT use in the country, including the government's application of technology to increase access to government information. This strategy is the result of the deliberations of a so-called "e-committee" headed by President of the republic. It follows the rapid growth of mobile telecommunication services in Algeria, but not internet and broadband services.

The E-Algeria strategy is based on several goals: boosting the use of ICTs in public administration and businesses; developing incentive mechanisms and measures to give citizens access to ICT equipment and networks; stimulating the development of the digital economy; strengthening high and very high speed telecommunication infrastructure; developing human capacities; strengthening research, development and innovation; updating the national legal framework; recognising the value of international cooperation; and establishing e-monitoring and evaluation mechanisms (Djoudi, 2009).

INTERNATIONAL PROJECTS

The exponential development of increasingly sophisticated communication technologies has prompted universities, companies and educational institutions to experiment with alternatives to the traditional teaching methods, thereby leading to the development of online courses. However, there are also new opportunities to be seized for learner participation in the creative process. At present, Information and Communication Technologies mediating learning represent an important component of education and training systems. Over the last two decades, concerted efforts have been made in the area of distance higher education in Algeria. These endeavours can be classified into three modes: Distance or open education programs provided by traditional higher education institutions, distance or open education institutions, and a virtual university (Mahieddine Djoudi, 2009).

Avicenna Virtual Campus
Avicenna was launched by UNESCO in November 2002 with funding from the European Commission through its Euro-Mediterranean Information

Society (EUMEDIS) programme. It is aimed at creating a self-sustainable virtual campus, based on cooperation between institutions of the member countries (Spain, UK, France, Italy, Turkey, Cyprus, Lebanon, Syria, Jordan, Palestine, Egypt, Malta, Tunisia, Algeria, and Morocco).

The Euro-Mediterranean partnership is to reinforce the cross-fertilization of expertise and innovation in the field of distance education and training. The campus is also aimed at concentrating on course development, by using ICT to produce, deliver and exchange courses, bearing in mind the necessity to develop curricula in an innovative and multilingual way within a multicultural context. The aim of online training course is to provide Avicenna course developers with necessary knowledge and skills required for the development of distance learning courses in general, and distance learning courses adapted to the context of Avicenna virtual campus in particular. In addition to producing courses, Avicenna has helped to establish local infrastructure and transfer best practices and professional know-how within the participating universities (EUMEDIS 2006). UFC is the focal point for Avicenna in Algeria. See Figure 3, a screenshot of a sample of courses in Arabic.

Figure 3.
AVICENNA Centre in Algeria

Construction Management Curricula

The project consisted of four phases: Assessment, Planning, Implementation, and Evaluation, aimed at:

- determining the educational needs and goals of the cooperating Algerian institutions,
- developing a roadmap to achieve these goals,
- gaining knowledge in core areas of Engineering Management, and
- offering degree programs in Algeria via traditional and distance learning methodologies.

Throughout the four phases of the project, the multi-perspective vision not only facilitated an effective assessment of the institutional needs in Algeria, but also led to integrated efforts for planning, implementing, and evaluating the proposed program.

The main outcome is a special graduate program in Engineering Management called PGS (Post Graduation Spécialisée Degree). After a providing the Algerian faculty members with the appropriate training in the USA, the graduate program was prepared based on the program offered at University of Minnesota Rochester, and was approved by the Scientific Committee of the School of Engineering and the Ministry of Higher Education in Algeria.

The program has been a success in Algeria since its first offering. Another new graduate program has been initiated at university of Tlemcen related to graduate study in Civil Engineering Management. A similar special graduate study program (PGS) in Construction Engineering Management has been accepted in other universities in Algeria such as the one at the University of Oran 3-year program provided a mutual benefit through a long-term partnership between the USA and Algeria. The faculty on both teams was able to work closely in developing/customizing courses and advising graduates.

The participating Algerian institutions is taken the leadership in reaching out to other higher education institutions and industry in Algeria, as well as neighbouring countries, to share their experience in order to develop collaborations. Although the Algerian educational system remains highly centralized, it is anticipated that these collaborations will lead to self-sustained programs for modernization of the Algerian economy, with the

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Algerian Ministry of Higher Education playing a major role in supporting these efforts. (Baghli, Grasman, Belarbi & Saygin 2007).

ALGERIAN VIRTUAL UNIVERSITY

Algerian Virtual University (AVUNET) is a Multilanguage environment for distance education making use of the new information and communication technology specifically Internet and hypermedia. Based on client-server architecture, the platform is developed in PHP/MySQL and is software independent. The data set is stored on the server in a centralized database (Djoudi, 2009).

Platform addresses users, who are either at the university, home or connected from access points and aspire to be trained, supplement their knowledge or to evaluate their qualification levels. The Information module presents a detailed description of the platform and the access methods and use with level and prerequisites indication.

The efficiency of an educational site is mainly based on the way textual as well as graphical information is organized, on the navigation flexibility and interactivity. Consequently, a design guide is elaborated according to appraisal concerning sites building, and taking into account several web sites analyses. Such guide is intended to facilitate teachers' task, while enabling them to build cognitive courses through a design plan and recommendations.
A course building serves to structure its content in order to facilitate its training, what will allows to reach pedagogical objectives and significantly reduce problems raised by users. Such design process may be achieved following several steps.

First, it is necessary to identify specific training objectives and structure content into logical training units. Second, a complete use scenario of use of the web site has to be achieved.

Finally, navigation flow chart and site logical links have to be specified, allowing thus user to build his knowledge mental structure and then produce pages models. A model is intended to standardize semantic units' presentation of the web site (typography, page setup, title, graphical element locations, etc.).

The educative server essentially focuses on information structuring and organization according to learner's abilities and skills, which are aimed at

learner model building. It provides to learners structured courses that are linked to several related exercises. Distance on-line courses are aimed at familiarizing learners with basic concepts of communication and networking and providing them with new ways of teaching and learning using distance teaching techniques. Furthermore, several collaborative tools have been designed to give them an opportunity to work together.

The server is structured into educational workshops, whose contents are individually or collectively built by teachers. Based on virtual book metaphor, every course is structured as chapters, sections and paragraphs. A course has a modular structure, including a presentation page, which contains links to a table of contents, glossary words, and an on line bibliographic list. Navigation within course components is achieved using buttons and arrows. For a start, students must execute a formal registration that should be transmitted to the server for authentication and options selecting (i.e. novice or expert mode, sound, etc.).

After finishing the course, a student will gain experience and may study the subject thoroughly (under expert mode) or evaluate his knowledge according to several parameters specification. This will help adapting training materials and interaction according to learner's performance. The underlying mechanisms are Java interface and interactive HTML forms. Such forms are automatically transmitted to the server and will be processed. After which, another page of information is returned to the learner for review. Thus, learners are enabled to communicate with teachers through email, and from any web page, they may ask a question or be well informed about frequently asked questions as well as the associated answers of teachers (Douidi, Djoudi & Khentout 2007).

Learner Evaluation Tool
The evaluation is a fundamental aspect in education. It is indeed crucial that the instructor can evaluate what the students have understood and what they did not. It is also important for the students, during their training, to be able to evaluate their knowledge.

This evaluation has double objectives. One it must make it possible for the instructor to propose, at the start of each learning object, either a pre-test, or a test of pre-requisites. Second it must also makes it possible for learners to self- evaluate at the end of each learning object by proposing an exit test. In learner evaluation tool the instructor in charge of the course can access this module in design mode.

Each questionnaire is associated with a learning object. In this mode, the user can create a new questionnaire or open an existing questionnaire. The user must be able to choose whether the questionnaire is intended for the general evaluation or the self-evaluation (should the response time be fixed or not).

He/she has the possibility of choosing the grading system for each question and for the whole questionnaire (number of correct answers, percentage, mark out 20, etc.). It is possible to illustrate the question by a text, image and possibly an audio or video file. A feedback is associated with each response in the form of a detailed comment (Figure 4.).

Figure 4.
Qestionnaire Design Interface

Once the questionnaire is finished, it is saved on the platform server. The learner can access it via the web navigator or learner interface. The user chooses the questionnaire of the concerned subject. Based on the questionnaire the learner can either take a general evaluation or a self-evaluation. In self-evaluation mode, the user has the choice between having the questions (and even the answers) in order or in a random order. He/she must be able to choose between displaying the answers instantaneous or wait until the end.

The evaluation process is done while moving forward from one question to another with the possibility of returning backward. At the end of the questionnaire, in self-evaluation mode the grade as well as the correct answers and feedback are displayed. In evaluation mode, the results are

recorded on the server and/or sent by email to the concerned instructor. This tool is used also to analyze the grades of group learners: display learners' lists and their grades, compute the averages, maximum, and minimum grade, etc. This option gives the possibility to the learner to compare himself/herself to other users automatically.

This comparison is also an interesting argument to make it possible for the user to see where he/she stands comparatively to others.The learner evaluation module is being tested in real practices within the framework of the instructors' didactic activities at the University Ferhat Abbas of Setif. The users expressed a real interest in the system where the different types of questionnaires are available through a unique and homogeneous interface.

The interface simplicity and the integration approach are positive assets of the system. The instructors will propose adequate questionnaires. After the evaluations, the course coordinator will recover the data. In self-evaluation mode, at the end of each questionnaire, the user will get a feedback in a form of comments on the questions and the various associated answers. Several teachers expressed the desire for operations that allow them to represent the questionnaire in other data formats (primarily rtf, txt and HTML).

AVUNET Platform Evaluation
The evaluation is a function which consists in carrying an appraisal, as systematic and objective as possible, of a completed project or in progress, a program or a set of actions lines, its design, its design and implementation and results.

It is a question of determining the relevance of the objectives and their degree of realization, efficiency in comparison with the development, the effectiveness, the impact and viability. The evaluation must have the possibility of improving the policies, programs and projects and provides the elements necessary to justify the actions taken, with the information intended for the public.

Any E-learning platform and provision should give opportunities to improve the quality and the variety of teaching and learning which would not otherwise be achieved through traditional methods.

The aim of AVUNET Evaluation is to give possibilities for different users of the platform to provide their opinion on the whole or a part of the platform. This is accomplished via the filling of online contextual forms. The collected

data will be then sent to the server to be processed. Using the forms, the user thus transmits information to the evaluation server. The forms are based on a relation between the user and AVUNET platform, and on the PHP scripts located on the evaluation server. At the time when a PHP script is started, the parameters fixed in a HTML definition of a form are automatically imported and made available in PHP script as variables bearing the same name.

In order to avoid collecting erroneous data, a method is chosen in which the user chooses from given possibilities only. This approach will eliminate the possibility of errors. The mechanism is to choose ready made options (list boxes, radio buttons operator, check boxes.The access to the data is possible only via the administrator account which gives the permission to examine, print, delete, and synthesize the data recorded in the database (Lamri Douidi, Mahieddine Djoudi, Chabane Khentout, 2007. See figure 5

Figure 5.
laSform Architecture & Evaluation System

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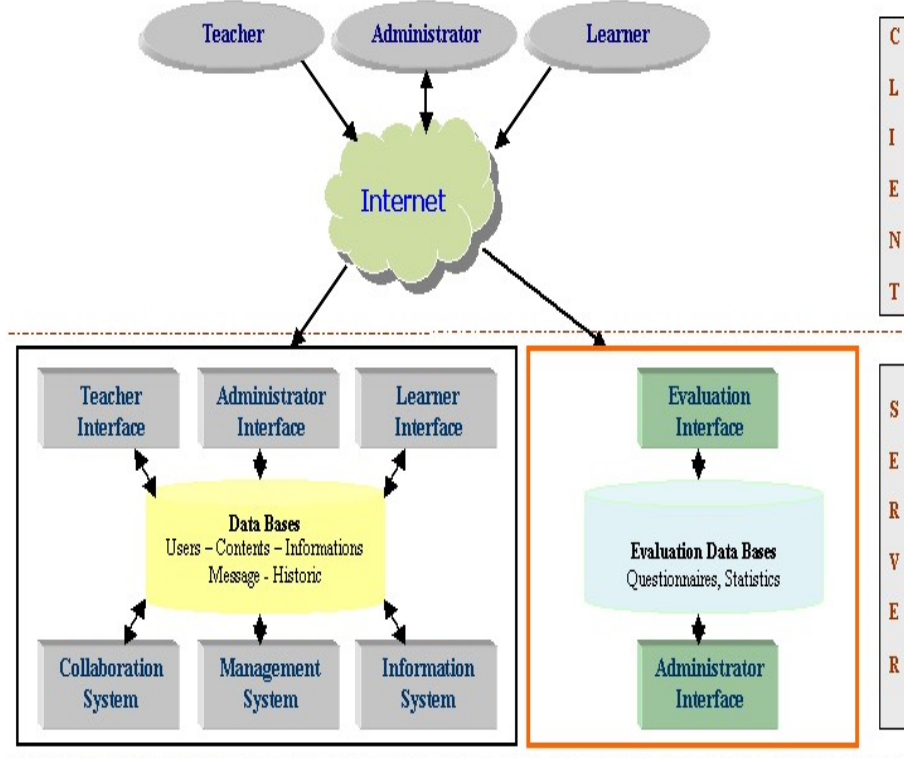
ELEARNING RESEARCH PROJECTS

The integration of information and communication technologies into the education field is in constant progression and generates empirical approaches for educational environment design. Some research projects in distance learning are introduced in several universities in Algeria

Virtual Laboratory for Elearning

A virtual laboratory is defined as: "A digital work area for distant collaboration and the experimentation in research or other creative activities, to produce and deliver results using the distributed information and communication technologies". In general, the development of such environments requires multidisciplinary competences: knowledge of the experimental installation and instruments, competences in distributed computing, communications protocols and the Web technologies. In many cases, this complexity leads to the development of applications specific to a particular laboratory or even to a simple.

The motivations which guided the development of this work were based initially on the fact that the AVUNET platform does not support practical work remotely because it does not contain a distant laboratory or a virtual laboratory.

The lack of such type of structure must be covered and thus the presence of a virtual laboratory is essential for any educational platform in order to complement the theoretical knowledge, acquired by the learners, with practical teaching activities collaborative or cooperative. Also the idea to propose a conceptual architecture of the virtual laboratories is justified by:

- The possibility of performing experiments that can not be done in real life for various reasons (high cost, experiment duration is too long and learner ability is insufficient, etc).
- The experiment can be simplified. Although this point deserves to be discussed, the operations to be carried out in a virtual laboratory are easier and faster than what is needed to be done in real experiment.
- The learner performing the experiment and the equipment used for the experiment do not have any risk in the case of wrong manipulation.
- The machine guides the learner and save the accomplished work.

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- If simulation is sufficiently complex, learner has the freedom to investigate which is usually not available during real practical work. The learner can decide the experimental strategy, proceed by trial and error, repeat many times different attempts, in other words to carry out a true research.
- The computer indeed allows the learner to make mistakes without danger, and without penalization other that time wasted.

In order to attend the expected objectives of a virtual laboratory, the design of ergonomic interfaces constitutes a very important task that must be dealt with. These interfaces are complex interfaces. They represent a real time simulation environment of real learning scenarios as much as possible. They even create imaginary scenarios that can not be done in the real world. The interfaces' design of scenarios of distant practical work requires the environment to be represented in synthesized images to solicit the learner's senses and motor competence within the framework of activity acting on virtual objects. So, the use of virtual reality is essential. The virtual reality with its capacities to manipulate virtual objects or to move in a 3D reconstituted digital scene, makes it possible to create interfaces which immerge the learner in micro world where he/she can realize his/her practical work and to cooperate with his/her colleagues in the same group and allows the instructor to supervise the learners and to even intervene during the manipulation (Harous, Djamila, Djoudi & Douar 2008).

Multi Agent System for E-Learning

As the teacher has multiple and diverse tasks to assume, moreover he has to follow-up and communicate synchronously with learners. Since he cannot be ubiquitous, and he is exceeded and overloaded by his tasks, some situations require artificial agents to assist him, and thus, bringing support and accompaniment to the learner, such as:

- Automatic correction of the quizzes;
- Learner exercises resolution assistance and orientation followed upon the request of the learner or the thinking time collapsing or a learner erroneous answer;
- Learner course majestic explanation
- To manage the meeting time taking account of the availability of the various actors, ensure the communication between members, and animate the dialogue and take care and motivate the learner left apart from the interaction.

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An agent is widely understood to be a software entity situated in an environment, autonomous, reactive to changes in its environment, proactive in its pursuit of goals and social. Whereas some characteristics cannot be used as determining factors since, they are grey shades of a scale that encompasses both objects and agents.

The Multi Agent Systems adapt well to the design of digital work environment because: The distance learning systems are open, dynamic and complex; and agents are a natural metaphor of human acts. These agents have to communicate with the users "actors", make decisions, assist learners, help teachers, consider and modify the users Database, access to the Knowledge Base. See figure 6.

Figure 6.
Human/artificial agents' cooperation
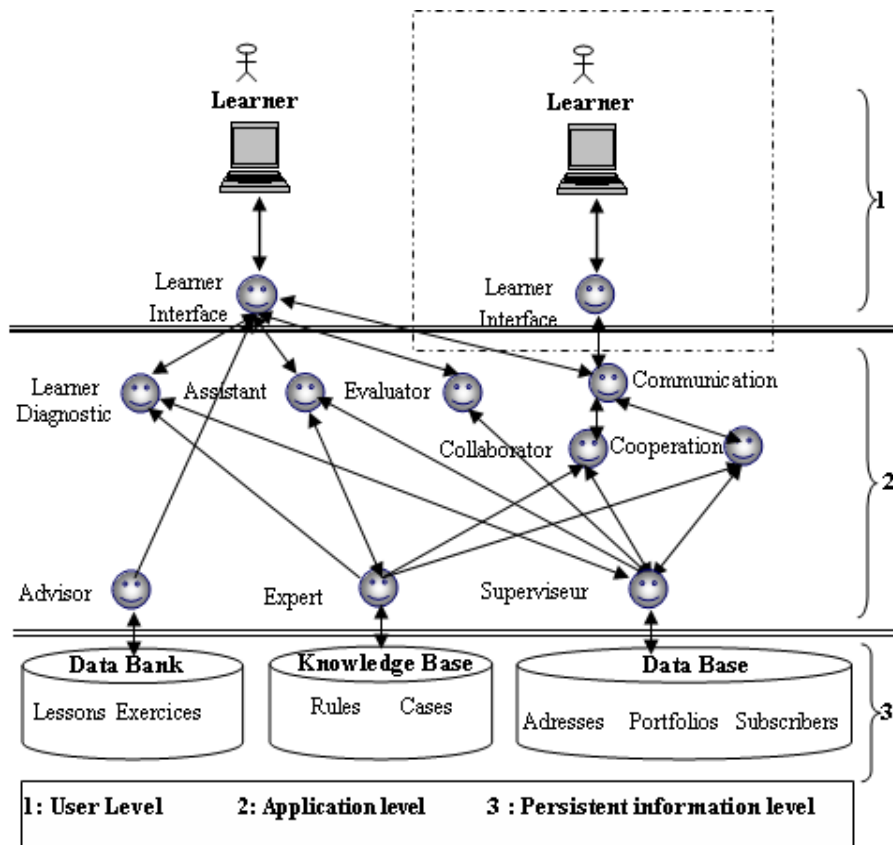
Two important metrics of the software engineering: cohesion and coupling enabled us to identify and structure agents according to the MASE "Multi Agent System Engineering" methodology. These agents are:

- Learner Interface: This agent has to get, announce and return available information relating to the user needs.
- The assistant "Companion": It has to assist the learner, to orientate him in the resolution of the assisted exercises, to answer his questions directly and dialogue with him.
- The collaborator: It notices and diagnoses correlations between learners of the same group. To re-aim the group in a productive direction and pay attention to the members left except correlation and save the group session work.
- Communication: Manage synchronous/ asynchronous, confidential/public communications, between the different dealers.
- Evaluator: It evaluates quizzes, returns result instantly and updates the learner valuation file.
- Cooperation: It facilitates co-operative work between working groups.
- Scheduler: It finds suitable meeting time according to the groups chiefs availability, schedules meetings according to a preset or improvised planning "programs, cancels or defers", and warns the absents.
- Supplier: It performs access to the Database.
- The advisor: communicate and makes available information relating to the knowledge.
- Learner diagnosis: It observes and diagnoses the intentional and emotional methods of learning.
- Learner analyzer: Analyze the intentional methods "capacity, knowledge, to want, believe, and have" and emotional "pleasure, confidence, benevolence" then draw up a behavioural and epistemological profile of the learner to bring adequate human and/or artificial assistance.
- Expert: Allows the access and the exploration of the knowledge base (Khadidja & Djoudi, 2007).

Learner Behavior Modeling
The learner modelling field aims at the creation of a cognitive and affective model from the observation of the learner behaviour to the learning environment interface.

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A learner model is a computer-based data management component or system that contains information about a person's learning activity (See figure 7). It typically forms a part of a larger system such as a learning management system or an intelligent tutoring system.

This model must represent the learner profile, his goals, his plans, his actions, his beliefs and his knowledge.

And must be used there after to explain why a learner can not complete his training work correctly and to intervene during the problem resolution process.

There are several aspects which characterize the learner model. The learner model can be: implicit or explicit, static or dynamic, specific, of surface or of deep. For the proposed architecture, two types of the collected information are identified:

Learner FOR URS
The learner modelling field aims at the creation of a cognitive and affective model from the observation of the learner behavior to the learning environment interface.

A learner model is a computer-based data management component or system that contains information about a person's learning activity (See figure 7). It typically forms a part of a larger system such as a learning management system or an intelligent tutoring system.

Static information: the learner must fill the questionnaire relating to this information on the subscribing level, among this information: The username, password, name, birth date, sex, addresses, e-mail, learner degree of motivation (high, middle, law motivation), type of media preferred (text, video, etc), the learning style of the learner (principle-oriented or example-oriented, general-to-specific or specific-to-general), type of exercise preferred (traditional exercise, semi-assisted exercise, quizzes).

Dynamic information: this information must be collected after the access to the learning platform, among this information: Degree of concentration (high, middle, law), degree of mastery of a certain topic (poor, fair, good, very good, excellent), the degree of learner interest in a particular topic (Chahrazed Mediani, Mahieddine Djoudi 2007).

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*Figure 7.L*earner activities traces

Electronic Library Management

Digital libraries are information systems in which all the information resources are available in a format that can be managed by a computer. All the acquisition, storage, conservation, search, access and visualization functions use digital techniques.With the availability of Internet technologies and because it is neither practicable nor acceptable to ask distance learners to travel to a specific site (which may take a lot of their times that they do not have, that is why they decided to be distance learners in the first place) to search for the necessary information. Also learners would like to have simultaneous access to all needed resources such as the courses, from any place, at any time, using whatever device (available to them) that is connected to the Internet. Then the idea to design and implement an electronic library proves to be a necessary tool that must be available not only to distance learners in particular but to all learners in general. The integration of the recent development techniques and the distributed digital content improves the learning pedagogical experience.

The goal is to design and implement an object oriented model of an electronic library. This will improve the teaching process because it facilitates the access to courses, books, theses, and also access to electronic course notes which constitutes a must companion document to any course.

The modelling language UML is used to design the model. The modelling of the electronic library is described by the following different diagrams: the case based diagram makes it possible to structure the user's needs and the objectives corresponding to the system; the class diagram is a collection of static modelling elements (classes, packages...), which show the model structure. The sequence based diagram shows the interactions between the objects in the system and the component based diagram makes it possible to describe the application physical and static architecture in term of modules: source files, libraries, executable, etc. (See figure 8).

Figure 8.
Sequence Diagram
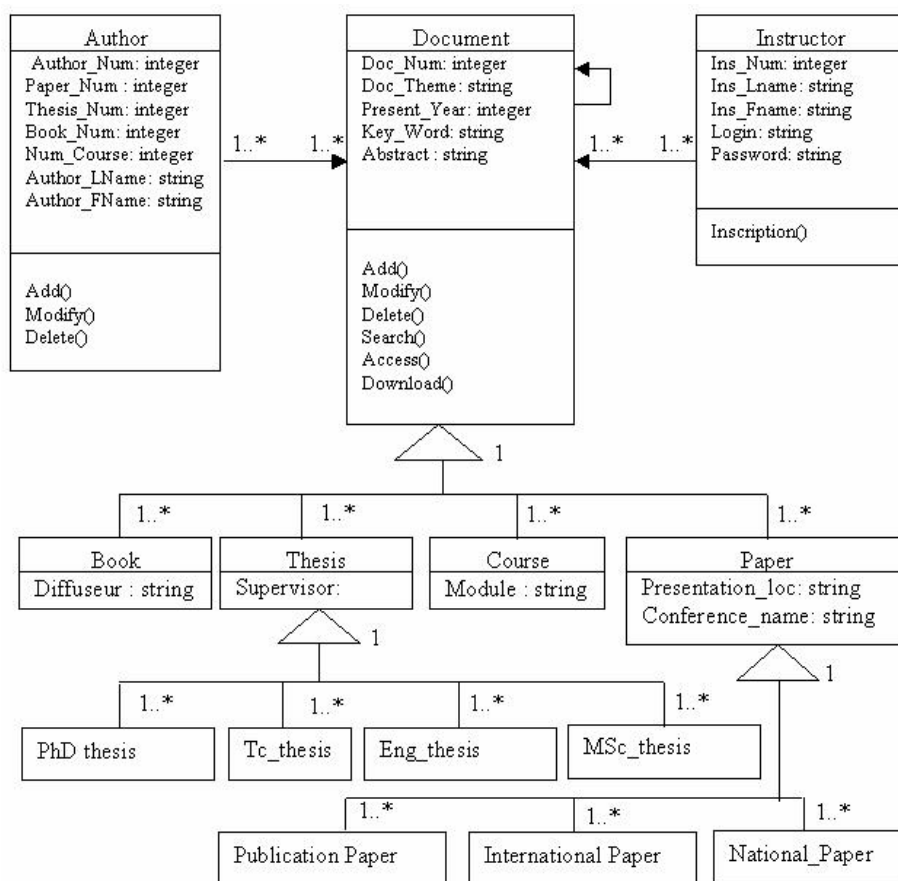
This modular structure allows the hierarchical design of the scientific documents and gives more importance to the storage problem of the scientific documents in an object based environment in order to get a better exploitation (Saad Harous, Djamila Mechta, Mahieddine Djoudi 2006).

Cooperative Authoring System for ITS

Since the cooperative aspect, through a computer network, has been experimented successfully in a lot of domains, this leads us to think that it would be desirable that the designers of future authoring tools should integrate this cooperation functionality for Intelligent Tutoring Systems (ITS) production. This project is related to the design of architecture of cooperative authoring system for intelligent tutoring systems called CAMITS. Integrating cooperation paradigm in ITS authoring systems is the original idea of this project. This system allows geographically distant authors to collaborate to produce a tutoring system according to a predefined ITS pattern.

The ITS pattern is implemented in PHP/MySQL and resides on a server; it can therefore be accessed simultaneously by different distant learners. The authoring mode software, implemented in JSP and Java, is organized as centralized client-server architecture. It makes it possible to several authors to be connected to a working session characterized by a cooperative space and a control strategy.

The cooperation space is represented by a set of structured components (Hypermedia Learning Units, prerequisite-networks, tutoring parameters and tutoring rules) and tools, which make it possible the edition and communication tasks.

Figure 3 shows an example of a window-space where developing a Data Bases tutorial. The control strategy manages the negotiation of the access right to a component of the ITS and then participation of users during the work session (See Figure 9). Five learning principles had been incorporated into the authoring process.

These principles were: a clear definition of pedagogical objectives; definition of pre-requisite knowledge providing a variety of presentation styles (tell, show and do), enhanced feedback and testing, and permitting the learner to control the direction of the learning session by choosing himself the pedagogical objectives.

Two different approaches were used to test the validity that the system actually incorporated pedagogy and effective cooperative design concepts as part of the developmental process.

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Figure 9.
Developing a Data Bases tutorial
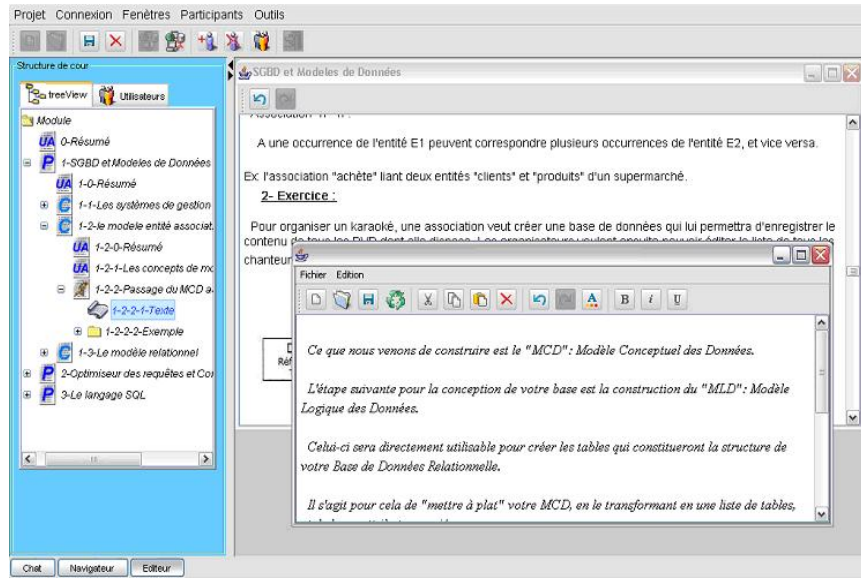
To evaluate the system a group of four teachers were surveyed to seek their opinion if the authoring system did incorporate the five learning principles into its design. Their survey results validated that the system would prompt developers to build an ITS based on pedagogy. In addition a high agreement was noted in the self-direction of the lesson offered to the learner. In a second means to validate the system, five teachers geographically dispersed were invited to develop a data base tutorial, via local network, and were surveyed to seek their opinion if the authoring system offers all cooperative tools necessary to construct the tutorial in a synchronized manner.Although the system does exhibit positive results after a pilot test in the local network context, a question for future research is the experimentation of the system in the internet/web context. This research would provide evidence that the concepts incorporated into the system do impact learning in a positive manner. On the positive side the survey results from the two different experimentations provides indication that the system is a positive benefit to teachers and developers of web-based intelligent tutoring systems (Talhi, Djoudi & Batouche 2006).

Task Collaborative Resolution
The tasks resolution in the current environments of distance learning is often achieved individually. The interactions between learners are rarely occurring

in these platforms. Even though the environment offers diversified tools of communication, these latter are little used in the activities of learning. Participation and the interaction between students remain limited enough .The distant collaborative resolution of tasks consists of two complementary structures:

- The first, of linear nature, represents the blackboard. Each node corresponds to an attempt of resolution leading to the final solution on behalf of the principal writer (the learner at the blackboard).
- The second, of tree form, records all the debate initiated by the proposal for a new attempt of task resolution. Each node records any intervention or contribution emitted by a learner.

The tree structure is widely used in the asynchronous forum of discussion. The main objective is to link each message to the one-it responses or reacts. The new subjects of discussion are placed at the root of the tree and represent the first reactions of the attempt to solve task, the others being hung up again with the existing messages. The advantage of this representation is to hold account of succession of discussion and thus of the topics for the conversation. Any message lately added to the forum is labelled by an option of menus; this label identifies the linguistic action (to answer, to agree, to disagree or to question, to precise or to rectify) The options of menus are available according to the selected reaction of the participant compared to an intervention already recorded but authorized by the sequence of actions in the resolution tool (see Table).

To avoid the confusion of the participants, only one student is, at the certain time, authorized to send his/her message. Any student has to ask for permission by emitting a request of participation. Once this latter is satisfied/accepted by the tutor, in case the teacher is present or each one has a turn in case in the absence of the teacher. For each intermediate solution, the principal writer engages an interaction with classmates through synchronous forum, to defend and clarify his/her argument(s). At the end of the interaction, all the classmates adopt a solution or a new version is proposed and the process of continuous resolution is taken place until reaching a final version of the solution. The structure of the forum enables the participants to identify of points of coordination in the debate started during the resolution. The fact of characterizing learner's intervention in form of a "question" or an "answer" drives the learner to think and reconsider "the act that he/she is realising" and therefore, will give an educational value and improves the state of progress of task resolution. The task resolution scenario, illustrated by table 2, is presented as follows:

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- The principal writer proposes a solution. One participant Approves, disapproves or questions.
- Any question is automatically followed either by a response, or a new question.
- Any response is automatically followed either by an approval, disapproval or a question.
- Any approval/disapproval is automatically followed either by an approval, disapproval or a question.

The teacher can use several well-known methods of intervention:

- Reformulating the learner's statement so that to make it clear to all participants.
- Encouraging the participant by annotating his contribution by an expression such as "Well done!"- "Wonderful!" –"Excellent", etc.
- Supplying the learner with more information besides that the tutor can put hyperlinks towards some parts of the courses that might help the learner (Zidat & Djoudi 2006).

Sequence of actions in the resolution tool

Pair interventions		Examples	
First part	Second part	Intervention of A	Reaction of B
Propose	Approve Disapprove Question	I propose the following solution by using a chained list.	- Yes, I agree. - No, Not immediately - Why not a table?
Answer	Approve Disapprove Question	Table structure is not adequate. We don't know the number of elements.	- Oh, yes - You are not right - And the pile?
Question	Answer Question	Which pointer?	- The one at the top - There are many?
Approve	Approve Disapprove Question	I agree with Salah's development	- So, do I - I disagree - Which development?
Disapprove	Approve Disapprove Question	I do not agree with the development of Salah?	- Yes, I also disagree - Me, I agree. - Why?

CONCLUSION

Consequently, f you look at training trainers who is supposed to take over shows that the number of positions available each year is still below that required to meet the demands of coaching in Algerian universities. Despite almost annual opening of new universities, overload students remains a problem for managers of these establishments. Add to this the insufficiency of teachers in some specialties where demand is high and spread over the vast territory of Algeria. E-learning presents an alternative then the more it brings benefits in terms of educational and economic consequences. Indeed with the e-learning problems of housing, food and transportation for students will no longer arise. Secondly Algeria can not afford to remain on the margins of technological innovations.

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CHAPTER-2

eLEARNING IN ARMENIA

Has Established The Pioneering Usage Of "hhh" Technology

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ABSTRACT

The chapter presents the development of "hhh" technology in eLearning in Armenia. All People Internet University (called "hhh") is a patented software tool that allows rapid creation of interactive simulations and modelling in Distance and Online Educations systems. The main features of these new capabilities, new issues and challenges in same private universities are presented.

COUNTRY

The Republic of Armenia is a sovereign, democratic, social, rule of law state. The state power is administered pursuant to the Constitution and the laws based on the principle of separation of the legislative, executive and judicial branches.

Official Name is Republic of Armenia - Hayastany Hanrapetoutyun (Hayastan). Capital City is Yerevan and major Cities are Gyumri, Vanadzor. Official Languageis Armenian. Religion are Christian, Armenian Apostolic Church. Currency Unitis now Armenian Dram, introduced in 1993. Armenia has 3,210,000 (as of 2001) population. Ethnic Breakdown is Armenians - 96% and minorities are Russians, Yezidis, Kurds, Assyrians, Greeks, Ukrainians, Jews and others.

Armenia is 29.74 thousand Square kilometres where rich in copper, iron, bauxite, molybdenum, gold, silver, lead and zinc. Substantial deposits of pumice, marble, tufa, perlite, limestone, basalt and salt also exist. Precious

and semi-precious stones are abundant. Average altitude above a sea level is 1,800 meters. The highest mountain peak is Aragats (4,090 meters)

Figure 1.
A Map of Armenia

Neighboring countries are in the North: Georgia; in the East: Azerbaijan; in the South: Iran; in the South-West: Nakhijevan (Azerbaijan); in the West: Turkey.

EDUCATION SYSTEM AND STUDY OBJECTS, GENERAL FEATURES AND EDUCATIONAL MODELS

In recent years, Armenia living standards have radically improved as a result of comprehensive development USSR educational programs. Education is at the forefront of the USSR Government's priorities. Armenia's education is going through an important phase in its history as a result of the reforms introduced by the USSR Government. Now after independent as a rule, the countries with transitional economies are ether developing under-developed hence with low gross-national income and level of poor living. Keeping in mind that countries in transition are typically rather poor, it is difficult to properly ensure the pre-conditions needed for a successful process of high education and training. Additionally, since the high education process is

long-term process it is impossible to obtain quickly the results of any changes and modifications introduced. At least it is necessary minimum four or five years to carry out one generation of engineers.

Therefore the problem is much complex than it seems at a first glance and a considerable deep insight is necessary in order to infer proper conclusions. Albeit Armenian high education is formally transformed according to these new trends in Europe, in reality it does not work so well and essential changes are moving slowly. It is the government's aim to 'strengthen Armenia's position by building brains and investing in humans' to ensure that its citizens become more qualified and skilful to match the religious, economic and social needs of the country and to eliminate adult illiteracy.

A measure of the government's commitment is the allocation of over 7% of the nation's annual budget for education and vocational training (www.edu.am Newsletter Ministry of Education and Sciences, 2008, retrieved on 26.01.2009). The Armenian educational system provides free education from pre-school until university for all citizens; it also supplies students with free books and health services. 100% of all children complete a full course of primary education and 100% of youth and 50% of the adult population are literate (UNESCO, 2008). In most educational settings, the intermixing of genders is prohibited.

The highest authority supervising education in Armenia is the Supreme Committee for Educational Policy. At the ministerial level, education is primarily the responsibility of the Ministry of Education and Sciences. Other authorities such as the provide kindergarten, elementary, intermediate, secondary and adult education, adhering to the curricula formulated by the Ministry of Education and Sciences. The Ministry of Education and Sciences General Directorate of Private Education is responsible of the supervision and planning of private education departments in all educational directorates and the private universities and vocational schools fall under the jurisdictions of the Ministry of Education and Sciences.

Policies for private education in Armenia stipulate that licenses may only be issued to Armenian citizens.

The largest university in Rep. of Armenia is "SS Cyril and Methodius" University, which is also a national university and located in capital Yerevan. It is consisted of many separate units working as faculties from technical and non-technical profile.

In the past almost all undergraduate studies at technical faculties had time duration of five years: 9 semesters' lectures of teaching and 10th semester was used to prepare a final diploma examination. So was the case with our eLearning "hhh" technology applied at tree private Armenian Universities: University of Urartu, Armenian Institute of Tourism and Yerevan Institute of Business and Law (The Study Objects-SO).

In the course of transition process we had to decide about the two education models: 3+2 or 4+1. The Urartu university and Yerevan Institute of Business and Law has indeed accepted the model 4+1, four years undergraduate and plus one year of postgraduate studies for MSc degree. It was not easy to transform all class lectures at undergraduate study from 9 to 8 semesters. This required an effort to change all curriculums in the means of a new philosophy using the European Credit Transfer System.

The principles of the European CTS include the following item features:

- Credit is allocated to course units according to the principle that an academic year equals 60 credits;
- Universities present the full range of courses to incoming students in an information package in which the credit value for each course is clearly indicated;
- There is a formal learning agreement signed prior to departure by the home university, the host university and the student, describing the student's program of study abroad, and accompanied by a transcript of record that lists the student's past academic achievements;
- The sending university recognizes the credits received by students from partner institutions in such a way that the credits for the past courses replace the credits which would otherwise have been obtained from the home university during a comparable period of study.

At this moment only the first two item points have been fully applied in the undergraduate studies. For the time being there is not an exchange of students and lectures between Study Object's and other similar institutions abroad in the wider sense, e.g. across Europe. Thus for the time being we have no experience with the last two item features.

Still, these are oriented at meeting the principles of high education in countries of European Union. It should be noted, the principles of the European CTS also include the following requirements:

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- Five year studies equal to 300 credits;
- One credit equals to 16 hours institutional study plus 10 hours home study;
- Credits are applied to all subjects and other relevant student activities;
- Recognition of credits is not set up in conjunction with the evaluation;
- Students do receive their credits, respectively, only after recognition of the subject.

From these five requirements the evaluation of the credits for each subject were the most difficult to satisfy. All courses are organized in 3 class-hours lectures plus 2 class-hours exercises per week, and divided in two groups: specialization elective courses and compulsory courses. To evaluate a subject credit we take into account class-hours lectures, class-hours auditory exercises, class-hours laboratory exercises and seminar works. The formula is:

Number of Class-hours Lecture × 1,5 credits + Number of Class-hours Laboratory exercises × 1,0 credit + Laboratory Exercises × 0,5 credits

Therefore the maximum credits per subject that can be earned are 7.5 credits, and the minimum – 4.5 credits. It may well be that this formula is not the best solution. Nonetheless, it is better than to evaluate each subject with equal number of credits. In this way whole student's effort and engagement about certain subject should be properly weighted.

DISTANCE EDUCATION

Like most former Union Soviet countries, has yet to authorize alternative providers such as private institutions or virtual universities Armenia is experiencing higher education capacity issues and there is need to adopt distance education as an instructional strategy, teaching and learning by printed; electronic or broadcast means for students who are not physically 'on site' has a very short history in the Armenia and not included the education laws.

Bachelor degree distance education programs have only been on offer through the some private universities for about a decade and policies for single-mode, distance and virtual tertiary institutions are still under development for approval by Ministry of Education and Sciences.

This approval process only formal because not really students. Some private universities such as Armenian Universities: University of University of Practical Psychology and Sociology - Urartu, Armenian Institute of Tourism and Yerevan Institute of Business and Law are dual-mode while single-mode distance education is offered by the All Armenian Internet University. Three examples exemplify the development of distance education in Armenia. The first is the establishment of the Deanship and Faculty of Distance Learning at Armenian Institute of Tourism (http://www.ait.am retrieved on 26.01.2009)

The second example is Urartu University. The University is permitted to offer four years of distance courses leading to Bachelor's level degrees. Admission is open for all students in all majors, lectures are transmitted live via the internet on a daily basis and they are recorded and uploaded onto the distance learning website for students to watch. Students/professor communication is carried out via the internet using emails, forums, and virtual classrooms.

The third example is distance education in the Yerevan Institute of Business and Law. The broadcasting centre was in the capital city Yerevan and lectures were broadcasted to Institute all around the Armenia.

The project consisted of two parts: the first part started in the first semester of year 2008 with the broadcasting of cultural, religious and economic public lectures; the second part was concerned with the development of electronic curriculums and hosting them in the our website (retrieved on 26.01.2009 http://www.hhhuniversity.com). Given this ambitious project for improving higher education opportunities and facilities for non-Armenian students, yet, no progress of the project have been reported since its launch.

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THE PIONERING USAGE "hhh" TECHNOLOGY IN ARMENIA

Designers of "hhh" technology learning online education environments may consider employing the "hhh" technology learning Framework developed from 4 years of designing, developing, delivering, and assessing "hhh" technology environments to students and teachers throughout the world. This framework is comprised of seven principles, which are interdependent of one another:

- a researched curriculum grounded in problem-solving,
- collaboration and interaction opportunities between students, experts, peers, and content,

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- the utilization of the Internet for curriculum and learning environment delivery,
- the enhancement of curriculum with media and text from the field in a timely manner,
- synched learning opportunities with the "hhh" technology learning curriculum,
- pedagogical guidelines of the curriculum and online learning environment, and
- education that is adventure-based.

These seven principles, which collectively comprise the "hhh" Technology Learning Framework, are expanded upon and outlined below using examples from an "hhh" technology archetype.

These principles can be utilized as a guide for designers who wish to provide transformative learning opportunities for students within an online distance education experience.

1^{*st*}*.* The majority of curricula are not written with "hhh" Technology Learning in mind and the majority of adventures or expeditions are not developed with its curriculum in mind. For example, as one researches many "hhh" Technology Learning online education environments, the curriculum that is written does not interact and correspond with the activities within the field, as the curricula are disparate from the adventure. Prior to planning any learning adventure, learning outcomes must be identified. From the start, learning outcomes, based on authentic problem-solving tasks, should guide the development of the curriculum and the online learning environment *as well as* the planning of the adventure. In other words, "hhh" Technology Learning should not focus on the exploration or adventure, but rather on the learning goals.

The development of curricula and online environments must situate the learning in an authentic environment knowing that the experiences are first and foremost for educational purposes, not the thrill of adventure.

Lastly, the work of cognitive psychologists has shown that students learn best when solving real-world problems and the number of instructional models related to this learning approach reinforce this thinking. "hhh" Technology Learning curricula are problem driven with an overarching question that needs to be solved through interacting with the AL online environment. Students interact with their peers, experts, teachers, and curriculum to solve the problems that are driving the curriculum modules.

Students most often do not look to their teachers for answers as the problems being solved utilize information delivered from the field as well as the interactions with others outside of the classroom. The traditional approach of teacher-directed learning is transformed allowing students to take charge in the search for answers. Teachers had ready and early access to the curriculum giving them ample opportunities to work with and plan their teaching in advance of the school year. The curriculum was made available for download via multiple portable document files (PDF).

*2nd*. although all "hhh" technology education must begin with a solid curriculum, collaboration is the heart of the educational experience. Internet isolation should be removed by providing collaboration and interaction opportunities, which encourages transformative learning at multiple levels—between students and teachers; between students and subject matter experts; between teachers and subject matter experts; between students, teachers, subject matter experts, and the hhh" technology learning content; and lastly, between students themselves, teachers themselves, and between the subject matter experts.

The collaborative and interactive opportunities were designed within *The Online Classroom* in an environment named the *Collaboration Zone* (the term used for the collaboration environment in the "hhh" technology educational program).

Student–Teacher and Student–Teacher–Content
Interaction and Collaboration
Student–teacher interaction and collaboration occurs primarily within the brick-and-mortar classroom as teachers utilize the curriculum and *The Online Classroom*. Teachers guide students to investigate the problem that needs to be solved within the unit lesson plan while using the many media and interactive options online.

Teachers are available to answer student content and technology-based questions while assisting them in interacting and collaborating. Students interact with the curriculum-based content, access the real-time content delivered from the field, and collaborate with students from around the world within the collaboration zones in *The Online Classroom*.

Furthermore, teachers are able to access content within the curriculum to aid their content knowledge before and during teaching while also accessing the real time content online.

Lastly, teachers are able to interact and collaborate with other teachers for content and pedagogical knowledge—both online and within their own school building.

Student–Expert and Student–Expert–Content Interaction and Collaboration

"hhh" technology affords many opportunities for students to learn from subject matter experts. Primarily, this occurs within moderated chat environments based on the unit lesson plan topic. Teachers scaffold their students on subject matter prior to entering the moderated chat environments. Students submit their questions within the chat environment to a moderator at Education Base camp who chooses the questions that would most enhance the learning discussion.

The questions are in turn submitted to the expert who chooses what s/he wishes to answer before submitting it into the chat environment.

Thus, it is not until the expert releases the submitted question(s) and answer(s) that the students see the synchronous discussion. The collaboration opportunities continue through asynchronous discussion and file sharing within collaboration zones.

Teacher–Expert and Teacher–Expert–Content Interaction and Collaboration

K-12 teachers are required to be subject matter experts in multiple areas. Social studies teachers are, at many times, required to teach numerous courses in areas where they are not prepared. Therefore, the opportunity to collaborate and interact with practicing subject matter experts can be a unique advantage and rare in classrooms today.

An "hhh" technology learning environment provides these opportunities through synchronous and asynchronous discussions within the chat environments and collaboration zones, respectively. The subject matter experts are identified prior to the release of the curriculum to the teachers. Thus, teachers have the opportunity to augment their content knowledge by interacting with the subject matter experts.

Student–Student, Teacher–Teacher, and Expert–Expert Interaction and Collaboration

All "hhh" technology learning participants -students, teachers, or subject matter experts- benefit from interaction and collaboration opportunities with their peers. Within "hhh" technology learning, students work with each other in the classroom, but more importantly, with students throughout the world

within the chat and collaboration zone environments. Students share media (e.g., photos, videos, and Microsoft PowerPoint™ files) and discuss the content through various opportunities. Teachers normally interact and collaborate on lesson plan ideas and appropriate pedagogy, and subject matter experts normally discuss their area of research and how to effectively communicate this with the K-12 population.

Student–Content, Teacher–Content, and Expert–Content
Interaction and Collaboration
All "hhh" technology learning participants also have numerous opportunities to interact with the content in various formats ranging from paper-based curriculum to real-time updates delivered from the field. It is important for planning purposes that the teachers have the curriculum in order to study the content prior to the adventure; the subject matter experts must also know their discussion content topic weeks before entering the chat and collaboration environments.

Typically within society, we solve problems by working and conversing with others; but despite research that points to collaboration as an important aspect of meaningful learning in the classroom, students are usually encouraged to solve problems and learn independently. AL is based upon creating opportunities for students to collaborate and reflect within the online learning environment in order to encourage transformative learning. Transformative learning requires all learners to work together through social negotiation -discussing, solving, and reflecting on the problem to be solved. Social negotiation can arise at high levels with an "hhh" technology learning approach as individuals who are goal-directed are working together to solve a common task within a common place- a collaboration zone. Furthermore, distributed cognition can occur when students collaborate within an online "hhh" technology learning environment and research indicates that solving problems as a group is much superior to individual problem-solving.

3rd. achieving true collaboration and receiving timely updates from the field requires the use of the Internet. The Internet also provides ready access to a curriculum for students and teachers throughout the world. If one does not utilize the Internet for an "hhh" technology learning project, the heart of "hhh" technology learning -interaction and collaboration with experts, teachers, and peers throughout the world and timely and frequent updates from the field- cannot occur. Furthermore, the opportunities for transformative learning are diminished, as students cannot collaborate with any content or individuals outside of their classroom.

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4th. media (e.g., video, sound, QTVR, and photos) and text from the field provide authentic enhancements to an "hhh" technology learning curriculum and motivation for student learning.

The media along with appropriate pedagogy motivate students as every update from the field reinforces the content of the curriculum situating the learner's participation in an authentic real-time environment. Teachers and students must know when the field updates are expected to be available within the learning environment.

Teachers can plan their lessons accordingly and also the timely updates provide motivation for students entering the learning environment and seeking the latest adventures from the field.

5th. the "hhh" technology learning curriculum is enhanced with a strict practice of providing synched instructional learning opportunities. These opportunities begin with learning tools within the online learning environment that enable the learners to interact live with explorers, educators, subject matter experts, and fellow users.

These tools include Web offerings (thematically based virtual tours and educational animated movies), multimedia (access to images, audio, video, and data from the field that is central to the learning experience), and integration of geographic information systems technology, collaboration zones, and moderated chats. The online learning environment where the media opportunities exist must be designed in tandem with the curriculum.

6th. the utmost value of the "hhh" technology environment is achieved when the appropriate pedagogy is defined and aligned with the curriculum and online learning environment. An effective learning environment should not be designed without its instructional uses in mind. These uses of the online environment, as well as the curriculum, need to be outlined in detail so the curriculum can be implemented effectively and easily.

7th. "hhh" Technology Learning education captivates and motivates learners. Traveling to any location on the earth provides the mechanism to bring authentic content into the classroom. Because "hhh" Technology Learning education is delivered via the Internet, the adventure that may be local for one individual is a remote unknown distant location for another.

As we strive to make learning opportunities more authentic so that it is meaningful to students, the "hhh" Technology Learning model delivers.

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**eLEARNING AS COOPERATION BETWEEN
PROFESSIONAL HIGHER EDUCATION AND BUSINESS**

The global economic and social changes in Armenia dating back to 1990s revealed the necessity of the totally new approach to the linkage of the higher education and business in this area as a dictated challenge and feedback of the upcoming processes. The former economical system was totally destroyed and soon replaced by new market relations between all business and relevant arenas of the social processes. Therewith, the higher education itself had to take certain urgent actions not to get disconnected from the economic life otherwise it would lose its essential sense as a professional base for the economy both from the point of view of the upcoming personnel and new scientific platform.

In several years, once the economy made a rather fast and efficient transition from the previous style to the new market relations, the cooperation between higher education and business gained a special immediate purport. The business needed up-to-date young specialists to get the rid of the new era. Higher education, in its turn, had to meet the demands of the economy to make the most of the educational system in whole.

The first approach was limited to a very narrow rather claimed comprehension of the cooperation: business firstly needed young specialists fluent in foreign languages and specialized in basic computer usage.

Meanwhile, when the business started growing rapidly, it was realized that the existing level of collaboration was rather insufficient because the role of the specialized higher education got a different challenge: to introduce prepared graduates on the point of business occupation.

Only a couple of higher educational entities were focusing to the top of the market reveal to produce complaint specialists (American University of Armenia, etc.). Soon the other local institutes and universities realized the whole system itself should be monitored to face the dominant demands of the business.

The main goal is to prepare competitive, highly qualified young specialists in fields of management, marketing, tourism and hospitality management, economy and computer studies, trained to meet the needs of the Armenian and even the international business and to face the challenges of the fast-changing labour market. From this point of view we would like to focus on the following highlights taking place in the cooperation between higher

education and business: The representatives of the front-running business entities are involved into the educational process of several higher educational establishments (universities and institutes) operating in Armenia.

As an example, we would like to mention the mutual cooperation with the Armenian Institute of Tourism, a branch of the Russian International Academy of Tourism. This collaboration is dating back to 2001 when the above mentioned institute started functioning in Yerevan, Armenia. Several chief executives and tour-managers of the advanced tour-operators and tour-agencies based in Yerevan started teaching at the Armenian Institute of Tourism ("Levon Travel", "Avarair Tour Company", "Rumea", etc.).

- The teaching process revealed its mutual advantage shortly. From one point of view, the professors could assess the potential of the future labour market in sphere of tourism and related fields. The students, in their turn, could gain the advantage of getting real practical and theoretical knowledge just from the target orientation specialists.
- The next step was to organize practical training of the advanced students at several companies involved in travel and tourism. The students could see the real world of business and its relations to apply the theoretical knowledge into business.
- The best graduates and even undergraduates could start working at business entities bringing the new breath into professional activities.

This cooperation detected soon various insufficiencies taking place in these relations and just in the process of the education.

- There is a serious gap between the business and educational process. Students do not realize the importance of the theoretical preparation and knowledge. The theoretical training seems to be something abstract not important for the practical work especially in the area of the economics and finances. Several significant and major conceptions like price formation, taxes, income and profit, marketing, etc. do not meet the demands of the business representatives and mainly refer to the abstract notions.
- The linkage between various theoretical disciplines is missing. Students often forget the knowledge taken during the previous courses and forget once they pass the examination procedures. Students do not realize the linkages and important intersections between various fields of knowledge. Each time professors have to remind them the basic knowledge of the disciplines taken previously

which is a waste of time and shows the unproductiveness of the educational process on the whole.

- The above mentioned problem is not limited to time efficiency issue only. Sometimes it's difficult for students to realize the links between, for instance, theoretical course of management and microeconomics and real process of functioning of a travel agency. A basic notion is that theoretical courses just focus on the paper work and diploma issue and do not work out as an essential base for the future work.

Once the students graduate from the universities and institutes they start working at travel agencies and tour companies as full time employees. But the generations transmission process does not pass through smoothly as the new personnel is rather far from the essence of the professional experience. We would like to concentrate on several problems taking place in this process of involvement.

- The insufficient preparedness of the students to achieve the basics of the practical work is the main issue. This topic refers both to mean level of knowledge and, as shown above, the abstract understanding of the role of theoretical basis and practical work. As a result, the graduates start working but soon the employers realize that a second stage of intensive practice is required to make these graduates to understand they are in a real business atmosphere and relationship. At least a couple of months of intense experience is required to evaluate this gap.
- The second point is the idea of aligning educational systems and "localization of knowledge". This phenomenon refers to countries with small population like Armenia. It's not a secret that the technical literature is mainly either in Russian or in English which are the main foreign languages in Armenia. The professional literature in Armenian is mainly missing and students have nothing to do but going with Russian and English texts both from libraries and through Internet. These foreign research and analysis are really good from the point of view of knowledge but they refer to Russian and West European/American style of work and mentality which is appreciated but it creates again a discrepancy and lack of correspondence between theoretical attainments and practical skills which we call as a problem of the "localization of knowledge". For instance, the whole experience of a travel agency in Armenia submit to the local "Law of Tourism and Tourist activity" which has its specifications and nuances in comparison to the similar legislative

basics of Russia and other countries. Students learn something which differs from what they see in future. The solution we see is to prepare the students to the real legislative and practical work just during the educational and training courses. Another example refers to the notion of the taxation process which has its nuances in Armenia and students have to know the basics of the local taxation principles.

- Another issue if the shortage of the technical means and didactic materials during the educational process. The contemporary tourist business is based mainly on the use of the Global Distributional Systems (GDS) like Amadeus, Galileo, etc. Unfortunately the educational institutions venture to have such technical laboratories equipped with enough number of GDS post-terminals to prepare the students. The aim of such systems is not limited to the air-tickets reservations only but also allows to make the most of these systems (hotel reservations, car rentals, tours, export/import issues, visa regulations, necessary vaccinations, weather, etc.) referring mainly to travel and tourism. Coming to travel agencies ex-students suddenly realize that these systems are the basic part of the practical work and it takes months until they start working with GDS.
- The lack of the technical means is not limited to the GDS use only. The main communication, data search and promotion is going through Internet nowadays. Electronic means of mail and data processing, e-marketing, e-promotion, etc. could be worked out only with a stable, rather fast and comparatively cheap Internet. Almost all higher educational centres have special PC laboratories but the quantity and the quality is not enough to trust the Internet technologies as the base of the modern business.
- We would like to focus also on the topic of foreign languages possession. Students believe what they know is enough to work but soon they and their employers realize it's not enough. Speaking a foreign language means talking, understanding, reading and writing fluently. It's obvious we cannot expect form the just graduated students to be really fluent in foreign languages but a certain fundament should be taken during the educational process. Again, only after coming to travel agency students realize their lingual troubleshooting and start learning rapidly again which another waste of time and means is. The solution should be found during the educational process. A standard course of a foreign language should also contain a compulsory part of technical language exploration (tourist, in our case).

- At last but not least, the ethics of business relations. Unfortunately the higher education does not pay a special and necessary attention on this issue. Working process, especially in the sphere of tourism, is not limited to technical knowledge only. Tourism is a kind of vital activity and personal relation play an important and significant role in this business. Not only the contact personnel like guides, drivers, hotel staff, etc. but also the travel agents and managers should be prepared to work with people which are a rather specific notion. It's even meaningless to explain the role of the top-level business and public ethics in sphere of tourist activities. The ABC of this psychological treatment should be started in a university or institution and then developed during the practical work in business.

Short-Cycle Higher Education Programs can play a significant role to overcome above mentioned problems and imperfections. At least starting from the penultimate grade the educational institutions and business representatives should share the efforts to make the students prepared and ready for the real work.

CONCLUSION

The Armenian government is beginning to implement modern educational reforms and the Ministry of Education and Sciences are encouraging and supporting e-learning. The e-learning agenda is also being supported in higher education through the work of the state and private universities themselves. However, there are still formal and have many challenges. Human capacity is an important factor in the adoption and successful application of e-learning, and there is still:

- A lack of belief in the effectiveness of e-learning and lack of computer literacy and understanding of the requirements of e-learning among students and teachers.
- A lack of training in pedagogy and managing e-learning environments.
- A lack of incentives for using e-learning.
- Inadequate managerial understanding, strategic planning and funding in public sector organisations.
- The lack of coordination and conformity in procedures, standards and specifications, leading to duplication in efforts.
- A lack of awareness of e-learning in the corporate sector

Also, there is a lack of policy-making in regard to:

- Quality assurance in e-learning.
- Equivalency in admissions and graduation between distance teaching regular universities.
- Accreditation for cross-border distance and online learning and cross-border.

Telecommunications infrastructure is improving in Armenia and Internet services are extending to the more rural areas, but unreliable technology and infrastructure and poor maintenance and technical support could negatively affect the availability of, and accessibility to, online learning. As we see, there is much to do to stimulate the higher professional educational process in Armenia to achieve the demands of the fast growing market of tourism. The main idea is to coordinate the partnership and efforts of the educational institutions and business. To have prepared and skilled employees business should pay a more serious attention to the educational process. We would like to concentrate on two main aspects of this partnership:

- Business representatives should get involved into educational process seriously to prepare the students for the upcoming real work. By the way, business can cover partly or fully the fees of the best students who intend to work with certain entities in future.
- Educational institutes should not focus on the quantities of the graduates but think seriously of their practical skills. This seems to be the only way to stimulate the students to spend time and financial means for higher education. Universities should offer innovative curricula, teaching methods and training/retraining programs which include broader employment-related skills along with the more discipline-oriented skills. Credit-bearing internships in industry should be integrated into curricula. In general, universities need to grasp more directly the challenges and opportunities presented by the lifelong learning agenda.
- Government should encourage and share all these efforts and make the educational process effective and sensible. A special attention should be focused on the Bologna Process from the point of view of the European Qualifications Framework and Lifelong Learning. As the labour market is getting more and more international and the globalization processes waive the metes and bounds of education and job, the local governments should think of using the mental potential of the nation more sufficiently. Many students graduated in Armenia do now and will continue their education and work experience abroad. This phenomenon has also a reverse side: foreign employees will try to get involved into business in Armenia. The

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Bologna process will play a key role very soon from this point of view. It's important not to lose the local labour potential.

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CHAPTER-3

eLEARNING IN BELARUS

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ABSTRACT

This chapter is dedicated to the history and present state of e-learning in Belarus -the only European country not participating in the Bologna process. The authors analyze the low efficiency of governmental programs of e-learning in secondary schools and political obstacles to the spread of distance learning and the designing networked learning environment in higher education.

COUNTRY

The name Belarus derives from the term Alba Ruscia (White Rus), which first appeared in Latin medieval geographical treatise in 1255.(Bely, 2005) The country is located in Eastern Europe, bordered by Russia to the north and east, Ukraine to the south, Poland to the west, and Lithuania and Latvia to the north.

Until the 20th century, the Belarusian lacked the opportunity to create a distinctive national identity because for centuries the lands of modern-day Belarus belonged to several ethnically different countries, including the Duchy of Polatsk, the Grand Duchy of Lithuania, and the Polish-Lithuanian Commonwealth. Belarusian territories were acquired by the Russian Empire in 1772 -1795 and held until their occupation by Germany during World War I. After the short-lived Belarusian People's Republic (1918–19), Belarus became a constituent republic of the Soviet Union, the Byelorussian Soviet Socialist Republic.

The territory and its nation were devastated in World War II, during which Belarus lost about a third of its population and more than half of its economic resources. After the war ended, Byelorussia was among the 51

founding countries of the United Nations Charter in 1945 .After the collapse of the Soviet Union, Belarus declared independence on 25 August 1991. A national constitution was adopted in March 1994, in which the functions of prime minister were given to the president. Alexander Lukashenko has been the country's president since 1994. During his presidency Western countries have described Belarus under Lukashenko as a dictatorship. The Council of Europe has barred Belarus from membership since 1997 for undemocratic voting and election irregularities in the November 1996 constitutional referendum and parliament by-elections.

Figure 1.
A map of Belarus

Source: http://www.pickatrail.com/jupiter/map/belarus.html retrieved on 28.12.2009

The Belarusian government is also criticized for human rights violations and its actions against non-governmental organizations, independent journalists, national minorities, and opposition politicians. However, since late 2008, there have been signs of a slight easing of tensions with the West

The capital and the largest city of Belarus is Minsk, with population of 1.84 million people or 17%of of Belarus's 9,724,700 residents. Ethnic Belarusians

make up 81.2% of Belarus's total population. The next largest ethnic groups are Russians (11.4%), Poles (3.9%), and Ukrainians (2.4%), Jews (0.3%) (Belarus. 2009, p.95,14)

Belarus's two official languages are Belarusian and Russian, spoken at home by 36.7% and 62.8% of Belarusians, respectively. Minorities also speak Polish, Ukrainian and Eastern Yiddish (Belarus Annual Fact sheet. 2008, p. 18)

As part of the former Soviet Union, Belarus had a relatively well-developed industrial and agricultural base and a high education level. Among the former republics of the Soviet Union, it had one of the highest standards of living.

After an initial outburst of reform from 1991-94, including privatization of state enterprises, creation of institutions of private property, and development of entrepreneurship, Belarus has greatly slowed under Lukashenka's a "socially oriented market economy." About 80% of all industry remains in state hands, and foreign investment has been hindered by a climate hostile to business. Economic output, which declined for several years, revived in the late 1990s and early 2000s, but the economy, has been dependent on heavy discounts in oil and natural gas prices from Russia. Belarus has re-exported the oil and oil products at world market prices, using the windfall profits to subsidize state enterprises.

EDUCATION SYSTEM

The Belarusian system of general and professional education was largely formed when our country was part of the USSR. The first Belarusian universities were founded in 1920-ies, and by the end of the 20th century Belarus held leading positions in terms of the educational level in the USSR. The liberalization of the soviet education in the late 80-ies created preconditions for the reform of the Belarusian educational system after the declaration of the country's independence in 1991. In October 1991, a new law on education was adopted.(Vetokhin,2001,p.25-34) It guaranteed the priority development of education, appropriate social and economic conditions for the functioning of the educational system, the rights of citizens to receive general and vocational schooling, the transmission of general cultural values, and protection of intellectual property, talent and culture. The law also guaranteed the accessibility of free education at the state-owned general and professional educational institutions; free secondary, higher and postgraduate professional education at the state-

owned institutions on a competitive basis if education on this level is received for the first time; continuity of education; and partial or full financial support to people in need of social assistance during their studies.

In addition, the law guaranteed equality of educational institutions of all forms of ownership and de-politization and de-ideologization of education. In response to the communist party control during the soviet times, the law prohibited the creation of political organizations in educational institutions.

The law declared the secular nature of education, its national and cultural basis, ecological and humanistic nature, democratic management and so on.

The reform of secondary and higher education prompted by this law further contributed to Belarus's international reputation as a country with a high level of education among its population. In the 2008 UNESCO Education for All Report, Belarus occupied the 41st line, giving way to its Baltic neighbours–Estonia, Latvia and Lithuania, placed on the 25th, 36th and 39th lines respectively, but being above the majority of the CIS countries (Commonwealth of Independent States, former republics of the Soviet Union). The literacy levels among adults (99.6 %) and among youth (99.8 %) in Belarus is also higher than in other CIS countries (UNESCO, 2009, p. 248-250) According to the 2007-08 UN Human Development Report, the adult literacy level puts Belarus to the 33rd place in the list of 177 countries (UNDP 2007/2008).

By the number of university students per 10,000 people (438) Belarus is at the level of the developed countries.(Zhuk, 2009) However, the changes in the country's political system in 1994 –transition from the parliamentary to presidential rule and further development of authoritarianism – have put the reform on hold and resulted in the growth of conservative tendencies in the educational policy. The development of education in Belarus since the beginning of the current century has been determined by the utopian idea of restoring the soviet system of education. Belarusian President Alexander Lukashenko declared it the strongest and best system in the world (Lukashenko, 2005)

The government set the course toward the growing centralization of the educational management, revival of the totalitarian ideological and political control of the content of education and the life of the academic community, return of a mass political youth organization to educational institutions, marginalization of the Belarusian language and expansion of the use of the

Russian language in teaching, and isolation of the national educational system from the West.

Today, Belarus is the only European country outside the Bologna process, and the level of the internationalization of education has decreased even compared to the soviet times. Under the pretext of increasing the quality of education, Belarus pursues the policy of the systematic curtailment of private education. The power openly admitted that the struggle against private education is conducted with the use of administrative means, in violation of the constitutional principle of the equality of all forms of ownership (Lukashenko, 2004).Belarus has rolled back the legislative reform of education, which started in 1991.

In 2004, Lukashenko suspended the adoption of the law on higher education, which had already passed the first reading at the Chamber of Representatives of the National Assembly.

The law envisaged limited liberalization and internationalization of higher education. The new version of the law, passed by the Parliament in 2007, legitimized the isolation of the country from the European higher education area and the exclusion of the country from the Bologna process. The law established the re-sovietization of higher education both in terms of its architecture and educational management centralization.

The chapter on academic freedom and university autonomy was simply removed from the law. In 2008, the reform of secondary education, launched 15 years ago, was put on hold. One of the goals of this reform was bringing the architecture of secondary education into conformity with the European standards.

In 2008, President Lukashenko decided to go back to the 11-year secondary education, which existed in the soviet times. At the same time, the economic policy of the government in the field of education is quite far from the soviet model. Thus, the government systematically decreases the amount of the state financial support in university budgets. Like in many other East European countries, the post-soviet development in Belarus was marked by a sharp increase in the share of paid education, which was untypical of the soviet system of education. During the past 20 years, the total number of university students in Belarus has more than doubled, from 189,400 (Vetokhin, 2001, p.53) in the academic year 1989/90 to 420,000 in 2008/09. (Zhuk, 2009). The increase is largely due to the expansion of paid education in state universities. In the academic year 2006/07, the amount of the state

financial support was for the first time less than 50 % of the actual tuition cost. At the same time, further demographic decline and insufficient growth of the population's income will make old measure ineffective in solving financial problems in education. The economic expediency will force university administrators to look for ways to develop life-long learning programs and increase the number of foreign students. However, such changes will inevitably require serious changes in the educational policy.

TECHNOLOGY AND ICT

On 27 December 2002, the Council of Ministers of the Republic of Belarus approved the State Program on the Informatization of the Republic of Belarus in 2003-2005 and prospectively till 2010.

The Program is primarily aimed at creating in the country a common information space as a milestone in the development of the information society, which would create conditions for increased efficiency of economy, central and local government, and safeguarding the right to freely search for and disseminate information about the economic and social development of the society. The program is multisectoral and is based on the provisions of the Concept on the State Policy in the Field of Informatization.

During the past 15 years, as a result of the state program implementation, a series of national-level and departmental information systems have been developed and a national system of developing and registering information resources has been created.
The highest bodies of state authority, all sectoral and territorial government bodies now have corporate information systems, which secure interaction between different government levels, as well as interaction with subsidiary enterprises. These systems also allow collecting and analyzing sectoral and departmental reports. In accordance with the ruling of the Council of Ministers, state administration bodies have developed websites that serve as sources of information related to relevant bodies.

The e-government readiness of Belarus was evaluated within the framework of the UN E-Government Survey 2008: From E-Government to Connected Governance (Belarus was ranked 56th among 192 UN member countries in the e-government readiness index. In the e-participation index, Belarus was ranked 98th, along with Russia and Uzbekistan (UN e-Government, 2008, p.37)

The International Telecommunication Union ranks Belarus 54th among 154 countries on the ICT development index, which is below only Russia and

Ukraine in the CIS. The situation seems to be much worse in the field of e-commerce. The National Academy of Science of Belarus ranks the country 64th among 74 countries included in the rating. Belarus is placed on the 67th line in the same list of countries on the e-payment systems index, 62nd on the development of commercial websites index and 70th on the online business development index (Starovoitova, 2008, p.156-159).

According to the Ministry of Communications and Informatization of the Republic of Belarus, as of the end of December 2008, there were 2,809,800 Internet users in Belarus (29 % of the total population), and in July 2009 their number reached 3,1 million, with over 470 thousand of them being users of broadband Internet connection. These data are similar to the results of the gemius Audience survey, according to which in January 2009, there were 2.16 million Internet users and in May 2009 – 2,907,885. Among them, men constitute 55.2 % (53.05 % – July 2009) and women constitute 44.8% (46.95%–July 2009). According to this survey, 28.64 % of users live outside big cities. The percent of active (everyday) Internet users in Belarus is 15-17% of the total population (TUT.BY). To compare: in the EU country this category amounts to 56 % of the total population (Information Policy, 2009)

According to the All Providers of Belarus Project, 39 Internet providers operate on the Belarusian market (Providers. by). However, external (outbound) data transmission channels are the monopoly of Beltelecom, a state-owned company. At the end of 2008, the total external Internet gateway bandwidth of Belarus was 5.2 Gbps, in March 2009 it was 8 Gbps, and in May 2009–12 Gbps.

The Russia-bound channel bandwidth was increased from 6 to 10 Gbps, while the bandwidth of the channel to Western Europe and North America is 2 Gbps. On 1 July 2009, Beltelecom reduced the cost of the committed bandwidth for Internet providers by 10-30 %, depending on the amount of services consumed. Thus, providers with the total channel bandwidth of 155 Mbps, now pay $498 for each additional Mbit compared to $552 paid before 1 July 2009.

E-LEARNING IN BELARUS
IS USED TO TERM DISTANCE LEARNING

DL portals at universities and educational companies in Belarus are created on the basis of six platforms: Moodle, Prometheus, eUniversity, JoomlaLMS, eLearning Server, and WEB CT.

Besides well-known Learning Management Systems (LMS), the Belarusian providers use Russian LMS (Prometheus and eLearning Server) and Belarusian one (eUniversity). However, none of the six above listed LMS, except for Moodle, offer the Belarusian interface.

E-Learning

In 2007 the Belarusian government approved a four-year program on the comprehensive informatization of the Belarusian educational system in 2007-2010 (Programma, 2007) The first program on the informatization of the educational system in 1998-2006 was aimed at equipping state-owned educational institutions with personal computers in compliance with requirements set by the relevant state standards related to the provision of students with PC's.

The goal of the program was reached to a great extent, bringing the ratio of students per computer to 30:1. At the same time, the quality of computers left to be desired, since most of them were outdated. Yet, even so, computer classrooms created in almost all schools made it possible to teach computer science in schools and thus secured the minimal level of computer literacy among school and college students. (Programma, 2002)

The second stage of informatization of education launched in 2007 is aimed at increasing the quality of education on the basis of a modern educational environment and broad use of ICT in education. The government sees this goal as an important contribution of the educational system to the formation of the information society and development of hi-tech information economy in Belarus.

The state educational system is assigned with a mission to integrate technical and information resources, available within the educational system and territorially dispersed, into one common system. All participants in the educational process should have a remote access to a wide range of national educational resources. Furthermore, the program focuses on the development of national e-manuals for general and vocational secondary schools and colleges.

The higher education system is only involved in this program in terms of training and re-training of teachers who can use modern ICT in the educational process and methodological support of e-learning in secondary school. The program envisages the training of 1,200 educators to work as IT tutors. Over 600 various online resources are expected to be developed within the framework of this program. First of all, these will be methodology

websites focusing on general secondary education and websites of educational institutions.

As a result of the telecommunication system modernization by 2010, some 80 % of secondary schools are expected to have quality access to national and world web resources. The number of computers with Internet access is expected to reach 2,637, which looks very modest and insufficient against the background of the total number of Internet users in Belarus (three million users).

Seventy-five textbooks will be developed by 2010 for secondary school, and nine textbooks for secondary vocational schools. These courses will be distributed on CD-ROMs, and over 94,000 copies will be installed by the end of 2010.

The Belarusian Ministry of Education coordinates this program, and the total program budget is 78,542 million BYR (USD36,5 million at the 2007 exchange rate), of which 64,103 million (over 80%) should come from local budgets. In December 2008, the Ministry of Education reported the use of electronic means of education by 66 % of Belarusian schools. There are some 180 titles of software products for the educational process, 55 of which were developed in Belarus. Over 3,000 multimedia presentations developed by teachers are used (Alma Mater, 3.12.2008).

On 23 December 2008, the National Institute of Education, which coordinates the preparation of e-textbooks and e-manuals for secondary school, announced that e-versions of secondary school textbooks for the second semester were ready. E-manuals in 12 school subjects (altogether 29 titles) were developed and recorded to CD's. By releasing e-manuals for graduate classes, the Ministry of Education tried to alleviate the growing tension in the society caused by the rapid termination of the secondary school reform and the return from the 12-year secondary education to the 11-year one, which existed in the soviet times. The victims of this move became 11th grade pupils, who had to study within one year the two-year program of the 12-year school (Alma Mater,26.12.2008).

However, the quality of the e-manuals produced by the Ministry of Education caused a lot of public criticism and doubts that these texts can be considered e-manuals. In reality, they are usually digital copies of regular textbooks and manuals installed on certain PC's in school computer classrooms. Nikolai Listopad, director of the Main Information and Analytical Centre of the Ministry of Education, responsible for the

implementation of the informatization program, had to admit in March 2009 that so far no true e-manuals had been developed, and the ones in use were no more than an electronic means of education, supporting regular books, certain topics or chapters in the digital format (Kozlovich, 2009). The public reaction to the release of first e-textbooks shows that e-learning is becoming a topic for public debates. In the context of the hasty reform of secondary education, the hopes of pupils and their parents that the deficit in printed textbooks will be covered by quality e-resources were not justified.

The excessive centralization of the administration of the secondary education informatization has revealed the lack of coordination between the schedule of publication of e-manuals within the framework of the complex informatization program and the schedule of the development of requirements as to the structure and content of e-manuals for secondary school, set by the 2007-2010 E-Manual Program. The development of methodology for the creation of e-manuals goes behind the actual production of e-manuals (Programma, 2006). Initiatives on the creation of advanced e-manuals, existing at some of the schools, make inefficiency of the current centralized system of e-learning management ever more obvious. Unlike the centralized system of the informatization of secondary education, e-learning in Belarusian universities is not developing within the framework a unified plan, and is largely based on the initiative of individual enthusiasts supported by the administration of some of the universities.

An important role in the development of distance learning (DL) in Belarus was played by the Internet and Internet-2 projects implemented by the UNDP Mission in Belarus and Belarusian Government in 1997-2006. The project was launched in 1997, when the IT sector in the educational system was poorly developed. Within the framework of the Internet and Internet-2 Technical Aid Projects funded by UNDP and the Open Society Institute (USA), the Belarusian Ministry of Education was able to launch UNIBEL, a network that provided Internet services to Belarusian NGOs. Internet access points were created on the basis of regional universities and public libraries in all oblast centres of Belarus. For the first time in the country, the technology of data transmission via DOV modems was licensed and introduced, which provided Internet access via landline phones and made it much easier. This enabled UNIBEL to provide Internet access to over 400 educational institutions and NGOs. Over 100 secondary schools in Belarus were equipped with modems to access the Internet. In cooperation with the International Federation for Education, iEARN, Internet Access and Training Program and other organizations, over 500 country-wide and local workshops, summer camps, teleconferences and presentations for teachers

and pupils were held. A draft concept of the national DL system was developed together with the Scientific and Methodological Council on Distance Learning of the Ministry of Education. The concept laid down the goals, objectives, principles and stages of developing the national DL system and stressed its cross-sectoral nature. Specialized software (Toolbook, eLearning Server and so on), purchased within the framework of the project, assisted in the development of DL technologies at some of the Belarusian universities. Since 2000, DL courses have been developed at the Belarusian National Technical University, Academy of Public Administration under the aegis of the President of the Republic of Belarus, the State Institute of Management and Social Technologies of the Belarusian State University and other institutions (Tavgen, 2005). In the field of postgraduate education, the Institute of Business and Management Technologies of the Belarusian State University and the Institute of Advanced Training of the Emergency Situations Ministry have experience in e-learning.

In 2002, the Belarusian State University of Informatics and Radioelectronics were granted permission by the Ministry of Education to start providing DL education in the main areas of the University's curriculum as an experiment. To implement the experiment, the Centre for DL Education was set up as a structural subdivision of the Department of Low-Residence, Evening and DL Education. DL Regulations were drafted, setting requirements to academic programs and the main methodological principles of developing the DL system. This document established the following:

- correspondence of the DL curriculum to the overall standard of a particular program;
- flexible terms of education;
- individual schedule;
- three learning modules: liberal arts, specialized training and diploma research work;
- the study of optional courses;
- aggregation of disciplines accompanied by the decrease in their number;
- distance learning of disciplines (individual work, self-testing and tutorage);
- evaluation during the direct communication with a teacher ;
- paid education.

In developing the DL concept, its authors sought a higher level of the liberalization of the academic process than was allowed by the Ministry of

Education. Their ideas were not groundless since there were hopes at the time that Belarus would join the Bologna process. In 2003 Belarus was represented as an observer at the Berlin Conference of the Ministers responsible for Higher Education in the signatory countries of the Bologna Declaration. The Ministry of Education and Parliamentary Commissions were engaged in the preparation of a new higher education legislative basis, corresponding to the European academic tradition. This explains why the Ministry of Education passed a rather liberal DL regulation in 2002. Later, when the Belarusian educational policy turned toward self-isolation from the European higher education area, an attempt to expand the DL provision to embrace the whole higher education system in Belarus was unsuccessful. Up to now, Belarus has not adopted the DL regulation, which, according to many experts, is one of the main obstacles for the development of e-learning in the country (Krasovsky, 2006)

The development of the DL institutional framework in Belarus started with the creation in 2003 by the Ministry of Education of the Scientific and Methodological Council on Distance Learning, consisting of four committees: on the DL academic standards and methodological support, on the DL legislative framework, on relations with CIS and other countries in the DL field, and on the promotion of the introduction of DL in Belarusian academic institutions. This structure was expected to ensure the fulfilment by the Council of all functions related to the analysis of the technical and methodological potential of academic and research institutions in the DL field, as well as to the evaluation and application of international and local experience in e-learning. It was also expected to ensure participation in setting research priorities in DL, evaluation of research programs and projects in this field and so on. The Council drafted several important normative documents on the DL development in the country, established working relations with the CIS Standing Committee on Distance Learning and supported three international scientific and methodological conferences on DL (Krasovsky, 2006).

However, initiatives on further development of the DL institutional framework based on the existing territorial principle of the organization of the national educational system were not supported by the Ministry of Education. The DL institutional and administrative structure in Belarus has not taken shape up to now, which tells on the speed and scale of the DL development in the country. At its January 2007 meeting, the Council on the Informatization of the System of Education of the Ministry of Education discussed the current state of the DL system in Belarus. According to the Ministry of Education, in the beginning of 2007, the Belarusian universities

offered DL education in 13 areas of concentration, which fall under four categories:

- IT and programming (software programming, digital systems of processing information, artificial intellect, computer science and information systems and technologies)–39 %;
- economic (marketing, public administration and economics, economics and management, management, finances and credit)–39 %;
- socio-legal (law studies, social work)–15 %;
- technical (IT and management in technical systems)–7 %.

The student body breakdown is presented in Table 1.

Table 1.
Distance Learning student body in
Belarusian universities as of January 2007

Institution	Total # of DL students	# of DL students receiving 1st higher education	# of DL students receiving 2nd higher education
Belarusian State University of Informatics and Radioelectronics	954	652	302
Academy of Public Administration	550	550	-
International Institute for Distance Learning of the Belarusian National Technical University	831	785	46
Belarusian State University	699	622	77
Polotsk State University	10	10	-
Belarusian-Russian University	44	44	-
Total	**3088**	**2673**	**425**

Many universities use case technology in the learning process. However, recently, the following tendencies have appeared in the development of DL: application of e-technologies and networked information resources, creation of corporate e-libraries and the use DL technologies in traditional learning forms (Batura, Krasovsky, 2008). Yet, despite certain achievements, the results of the introduction of e-learning are fairly modest. The number of DL students does not exceed 1 % of the total student body. The Council on Informatization had to admit that the DL development in Belarus had not

gone beyond the framework of an experiment, in which only a small number of universities had taken part. Further development of DL is hampered by the lack of a proper legal basis, underdevelopment of approaches to the creation of electronic learning and methodological resources and lack of financial support from the state budget. Unfortunately, after the 2007 meeting of the Council, the development of e-learning at universities slowed down.

While plans to support DL at secondary schools were to a certain degree reflected in the government's program on the complex informatization of the educational system, in higher education, experimental development of DL has not received any legal or financial support since the Council meeting in 2007. The Scientific and Methodological Council on Distance Learning has become inefficient and its proposals regarding the legal and organizational framework of the open e-learning have not been supported by the Ministry of Education. The annual scientific and methodological conference on distance learning has been put on hold.However, the picture would not be complete if the analysis of the current situation in the field of DL in Belarus were limited to home providers. A serious role on the Belarusian market of educational services is played by the Russian educational institutions.

Despite the official recognition of the divergence of educational systems in Belarus and Russia, the Russian DL system remains a model for the state system of higher and postgraduate education in Belarus. E-learning organizers in Belarus acknowledge Russia's leadership in the development of the DL theoretical basis and legal framework. Such Russian DL providers as Virtual Technologies in Education or Hyper Method play an important role, offering popular in Belarus e-learning management platforms, Prometheus and e-Learning Server.

The Russian provides successfully compete with the Belarusian ones in the field of corporate and business education and promote higher education programs in the e-learning format.

Although the Belarusian authorities make efforts to protect the national market of educational services, the e-learning still remains outside the scope of their attention. There are no statistical data that would allow evaluating the level of penetration of foreign providers into the DL field in Belarus.

Vilnius-based European Humanities University (EHU)
Against this background, exceptions are DL programs of the Vilnius-based European Humanities University (EHU). EHU was created in Belarus in

1992 as a private university, whose mission was the internationalization of the Belarusian higher education. In 2004 the University was closed by the authorities for political reasons and was compelled to continue its operations in exile as a Lithuanian University, working in accordance with the Bologna model. Having started in 2004 with 22 non-degree online courses for 202 students only, in the academic year 2009-10, EHU increased the student body of currently nine bachelor's degree programs up to more than 1000 people. (http://www.ehu.lt/news/notice/0014166 retrieved on December 4, 2009) While DL embraces only a small number of students at other Belarusian universities, at EHU the number of DL students largely exceeds the number of full-time students. EHU, like the Russian providers, offers its DL programs primarily in Russian that dominates in the Belarusian educational system, but bases the DL development on the US experience.

The outburst of interest toward DL in the Belarusian higher education in the first years of this century has been replaced by stagnation and decrease of interest to this field of education on the part of the state. There is no space in a closed society for an open education. While we are waiting for the liberalization of the educational policy, the national market of educational services will be actively assimilated by providers from the neighbouring countries.

CASE STUDIES

A pioneer in the development of distance learning (DL) in Belarus is the Belarusian State University of Informatics and Radioelectronics (BSUIR). Since 2002, when the DL experiment had been officially launched, the number of students grew from a few dozens to 959 as of early 2008. (Batura, Krasovsky, 2008)The following seven specializations are offered: IT software, information systems and technologies in economy, artificial intellect, informatics, marketing, IT and management in technical systems, and computer-managed systems of processing information.

BSUIR chose Prometheus as DL management software. Modern licensed suites are used to create electronic teaching materials. The same design style is used for all electronic teaching materials at the BSUIR Centre for Distance Learning (CDL), and structurally materials for each discipline are divided into the following sections: general methodological guidelines on teaching a particular discipline; working program (with a full list of texts used in the course); lecture summaries (with inbuilt or independent tests); guidelines and tests (with a description of practical assignments, problems and exercises); lab practicum (including descriptions of virtual laboratory work); and

guidelines on and topics of course projects. Over 200 electronic teaching materials have been developed at BSUIR.

Students are admitted on the basis of the general university entry and admittance rules, but the learning process is arranged in a different way. After registering in the DL management system and getting access to the e-library of electronic teaching materials, students select and pay for the first package of courses from the curriculum, consisting of no less than seven disciplines that should be studied for no longer than two years.

Although the learning process is more flexible than traditional face-to-face or low-residence studies, exams are taken in a face-to-face mode during exam sessions that coincide with the traditional end of a semester.

Before the exam session, students register for declared courses in order to do face-to-face lab work and tests, to take exams or defend course research projects. In between exam sessions, students can visit the university for the same purposes with the agreement of a teacher and the CDL. It should be mentioned that dynamic student groups consisting of 7-12 people are formed for face-to-face lab work to ensure the efficient use of classrooms and tutors' working time.

Students who fail to complete the selected curriculum in a two-year period are subject to expulsion. If the selected package is successfully and timely completed, then a student together with a CDL supervisor selects the next package for studies and the process is reproduced. In this way, an individual curriculum for each student is formed. When a student completes the entire study cycle, he or she is admitted to pre-graduation practice and graduation research work, procedures for which are the same as those for low-residence programs. If students successfully defend their graduation research projects, they receive standard state higher education diplomas (Batura, 2008). Although BSUIR is justly regarded as a leader in the DL field in Belarus, the efficiency of this form of studies at the university is fairly low. According to the information on the BSUIR website, only five DL students will graduate in 2009.

Admission to DL programs is also decreasing. In 2009 only 170 students will be admitted, which is some 30 % less than in previous years. With a view to introduce information technologies in the specialist retraining process and to improve teaching methods, the Institute for Retraining and Advanced Studies of the Ministry of Emergency Situations of the Republic of Belarus (IRAS) launched a laboratory on the development, approbation

and introduction of distance learning. The main objectives of the laboratory are to test the DL technology on IRAS students and to analyze its efficiency.

IRAS is using Moodle, an open-source DL management system. After being tested on the IRAS intranet, Moodle was placed on the IRAS website at http://mchs.bp.by/moodl, as well as on website of the Belarusian Ministry of Emergency Situations (http://mchs.bp.by retrieved on June 25, 2009). In 2008 four groups studied in the DL mode within the framework of the advanced studies program on the basics of computer science, information systems and application software for supervisors of the Operations Control Centres. The results of their studies proved the system to be very convenient for both teachers and students who requested that other specializations be developed in Moodle as well. On the basis of their feedback and analysis of student questionnaires, it was admitted that the use of Moodle in DL is effective and economically wise and should be developed further. Currently, six DL courses are offered on the IRAS website. IATP (Internet Access and Training Program) has been working in Belarus since 1999. Internet cafes opened in seven cities of Belarus. Some 3,000 people are trained at the IATP trainings and seminars every year. From 2004, IATP has been implementing the project "Distance Learning in the IATP-Belarus" (http://distance.iatp.by retrieved on June 25,2009) on the basis of CMS Moodle Around 40 courses have been designed within the framework of the project, most of which are developed on volunteer basis. 1,200 people were trained in DL courses.

ISSUES

The experience of the DL development in Belarus shows that when the state tries to plan the use of information technologies in the learning process, the focus is mainly on the development of the technical basis, such as provision of students with computers, development of corporate networks and so on. Little attention is paid to the virtual pedagogy and methodology of self-studies. The DL is mostly reduced to the distribution of traditional textbooks and manuals in an electronic format and is next to never perceived as a new networked learning environment.

In recent years, little if anything has been done in the country to develop a legal framework for e-learning or its methodological justification and large-scale preparation for the training and retraining of teachers for DL.

Individual positive examples of e-learning at secondary and higher educational institutions in Belarus do not go beyond the local experiment framework and do not receive state support. The state expects DL to be

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financed from either local or university budgets, which, in their turn, are compelled to offer e-learning programs as paid educational services. The indifference of the state toward the development of an efficient DL system in higher education leads to stagnation of this form of education at Belarusian universities. Belarus lags behind its neighbours in the development of e-learning.

At the same time, DL is becoming more popular among Belarusian youth, and at the moment the growing demand can chiefly be satisfied by providers from neighbouring countries, primarily Russia. If no substantial changes occur in the Belarusian educational policy soon, our country has all the chances to turn into an educational province of Russia, and even a certain divergence of our educational systems will not be an obstacle in this.

The DL development in Belarus is also hampered by the weakened human resources in teaching, which, according to experts, in late 80-ies and 90-ies were the best in the USSR and CIS. Human resources are not yet fully exhausted, but the absence of state support of DL and high demand for them on foreign markets can soon leave Belarus without this resource as well.

CONLUSION

E-learning in the Belarusian situation bears the potential of openness and therefore is a challenge to the traditional practices of the centralized governmental control of education. Two short-lived attempts to liberalize this system in the early nineties and first years of the 21st century failed and were not able to combat the Soviet legacy in the administration of the Belarusian education. The subsequent ideological instrumentalization and self-isolation of the Belarusian educational system from the European education area further deepened the gap between Belarus and even its neighboring countries in the field of e-learning. Certain improvements in the relations between the EU and Belarus in 2008 gave rise to hopes for the evolution of the educational policy in the direction of internationalization and liberalization.

Although there are yet few if any signs of changes in the field of education, the Belarusian academic community has to make an effort and develop a new agenda for e-learning.

The objectives to be addressed as a top priority are as follows:

- Development of the national strategy of the development of e-learning in the country as a new networked learning environment on all educational levels;;
- Creation of a public system of e-learning administration;
- Development of relevant legislation;
- Implementation of a flexible quality control system that would meet requirements and expectations of all stakeholders;
- Reallocation of the budgetary resources with a view to support the sustainable development of e-learning;
- Development of training programs for e-learning teachers, managers and trainers in high school, universities and adult education.

Of no less importance is international assistance in the design and implementation of an e-learning development program, legal framework, methodology guidelines and teacher training. A dynamic educational policy and international assistance would make it possible for Belarus to bridge the existing gap in the development of e-learning.

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CHAPTER-4

eLEARNING IN BULGARIA

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ABSTRACT

The goal of this chapter is to present the recent challenges and conditions in Bulgaria for involvement and efficient use of e-learning in different forms, types, modes and levels of education.

The chapter gives an overall picture of the Bulgarian educational system, taking into account the current political priorities and the most significant concrete measures, accelerating the ongoing reform in different sectors of the educational domain. It captures in brief the government requirements for implementation of distance learning in the higher education institutions. Some good practices, applied by non-governmental organizations and private educational companies, are outlined. ITC-The Information and Communication Technology development in Bulgaria is discussed on the basis of the main relevant strategic and regulatory policy documents. The advance is illustrated by some pertinent statistical data, derived from several studies and indexes.

Aiming to show the integration of the Information and Communication Technology into the e-learning activities in Bulgaria, a series of skills-development projects, carried out by the government and other organizations, are pointed out. Two case studies demonstrate the experience of two Bulgarian universities in the field of e-learning; the first one – in providing of e-learning courses, and the second one -in experimenting on a new approach to e-assessment. Some of the key challenges, which Bulgaria faces in the field of e-learning in the dawn of the millennium, are pointed out.

INTRODUCTION

Major changes in the social and economical conditions in Europe and worldwide force new needs and trends upon the Bulgarian education. The main challenge for "the knowledge society of the future" is to ensure that each member of the society has the opportunity of continuous professional development, frequent retraining and obtaining of new competences, mastering new information technologies (IT), lifelong learning (LLL), and so on. The tendencies in the development of the Bulgarian education reflect the European and world directions. The central concern is to ensure the adaptability of the education system towards new challenges, as well as to guarantee sustainable system improvement in compliance with the objectives of the European Higher Education Area (EHEA) and capability to provide valuable and competitive knowledge and skills. In the years of the pre-assessing process of Bulgaria to the European Union (EU) and now, when Bulgaria is a full member of the European community (since the 1st of January, 2007), the understanding of the role of the e-learning in the development of the information society has been significantly improved.

According to (Tuparov, &Tuparova, 2007), in the last years of the process of pre-accession of Bulgaria to the EU, the conditions for involving and efficient use of e-learning in different educational institutions were significantly improved. The basic factors that positively influenced the improvement of the e-education index in Bulgaria could be summarised as follows: the participation of educational and research institutions in a lot of international projects; government policy; initiatives by universities, educational and research institutions; well-qualified experts in information and communication technologies, didactics, psychology and other subject areas that, with enthusiasm, add value to the development and dissemination of e-learning content.

COUNTRY

"Bulgaria is one of the oldest European States with 20-century old history and traditions. Modern Bulgaria is situated in South-eastern Europe, on the Balkan Peninsula-a busy crossroad of ancient cultures. For centuries, the roads passing through the territory of the country have been connecting Europe with Asia and Africa. Four common European transport corridors, connecting West and North Europe with the eastern and southern part of the continent, cross their roads here. Bulgaria is also known for its picturesque nature and rich cultural heritage. According to the statistics, the country

ranks third in Europe, only after Greece and Italy, for the number of its valuable archaeological monuments." (Ministry of foreigner affairs, 2009)

According to the National Statistical Institute (NSI, 2009) the estimated in 2008 population in Bulgaria is 7 606 551, having a female prevail of 51.6%, i.e. 1 066 women correspond to 1 000 men. The density of the country is 68.9/km^2.

At the end of 2008, 5407.1 thousand persons or 71.1% live in urban areas, and 2 199.5 thousand or 28.9% -in rural. At the end of 2008 the working-age population is 4 806 thousand persons or 63.2% of the total population, the population of over-working-age is 1 701 thousand, and that of the under-working-age category-1 100 thousand.

Figure 1
A map of Bulgaria

Source: Download Free Bulgaria Maps/ Bulgaria (Small Map) 2008,
http://www.mapcruzin.com/free-maps-bulgaria/bulgaria_sm_2008.gif

EDUCATION SYSTEM

In the process of developing the Bulgarian National Programme "Modernization of Education" and the National Employment Action Plan (2005), the Republic of Bulgaria takes into account the Lisbon strategy till

2010, the LLL conception, the Education and Training 2010 program, the European Employment Strategy, etc.

In comparison with other EU countries, Bulgaria has lower school attainment rates and higher inequalities in school access (relevant mainly to children from ethnic minority, low income families, rural areas, and disadvantaged populations).

Bulgarian educational policymakers understand that the integration into the EU provides the imperative for an education system reform. The brought demands for increasing the quality and relevance of skills, as well as the participation in Upper Secondary and Higher Education (HE) have to be satisfied with cost effective utilization of resources – integral to achieving the Lisbon goals.

Observing the above, the following are stated in the political priorities of the Government: "change of the educational model from resource-oriented towards results-oriented; binding the expenditure level with the quality of the educational product; decentralization and autonomy of schools; optimization of the school network…" (Bulgarian Government, 2005). A number of specific strategic documents determine the current priorities in different sectors of the educational domain (Ministry of Education and Science [MES], 2008b; MES, 2008e; MES, 2006; MES, 2005). Some of the most significant concrete measures, accelerating the reform pace in the last years, are listed below (MES, 2008a; MES, 2008c; MES, 2008d).

General Education
- *School education financing mechanisms are improved and cost efficiency is enhanced.* For example, pioneered in its "delegated budgets", the model of school autonomy has been strengthened with establishment of a strong monitoring and assessment system for accountability. Additionally, the staffing and facilities overcapacity in Bulgarian education system is in a process of resolving;
- *Positive effects are achieved at improving the quality and relevance of skills.* A comprehensive strategy to enhance teachers' quality has been defined in collaboration with all key stakeholders. The components of a national external assessment system have been introduced (e.g. State school-leaving examination – Matura), etc.;
- *The number of students of compulsory school age, who are out of school or are dropping out, is lowered.* Various interventions to include hard-to-reach groups are taking place to increase access,

participation and completion in school (free access to learning content, free transport, etc.).

Vocational Education and Training (VET) and LLL

- The List of Professions in VET is updated with new entries, in accordance with the labour market needs. New state educational requirements for acquisition of professional qualification are in a process of development;
- The structure of training plans for vocational high schools has changed; some new training plans have also been developed with respect to acquisition of the 1st, 2nd and 3rd degree of professional qualification; the number of training hours in computing and software, as well as in foreign languages, has increased too;
- A new unit with the National Agency for VET has been established to control the quality of training;
- The access to continuing vocational training and continuing education is boosted;
- The basic element of the LLL concept implementation in Bulgaria is the VET for adults. The aim is the enhancement of adults' employability. A special emphasis is laid upon the Information and Communication Technology (ICT) and language training. Companies attach high priority to employee certification according to internationally recognized standards. Trying to respond to the increasing training needs, many government and non-government initiatives are currently underway, focusing on building an open, flexible, and transparent LLL system in the country. (e.g. world leaders like HP, IBM, Microsoft, and Cisco provide a variety of training courses to students and employees);
- Bulgaria is working on projects under European LLL Programme in the field of education, training and labour market, where the coordinating body is the Human Resource Development Centre (www.hrdc.bg retrieved on 28.12.2009)
- Considerable progress has been made towards bettering the understanding of LLL in a HE context.

Higher Education

- Based on the State Educational Requirements in Higher Education, a progressive policy framework for quality assurance (QA) by the National Evaluation and Accreditation Agency is in place. In 2008 the national QA agency gained full membership in the European Association for QA in HE.

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- The harmonization with EHEA is at a very advanced stage – a special Ordinance on State Requirements to the Basic Documents Issued by the Bulgarian Higher Schools defines their correspondence with the European requirements (e.g. European Diploma Supplement). The Credit Accumulation and Transfer System has been adopted. Moreover, the student and teacher mobility is being supported in and beyond the EHEA. The access to the education and the living conditions of students are improved, etc. The Bulgarian progress towards achieving the Bologna goals is evaluated at about 4 (on a 5-grades evaluation system) in respect to the degree system, quality assurance and recognition (Rauhvargers, Deane, & Pauwels, 2009);
- The cost effectiveness is improved. For example, the role of the private sector is leveraged to expand financing and qualitative participation; at the moment there are about 15 private universities and colleges in Bulgaria, which have experienced a sharp enrolment increase;
- The need of strengthening the linkages with industry is well understood.

DISTANCE EDUCATION

In the last 10 years the Bulgarian Government accepted several state documents and strategies for the development of the distance education at different educational levels. In the frames of international and national projects the National Centre of Distance Education and the Bulgarian Virtual University (BVU) were funded.

Higher Education

For the higher education level the form of distance education is regulated by the "Law for Higher Education" and the "Instruction for State Requirements for Organizing of Distance Education in Higher Education Schools". In the "Law for Higher Education" 3 educational forms are constituted: *full time education*, *part time education* end *distance education*. The "Instruction for State Requirements for Organizing of Distance Education in Higher Education Schools" on the other hand, regulates the rules according the distance form of education, applied by the universities. With respect to this instruction the universities should provide:

- special center for Distance education;
- broadband Internet access to the learning recourses;

- e-learning environment for publication learning resources and management of educational process;
- at least 70% from the educational resources should be published in the e-learning environment.
- The organization of the distance form of education could also include "face to face" lectures and tutorials. These however should not exceed 30% of the lectures and tutorials, offered by the full time form of the education. Each major at the Bulgarian universities in each of the three educational forms should be accredited by the National Accreditation Agency (http://www.neaa.government.bg/en retrieved on 28.12.2009), according to the "Law of Higher Education" and the "Instruction for State Requirements for Organizing of Distance Education in Higher Education Schools".
- **Distance education majors**. Although there are some opened procedures for accreditation of several majors in the field of distance education, none of them has been completed up to now (the 30th of July 2009). The duration of accreditation process lasts about a year. Due to the heavy procedures for accreditation of distance education form, the universities use technologies of e-learning to support mostly their full and part time forms of education.
- **Part time education majors**. The most courses, included in the part time form of education and supported by e-learning technologies, are basically part of the master level degrees.
- **Full time education majors**. Regarding the full time majors' courses at all universities, it should be noticed that some of them are to a great extend supported by the e-learning technologies.
- The good practices in the area of distance education are developed by:
    - Academy of Economics „Ivan Tcenov" (http://www.uni-svishtov.bg/intranet/EN/centers_01.asp?m=6); retrieved on 28.12.2009)
    - New Bulgarian University retrieved on 20.12.2009) (http://www.nbu.bg/index.php?l=25);
    - University of National and World Economy (http://cde.unwe.acad.bg) retrieved on 20.12.2009)
    - University of Sofia (http://www.uni-sofia.bg/index.php/bul/obrazovanie/distancionno_obuchenie), etc. retrieved on 20.12.2009)

Secondary Education

On the other hand, the implementation of distance education in the secondary level of education is still not regulated by special regulatory

documents. The development of law regulations has been proposed to the "National Strategy for Implementation of ICT in Education (MES, 2008e)", that was accepted in 2005. Since 2007 several initiatives have been started to support secondary education with e-learning content – National educational portal, Development of e-learning content, teacher training in area of ICT etc. On the 30th of July 2009 a new program, directed to the Bulgarian students/pupils who live abroad, has been started by the Ministry of Education and Science (MES). In the frame of this program distance courses, relevant to Bulgarian educational curricula and syllabuses, will be offered.

Non Government and Private Sector
The non government sector and private companies offer distance courses in different areas that aim various target groups. Some of the qualitatively developed distance education courses in this sector are offered by:

- Network of Innovative Teachers, supported by Microsoft Bulgaria (www.teacher.bg) – more than 20 000 Bulgarian teachers are involved in the network, several distance courses in English language and Development of e-learning content are carried out.
- Microsoft IT Academy for Secondary schools (http://itacademy.teacher.bg/cs/blogs/itacademy retrieved on 28.12.2009)
- Kabinata.com offers distance courses in foreign languages (http://www.kabinata.com retrieved on 28.12.2009))
- Future Now Ltd. offers distance courses in foreign languages, e-learning for teachers, civil education, Bulgarian language and Maths for secondary school students (www.futurenow.bg retrieved on 28.12.2009).

These and many more have put to good use the distance education technologies- it is impossible to name and describe all of them. Some of the proposed courses are part of European projects, or are developed by the companies for corporate training of the personnel. All educational institutions need really working regulatory instruments for implementation of distance learning in order to provide high quality of distance education form.

TECHNOLOGY

The supreme document on ICT policy in Bulgaria is the Strategy on Information Society Development (drafted in 1999 and updated in 2001). In accordance with its stipulations, several regulatory acts were adopted, setting

a framework for the development of the information society. After the accession of Bulgaria to the EU, the government has set a number of priorities in the ICT sector, which include developing high-speed broadband internet infrastructure; modernizing the public sector through e-governance; providing qualitative e-content for education; and improving Bulgaria's competitiveness in the field of science and technology. The State Agency for Information Technology and Communications (SAITC) is one of the bodies, responsible for implementing the state policy at a national level.

In October, 2008 the National Programme for Accelerated Information Society Development 2008-2010 (State Agency for Information Technology and Communications, 2008) was accepted by the Council of Ministers. The programme emphasizes the convergence of ICT, e-content, public services and an improved quality of life. It is in line with the European Information Society Policy Strategy, 2010. Six guidelines for development have been defined in the programme: ICT infrastructure and security; society and culture; economy and employment; research and development; education and training; and marketing the ICT sector. Several studies and indexes show the positive trends in development of ICT in Bulgaria.E-Bulgaria index (e-Bulgaria 2006), studied by Application Research and Communication Fund (ARC Fund) was growth significance from 2001 till 2006 respectively from 3.46 to 6.77. The components of this index and their dynamics are presented in fig. 2.

Figure 2.
Index e-Bulgaria 2001-2006. Source (E-Bulgaria Report, 2006)

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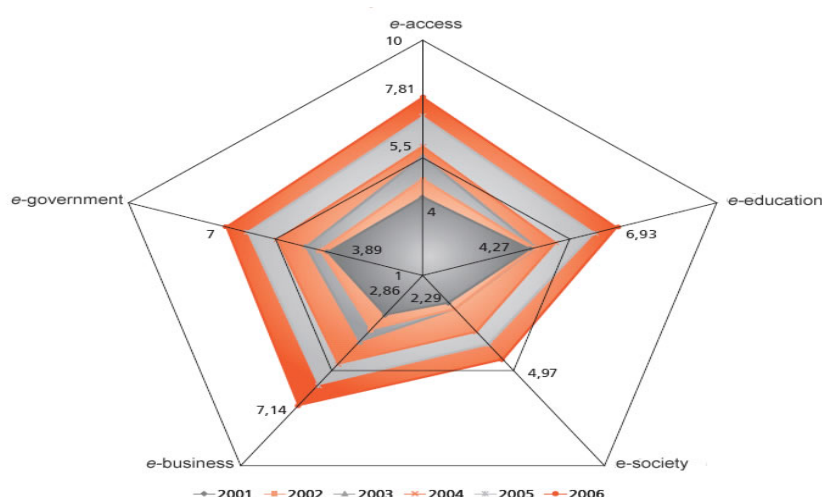
According to (International Telecommunication Union, 2009) the International Internet bandwidth per Internet user (bit/s) has been growth from 110 in 2002 year to 15 787 in 2007 year, the households with computers in 2007 have been 23%, households with Internet access in 2007 have been 19%. In 2008 Bulgaria takes 48-th place in Rank List for e-readiness of Economist Intelligence Unit (http://www.eiu.com). The e-readiness index of Bulgaria for 2008 has been improved from 5.01 for 2007 year to 5.19. The e-readiness index components are: Connectivity-4.40, Business environment-6.79, Social and cultural environment-5.33, Legal environment-6.30, Government policy and vision-4.55, Consumer and business adoption-4.70.

The e-Government readiness index 2008 for Bulgaria is 0.5719 (United Nations, 2008). Bulgaria takes 43-rd place (from 192 studied countries) in the ranking list of the United Nations for e-Government readiness. The e-Government readiness index consists of 3 components -Web Measure Index (0.4849), Infrastructure index (0.3071) and Human Capital Index (0.9262).

- The data from National statistical institute (www.nsi.bg retrieved on 28.12.2009) shows for 2008 the trend for increasing with 8% the use of Internet and e-commerce by the enterprises. This trend is sensitive for small enterprises (11%). The enterprises used e-government services have been increased from 45% for 2007 year up to 58% in 2008 year. The households with internet access have been increased up to 25% in 2008 (19% in 2007). The persons, who used computers in 2008, have been 43% (37% for 2007 year).

The last studies on the development of ICT infrastructure and innovations in Bulgarian enterprises are presented in the report of ARC Fund "Innovation.bg-The Bulgarian Innovation System in a Time of Global Economic Crisis" (Innovation.bg, 2009).

According to this report "Bulgaria is already second after Ukraine in investments in ICT as a percentage of the Gross Domestic Product for 2006 and among the 25th most fast developing ICT markets in the world for the period 2003-2007. ...

The introduction of computers in enterprises (91%), connecting them to local networks (60% of the enterprises according to Eurostat and 78% according to Vitosha Research) and to the Internet (83% of the enterprises and 79% of the computers) has reached its plateau in Bulgaria under the present structure of the economy. At the beginning of 2009, only 1% of enterprises do not

have computers. "Independent of the efforts of the government and all stakeholders of development of ICT, Bulgaria ranks in the last positions of the Lisbon Review 2008 list. In comparison to the average values of development of the EU members, USA and East Asia, Bulgaria needs more reforms and efforts in area of ICT development.

E-LEARNING AND ICT INTEGRATION

A main paper for further development of Bulgarian education system is the National Strategy for implementation of ICT in Bulgarian schools (MES, 2008e). It follows the eLearning Action Plan of the European Commission for integration, support and implementation of ICT in the education.
The main goals are effectively applying of ICT in the education, provision for e-learning in schools and improving the educational quality.

Generally in Bulgaria, the population's ICT skills are at relatively low levels. According to the National Statistical Institute (www.nsi.bg/Index_e.htm retrieved on 28.12.2009) 57% of the population has no ICT skills, compared to the EU average of 40%. Realizing the need for higher IT skills, the government, together with other organizations, has started a series of skills-development projects.

General Education

The ICT in National Education Strategy initiative of the MES implied supplying all Bulgarian schools with ICT infrastructure (including broadband).

The results of its implementation are:

- All 3 000 Bulgarian schools have computers, broadband connections, laptops and projectors for the use in classrooms;
- A national educational portal (fig. 2) with educational resources and shared content was constructed (http://start.e-edu.bg retrieved on 28.12.2009);
- In order to ensure successful implementation of e-learning technology in schools and to improve teaching skills and confidence, teachers have had ICT training on core ICT skills and productivity tools and on ICT pedagogy. The cascade method in teacher training was applied, aiming to train a larger number of teachers in a relatively short time span;

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Figure 3.
National Educational Portal
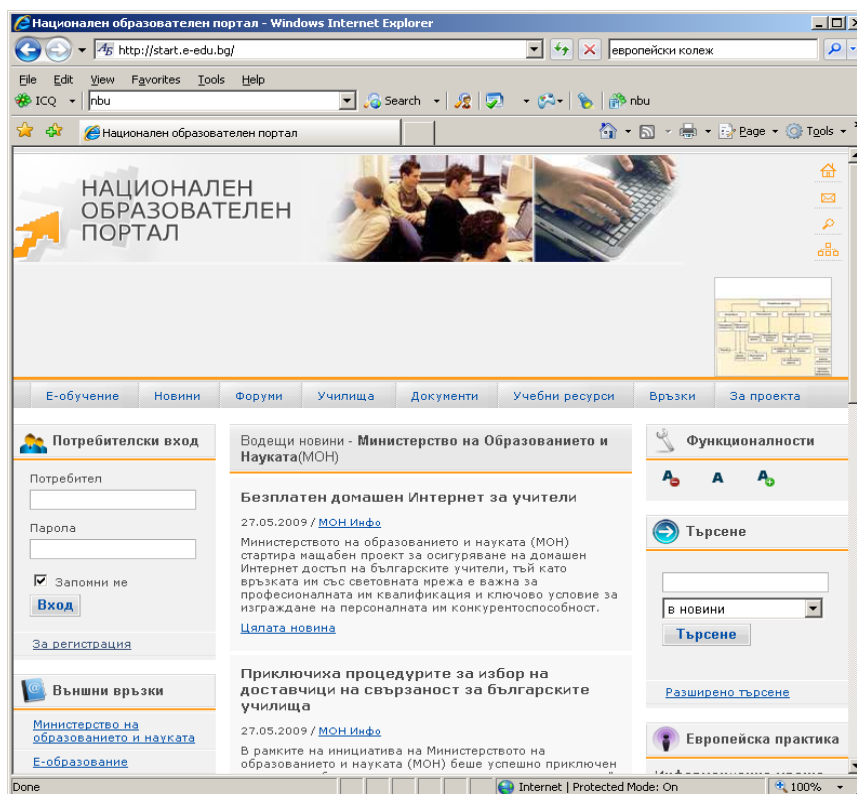
- Addressing the dearth of good, fit-for-purpose Bulgarian e-learning content, especially for secondary school students, a lot of e-lessons across the curriculum and other e-contents are created (through commissioning creation, by Bulgarian teachers and students and by Bulgarian educational software developers);
- The school curriculum was reformed to promote effective, creative use of ICT across all subjects. One hour of ICT per week was introduced as a subject for all schools from 5th Grade up, keeping the same option for the schools from 1st Grade up. Teacher training and reform of the curriculum are synchronized with the European Framework of Key Competences LLL;
- A pilot project for providing wireless internet in schools was launched in April 2008;
- At the moment MES is providing a free Internet access for all interested teachers from School and Pre-school Education.

The better use of ICT in education is closely related to the general development of Bulgarian educational system (Danish Technological Institute, 2008).

Workplace Training and LLL

In 2006, the iCentres project (http://www.icentres.net retrieved on 28.12.2009) developed and implemented the largest Bulgarian training programme, using e-learning technology (both for learning materials and exams). The target group was the state administration, and more than 55000 civil servants were trained on-site in core IT skills. Till May 2009, 118 iCentres (or telecentres) were created. The iCentres Association signed a three-year contract with Microsoft for coaching of trainers and unemployed citizens in IT skills. At the same time, the project's partnership with Cisco resulted in the establishment of local Cisco Academies and the organization of Cisco Certified Networking Associate courses for telecentre managers.The SAITC project, focused on providing IT and business communication skills to disadvantaged groups, started in 2007. The aim of the project is to streamline the professional development of the target groups, whose new professional skills can facilitate their access to the labour market. Further in the frame of the initiative to make ICTs available to as many Bulgarians from disadvantaged groups as possible, the National Innovations Centre at SAITC has offered a free ICT skills course for young people with disabilities.

Some projects, aiming to enhance the employment opportunities of the Roma people as one of the biggest minority groups in Bulgaria, are being developed under SAITS coordination. Among those are "I-integration of minorities" (started in 2008) and the last project- "i-Integration of Roma" (started on the 20th of March 2009). Amongst other components, the projects comprise e-learning courses on ICT, language teaching and training in business communication skills. In the last few years, the non-governmental sector has been actively working to support human capacity development at local level in the country. Some of the numerous examples are: the eFLAG Ltd. (www.eflag.cc retrieved on 28.12. 2009) -a private consulting and executive training company, offering e-learning courses on Business Planning, Financial, etc.; Projecta Ltd. (www.projecta.bg retrieved on 28.12. 2009) -a Bulgarian company, specialized exclusively in project management consulting and on-line training; etc. In the Bulgarian educational system the universities are still the main centres of LLL. All state universities have a well-organized structure and a long experience in providing professional qualification, post-graduated qualification and continuing vocational training programmes and courses.

Higher Education

Generally, the documents of the government general policy address specific priorities, such as: modernization of the HE sector through providing qualitative e-content for students; improvement of the Bulgaria's competitiveness in the field of science and technology; establishment of distance-learning platforms and standards; provision of high-speed national and international internet connectivity to universities and research institutes in Bulgaria, etc. But still, a clear government strategy and concrete actions for the development of e-learning in HE are missing. To some extend, this situation is justifiable by the academic autonomy of the Bulgarian universities. Although in a some-how chaotic and amateur manner, the Bulgarian universities, colleges, researchers and academic staff are trying hard to implement ICT in the educational process. A positive factor in these attempts is the availability of a lot of trained specialists in the sphere of ICT-almost all of the university lecturers use computers in the course of their work (at least for word processing, preparation of presentations and Internet access). Some of the most important e-learning activities in the sphere of HE are presented bellow.

All Bulgarian HE Institutions (HEIs) have already their own web-sites to present their structure, curricula, etc. and to support their students, teaching and administrative staff and guests, but it could be said that almost all of them are at a contemporary initial stage of the practical integration of e-learning. In the Bulgarian HE e-learning is implemented mainly by blended learning study programs and traditional study programs, supported by ICT in the area of content presentation, communication and collaboration (at present about 70% of the universities have e-learning environments with different level of functionality, where they offer e-learning materials to support full-time tuition or in some cases – distance learning).

There are certain full e-learning study programs or e-learning single courses, offered by some Universities and Colleges, as for example: D. A. Tsenov Academy of Economics, Svishtov; University of National and World Economy, Sofia; Technical University, Sofia; Medical University, Sofia; etc.As a result of the i-University programme, over 100 computer laboratories for e-learning at universities and research institutions were equipped at the end of 2004. The initiative "Bulgarian Virtual University" was started at 2002. The BVU (http://www.bvu-bg.eu/index.php?lng=eng, retrieved on 28.12. 2009) see fig. 4) is the home for the virtual information center for Ph.D. students, virtual libraries, e-learning courses offered by different universities, etc.

Figure 4.
Bulgarian Virtual University
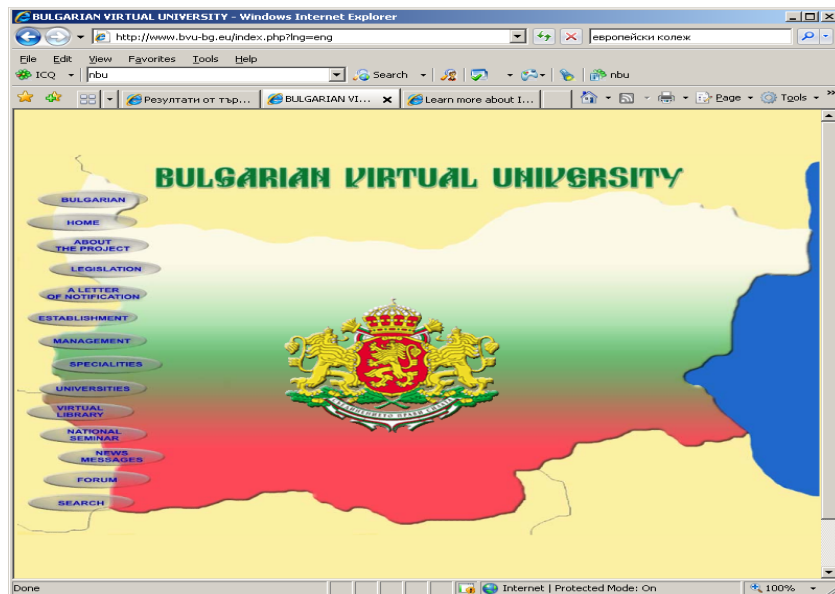
The Bulgarian university community has already recognized the need of e-learning platforms, and has taken steps to integrate them into the educational process.

Figure 5.
PeU e-Learning Environment
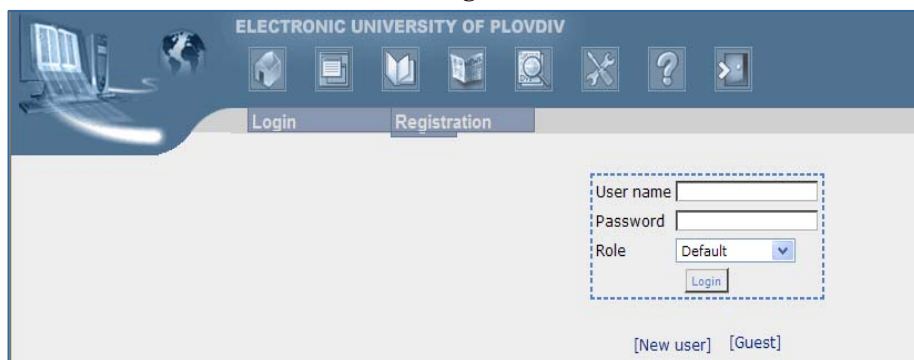
Enthusiastic professors and students in a number of universities started designing their own environments for virtual education. Examples of such environments accessible on-line at the moment are:

- ELSE-University of Rouse, e-learning Shell
  http://ecet.ecs.ru.acad.bg/else retrieved on 28.12. 2009)
- PeU-Plovdiv University (http://peu.uni-plovdiv.bg, see fig. 5);
- E-student–New Bulgarian University (http://student.nbu.bg retrieved on 28.12. 2009).

Other HEIs adopt some of existing open-code or commercial e-learning environments and collaborative platforms for the needs of their electronic tuition. Currently in Bulgaria the systems Moodle, Microsoft Class Server, IBM Lotus are the most popular for that purpose.

Obstacles
In spite of the high level of the Bulgarian research in the sphere of e-learning and irrespective of the improved technological basis, the level of practical implementation of e-learning in different levels and forms of education is not good. Some of the reasons about the still slow development of e-learning in education are:

- Lack of clearly stipulated government policy and legislation in regards to e-learning in degree courses and programmes;
- Lack of quality standards for distance learning/e-learning;
- Lack of knowledge and skills for e-learning courses and materials development;
- Lack of satisfactory financial compensation for the design and development of e-learning materials in state schools, universities and colleges;
- The poor reputation of e-learning amongst prospective employers,

CASE STUDIES

Bulgarian Case Study 1: Collaborative Learning and e-Assessment
At the South-Western University "Neofit Rilski" (SWU) the "Regional Center for Distance Education", the "Educational and technological center for e-learning", and the "Research laboratory for e-learning" have been established in the frame of several educational and research projects. In the last years a lot of e-learning courses in areas of computer science, pedagogy, geography, chemistry, etc. were developed and offered to full time and part time students in Bachelor and Master degree. Some of these courses have been adapted to the curricula for post graduated qualification of teachers in Informatics and ICT at primary and secondary schools. In order to support the e-learning courses the wide spread and popular e-learning environment Moodle is used. In the frame of the projects "Technological and didactical

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problems in e-learning" and "BEST", funded by National Scientific Fund, several modules and approaches with extensions of Moodle functionalities were developed. The modules for studying of learning styles of the students (Dureva, & Tuparov, 2008) and implementation of collaborative pedagogical method "Jigsaw" in Moodle (Tuparov, Dureva, & Zafirova, 2009) have been successfully implemented in the e-learning process.

The studying of learning styles with integration in e-learning environment is a prerequisite for future development of adaptive e-learning environments. Such studies give additional possibilities for design and development of more effective e-learning courses. The recognizing of students' learning styles allows for offering of suitable e-learning content and activities to the learners. The Jigsaw (Aronson, 2009) method is a strategy for collaborative activity management which allows each member of a particular group to work on a defined aspect of the learning content. From a methodological point of view, the Jigsaw method is very well developed and is successfully applied over several decades. It, however, has not been realized in any learning management system yet. The problem lies mainly by the specific way of grouping the learners. This approach is currently implemented at the SWU, Bulgaria with 26 students of the part time Master program "ICT in primary schools".

The students in this program have a Bachelor degree in Primary education and most of them are teachers at primary schools. The pilot courses are "Computer games and education" and "Didactics of ICT in primary schools". Both courses are realized in blended approach. The offered courses in SWU include different learning activities:

- Tests-widely used for examinations and self evaluation;
- Assignment-most of courses require development of a single or a group project;
- Discussions;

The learning content consists of web pages, presentations, interactive demonstrations and simulations. The interactive demonstration and simulation have been performed in the course "E-learning-technologies and platforms" of the part time Master program "ICT in primary schools". All simulations are SCORM based learning objects, developed with Adobe Captivate 3.0. (fig. 6 and fig. 7).

The opinion of the students is that simulations helped them to master easily learning content and to develop own e-learning content in training courses.

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Figure 6.
e-Learning course at SWU-
"e-Learning technologies and platforms"
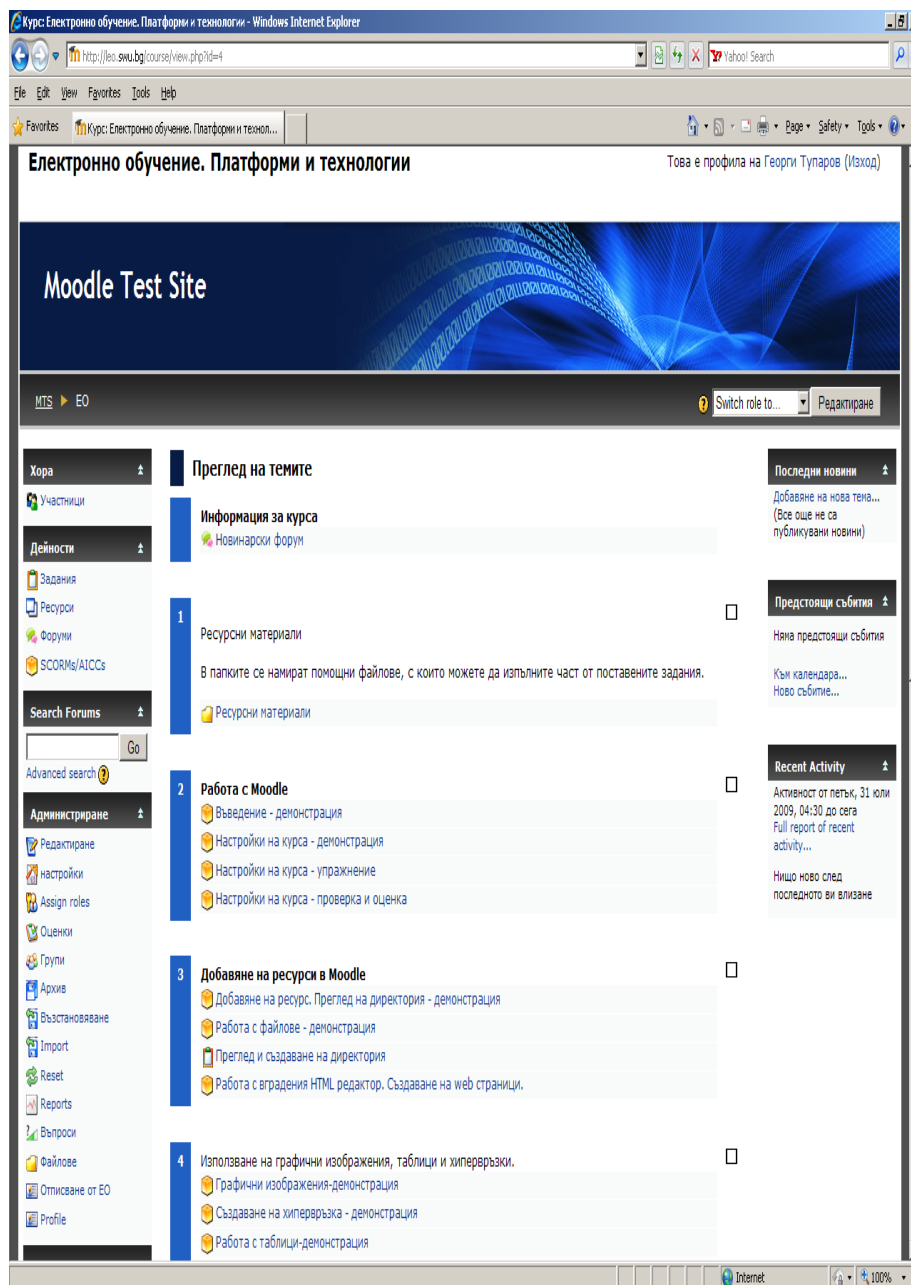
Figure 7.
SCORM object in e-learning course
"e-Learning- technologies and platforms"
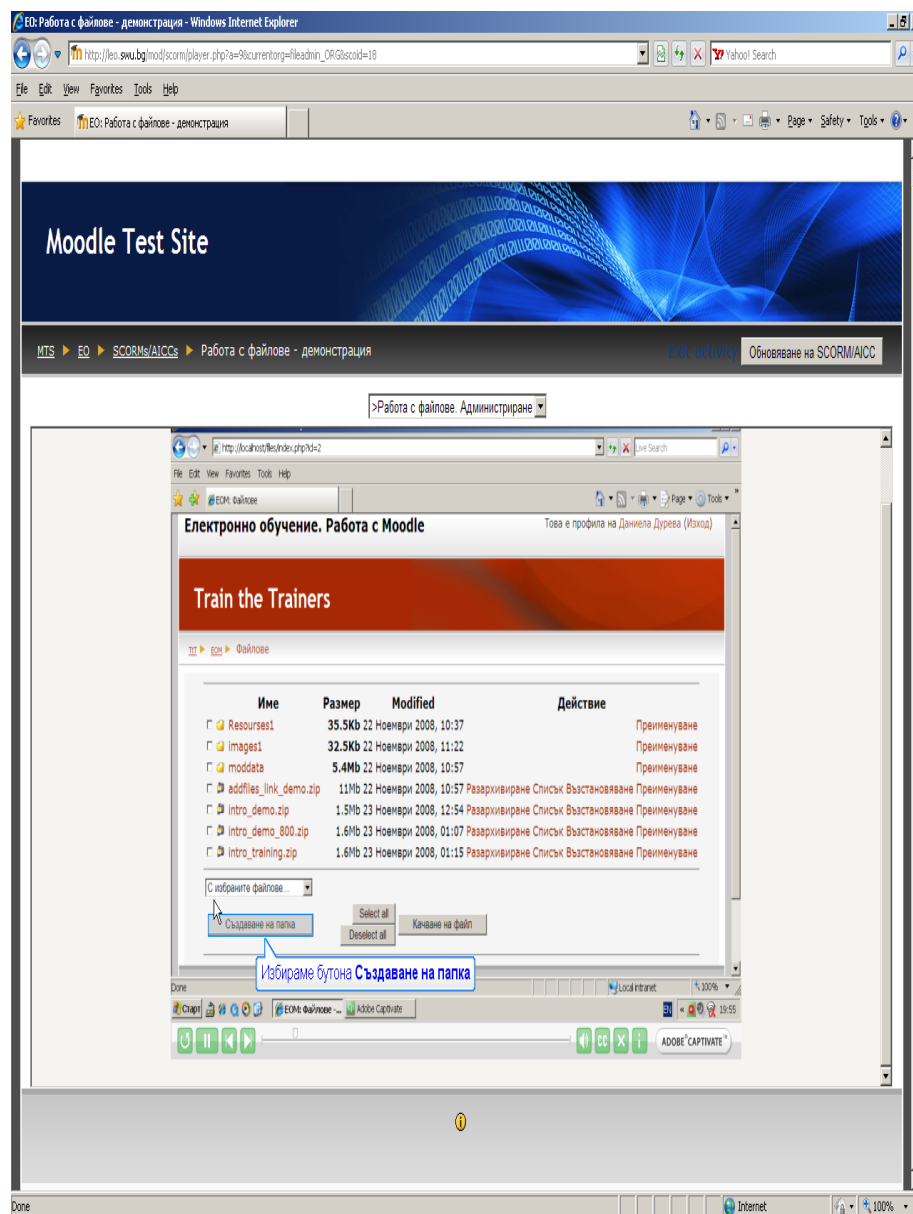
Bulgarian Case Study 2: An e-Assessment Approach

Over the last few years at the Plovdiv University a new approach to e-assessment is being experimented on. It is integrated in a software tool for e-testing that is being developed by a team from the Department of Computer Science. It seeks to introduce a proper intelligence into the e-test system. The substantial element in the approach (Sokolova, & Totkov, 2007; Totkov, Sokolova, & Doneva, 2005) is a classification of the so called accumulative question types (AQT), developed on the basis of the commonly used test question types.

Most of the scientific classifications of test questions are developed from an educational, psychological or pedagogical perspective (Pashin, & Metin, 1985; Dalton, & Smith, 1986; Bijkov, 1995; Rutter, 1978) and their automatic transfer to computer systems hampers the software implementation.

The regarded classification is done in respect to the questions' formal structure (in the point of view of their computer implementation). For example, the well-known test type 'Open Question with Short Free Text Answer' has the following common structure: <name, condition, assessment scheme, free text answer>. A lot of other question types such as 'Multiple Choice', 'Free Answer', 'File Answer', 'True/False' have the same composition of elements (see fig. 8), except for its last one, which by them belongs to another data type. Instead of free text answer, it could be a set of short text answers, file, etc. Thus, all of these test question types are related to (produce) one AQT class/type. The AQT main characteristic could be simply described as follows: the students' answers to a specific AQT question during the real e-learning process are used to accumulate necessary data, such as Student's answer, Answer count -how many students have that answer and the Answer grade-grading could be done automatically or by the teacher.

The idea of AQT allows using:

- The questions of AQT along with accumulated data as templates for generation of new test questions of some concrete type related to the given AQT.
- Questions of any concrete type related to the given AQT as templates to produce test questions of the related AQT, and as consequence-from all other related concrete types (see fig. 7).
- Test questions of AQT to measure the learner's knowledge level having the accumulated data.

Figure 8.
Question from type 'Free answer' can generate
or to be generated from other question types
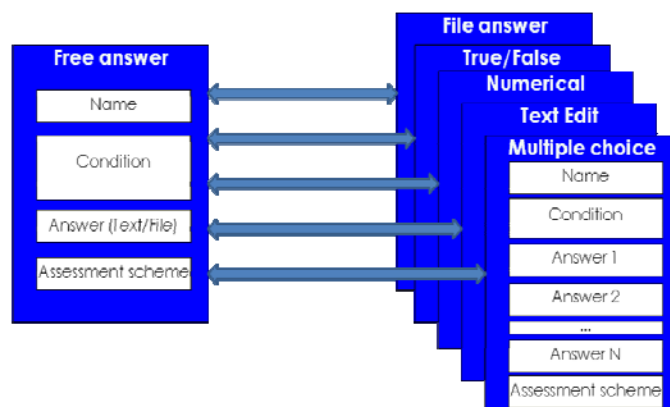
The above described approach allows overcoming some of the problems in e-testing (Sokolova, & Totkov, 2008):

- limited number of the offered test question types (well known e-learning environments have means for creation and usage of not more than 7 to 10 different test question types);
- lack of an adequate picture for the students' knowledge level;
- remembering of the assessment item by the students- automatic creation of different questions, automatic adaptation of the test process, etc.

Software tools for e-testing and e-assessment based on this approach are implemented both in the PeU 2.0 (Totkov, Sokolova, & Doneva, 2005) and BEST. In comparison to other e-learning environments, the PeU 2.0 supports 37 test question types. On the other hand, BEST (Bulgarian Educational Site) is a web-based platform for e-projects and e-learning management. Currently, BEST is at an experimental stage, integrated at the Economics and Administration College, Plovdiv (http://bell.uni-plovdiv.bg/best retrieved on 28.12. 2009), where it serves administrative support, e-learning, and distance learning purposes.

ISSUES

During the recent years Bulgaria marks a significant progress in relation to e-learning, but its level of spread, accessibility and quality is still

insufficient. The e-learning technology advance is hampered by the not completely developed ICT infrastructure in the country, the lack of good awareness and confidence, the shortage of relevant skills and literacy, and the lack of funds in both the private and public sectors. It is indisputable that the efficient applying of the e-learning in the education is a key priority on a national level. Following this great demand, this section could contribute to the initiation of an in-country debate on identifying the key challenges, which Bulgaria faces in the field of e-learning. To accelerate the pace of the needed reforms some of the main future challenges are pointed out. They could be systematized in the following groups:

- Acceleration of ICT infrastructure development on national and institutional/ organizational levels.
- Improvement of governance, including: adequate government legislation for e-learning; development of national and institutional strategies; guarantee for the academic autonomy of the HEIs; etc.
- Quality assurance, including: clarifying of the QA and control system for the e-learning (different from the one applied to the traditional education) and the criterion system for the quality of e-learning materials; establishing internal QA systems; involving of employers and students in developing QA policies; improving the quality reputation of the country; providing training for teaching staff – not only on a technical level, but more importantly in the pedagogical aspects of e-learning; etc.
- Opening the e-learning initiatives to each other and to the world by: development of a national network on the basis of those persons, institutions and universities, which have already embraced the idea of e-learning for the distribution of good practices and achievements in the area, for professional consultations and support of academic staff in the process of design and implementation of e-learning; adopting e-learning and technical standards for to facilitate the exchange of e-learning resources and tools; participation in international networks, internationalization of the educational system; mobility (incl. virtual) of students, staff and researchers; etc.
- Assuring sufficient funding by: offering competitive e-learning programmes and courses within Europe and world-wide; establishing mechanisms for more efficient ways of its funding and the use of funds; absorption of financial resources from EU Structural Funds; real and favourable providing of student loans; etc.
- Other challenges: innovation and technology transfer; balance between teaching and research; strengthening the universities' positions as centres for research and development; equal access to e-

learning offerings for all; strengthening the role of LLL; relevance of qualifications to the labour market needs; improving cooperation with employers/ businesses; etc.

CONCLUSION

The current situation in Bulgaria indisputably shows the widespread adoption of e-learning, for in the last few years it has become an irrevocable part of all forms, types, modes and levels of education.To all players in the educational sphere it is clear, that the e-learning can enhance the quality of education, can make the obtaining of knowledge and information considerably easier and thus improve the access to education, formal and informal learning, and employment opportunities. Especially concerned are people with disabilities, those who live in remote rural areas, and full-time employees, who wish to fit courses around their work schedules. But the new era requires providing of constructive, open, dynamic, interconnected, distributed, adaptive, user friendly, socially concerned, and accessible e-learning services. Even though the e-learning in Bulgaria has made up to now a big quantitative and qualitative advance, it could be concluded that still a lot is to be done. In order to meet the new requirements and challenges, special efforts related to e-learning have to be made in the following main directions:

- Quality assurance-Providing good online instructions, learning materials, student support, delivering tools, infrastructure, administration, etc.;
- Training of trainers-Providing e-learning trainers with continuous training and support in the process of teaching, in their technical skills, etc.;
- Financial support-Investments in e-learning science research, practical implementation and dissemination;
- Links with other sectors-The interaction between educational institutions and social partners-such as enterprises, public administration, and non-governmental organizations-with respect to training activities should be strengthened. It will raise the dissemination of science and education into the society and the developing knowledge-based economy. E-learning should become a standard feature of employee training;
- E-learning standardization-The adoption and implementation of standards, affecting different aspects of e-learning and e-education, is an issue of great interest for all organizations, authorities and experts, working in the field of education at an European and

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international level. The formation of a national policy for e-learning standardization is a solution that would help Bulgaria overcome the numerous problems on the way towards the building of a unified educational information environment, etc.

Acknowledgment

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CHAPTER-5

eLEARNING IN EGYPT

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ABSTRACT

This chapter summarizes the current situation of using the e-learning technologies in Egypt. Higher education in Egypt faces many challenges like

- high student numbers,
- financing of education,
- governance and management of the education system, and
- quality assurance.

Therefore, the national institutional ICT policies and initiatives adopted the e-learning as a teaching strategy to overcome the challenges of the traditional lecturing style.

In this manner, the National E-learning Center (NELC) was established, Egyptian E-learning University (EELU) established 2008 to provide e-learning nationally, regionally, and internationally.

And this is one of the Information and Communication Technology Project (ICTP) outcomes, to serve as a technical unit within the Supreme Council of Universities to promote and support the development of e-learning in Egypt by improving the development of the e-learning content.

COUNTRY

Egypt, sometimes referred to as the "Motherland of the World" and the "Land of Civilizations," is famous throughout the world for its ancient civilization and 7,000 year history along the Nile River.

Figure 1.
A map of Egypt

It is an important political and cultural centre of the Middle East.

Table 1. provides some selected socio-economic indicators for Egypt.

Figure 2. shows the growth rate for Internet users until year 2008 (MCIT, 2009).

Egypt faces significant challenges in harnessing its education system to promote its development plans.

Table 1.
Socio-economic Indicators

Indicator	
Ethnic groups	Egyptian 98%; Berber, Nubian, Bedouin, and Beja 1%; Greek, Armenian, other European (primarily Italian and French) 1%
Religions	Muslim (mostly Sunni) 90%; Coptic 9%; other Christian 1%
Languages	Arabic (official). English and French widely understood by educated classes.
Population	78.9 million (July 2006 est.)
Population growth rate	1.75% (2006 est.)
Internet users	12.57 million (2008)

The government has articulated a vision of an information society in which widespread access to technology can nurture human capital, improve government services, promote Egyptian culture, and support economic growth, and the ICT sector has been targeted as a vehicle for this growth and social development.

Figure 2.
The number of Internet users in Egypt increased to 12.57 million in 2008
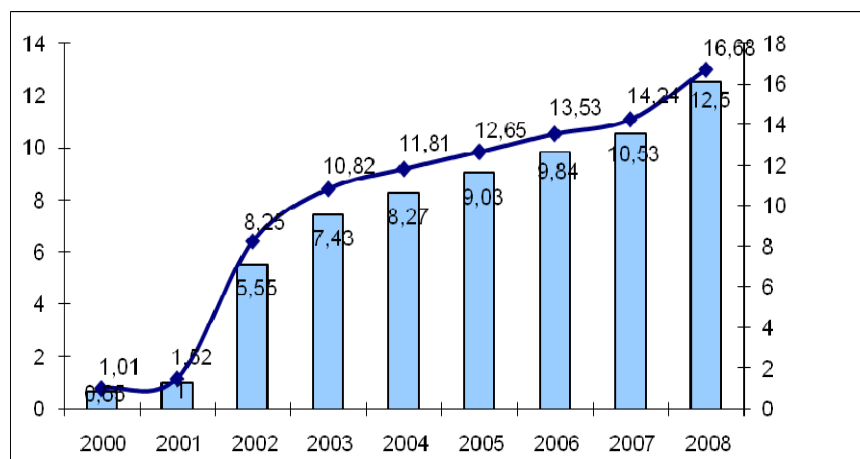
A national ICT policy has been adopted and is managed by the Ministry of Communication and Information Technology (MCIT), of which education is

one priority. This chapter summarizes the current situation, the prospects and the roadmap of using the e-learning technologies in Egypt.

EDUCATION SYSTEM

The education system (pre-university) in Egypt is state-sponsored and set up in three stages: primary school (six years), preparatory school (three years), and secondary school (three years). Basic education consists of the first two stages and is obligatory for all students in the country.

The higher education sector in Egypt has 2.4 million undergraduate students, 250,000 post graduate students, and 63,000 staff members.

It comprises universities and institutions of technical and professional training. The system is made up of 18 public universities, 15 private universities, 12 technical colleges, and 115 private institutions.

The Ministry of Education has jurisdiction for all levels of education through secondary school. Each of the 27 governorates has its own governance system.

The state Ministry of Education is responsible for the planning, policy formulation, quality control, coordination, and follow-up for all levels of public education, including the universities. The state government is responsible for most of education finance for both educational systems.

E-learning Solution

E-Learning is considered as a mean of alleviating conventional educational problems that faces Egypt (Abdel-Wahab, 2008). In academia, e-Learning is currently the focus of piloting and prototyping to provide innovative solutions to problems such as over-crowded classrooms, high prices of traditional educational books, transportation problems, need for continued education and specialized training, interaction with the international educational community and the enhancement of the level of national education (Fayek, 2004).

Fayek has reported on e-Learning projects under taken by the Ministry of Higher Education and the Ministry of Education. Examples were given of the Faculty of Engineering, Cairo University, with e-Learning related activities such as, conversion of text books to interactive CD-ROMs and pilot projects in virtual classrooms, as well as the American University In Cairo in using WebCT as a learning management system (LMC) and

providing a center for helping faculty members to convert their materials to web-friendly format. From a business standpoint, Egypt wants to become an exporter of e-Learning technology, especially contents in Arabic.

There are two significant government initiatives that should positively affect further the realization of e-Learning in Egypt; namely the Internet and Personal Computer Initiatives. Regarding The Internet Initiative, the Ministry of Communications and Information Technology is maintaining a free internet access nationwide since 2002, where more than 15,000 ports serving 2 million internet have been set-up, with users paying only for local dial-up phone tariffs.

Figure 3, shows that Internet access costs in Egypt are internationally competitive (According to the World Bank price basket methodology), the monthly cost of Internet service in Egypt was USD 4.50 in 2007, which compares favorably to the cost in its North African neighbors Morocco, Algeria and Tunisia (MCIT,2008).

Figure 3.
Internet access costs in different countries
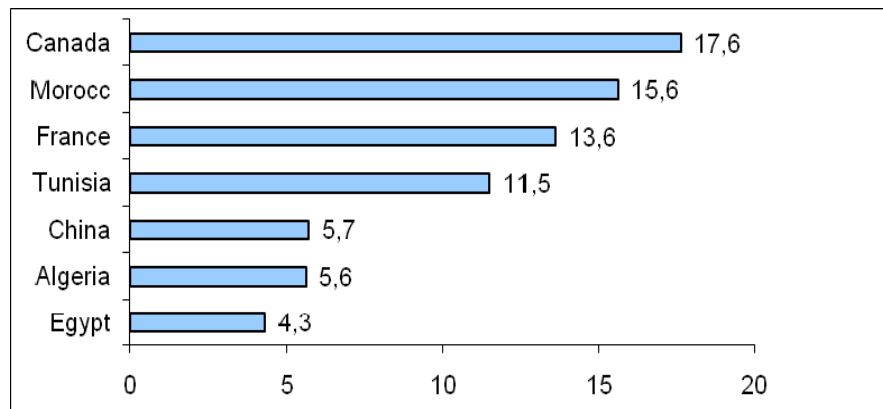
As for the Personal Computer Initiatives, affordable PCs and laptops have been made available to students and professional within a monthly installment plan that could be also financed up by a low interest loan. The result of these two initiatives allows people to be connected to Internet from home easily.

Figure 4, shows that 46% of individuals using the Internet for educational purposes, while 25.7% of individuals using the Internet in Egypt engage in

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communication-related activities, including sending and receiving e-mail, chatting and Internet phone communication.

Figure 4.
Purposes for individuals using the Internet in Egypt
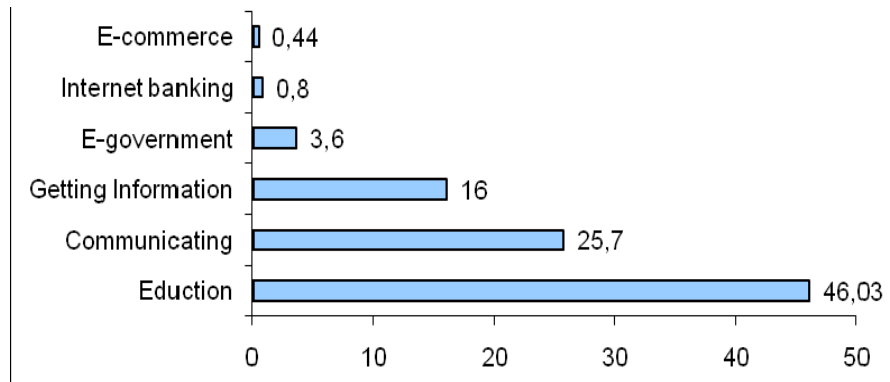
The National plans for ministry of education up to 2015 are as follows:

- Providing a computer, data show, and wide screen connected to the Internet for each class
- Providing computer labs in schools at the rate of one lab for every 15 classes
- Developing the production of software on scientific bases and linking it to curricula.
- Uploading the entire primary, preparatory, and public secondary schools curricula on the Internet so that the students can use them at school and at home, take exams
- that determine their level, and move from one class to another after passing the exams provided
- Extending virtual classes for effective transmission to include a class at least in each educational directorate
- Increasing the capacity of the international Internet of the ministry to allow the
- biggest possible number of people to log onto the ministry site, and to make use of the provided services especially the electronic education
- Expanding the tools of linking the Internet to the "E1 circles" (Internet connectivity)

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- that are specialized for exchanging information among schools, administrations, educational directorates, and the ministry to avoid overcrowding
- Expanding the use of ADSL (broadband) and leased lines in addition to what is available now in (dial-up) circles to help schools log onto the Internet.

Figure 5, shows that the number of broadband users in Egypt increased by 41% between 2007 and 2008 to reach 7.03 million, the total number of Internet users in Egypt increased by around 19% between 2007 and 2008, from 10.53 million to 12.57 million, and the number of broadband users increased over the same period from 4.99 million to 7.03 million – a year-on-year growth rate of 41%.

Figure 5.
Broadband users number vs total Internet users number
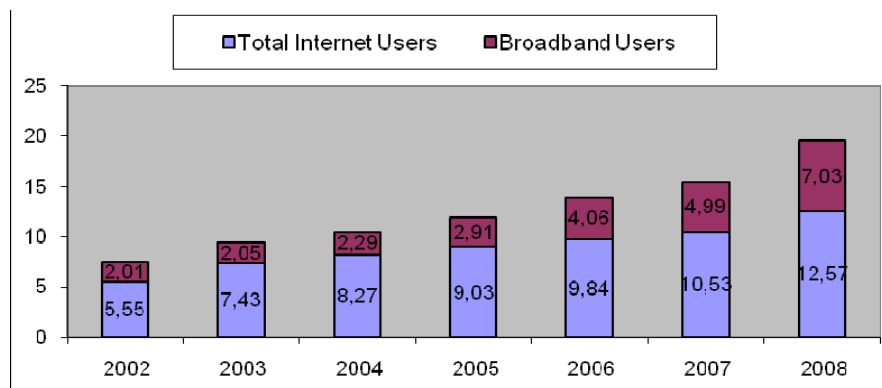
- Upgrading the equipment of the distance-training national net (video conference)
- Using video streaming to include rooms in schools
- Using distance interactive learning for testing the standards of those attending the training sessions in the video-conference halls, and for an active participation with the lecturer.

The past decade has witnessed great emphasis on success the National plans. The result can be summed up as:

1   Access to " the Egyptian educative network " was provided to educational institutions in order to make use of the beneficial

information available on it, such network is widely spread in 27 governorates , 249 educational unit and links 2700 school.

2   The ministry has been linked to an internet network with speed 20 mega bytes per second, whereas governorates have been linked to communication lines with speed 128 mega bytes per second or with E1 lines with speed 2 mega bytes per second.

3   The ministry provided the facility of getting access to the internet where:

- 22 thousands schools were linked to the internet. Figure 6, compares between the number of connected schools to the internet in years 2007 and 2008.
- 25 technological trail were provided
- 6 satellites used for distant training were being provided.
- 7.7 thousand school have been linked to the distant educational
- A video conference network was established to link 57 websites for the purpose of training & conferences.

Figure 6.
Around 87% of Egyptian public schools using computers
in 2008 were connected to the Internet
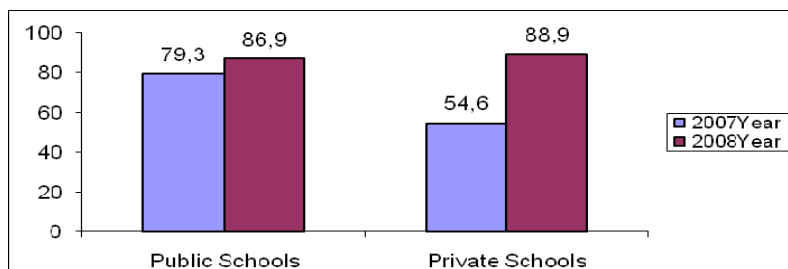
TECHNOLOGY

The Ministry of Communications and Information Technology (MCIT), firmly believes in the necessity of establishing a technology- and information-driven society, and considers it a priority to provide future generations with all possible opportunities to realize their dreams. MCIT's implementation of an e-learning initiative is a step in this direction. The goal is to equip students early on with skills that will permit them to work in any field, rather than allowing thousands to graduate who then cannot find work. Eventually, this will bring about a transformation from a traditional to a high-tech society.

The E-Learning Competence Center (ELCC) is one of many projects that aim to help Egypt's youth to find their way and to contribute to the growth of the economy. It was established in September 2004 by MCIT and Cisco Systems, a leading global communications company whose many activities include the provision of e-learning services that present a wide base for knowledge and training seekers. The center's mission is to contribute to Egypt's economic growth by enhancing workforce performance, boosting the skill development of the workforce and supporting efforts to educate youth in the use of technology. According to the agreement signed by Cisco and MCIT, the Cisco Learning Institute (CLI) is, for the first time, sharing its Virtuoso e-learning platform with partners. The ELCC's many objectives include; increasing Egypt's competitiveness by investing in human resources, creating a well-educated pool of human resources, training Egypt's workforce in the use of advanced technologies, disseminating quality training methods and creating a network of e-learning training centers. To achieve these objectives, a number of programs have been designed. At present, there are three programs:

- Essential Skills for ICT provides a thorough introduction to information
- technology, multi-user installation procedures and networking
- Building Internet Corporation focuses on leadership and management
- development/application with the aim of supporting a thriving business sector
- ICT and Business Development provides technology training for both children and adults

Other ELCC activities include a project to convert a part of the Ministry of Higher Education curriculum into an e-learning format. To facilitate implementation of its programs, the center has installed a Learning Management System (LMS), provided by the CLI, which is already working on adaptation of a series of Arabic Desktop Software Skills courses based on Microsoft's Unlimited Potential Program. The CLI has also certified the ELCC to deliver the IT Essentials Curriculum.

FACTORS INFLUENCE E-LEARNING

Economic Factor
One model expects that an investment of £2,163 LE per student per year will be sufficient to provide the infrastructure and content to address just the incoming undergraduate student problem alone. Students who can, will go

outside Egypt to get education will do so, which causes Egypt to loose hard currency. E-learning may stem this tide.

Legal Factor

No real policies are in place to compensate or protect e-learning content authors. The Supreme Council of Universities still does not accredited courses or degrees delivered through eLearning –expect for EELU started at September 2009.

E-learning Polices
- Educational administration and leading change
  - Improving the capabilities of high and level management on e-learning platforms (planning, following-up and implementation).
  - Introducing management information system into educational departments as part of transformation towards e-government.
  - Joining the schools and universities into an integrated e-leaning framework.
  - Finding financial resources to apply e-learning.
  - Establishing evaluation systems to measure the e-learning efficiency and ensure its quality.
- Building adequate environment for e- learning
  - Developing the legal platform required to apply e-learning.
  - Distributing the equipments and technical supports among the governorates/universities and schools on equal basis
- Structuring education system using the technological framework
  - Developing the instructors and the professors on how to teach using IT
  - Designing and building e-learning curricula and content.
  - Learning from the best practices in e-learning.
- Educational output and its Competitiveness
  - Empowering students in all educational levels to subscribe in e-learning programs.
- Accreditation and evaluation system for achieving economic effectiveness and quality
  - Developing evaluation system which can measure the student skills in efficient manners.

Socio-cultural Factor

The opinion was expressed that Egyptian students need to "learn how to learn." In other words, there is a fear that they lack the discipline required for self-paced learning. It is clear that beyond an elite circle, most people in

Egypt do not know what e-learning is really about, or how it can be used to improve the quality (and reach) of education. Even within educated circles, there is a big difference in depth of understanding. E-learning is still an evolving term in Egypt. The current e-learning efforts are largely funded by the government (need a Public/Private collaborative effort). The opinion was expressed that e-learning is less effective and less desirable than traditional classroom training, and that those learners who get their education that way will miss out on proper education.

Current Content Situation
- There is no large-scale production of courseware for the university and vocational areas (in Arabic).
- Some of the existing content in Arabic does not follow web-based training standards (SCORM/AICC) (Beckstrom, 2003).
- There is little evidence that content developers are trained in instructional design, learning theory and instructional technologies
- There is no Egyptian source for training e-learning course developers and
- Instructional technologists. Egypt has the human resources, but they need to be trained and developed as skilled instructional technologist/course developers.
- None of the e-learning providers are working in cooperation/collaboration. They are approaching e-learning on a very piecemeal basis. They are not holistic in their approach to e-learning.
- The programmers at the Ministry of Education centers are mostly focusing primarily on re-purposing existing content (from paper-based to web-based) rather than transforming courses to eLearning formats.

Content Providers
The following organizations and companies are among eLearning Content providers that are currently in use or are being actively marketed in Egypt in Arabi. ACE-GNC-NIIT-Horizon Interactive Studios–Information Technology Institute–Ministry of Education.

E-LEARNING AND ICT INTEGRATION

Schools
The government increased IT accessibility as follows:

- 2000 schools equipped with additional 8 PCs to bring the total number 13 PCs/lab.
- 2000 data shows delivered to 2000 schools (1 data show/school).
- 1400 schools equipped with extra PCs (17 PCs/school) to bring the total number 30 PCs/lab. (Total number of PCs delivered to schools is 39800 PCs)
- Modern Classrooms (laptop + data show + trolley):
- 1512 schools equipped with 3 modern classrooms each

Connectivity
- 1120 schools connected to internet using ADSL, from which 10 schools are wireless (9 WIMAX+1 CDMA)
- 59 technological development centers were connected to internet in order to be ICDL certified centers.
- Conducting training on ADSL to raise awareness in all schools in 27 governorates.

Enhanced education process management
- Installed a certified software application for on-line management (SMS) in the 2000 EEI schools (a school health care module is embedded in the SMS where each school has the ability to develop the health care profile of its students).
- Trained 200 IT specialists on SMS (ToT).
- Trained 4979 educational leaders (from all governorates)on Microsoft Leadership training to use ICT in managing the educational process Improved teaching and learning skills via ICT:
- TOT training for 966 teachers (464 ITTF, 502 JDP)
- Training of 45000 teachers and administrators on digital literacy program
- Training 67,019 teachers on using ICT in education (MS Innovative Teacher Program / Intel Teach)
- 633 teachers trained on Think.com
- 200 trained at Oracle Academy.
- 2616 trained on MOS (Microsoft Office Specialist)
- 351 trained on Cisco Academies
- Building the capacity of 7864 parents to use ICT tools (Microsoft Parents Training).
- Building the capacity of 5368 students on the MS Junior Developer Program.
- Building the capacity of 35000 students on the Intel Learn Program. Improved teaching material delivery:

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- A comparative study of local and regional available e-content has been conducted based on international standards.
- Trained 57 developers from the MoE e-content developing team on e-content development according to the international standards.
- A Computer Aided Lesson Design (CALD) tool developed by Microsoft in Partnership with MoE and MCIT.
- Built a library of 1250 high quality learning objects with a search engine to be used through CALD for designing the teacher lessons.
- MoE accreditation of 3 local e-content offered by local partners (PC Lab) and distributed to EEI schools.
- Piloting CALD in 100 EEI schools in 6 governorates 3/7
- Peer Coaching training (ITN & CALD) to 15 teachers for 4 days in Mubarak City
- Drafting Web2 assignments for second term for Social Studies subject
- WEB2.0 ToT conducted to 14 trainees (9 from MoE & 5 from outreach team) for 3 days.
- Conducting training in Pharaana School for implementing WEB2.0 technology. The teachers and some students created their blogs.

Higher Education

On a national level, there are several programs operating to address the issue of e-learning centers at the higher education level. The effort of ministry of higher education can be summed up as:

Reducing ICT Illiteracy:

- 3000 administrative staff & faculty members trained on ICT illiteracy (Microsoft DL Program).
- 200 administrative staff trained on MIS (MS) Improving teaching and learning skills:
- 814 faculty staff members trained on e-content development (Microsoft).
- Training of 4 professional teams (28 technical) to develop e-content (IBM).

Enabling E-Learning in Higher Education

- 18 e-learning labs (6 PCs + server + LAN) have been installed in all universities (17 public universities + Alazhar University).
- 20 e-learning labs for students (20 PCs + LAN) accessibility have been installed in all universities and branches. Figure 6, shows that 81.4% of Egyptian higher education institutions had computer labs

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and Internet access in 2008, and 98.7% of Egyptian higher education institutions had PCs in 2008, while 81.4% had electronic labs.

Figure 7.
81.4% of Egyptian higher education institutions
had computer labs and Internet access in 2008
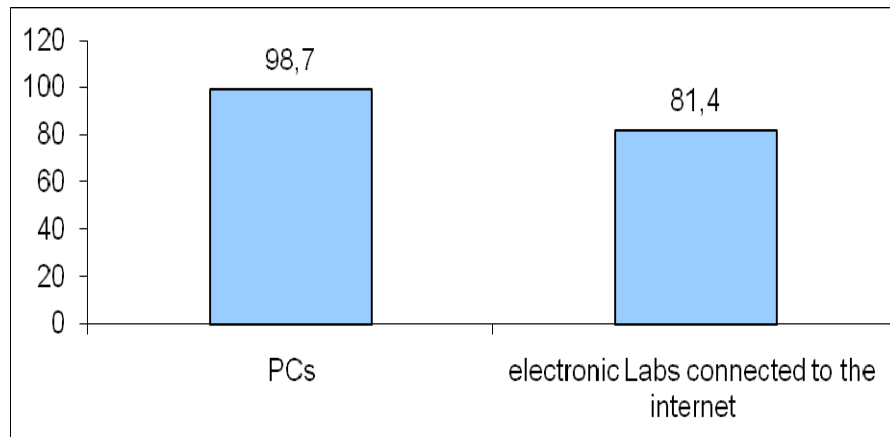
- Equipping Faculty of Engineering–Ainshams University with a wireless network (Siemens).
- Equipping Faculty of Engineering–Assiut University and Ainshams University with latest technologies of e-learning offered by HP (the 2 faculties of Engineering won the labs in the HP e-learning competition).
- Developed and inaugurated phase I (1.2 million scanned research pages) of Science and Technology Portal.
- Multinationals' e-content:
  - The NetAcad curricula of Cisco were mapped to the Technical Colleges Curricula (3 colleges).
  - Creating a CCNA network in all faculties of Engineering and Computer Science (36 faculties).
  - Currently studying e-courses from Microsoft and Oracle to be accredited as part of the higher education curricula in all faculties of Engineering and Computer Science (36 faculties).
  - Studying MS e-content for disabled (visually impaired/hearing impaired) for TOT training.
  - Getting new 30 Cisco CCNA bundles to be used in all universities
  - Multicore was implemented in Cairo University
    ICDL was accredited and implemented in Helwan University

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Improving Faculties of Education
- Accrediting *Intel: Teach to the Future* course as an undergraduate course in all faculties of education (26 faculties).
- Implementation of *Intel: Teach to the Future* started fall 2007 in 12 faculties. Summer training of 7021 undergraduate students from all faculties of Education on MS Innovative Teacher Program
- TOT training on *Intel: Teach to the Future* in all faculties of Education
- Focused training of 120 Master trainers staff members in faculties of Education on

Exposing Students to Advanced ICT Tools
- Current training of 3,000 students on ICDL
- 220 undergraduate students were trained on advanced ICT tools.
- Trained 500 teaching assistances on advanced ICT tools (Oracle).
- Currently all faculties of Engineering and Computer Science are joining 2   international academic initiatives offered by Oracle and IBM allowing them to get exposed to more than 1000 technical e-content as well as development tools, aiming an improvement in the software industrial sector at large and e-learning technologies in particular.

Enhancing ICT Infrastructure in Higher Education
- Inaugurating phase I of the Egyptian Universities Reasearch Network (34Mbps to all universities and research institutes, connection to Internet II)
- Equipping the above network with a video conferencing system interconnecting all public universities + Alazhar University.
- Equipping the new Cultural Affairs and Scholarships premises with the necessary ICT infrastructure and video conferencing system interconnecting it with 10 remote Egyptian cultural bureaux abroad.
- Equipping 4 faculties of Engineering and computer science in 4 Universities (Cairo, Assiut, Alexandria and Mansoura) as well as the Information Technology institute (ITI) with Multicore labs, offered by Intel.

Track Events
- Assiut and Einshams universities won 2 awards in the international e-learning competition offered by HP.
- EEI cooperation protocol between MCIT and MoHE signed.
- EEI cooperation protocol between 4 universities and Intel signed.

Egyptian E-learning University (EELU)

EELU (http://www.eelu.edu.eg/wps/portal) is a private non-profit University established with the Decree, No. 233, of the President of the Arab Republic of Egypt in the 16th August 2008 to provide distance education through 24-hour online learning with a vision to be a leading university providing e-learning nationally, regionally, and internationally.

EELU gives educational opportunity to learners who cannot attend a campus university. The scope of EELU is not only intended to cover Cairo but also can be extended to cover all the governorates in Egypt and some Arab countries and as a start point there are three learning centers located in Cairo, Delta (Tanta) and upper Egypt (Assuit).

Students can access courses' materials, lectures, and any piece of information through both the EELU Intranet and the Internet.

This type of learning permits collaboration between the students and the instructors and among the students themselves. In addition, students can learn remotely from different geographically distant locations.

In this manner, EELU provides a virtual educational environment that reduces dependence on the concept of physical and geographical proximities between student and teacher and in the mean time provide maximum educational interactions, benefits and management.

Other Relevant Initiatives

Higher Education Enhancement Project Fund (HEEPF) and TEMPUS have funded more than 75 projects in the Egyptian universities to develop e-content in different fields (http://www.heepf.org.eg).

Although the worldly recognized e-learning was not clear for many of the faculty staff members participating in HEEPF projects, yet many projects developed electronic courses that could be displayed on a screen using the PowerPoint (453 courses distributed on 64 projects) during the four cycles of HEEPF first phase.

When calculating the number of courses that were subject to e-learning, they were 213 courses using one of the e-learning management systems (LMS), i.e. Moodle and A-Tutor.

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Figure 8.
A graph of the number of electronic courses produced for the
undergraduate and postgraduate stages
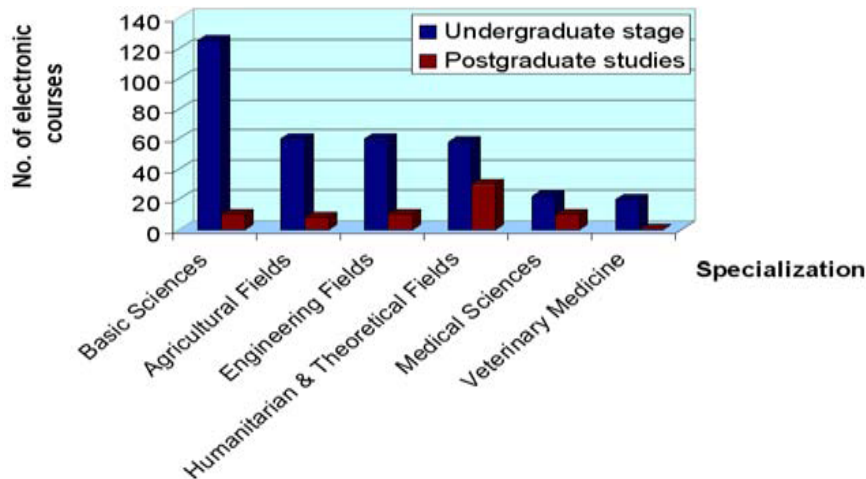
The graph in Figure 8. (HEEPF, 2008), shows the number of electronic courses produced for the enhancement of the educational process in both the undergraduate and post-graduate stages according to the different theoretical and scientific specializations through HEEPF financed projects during the four cycles. The share of different specializations and universities of electronic courses can be summed up as follows:

- Sciences: (147 courses of which 46 were subject to e-learning systems). Assiut
- Univ. produced the largest number of courses in sciences. Compared to other universities, Helwan Universty excelled in the number of courses that were subject to e-learning systems.
- Engineering: about half the number of science courses (72 courses). Cairo Univ. comes at the top with regards to the number of courses that use e-learning systems.
- Information Technology: (7 courses)
- Medical sciences (Medicine, Pharmacy, and Dentistry): (30 courses implemented through 11 projects of which 26 use e-learning systems)
- Agriculture: (78 courses produced through 9 projects of which 23 used e-learning systems)

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- Higher Institute for Public Health: (7 courses produced through one project)
- Veterinary Medicine: (23 courses produced through 7 projects)
- Education: (57 courses produced through 5 projects of which 46 use e-learning management systems) The Faculty of Girls had one project which developed 8 courses using e-learning systems.
- Arts: (24 courses produced through 2 projects)

National E-learning Center

The National E-Learning Centre (NELC) is a building block within the Higher Education Information Center, SCU.

Its primary objective is to 'promote and support the development of e-learning in Egypt by improving the development of the learning content to the highest maturity level, to achieve strong presence both locally and regionally'. The further objectives of the NELC (http://www.nelc.edu.eg) are to

- provide an e-learning infrastructure to defined, high quality specifications;
- provide a range of e-learning tools to defined, high quality standards;
- provide information, training and support for staff and students in the use of e-learning tools and facilities, in collaboration with the universities;
- provide nationwide co-ordination for e-learning development, where the centre will integrate courses produced by other projects;
- focus on both asynchronous and synchronous learning;
- produce courses on a competitive basis;
- promote the use of appropriate standards and specifications in e-learning development, including conformity with accessibility guidelines and standards;
- provide support to universities in their evaluations of e-learning developments and, where appropriate, carry out such evaluations, especially at institutional level;
- adopt standards for courseware development in Egypt;
- encourage courseware export and offshore development.

In order to meet these objectives, the NELC's revised a strategic plan aims to develop a robust infrastructure at each of the public universities, capable of facilitating an effective e-learning system. This will be achieved through the establishment of an e-learning centre at each of the 17 Egyptian

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universities. These centers are able to develop pedagogically sound e-courses that fully utilize the potential of ICT in an interactive way. Each will be staffed by a centre director, instructional designer, e-content developers, graphics designers and subject-matter experts. The NELC monitors the progress of the university centers and develops national standards. The university centers are networked with the NELC through the Egyptian Universities Network (EUN).

DISTANCE EDUCATION

Arab Open University

A branch of the Arab Open University (AOU) that offers distance learning, including e-learning, opened in Cairo in February 2003. The Arab Campus ELearning System (ACES) is a learning-management system that provides a virtual learning environment. It is built on a foundation of two key elements: computer technology and education. ACES tools fall within four broad categories: content-delivery tools, synchronous and asynchronous communication tools, assessment tools and course-management tools. It relies heavily on the tutoring process, which aims to promote a proactive environment of learning. Course lectures are laid out in a programmed and progressive mode via textbooks and supporting notes, and other supplementary forms of delivery media based on audio and video cassettes, CD-ROMs and online web sites.

These various components work together to offer an environment of supported open learning. In co-ordination with UNESCO, the university is working on developing a telecommunications network linking all of its branches in the Arab countries. In addition to teleconferencing, this network will allow the AOU to transmit lectures delivered in any branch to all the other branches, where they can be shown concurrently or recorded for later viewing. Within this framework, the AOU also aims to set up a virtual library to allow students to access electronic sources located at a number of Internet sites, providing a nucleus for back-up sources of electronic learning.

Mediterranean Virtual University

The Mediterranean Virtual University (MVU) brings top universities in the Mediterranean region together with two European Union universities – the University of Strathclyde (Scotland) and the University of Aalborg (Denmark). The MVU will establish a network of universities that collaboratively will build online courses and deliver them to students across the region. Initially, the courses will be in IT-related areas, defined in

partnership with industry and relevant to its needs. They will be facilitated using live videoconferences with subject experts, streamed video lectures, online text-based discussions, online assessment, interactive courseware and simulations. The Faculty of Computer and Information Sciences at Ain Shams University in Egypt is one of the project partners.

Avicenna Virtual Campus

The AVICENNA project is dedicated to accelerating the adoption and best use of ICT-assisted Open Distance Learning (ODL) in 11 Mediterranean non-EU Member States (MNMS). Demand for ODL in the target Universities and societies already exist. The project aimed at establishing adequate local infrastructures and transferring best practice and professional know-how within target universities.

It was stimulated and met by the sensitive engagement of some of the EU's leading Open Universities and ODL providers, under the aegis of UNESCO. Together with European universities they formed a network of 15"AVICENNA Knowledge Centers" (AKCs). Adequate expert support, intensive training of key personnels in "AKCs", content sharing and translating created the conditions for a successful take-up of ODL within the target universities and countries, while reducing the cost of such an initiative. This implies that all the centers respect common standards and norms with regard to technology and ODL services, including facilities for blind students. Each country has already identified its own AVICENNA Knowledge Centre (AKC). The Faculty of Computer and Information at Cairo University in Egypt is one of the project partners.

Lifelong Learning Track

The lifelong learning track aims to attain the goals set by the Government of Egypt to close the information gap and accelerate the introduction of the knowledge-based society. Lifelong learning is designed to mobilize the education and training of communities, along with economic, social and cultural players concerned. The lifelong learning track will be realized using e-Learning technology. E-Learning has the potential to strengthen the partnership between the public and private sectors and between the stakeholders involved in education, training, and content development.

The component's output consists in the construction of a knowledge-based society accelerated through utilization of e-Learning technologies in lifelong learning. In doing so the Government of Egypt is seeking to close the information gap that exists within Egyptian society, accordingly the government believes that e-Learning has the innate potential to offer to

component participants the opportunity to strengthen existing work skills and compliment their abilities by ITC training. E-Learning will build capabilities using the latest cutting edge tools and techniques.

A lifelong learning portal will be developed and sustained to offer participants' relevant material and information about related skills and competencies. The portal's design will be partially based on lessons learned from other such e-Learning portals using partnerships to foster its construction. The establishment of an e-Learning Competence Center (ELCC) and an R&D Division within Ministry of Communication Information and Technology will be a key source for innovation within this component.

The ELCC and R&D division will assist in the creation of national e-Learning standards that will streamline the deployment of e-Learning courses and subcomponents nationwide. Additionally, the development and localization of courses based on fundamental skill sets, such as Business Fundamentals Course(s) teaches component participants crucial concepts in fiscal management.

This will allow participants to be more ably to handle their related work and personal responsibilities. These courses will be piloted by the ELCC and use e-Learning delivery systems that will utilize the Lifelong learning portal among other delivery tools.

ISSUES

Despite the progress and steps taken in Egypt in order to disseminate the information technology in the education sector there are major challenges still exist and can delayed the adoption of e-learning as follows:

- Setting an e-learning strategy for organizing the educational process, defining its objectives, its components, and the implementation mechanisms.
- Empowerment of students in all educational levels through an active educative system, where scholars can choose the courses they would like to study.
- Designing the educational courses & subjects and Defining the personnel responsible for periodic maintenance and continuous improvement of the program & its electronic means.
- Using electronic means for teaching & delivering various subjects.

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- Accreditation and evaluation criteria that would be used by the educational institution to guarantee its success & excellence.
- The financial support for the faculty member since they find that selling their books is one of most important source of income and no clear policy about the financing operation of e-learning.
- Focusing on equipment rather than training, concentrating on copying current education curricula on CDs rather than modifying them to match modern technologies.

Staff Development and Research

The main consideration in hiring academic staff into permanent positions is the merit of their undergraduate academic results, without considering actual competency or potential ability in teaching or conducting research. These undergraduate teachers often lack the experience and expertise to teach, thus impacting on the quality of teaching.

Other challenges faced are that the salaries of academic staff are very low, and their workload allocation leaves little time to prepare for teaching. The very high loading of staff has a direct impact on the average quality of graduates.

There are only two formal promotion exercises carried out during the entire career of an academic, and there are no mechanisms to measure quality of teaching or accountability, such as annual reporting by staff on the work, they have done.

The working environment in most faculties does not appear to be conducive either to innovative teaching or to carrying out research. Office spaces are not sufficient or adequately used, and, as a rule, universities do not provide academic staff with computers (Said, 2001). Egypt's administrative-to-teaching staff ratio of 4:3 is high by international standards, and university officials cannot readily remedy this because personnel management is constrained by regulations that make termination difficult.

Therefore, the share of public spending devoted to actual teaching is low. In addition, there is no mandatory retirement age, resulting in more senior faculty members and fewer junior teaching staff to meet the teaching needs of students.

Nearly all full-time faculty members are permanently appointed from the outset (Said, 2001). According to Hassan (2009), the environment at most

universities does not foster research productivity or innovation by staff members.

The main incentive to initiate and publish research is to fulfill promotion requirements rather than to produce quality and innovative research.

In addition, the quality and quantity of research is affected by limited funds, lack of remuneration and poor relationships between industrial enterprises and universities. Internationally cited research work emanating from Egyptian universities is relatively sparse and disproportionately low considering the number of faculty members working in Egyptian universities.

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CHAPTER-6

eLEARNING IN ESTONIA
Cooperation Models for National e-Learning Development in Estonia n Example of the Estonian eLearning Development Centre

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ABSTRACT

In this chapter evolvement of the Estonian e-Learning Development Centre (Estonian Information Technology Foundation) will be analysed during its five years of operation. Attention will be paid to processes that were the drivers behind the formation of the Estonian e-Learning Development Centre and contributed to its sustainability.

COUNTRY

Estonia, officially the **Republic of Estonia** is a country in Northern Europe in the Baltic region. Its territory covers only 45,227 km² and is divided into 15 counties. Estonia is a democratic parliamentary republic. Its capital and largest city is Tallinn. Estonia was a member of the League of Nations from 1921, has been a member of the United Nations since 1991, of the European Union since 2004 and of NATO since 2004. With only 1.4 million inhabitants, Estonia comprises one of the smallest populations of the EU countries (http://www.virtualcampuses.eu).

In 1918, the Estonian Declaration of Independence was issued, to be followed by the Estonian War of Independence (1918-1920), which resulted in the Tartu Peace Treaty recognizing Estonian independence in perpetuity. During World War II, Estonia was occupied and annexed first by the Soviet Union and subsequently by the Third Reich, only to be re-occupied by the Soviet Union in 1944. Estonia regained its independence in 1991 and it has since embarked on a rapid program of social and economic reform. Today, the country has gained recognition for its economic freedom, its adaptation of new technologies and as one of the world's fastest growing economies.

The official language in Estonia is Estonian, which belongs to the Finno-Ugric language family and is closely related to Finnish. Along with Finnish, English, Russian and German are also widely spoken and understood. The major minority language is Russian with its speakers making up about 30 % of the population. Russian-language education is provided in public and also in private schools at all levels: pre-school, basic and secondary schools, as well as vocational schools higher education institutions. About 24 % of all Estonian school children attend Russian-language basic and secondary schools. Some 10 % of higher education students study in Russian (http://www.hm.ee/kogumik2009/en/open.html)

Figure 1
A map of Estonia

Source: http://geography.about.com/od/findmaps/ig/Country-Maps/Estonia-Map.htm

EDUCATION SYSTEM AND POLICY

The Estonian Constitution states that everybody has the right to an education. Attending school is compulsory for all school-age children to the extent established by law, and is free in general education schools established by state and local governments. In order to make education accessible, the state and local governments are financially responsible for

maintaining the necessary number of educational institutions. The law allows the establishment and operation of other types of educational institutions, including private schools. Everybody has the right to an education in the Estonian language. In an educational institution in which minority students predominate, the language is chosen by the educational institution. Education is under the supervision of the state. The Education Act has established that the objective of education is:

- Creating favorable conditions for the development of individuals, family, the Estonian nation, national minorities and Estonian economic, political and cultural life in the context of the world economy and culture;
- Developing a law-abiding citizenry;
- Providing conditions for continuing education.

A wide network of schools and supporting educational institutions has been established in Estonia. The Estonian educational system consists of state, municipal, public and private educational institutions. The Education Act states that in accordance with the UNESCO international standard of education classification, education has the following levels: pre-primary education, basic education, secondary education and higher education. Each level has its established requirements, which are called the state educational standards and are presented together with state curricula. The curricula contain the mandatory study programs, time scheduled to cover the programs, and descriptions of compulsory knowledge, skills, experience and behavioral norms.

The Republic of Estonia Education Act *(*hereinafter Education Act*)* stipulates the organisation and principles of the education system. According to its objectives, education is divided into general education, vocational education and hobby education. Education has the following levels: preschool education, basic education (first level of education), secondary education (second level of education) and higher education (third level of education). All information regarding the Estonian education system is entered into the national online register EHIS – the Estonian Education Information System (www.ehis.ee). EHIS includes data about educational institutions, students, teachers, study modules as well as education licences and educational certificates. Children who turn 7 years of age by 1 October of the current year are obliged to attend school. Before starting school children usually attend preschool child care institutions. The compulsory schooling obligation applies to children until they acquire basic education or turn 17 years of age. Pupils in grades 1 to 9 acquire basic education. In grades 7 to 9, they also have the opportunity to enter into vocational training in the field that interests them.

Pupils who do not finish basic school and who are at least 17 years old can enter vocational education without the requirement of basic education (0.5 to 2.5 years, only professional skills are acquired) and/or continue acquiring basic education in an adult upper secondary school.

After basic education, pupils have four options for further studies
- Upper secondary school – general secondary education is acquired (3 years);
- Upper secondary school with vocational training (preliminary vocational training) –general secondary education and some professional skills are acquired (3 years);
- Vocational educational institution –secondary vocational education is acquired (at least 3 years);
- Vocational educational institution –professional skills are acquired without general education (1 to 3 years).

After secondary education, pupils have three options for further studies
- Vocational educational institution – vocational education (0.5 to 3 years) or professional higher education (3 to 4.5 years) is acquired;
- Professional higher education institution, colleges of universities– professional higher education (3 to 4.5 years) is acquired;
- University–academic higher education is acquired; Bachelor's degree (3 years) -Master's degree (2 years) -doctoral degree (3 to 4 years).

Further education in the adult education system allows employed persons to
- Complete unfinished basic or general secondary education in the form of evening classes or distance learning or as an external student;
- Acquire vocational or secondary vocational education in the form of part-time study;
- Acquire higher education in the form of part-time study or as an external student.

Acquisition of general secondary education and secondary vocational education is free whilst acquisition of higher education in the form of part-time study usually requires students to pay tuition fees.

Employed persons can also attend
- Professional training courses for adults in several private schools, vocational educational institutions, professional higher education institutions, and universities and professional associations;

- Informal training courses at folk universities, informal training centres and cultural centres.

Figure 2.
Estonia Education tree

Estonia's higher education system has two branches comprising different types of institutions. Universities are institutions focused on research, development, education, and culture.

The activities of universities are aimed at the implementation of basic and applied research on par with international standards.

One of the preconditions of this process is the provision of second and third level theory-based higher education focused on research. Institutions of professional higher education and, as an exception, some vocational educational institutions prepare motivated specialists with good professional skills at the first level of higher education, taking into consideration the needs of the labour market.

The prerequisites include the flexibility of curricula and their focus on practice as well as close cooperation with companies, professional associations and other social partners in the relevant field.

The Government of the Republic may permit the opening of a master's study curriculum in an institution of professional higher education.

As of March 2008, there are six institutions of professional education in Estonia that have the right to conduct master's studies.

In addition to universities in public law, state institutions of professional higher education and some vocational educational institutions, opportunities for acquiring higher education have also been created in the private sector.

These include privately owned universities, professional higher education institutions and vocational educational institutions.

As of 30 March 2009, 34 educational institutions offer higher education in Estonia and can be divided as follows according to their form of ownership:

- 6 universities in public law
- 4 privately owned universities
- 10 public professional higher education institutions
- 11 private professional higher education institutions
- 2 public vocational educational institutions
- 1 private vocational educational institution

Figure 3.
Change in the number of higher education institutions
from 1990/1991 to 2008/2009
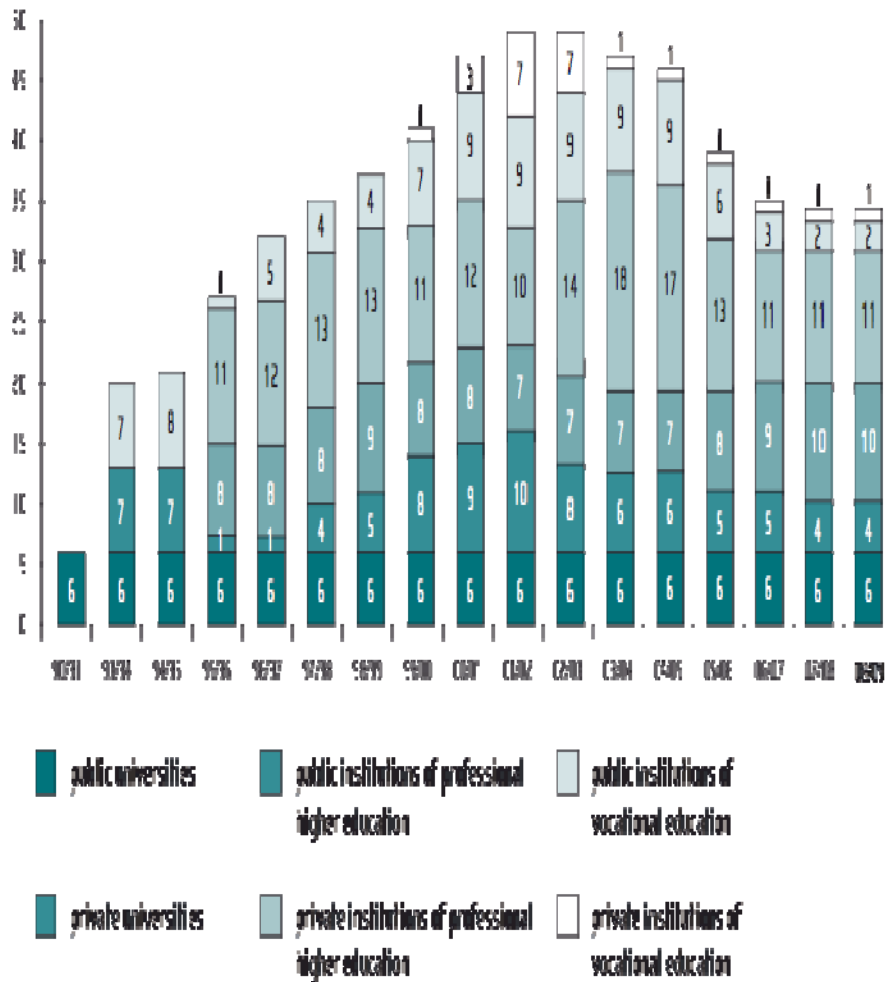
The number of students studying according to higher education curricula has increased 2.7 times in the 2008/2009 academic year, compared to 1994/1995 – growing from 25,000 to 68,000 (http://www.hm.ee/kogumik2009/en/open.html) The higher education system is regulated primarily by the Universities Act, the Institutions of Professional Higher Education Act, and the Private Schools Act. The higher education system is also regulated by the following legislation:

Figure 4
Total number of students and the change thereof (%) when compared to the
previous academic year from 1994/1995 to 2008/2009
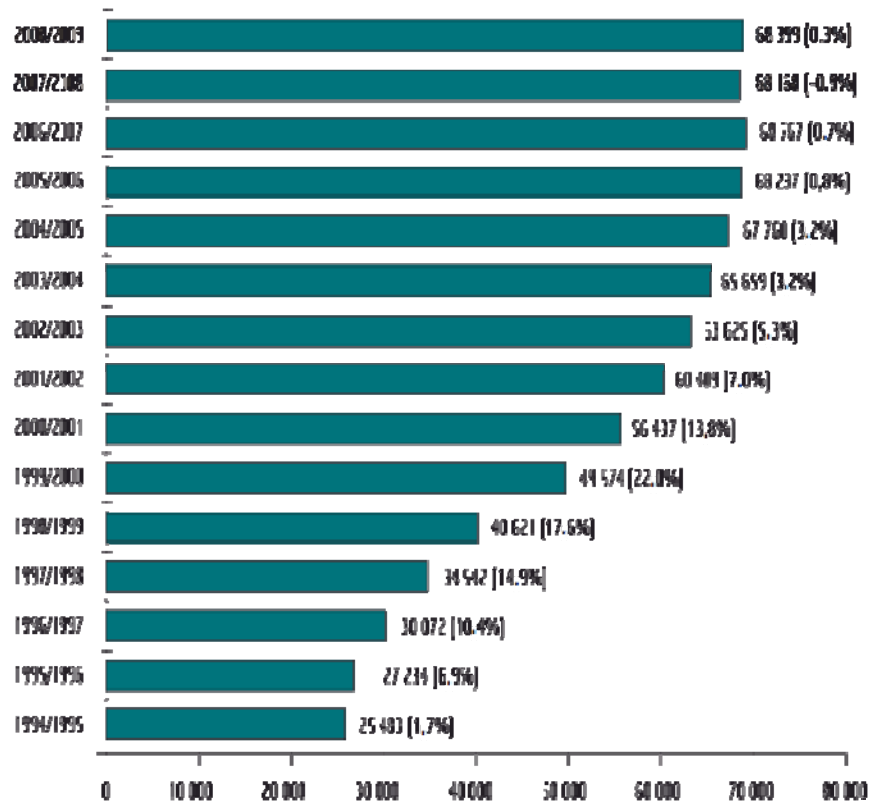
- Organisation of Research and Development Act
- Study Allowances and Study Loans Act
- Adult Education Act
- Standard of Higher Education (regulation of the Government of the Republic)
- Conformity of the qualifications of the Republic of Estonia and the qualifications of the former Union of Soviet Socialist Republics prior to 20 August 1991 (regulation of the Government of the Republic). (http://www.hm.ee/kogumik2009/en/open.html)

One of the most important framework documents in addition to the acts and regulations listed above is the Higher Education Strategy for 2006–2015 approved

with a resolution of the Riigikogu on 8 November 2006, which defines the development objectives for Estonian higher education until 2015. The aim of the strategy is to ensure the internationally competitive quality of the higher education offered in Estonia, a volume of higher education that corresponds to the needs of Estonia and the development of education and culture in the Estonian language. The strategy seeks to develop a functional structure of higher education in Estonia, to promote the social dimension of higher education, and to guarantee that higher education serves Estonia's developmental interests and innovation. On 2 August 2007, the Government of the Republic approved the Higher Education Strategy Implementation Plan for 2008–2010, which proceeds from the objectives set out in the Higher Education Strategy by outlining the activities required for the achievement of the goal of the strategy along with the relevant deadlines, responsible persons, and budgets. All of the acts and regulations governing this field can be viewed through the electronic version of the State Gazette (www.riigiteataja.ee) and an overview is also available on the website of the Ministry of Education and Research (www.hm.ee).

Vocational education, which can be acquired through several options on the basis of both basic and secondary education, provides both professional knowledge and skills.

Vocational education without the requirement of basic education, where only the profession is acquired, was implemented for persons without basic education who have exceeded the age of compulsory school attendance (17 years) in the 2006/2007 academic year. After completing their vocational training, such persons can continue their general education studies with the aim of obtaining a basic education.

Vocational education based on basic education is a type of education where only the general education subjects related to the profession are taught in addition to the profession. The pupil's level of education (basic education) does not change.

Secondary vocational education is provided on the basis of basic education and the pupil acquires a secondary education in addition to the profession. The minimum study period is three years. Since the 2006/2007 academic year, pupils who have completed a secondary vocational education curriculum in a vocational school can study general education subjects of their choice for up to 35 additional study weeks (the so-called additional year) and take state examinations. This increases the competitiveness of graduates of vocational schools with regard to further studies at the tertiary education level. During the voluntary additional year, the pupils' studies take place in adult upper secondary schools or in the evening or distance learning departments of upper secondary schools and are free of charge.

Vocational training based on secondary education represents the opportunity to acquire professional skills within 0.5 to 2.5 years of graduation from upper secondary school.

Vocational education in basic schools and upper secondary schools is intended for pupils of general education schools and is provided by vocational educational institutions.

The studies take place on the basis of a separate curriculum and last for at least 15 study weeks during which pupils acquire basic knowledge of the selected profession and receive a certificate confirming the completion of the vocational education course.

The knowledge and skills acquired in the basic school or upper secondary school can be taken into account in further studies if the pupil wishes to continue their studies in the same specialty. There are 45 vocational educational institutions in Estonia in the 2008/2009 academic year, 31 of which are state, 3 municipal and 11 private vocational schools.

Figure 5.
Number of pupils acquiring vocational education, 2004/2005–2008/2009.

LEVEL	2004/05	2005/06	2006/07	2007/08	2008/09
Vocational training without the requirement of basic education	267	28	169	307	414
Secondary vocational education and vocational training based on basic education	18 886	18 882	18 795	18 030	17 648
Vocational education based on secondary education	10 762	10 101	9478	8620	8672
Total	29 915	29 013	28 651	27 381	27 239

In the 2008/2009 academic year, 11,456 vocational education students commenced their study in state-commissioned student places (an increase of 142 students compared to the 2007/2008 academic year) and the total number of vocational education students came to 27,239 (http://www.hm.ee/kogumik2009/en/open.html) The implementation period of the **Development Plan for the Estonian Vocational Education and Training System 2005–2008** ended in 2008. The following can be considered the main results of the development plan:

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- Vocational education is more closely connected with life and corresponds better to the needs of the society.
- We are engaged in productive cooperation with our social partners.
- Conditions have been created for updating and improving the quality of vocational education.
- The flexibility of vocational education has increased considerably.
- Study opportunities have been created for different target groups (workplace-based study, new types of vocational education).
- Opportunities for continuing education and retraining have been expanded effectively.
- Expenses related to vocational education have increased.
- Efficient investments have been made in modernizing the study environment.
- The network of vocational educational institutions has been regulated.
- The efficiency of vocational education has increased.

Despite the achievements, in some areas a significant positive shift could not be achieved or the effect of the implemented changes was more modest than had been hoped for, due to which the next implementation period of the development plan will include some important challenges. In 2008, the Government of the Republic approved the proposal for preparing the **Development Plan for Estonian Vocational Education and Training 2009–2013**. A broad-based working group began preparing the development plan at the beginning of 2009. The development plan will be submitted for approval to the Government of the Republic during the summer of 2009.

ESTONIAN E-LEARNING DEVELOPMENT CENTRE

The scene of Estonian higher education is rapidly changing towards more flexible ways of providing higher and continuing education. The number of adult students in continuing education and retraining programmes will grow and the number of high school graduates decrease. This is the place where the void is filled by the Estonian e-Learning Development Centre. The Estonian e-Learning Development Centre operates as a department under the umbrella of the Estonian Information Technology Foundation and coordinates the activities of two consortia–Estonian e-University and Estonian e-Vet. The main objectives of these two consortia is to instigate and facilitate cooperation in universities and vocational schools respectively, to implement e-learning solutions and support e-learning related activities based on the principles of life long learning. The Estonian e-University consortium was founded February 21, 2003 by eight largest Estonian public

and private universities and the Ministry of Education and Research. The Estonian e-VET consortium was founded February 16, 2005 and currently includes 27 vocational schools and 8 applied universities. A significant driver behind the fast progress of e-learning in Estonia has been positive approach to ICT by the European Union. Substantial funds allocated to e-learning within the EC education programmes have resulted in drastic growth in different collaboration projects. In this process of globalisation it can be noted that Estonia has nothing to be ashamed of. Rather on the contrary, the e-learning cooperation train that has been set on the tracks is constantly gaining speed and attaching more and more new wagons onto its tail along the way. Due to the formation of the e-University and e-Vet consortia at the right time, there is very little internal competition within higher and vocational education institutions. In fact, cooperation and support have been the keywords over the years. As and example of networking, two consortia have launched series of thematic seminars with an aim to promote discussion about future developments in various sectors of education.

It has been extremely satisfying to be part of the activities where teachers and lecturers of universities and vocational schools are trying to implement in cooperation e-learning into the learning process. The synergy has been outstanding. This particular cooperation format is rare. In that sense, the Estonian e-Learning Development Centre is a unique example how successful collaboration can be achieved within and between different education levels. The underlying factor for creating the e-University consortium five years ago was a joint purchase of the WebCT licence.

However, it quickly became evident that there were many more overlapping points of interest such as student mobility, for instance. After thorough deliberation the following activity pillars formed the basis: staff training, employing educational technologists and developing unified e-learning infrastructure. Several new staff training courses were created within the three level training programmes. The position of educational technologists was new to the universities and vocational schools at that time. Thus new people had to be trained and instructed. Assignment of educational technologists to every institution resulted in a massive increase in e-courses, also the quality of the content improved significantly due to better consultation of the teachers.

All these activities are supported by constant development of the infrastructure-high quality joint hardware and software has been acquired to accommodate the needs of every member institution. All the above has contributed to the feeling of security and sustainability for the coming years.

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STAFF TRAINING AND SUPPORT

Training

Great emphasis is on staff training and on new possibilities in the study process. The training program is closely related to the ICT competences of teachers and lecturers and it is built up on three levels:

1. basic training
2. intermediate training
3. expert and tutor training

Since 2004 development of a training program for teachers, lecturers (and educational technologists) started to help and support them by creating their own e-courses. Today the training program is known as the e-learning program and consists of 25 e-courses (total volume 36 ECTS). The program is elaborated in cooperation with our partners from the Estonian e-University consortium (University of Tartu, Tallinn University and Estonian Information Technology College).

Briefly, the goal of basic training courses is to introduce e-learning opportunities and to provide e-learning experience. Main topics here are e-learning methodologies and virtual learning environments. Courses on intermediate training level concentrate on e-learning technologies and platforms, e-course design, multimedia, pedagogical aspects of e-learning, social software etc. Expert training covers topics like image processing and animations, graphics, audio and also requirements to the courses for handicapped people. Most of the courses have practical value that helps participants create their own e-course or to follow up existing course(s). Procedure of renewing the e-learning program foresees that every course will be followed up at least once in every 2 years.

Support

One aspect of e-learning is the change in the role of the teacher and a greater division of tasks in education. While preparing quality e-courses, an important role is played by educational technologists. Starting from autumn 2003, there are 53 educational technologists working at the member universities and vocational schools of the e-University and e-VET consortia. Educational technologist is considered to be a very young profession which is under constant development in Estonia. As a consequence, educational technologists need to multitask during everyday

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work. Altogether educational technologists have five areas of responsibilities within the schools: improvement of cooperation; staff training; project management, content development and dissemination.

Figure 6
Concept of educational technologists' profession
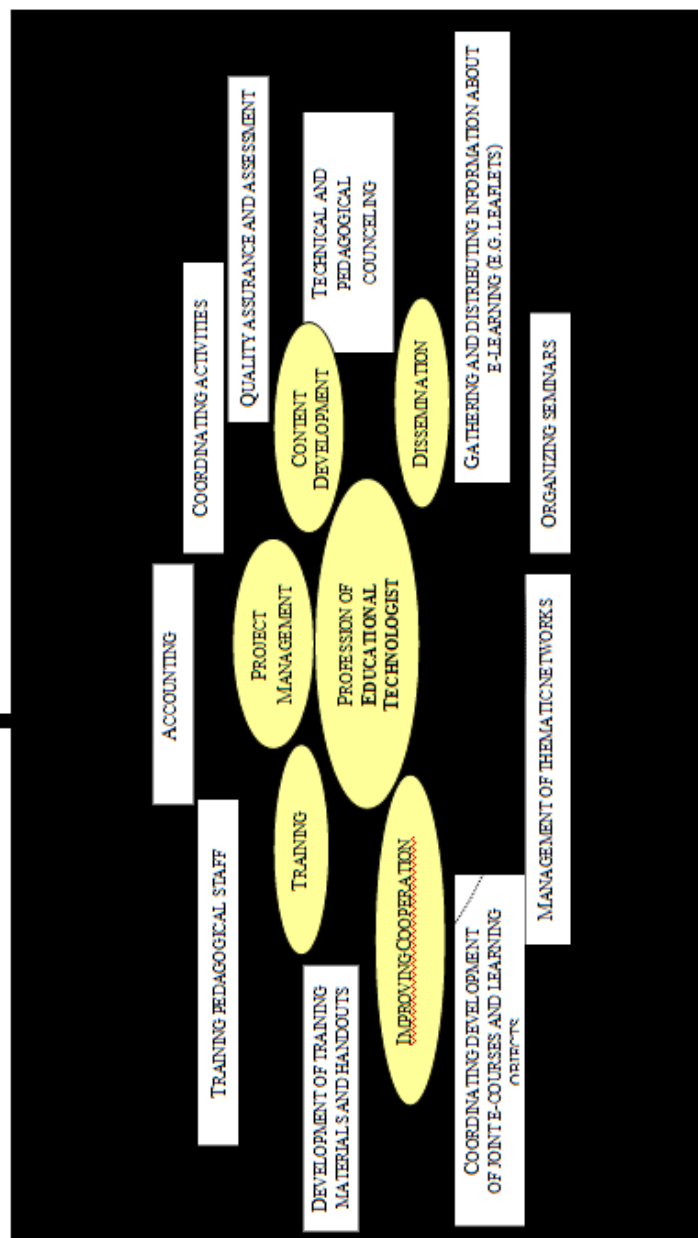
It is important to notice that in Estonia there is a growing network of educational technologists. It means that there is constant information exchange and cooperation between them even though they are spread out all over the country in 43 different schools. In addition to their own cooperation to solve different issues in everyday work, they also bring together teachers that have same areas of interest. To conclude, educational technologist is seen as a key person for creating a suitable environment of trust and communication within the school for development of e-learning which are the preconditions for innovation and cooperation.

E-LEARNING CONTENT DEVELOPMENT in ESTONIA

Content Development
Higher and vocational educations institutions have received financial support in making ca 600 ECTS of e-courses, 50 video lectures and 200 learning objects or content packages per year. This support must motivate teachers to design and develop e-courses, video lectures or learning objects.
 Universities and vocational schools had more than 50 000 students registered in e-learning environments and 4 500 e-courses available at the end of 2009.

Quality Management
One of the main goals of Estonian e-Learning Development Centre is to assure quality in e-learning. Staff training system and support activities, development of infrastructure, the annual "Quality e-course" prize awarded since 2004 ensure that it is achieved. Estonian e-Learning Development Centre is developing its own quality mark application procedure so every teacher or lecturer can apply for the quality mark for their e-courses in 2008. There are several activities/procedures in conjunction to staff training that help assess quality and achieve an overall goal – assure quality in e-learning. "E-course of the year" is an annual contest that is organized since 2004. All lecturers and teachers can submit their e-courses to the contest. The e-courses will be assessed by e-learning and faculty experts and the best course authors will be awarded. Everyone interested can use the handbook for e-course for instructions for an excellent e-course. The latest version of the guide will become available in autumn 2008.

In addition, Estonian e-Learning Development Centre is developing its own quality mark application procedure so every teacher or lecturer can apply for the quality mark for their e-courses in 2008.

ICT Competences of Teachers and Lecturers

The knowledge level of teaching staff for using ICT in the learning process is very uneven. In order for them to be more aware of their existing skills and make right choices in choosing the most appropriate training courses, we started to elaborate ICT competences for teachers and lecturers. Since 2006 the ICT competences model for teachers, lecturers, and educational technologists (also for schools) has been available. Every competence in this model describes a skill that is known in their regular work. It can be used as self assessment tool to map individual ICT competences. The model of ICT competences and all the courses in the e-learning program are connected in a way that every course in the program includes competences that can be achieved by the end of the course. The model of ICT competences will be annually revised and renewed by a group of e-learning experts. Today we are working with a self-assessment tool that enables to test ICT competences and get recommendations for following studies in the field of e-learning. The tool will be available by the end of 2010.

ELearning Services

Estonian e-Learning development Centre offers an opportunity to use several central services for the member institutions of both consortia.
Learning Management systems:

- Most of the universities use **Blacboard Vista** with more than 28 000 users and 2 500 courses. Approximately 75% of e-courses at university level are in Blacboard VISTA.
- Half of the vocational schools and universities use **Moodle** with more than 20 000 users and 2 000 courses. Some vocational schools have also Moodle installed in their own servers.
- **IVA** is developed at Tallinn University (Estonia) based on social-constructivist pedagogy. The other half of the vocational schools and Tallinn University use IVA with 1200 courses and ca 8000 users. (http://www.e-ope.ee/en/teachers/e-learnin_environments)

Additionally e-Learning Development Centre provides:

- **Codian multipoint video conference server** provides an opportunity to connect up to 20 different points. The Codian server is very popular with universities, where it is used for organizing multi-point videoconferences for various purposes.

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Inter-university Cooperation

15 university and vocational school level thematic networks are currently active. The objective of a thematic network is to instigate and support cooperation in one subject field which would result in better quality e-courses and modules. Thematic networks create an environment where discussion about the need and implementation of e-learning takes place in one subject field, joint modules are being planned and created in collaboration. There are usually two ways of creating a thematic network in Estonia.

Figure 7.Bringing thematic networks to life
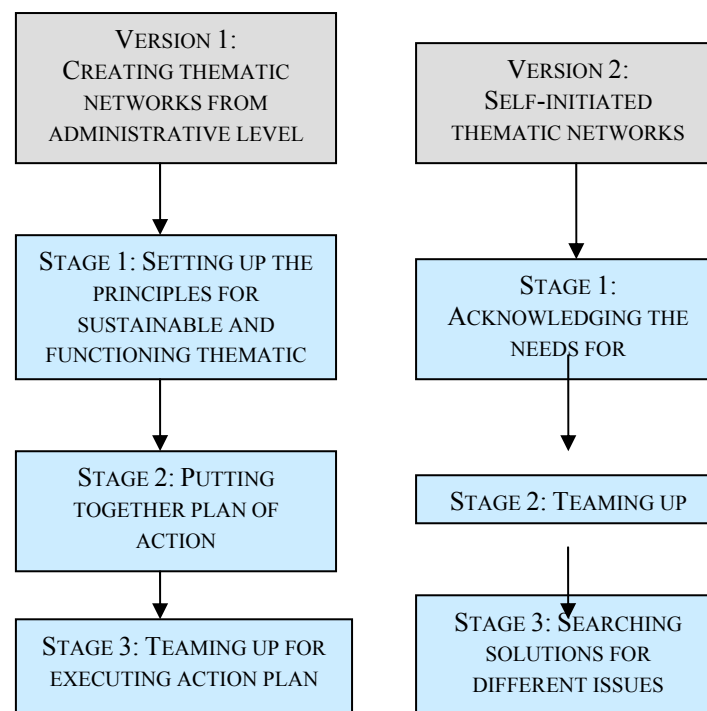
Thematic networks have three main objectives:

1. Cooperation between teachers
   Teachers have an opportunity to exchange their experiences in a sense that other teacher is seen as the best resource for getting new ideas. As a result e-learning implementation on a specific field will progress rapidly, since there are no duplicate activities. Secondly,

through community of specialists there is a better quality and united responsibility when creating new e-content on a specific field.

2. Recognition of each other among teachers

   Thematic network is a community of trust and support while facing difficulties in implementation of e-learning, because it combines different teachers with different competencies. For example, during e-content development (e-courses and learning objects) teachers need to discuss their ideas with each other, find different solutions for different settings in the content and they need feedback from each other. Thematic networks' dynamics will create the environment for those needs to be met.

3. Providing change by involving enough opinion leaders.

   Thematic networks raise issues that are important milestones in e-learning development (e.g. teachers' work load in e-learning, combining learning information and learning management systems and other administrative obstacles).

Community building is the basic impelling force for e-learning development in Estonia, since it is a very small country and needs all the existing know-how.

**Development and Promotion Activities of
Estonian E-Learning Development Centre**

One important aspect is to improve awareness about e-learning possibilities among teachers and the public. To achieve that goal, Estonian e-Learning Development Centre conducts seminars and discussions, publishes articles and disseminates information. A conference in early spring is becoming an important tradition. In addition, there is an annual training seminar each autumn oriented more on hands-on activities and sharing of experiences, successes and failures. A long term goal of Estonian e-Learning Development Centre is to create inter-university e-learning curricula in English as well as being an international marketing channel for e-learning.

Estonian e-Learning Development Centre is a member of European Distance and e-Learning Network (EDEN); European Association of Distance Teaching Universities (EADTU); European Institute for E-Learning (EIfEL); European Foundation for Quality in eLearning (EFQUEL) and Baltic Sea Virtual Campus (BSVC). Strong emphasis is placed on international contacts and cooperation, thus providing opportunities to participate in numerous international projects:

- E-xcellence, creating an standard of excellence for e-learning
- MegaTrends in e-learning provision
- EQIBELT–education quality improvement by e-learning technology
- EDU-Contact–European Distance Universities Contact
- e-MOVE–An operational conception of virtual mobility
- E-xcellence+: cross sectoral valorisation
- Qualite & professionnalisation

Due to active involvement at international level, Estonian e-Learning Development Centre has been the coordinator of two projects funded by the European Commission:

- UNIVe–creating network-based e-university model for the small countries in the context of e-learning in Europe
  - UNIVe aimed to collect and share the knowledge and experiences of developing a consortium-type e-university. Growing international competition in higher education supported by the development of ICT is a challenge for many universities. Establishing consortia for using better limited intellectual and financial resources is one opportunity to be successful in this situation. In order to provide an e-university model that would be relevant for different European countries, the project integrated available e-learning know-how of the previous successful int. projects and analysed and integrated existing consortium-type e-university models from Finland (Finnish Virtual University), Sweden (Net University), Scotland (Interactive University), and Estonia (Estonian e-University).
- e-JUMP 2.0 – Implementing e-learning 2.0 in everyday learning processes in higher and vocational education
  - The main objective of the project is to link up and connect various learning communities all over Europe and raise the role of communication in learning processes through implementation of 2nd generation e-learning (e-Learning 2.0) in higher and vocational education.

CONCLUSION

Involving information and communication technology (ICT) in the learning process has become common. The importance lies not in e-learning itself but

the learning process and its quality. In order to prevent education from succumbing to future developments, three aspects need to be taken into consideration:

ICT (e-learning)
Elearning is a tool to make the learning process more flexible, innovative and learner-centred. A future learner is a person born in the age of information technology. Classical learning process does not allow him/her to develop talents to the maximum. The use of e-learning is a basic level in ICT. The future belongs to high-end technology and the entire education sector needs to take advantage of that. More simulations, games, robots and virtual labs need to be integrated in the learning process.

Collaboration Is Important
National collaboration is as well as international and between different levels of education–general, vocational and higher education. Formal education must prepare people for lifelong learning and provide knowledge for competency development. Globalisation urges people to move between countries.

This has created a situation where we do not educate people for one nation but for the world. We, the teachers, cannot predict the country where the students will be working or where they will continue their studies. Education is a very global domain where cooperation facilitates better movement between education levels in the entire world.

Education Needs To Be More Open To New Trends and
Not Afraid of Change
Education is a conservative sector where the implementation of new trends is time-consuming. This results in education not being able to keep up with time. This constitutes a situation where the world requires a different person compared to the ones prepared by the education landscape. Education needs to be more creative, innovative, not be afraid of new challenges and always try to be two steps ahead.

Today it can be admitted that we still have plenty of work ahead and room for development. In order for the education to be coherent with the needs of people and the labour market, we need to become more creative, open, innovative and we cannot be afraid of changes.

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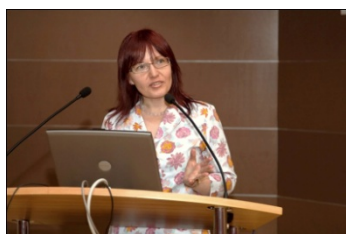
Ene KOITLA is born September 10, 1964 and graduated from the Faculty of Economics at the University of Tartu. She is the Head of the Estonian e-Learning Development Centre where she started working in June 2003. There are 6 people in her team. Estonian Development Centre managers the two consortiums–Estonian e-University and e-VET. Estonian e-University was founded February 16, 2003. There are 7 universities. Estonian e-VET was founded February 16, 2005. There are 27 vocational schools and 8 applied universities in the Estonian e-Vet consortium. The main goal of the consortiums is to cooperate in the following areas: e-Learning content development-Staff training (teachers, educational technologists). Staff support (educational technologists)-Infrastructure-e-Learning studies - Coordination of the e-Learning programs. She has participated in several working groups within the Estonian Ministry of Education and Research and take active part in the work of several different international e-learning organizations (EADTU; EFQUEL; EIfEL; EDEN).

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CHAPTER-7

eLEARNING IN FINLAND
The Path of E-Learning
in The Finnish Educational System

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ABSTRACT

e-Learning has been a strategically significant focus of development in the Finnish education system. In particular, ICT skills and deployment have been emphasised in the National Board of Education's strategies since the beginning of 1990. Other administrative bodies have also gradually recognised ICT utilisation as a significant skills area and in various development strategies and ventures e-learning has been seen as a pivotal method to promote skill development and innovation. In this article e-learning strategies and their implementation in different educational sectors are described from the perspective of life-long learning. Current Finnish e-learning best practices and development areas are also introduced.

COUNTRY

Finland (Finnish name: *Suomi*) is situated in northern Europe. It has a population of 5.3 million and a surface area of 338,000 square kilometres, making it the sixth largest country in Europe. The capital city is Helsinki. The overall population density is low, at 17 persons per square kilometre. Most Finns—about 67%—live in urban areas, while 33% remain in a rural environment. Roughly one-sixth of the country's total population lives in the fast growing Helsinki metropolitan area, comprising the three cities of Helsinki, the capital (population 560,000), Espoo (216,900), and Vantaa (179,900). Other important cities are Tampere (197,800 residents), Turku (173,700), and Oulu (123,300).

Finland lies between the 60th and 70th parallels of latitude. A quarter of its total area falls north of the Arctic Circle. Finland's neighbouring countries are Sweden, Norway and Russia, which share land borders with Finland, and Estonia, across the Gulf of Finland. Outstanding features of Finland's scenery are some 190,000 lakes and nearly as many islands. The principal archipelago and the self-governing province of the Åland Islands lie off the southwest coast.

Figure 1. A
map of Finland

The Finnish language is a member of the Finno-Ugric linguistic family that includes, in one branch, Finnish, Estonian and a number of other Finnic tongues, and in the other, Hungarian, by far the dominant language of the Ugric group. The official languages of Finland are Finnish and Swedish, the latter spoken as a mother tongue by about 6% of the people.

(The official status of Swedish has its roots in the historical period when Finland was under Swedish rule, from the early 13th century until 1809.) Another indigenous minority language is Sami, spoken by the Sami people (also known as Lapps) of Lapland. Christianity reached Finland before the end of the first millennium but did not firmly establish itself until the 12th

century, following a missionary expedition to south-western Finland led by King Erik of Sweden and the English-born bishop Henry. Nowadays the Evangelic Lutheran Church is the country's biggest denomination: 89% of the people are baptized as Lutherans, while 1% belongs to the Finnish Orthodox Church. The influence of the Orthodox faith spread into the country from the east.

Some Important Dates in Finnish History

- 1155-The first missionaries arrive in Finland from Sweden. Finland becomes part of the Swedish realm.
- 1809-Sweden surrenders Finland to Russia. The Czar declares Finland a semi-autonomous Grand Duchy with himself as constitutional monarch represented by a governor general.
- 1917-December 6: Finland declares independence from Russia.
- 1919-The constitution is adopted and Finland becomes a republic with a president as head of state.
- 1939–40 The Winter War the Soviet Union attacks Finland.
- 1941–44 The Continuation War: fighting between Finnish and Soviet forces resumes. Although some territory is ceded to the Soviet Union, Finland is never occupied, and preserves its independence and sovereignty.
- 1955-Finland joins the United Nations.
- 1956-Finland joins the Nordic Council.
- 1995-Finland becomes a member of the European Union.

All children between the ages of 7 and 16 receive compulsory basic education. Education beyond the age of 16 is voluntary, taking the form of either three to four years in upper secondary school or two to five years at a vocational school. Finland's repeated success in the PISA (Programme for International Student Assessment) study has focused widespread international attention on the country's school system and its support for lifelong learning. They form the basis of this excellence.

Finnish teenagers' maths, science and reading skills are rated at or close to the top of the nearly 60 countries assessed in the PISA (Programme for International Student Assessment) study. A three-yearly appraisal of 15-year-olds in the principal industrialised countries, PISA is organised by the OECD (Organisation for Economic Cooperation and Development). For the

results gathered in 2006 and published in 2007, a total of 4,714 students from 155 schools took part in Finland.

In that PISA study, special attention was paid to natural sciences, in which Finnish 15-year-olds came out on top by a large margin ahead of Japan, Hong Kong and Korea. Finland's score of 563 points in this category was also the highest total ever recorded in a PISA study.

In reading comprehension Finnish youngsters ranked second after South Korea, and in mathematics they trailed top-scorer Chinese Taipei by only one point.

According to the survey, the strength of the Finnish school system is that it guarantees equal learning opportunities, regardless of social background. Instead of comparison between pupils, the focus is on supporting and guiding pupils with special needs. Very few children need to be made to repeat a year. The teaching staff in Finnish schools is highly educated. Qualifications for all school levels require a Master of Arts degree including extensive pedagogical study and qualifications in special subjects. Small children's feelings of safety and motivation are increased by the fact that they are taught by a single teacher. Also, although students receive progress evaluations, scaled grading is not introduced until the fifth year. Finnish schools aim for natural, warm relations between teachers and pupils.

INTRODUCTION

Digital literacy has been a goal of Finnish education development strategies for two decades. Digitally literate individuals possess basic IT skills. These skills include the ability to function in and communicate through networks, and thus obtain, evaluate, produce, save and present knowledge. There has been a gradual shift from technology-centric development to an increasingly collaborative activity in networks, and the use of ICT is considered pivotal in innovative activities also.

Currently there is a belief that new educational technologies function as powerful drivers for change and the significance of virtual communities and electronic interaction is increasing rapidly as continuous learning in the workplace is sought and models that promote interaction and innovative learning environments are created. How the development of ICT has been strategically directed in Finland, how strategies have been implemented in

practice at different educational levels through various development ventures, and how digital literacy has improved over the years in the target groups are described in this article. In addition to the term e-learning, we also employ terms such as digital literacy, ICT and online education in our article. These concepts are part of e-learning as a whole.

National Strategies and Development Programmes
The development of e-learning has been directed through various strategies and development programmes for approximately twenty years in Finland. The objectives of an information society were defined in the Ministry of Education's strategies for the first time in 1994 for the years 1995-2000. Its goals included equipping teachers with basic ICT skills. Government money was ear-marked for teacher-in-service training. Also every school was to be connected to the Internet by the year 2000. The government reimbursed municipalities 50% of the costs incurred in creating these connections.

The second Finnish national strategy was written in 1999 and covered the years 2001-2004. This strategy was based on the assessment of the strategy period 1995-1999.

In 1998, an extensive technology assessment project, Information and Communication Technologies (ICT) in Teaching and Learning, was completed in Finland. Initiated by the Finnish Parliament and carried out by the Finnish National Fund for Research and Development, the project assessed all formal education from kindergarten to universities. In addition, it examined some aspects of informal learning taking place in homes, libraries, and at adult education establishments.

The study focused on the growing challenges presented by the information society both on individuals and on Finnish society in general, especially when viewed from the perspective of life-long learning (see Sinko and 1998). The assessment verified that in Finnish society ICT has enjoyed a high priority. According to the assessment there was still a shortage of high-quality digital learning materials, pedagogic and technical support was still insufficient and teacher training needed to be increased and better-focused. There was a need to improve the dissemination of promising practices, and furthermore, to deal with the paramount and constantly growing issue of equality. The Ministry of Education addressed these challenges in the second Finnish national strategy (Ministry of Education 2004) and the main goals were:

- Information society skills for all;
- The versatile use of networks in studying and teaching;
- Accumulating digital information capital;
- Strengthening information society structures in education, training and research.

The Finnish Ministry of Education launched a programme called Ope.fi in order to improve the ICT skills of in-service teachers and teaching personnel. The Ope.fi programme is in accordance with the European Commission's action plan eEurope -An Information Society for All. The programme is divided into three steps. The first, (Ope.fi I), comprises knowledge regarding the common uses of a computer, mastery of word processing, Internet browsers and e-mail, and an understanding of the principles of an educational use of ICT. These are the skills that every teacher must master by the year 2004. The second step, (Ope.fi II), provides skills in using ICT for educational purposes which at least half of all teachers must master by the year 2004.

These include a versatile use of e-mail, the www environment and groupware: generic tools, pedagogical applications and digital materials available in the subject taught and the principles of digital learning material production. The third step, (Ope.fi III), includes specialised knowledge which about 10% of teachers must master by the year 2004. These are content-specific and professional applications, the production of digital learning materials, institutional information management, an ability to assist, support and train colleagues and develop the school community and act as a part of an expert network. The third strategy of the Information Society Programme for Education, Training and Research 2004-2006 contains major priorities and actions for boosting information society development in education, training and research.

The strategy's core objectives were:

- to develop all citizens' information society knowledge and skills
- to enable educational institutions to use information and communications technology (ICT) in a versatile way in their activities
- to establish ICT-based procedures in education, training and research
- to promote social innovation through the use of ICT

The focus of the strategy was on three areas: knowledge in the information society, contents, and operating environment.

The aim was that Finland is an open and secure, networked society with high-level information society knowledge by 2007. All citizens have opportunities and the basic capabilities to use electronic services (eService) and content. Appropriate use of ICT in learning and in teaching is part of everyday school life. ICT is used widely and appropriately in research. Electronic materials are of a high quality, pedagogically justified, serve different user groups and available openly. Also, electronic materials are comprehensively available for science and research. The strategic objectives of the National Information Society Strategy (Prime Minister's Office 2006) concerning all citizens are in line with the educational objectives.

By 2015 all citizens should have the opportunity to acquire basic ICT skills, media literacy skills and be equipped with skills in using electronic and other civic services. It is assumed that all Finns possess skills acquired at home, work and educational institutions, which can be employed to secure economic, social and mental success.

The goal of basic education was that the entire youth cohort would be well equipped to utilise and apply the opportunities afforded by ICT. Basic education in Finland should be open and networked, as well as world renowned for its learning outcomes. Teachers' ICT skills should, by 2015, be high-quality and ICT a component of multi-modal teaching at all educational levels. The Government Programme for 2007 (Prime Minister's Office 2007) defined the development direction of ICT in schools in its transport and communications policies. As part of the everyday information society objectives, an experimental venture in basic education was initiated, its goal being the provision of a student-specific computer as the central learning tool for every student in basic education. ICT practices and the affect of these practices are being examined in the top schools of twelve municipalities. Models for a national implementation are also being sought (http://www.arjentietoyhteiskunta.fi).

The National Innovation Strategy (Ministry of Employment and the Economy 2008) emphasizes the significance of skill foundations and the construction of innovative encouraging learning environments. The significance of virtual communities and electronic interaction is growing rapidly. For innovative individuals and communities, information society

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development opens up new channels of influence and opportunities to further enhance innovative capabilities.

In a changing society there is a need for novel innovative solutions and knowledge management practices, which utilise and combine future educational technology, social media and business and workplace experts in new configurations. The application of web-based learning methods provides new possibilities in maintaining contact and exchanging ideas with business and workplace experts or international partners. The Innovation Strategy is informed to a large extent by the information society development in Finland and raises the significance of virtual communities and electronic interaction in innovative activities.

The objective is to create a high-class learning development environment in Finland that is an international pioneer in the development of both educational content methodology as well as technical tools. The Active Citizen of the Open Learning Environment programme, supported by the European Social Fund and administered by the Ministry of Education, was initiated in 2008.

The programme aims to enhance the ability of all citizens to utilise ICT in everyday learning and knowledge production through collaboration especially between the educational field, libraries and cultural institutions (www.aktiivi.info). Creating new ways of participation as a part of the everyday life of citizens can be seen as an important factor in social equality. It can be assumed, for example, that disseminating skills in the use of eServices will prevent social exclusion of citizens and improve their ability to participate in decision-making.

Strategically the focus of ICT in education over the last two decades has shifted from technology to pedagogy and from an individual ability to supporting collaborative work, in which an individual has the possibility to choose learning paths suitable for their particular learning situation.

A rigorous utilisation of ICT in all activities is seen as a means to maintain competitiveness in a global world. It is important that all age groups are guaranteed skills and free access to sources of knowledge and that the production and construction of one's own knowledge in open learning environments is facilitated.

EDUCATION SYSTEM

Children begin school in Finland at the age of 6 by attending pre-school. At the age of 7 children start primary school which they attend for 6 years. After that they change schools for secondary school. Three years are spent at this level and the next three to four years at upper secondary school or vocational school. Vocational studies also inlcude a competence-based qualification undertaken at one's workplace. On completion of upper secondary school and vocational school, students can go on to further study at university or a university of applied sciences (Figure 2.).

Figure 2.
The Finnish school system
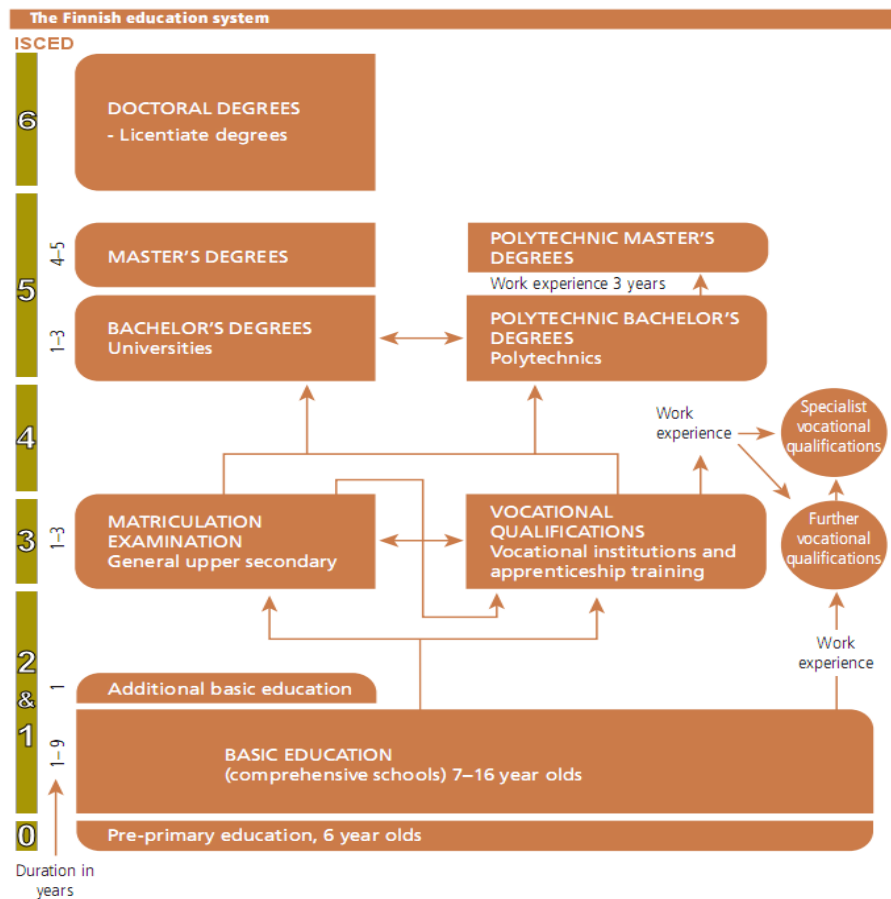
Comprehensive School

Comprehensive school education is provided by the child's home municipality, and the network of primary-level schools is dense. Instruction and all basic education materials are free of charge for the children, and services include a free hot lunch every day, school healthcare and free transport for children who live too far from the school to walk or use public transport.

Preschool instruction is provided for six-year-olds. This is voluntary, but almost the entire age group participates.

Instruction is provided in both official languages, Finnish and Swedish. In major cities schooling is available in other languages as well. Special schools exist for disabled or hospitalised children. Practically every Finnish child goes to school.

Classes number about 30 pupils per age group, usually less in the younger classes. For the first six years of comprehensive school, the children are instructed by a class teacher. Instruction during the last three years of comprehensive school is taken over by subject teachers. Pupils are also given special instruction if needed for speech impediments and for reading and writing problems or similar special needs.

Comprehensive school subjects include native language and literature; other languages; environmental studies; civics; religion or ethics; history; social studies; mathematics; physics; chemistry; biology; geography; physical education; music; art; handicrafts and home economics. The goals of instruction and the core curriculum are the same nationwide, but the local authorities and schools draw up their own local curricula on that basis.Finnish schools emphasize foreign language studies. The first foreign language is generally introduced in the third year of comprehensive school and the second domestic language (Swedish for Finnish-speaking pupils and Finnish for Swedish speakers) in the seventh year, if not sooner.

In addition, pupils may opt for up to six different languages by the completion of upper secondary level. The most common foreign languages are English, German, French, Russian and Spanish.

Immigrants with native languages other than Finnish or Swedish receive special instruction in Finnish as a second language. Municipally funded instruction in the children's native language is provided twice a week.Many municipalities have upper comprehensive and upper secondary level schools with weighted curricula focusing on subjects such as music, art or sports.Teachers' high education level allows them to plan their work and choose their methods independently. The Finnish school system is based on a culture of trust, not control, and teachers are active in developing their own work. On the job they set an example of lifelong learning.

Upper Secondary and Basic Vocational Education
Approximately 50 percent of each age group continues to upper secondary schools. The curriculum covers a great many optional subjects and takes an average of three years, concluding with the national matriculation exam. Matriculation provides a foundation for continuing studies.

Apart from upper secondary schools, a three-year basic vocational education alternative also exists. This line of study is chosen by nearly all those who do not continue to upper secondary schools – only 7 percent of young people choose not to continue studying. Those who obtain a further vocational qualification can continue their studies in polytechnics or other institutions of higher education.

Institutions of higher education
Higher education is divided between Universities and Universities of Applied Sciences. Universities of Applied Sciences provide education and training aimed at high-level professional skills to meet the requirements of working life, while universities carry out scientific research and provide conventional academic instruction. Depending on the institution in question, student selection is based on examination certificates or a combination of certificates and entrance examinations. Finland's national strategy aims to provide a University of Applied Science or University degree to 42 percent of young adults by the year 2020. In Finland, school education stretches over a long period of time; a significant number of higher education students do not graduate before the age of 25. The goal is lifelong learning; plenty of further training opportunities are supported by the public sector for adults who are already employed.All school levels are free of charge for the pupils. The government has provided funds for various social benefits for students relating to means of support, meals, housing and healthcare. Educational institutions are predominantly owned by the local or central government.

Thanks to its comprehensive, high-quality public-sector school system, Finland has no commercial training and education market in basic education. At other levels and in other sectors, commercial provision is also relatively small compared with many other Western countries.

THE FINNISH CURRICULUM MODEL

The National Board of Education draws up national core curricula for basic education, upper secondary schools, vocational education and adult vocational education.

Using the national core curricula each educational institution draws up its own institution-specific curriculum. The new National Core Curricula for Basic Education was adopted in January 2004, launching curricular work in municipalities and schools.

The new National Core Curricula obliges schools to prepare their own information strategies-this had only been a recommendation up until 2004. At present all schools are required to articulate the status of IT in instruction within their respective curricula.

Consequently, each school is responsible for developing the use of communications technology in instruction and for encouraging its students in diverse use of the media.

It is the school's role to ensure that all children have access to civic skills relating to communications technologies. In particular, equal encouragement for girls and boys to use new communications technology is becoming a challenge, because the field has so far been dominated by men in terms of both users and producers.

The cross-curricular theme entitled 'humans and technology' aims to help students understand the human-technology relationship and perceive the significance of technology in our everyday lives.

Basic education should provide basic information about technology, its development and effects, guide students to make sensible choices and lead them to reflect on ethical, moral and equality issues relating to technology. Instruction should develop students' understanding of the operating principles of tools, devices and machines and teach them how to use these.

In order to achieve the objectives set for the use of IT equipment and software and information networks as determined in the National Core Curricula, school communities are also required to have certain basic resources in terms of

Table 1.
ICT in education over the last two decades

1990	1995	2000	2005	2010-
5-10 computers in every school	Finland – an information society strategy	School specific ICT educational strategies	Learning object production	Open learning paths
School specific curricula	Objective is for each school to have 1 computer/10 students	– teacher training: technical skills, pedagogic skills	Virtual degree	Utilisation of social media in networks
development of new teaching methods based on a constructivist learning concept	Improving teachers' ICT skills	– individual teachers trained as content producers	Training of teacher teams and school specific development projects in addition to training of an individual teacher	Collaboration between different schools and internationally
Teacher in-service ICT training	–1 teacher/school trained	Development project	Intranet connection from every computer in every school	Combining physical and virtual learning environments
	– Internet connection in every school	Virtual school established	1-5 students/computer	
		Virtual University and Virtual UAS consortium established	Activity in networks	
		Production of learning material		

telecommunications connections, quantity of hardware and competencies of teachers. All National Core Curricula issued for different upper secondary vocational qualifications state that education and training should equip students with the capabilities to utilise IT as well as other forms of technology.

In order to develop the utilisation of technology and IT, students need to possess the basic skills required in an information society and the capabilities to utilise information and communications technologies as well as other forms of technology in a diverse manner at work and as citizens.

The educational route ought to be the backbone of curricular development. The overall aims of each level and the teaching aims of each level should be very

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clear and transparent. Upper levels must know which basic skills have been taught at a lower level. In the Finnish system, we talk about border skills for the whole age group when they are moving from primary to secondary school or from secondary to upper secondary or vocational school. Border skills ought to have the same basic skills status as reading and writing skills.

HOW HAVE THE STRATEGIES BEEN IMPLEMENTED?

Finnish schools were equipped with computers and Internet connections in the 1990s and at the end of the decade the focus shifted from developing technology to content production, teacher training, utilization of information networks and collaborative learning in networks. The objective was to construct diverse learning environments and produce innovative teaching and learning material.

A further objective was that every school has an institution-specific information strategy by 2003 in which is defined the educational goals and forms of teachers and other staff members, digital literacy levels of students in each education sector, and the implementation methods and resources of pedagogic and technical support. Continuing education for teachers was organized in each education sector, and a virtual school, virtual university and virtual university of applied sciences were established.

ICT is currently actively utilized in all educational modes, corporate staff training, and citizen activity in Finland. However, ICT deployment is unevenly distributed. A few educational institutions at the different educational levels are pioneers and students have an opportunity for very individual learning paths, but institutions employing very traditional educational implementation and models can also be found.

The use of ICT has not undergone a standardized assessment such as the evaluation project of 1998 (see Sinko and Lehtinen, 1998). Evaluations have been conducted thematically and by target group. Below we outline the results of a few of these evaluations, providing an overview of the direction of overall development. We also describe several best practices found in various educational levels.

The Situation in Basic Education and Best Practices
The greatest variations in ICT utilisation are found in general education. The resources allocated to ICT strategy implementation vary greatly from one

municipality to another. Ilomäki and Lakkala (2006) observed in their study that technological tools are readily accessible to teachers in Helsinki and Espoo: each teacher has a computer on the school premises, as do 90% of students.

IT is, however, sparingly used in teaching, equipment location is problematic in terms of teaching or there is an insufficient number of machines for the student group.

There are also pedagogic problems regarding equipment availability. For example, computers may only be booked for specific lessons or time periods, even though students are engaged in long-term projects. It seems, in fact, that a significant lack of usage access prevents teachers from employing computers on a continuous basis in teaching. But teachers are not a homogenous group, who 'know something' or 'can use to some extent', rather age, gender and education level divide teachers into different groups that differ from each other in terms of competence, patterns of usage and attitude. (Ilomäki and Lakkala 2006.)

The extent and ways in which the use of IT is integrated in teaching practices was explained in the SITES (Second Information Technology in Education Study) study. The study also aimed to identify factors having the greatest impact on an effective integration of IT in teaching and learning. The use of IT in high schools, especially in the teaching of natural sciences and mathematics, was analysed in the study. In Finland, 266 principals, 279 IT persons-in-charge and 1078 teachers of natural science and mathematics from 311 schools participated in the project (Kankaanranta&Puhakka 2008).

According to the SITES study, basic education in Finland has access to Internet connected computers, but there are large discrepancies between schools in the range of IT resources (Kankaanranta and Puhakka, 2008). Nearly all schools have office software, with more simulation and modelling programmes, smartboards and study management systems needed. Teachers consider IT's value to lie in its positive impact on students' learning motivation and the greater range of available work methods and learning tools it offers. Finnish teachers who use IT stressed its value in networking and establishing connections outside school. IT is regularly used or extensively used at certain times during the school term by 43% of natural science teachers and 24% of mathematics teachers (Kankaanranta and Puhakka, 2008). Kankaanranta and Puhakka's (2008) study found that less

than half the participating principals considered the use of IT important in various pedagogic activites, and only 10% of teachers felt training students to become competent users of IT an important goal. These attitudes explain to a large extent the existence of considerable differences in the use of IT between schools. If ICT is not considered a significant method, resources will not be invested in it. According to the principals, teachers' lack of time, insufficient IT equipment in science laboratories, limited range of digital learning tools and teachers' inadequate IT skills are barriers to an extensive use of ICT (Kankaanranta & Puhakka, 2008).

Just over half the teachers felt they received fairly good or very good technical support from the school or other source when needed. Principals were of the opinion that there was much support available for different pedagogic activities, although support was given to the realisation of smaller projects. The person-in-charge of IT is the primary person providing IT support. Very little use was made of the skills possessed by students in the provision of IT support. The index measuring the existence of pedagogic support was relatively low for Finland. Most educational organisations do not require their teachers to be trained in IT for educational purposes.

Also, very few educational organisations have reorganised teacher workloads to take into consideration the possibilities of new working methods offered by technology (Kankaanranta & Puhakka 2008).

The SITES 2006 study demonstrated that school related factors, national curricula and educational policy decisions have a central significance in IT becoming more common in teaching. Especially teachers' use of IT was influenced by how important the principal saw IT to be in students' learning, in issues related to leadership development, and supporting teachers in the use of IT. In issues related to leadership management, the pedagogic use of IT correlated positively to collective decision making in schools and related professional cooperation.

The technical and pedagogic support received by teachers was one of the permanent positive forecasters of increasing the pedagogic use of IT. And conversely, teachers defined a lack of support as one of the most significant obstacles to the use of IT. Of factors relating to education level, student/computer ratio as such did not have a significant connection to the deployment of IT in teaching (Kankaanranta & Puhakka 2008).

Innovative ICT projects

General upper secondary distance education was launched in Finland in 1997 as a joint project between the Finnish National Board of Education and the Finnish Broadcasting Company. It is a part of the **National Virtual School Project**. In the initial phase, 11 educational institutions were selected as pilot schools.

 The encouraging results led to a decision to continue the development of general upper secondary distance education for the period 2000-2004 by extending development activities to cover all provinces of Finland. The Upper Secondary Distance Education Project has involved 86 educational institutions, accounting for almost 20% of all upper secondary schools in Finland. The national network of upper secondary distance schools has been open to all educational institutions, and their respective maintaining bodies decide whether or not to join the network.

The Virtual School project is part of the national Information Society Programme. The project was launched in 1999 with the aim to develop the flexibility and diversity of the Finnish school system by making use of ICT. The core of the Virtual School is a user interface known as a portal, which functions as a channel to disseminate best practices and offers information about study opportunities and learning materials. Responsibility for provision of virtual education lies with the schools and other educational institutions. The Virtual School portal is part of the online Edu.fi service maintained by the National Board of Education.

The site can be found at www.edu.fi/viruaalikoulu (in Finnish). Best practices and learning material accessible to all schools is collected into the Virtual School portal. New ventures include a Tips-Net service for teachers, which, employing social media, gathers together teachers, students and others interested in the new winds sweeping the school world to exchange experiences, share knowledge and together construct new knowledge (http://vinkkiverkko.ning.com/) (in Finnish).

The Tips-Net predecessor was Open Idea www.edu.fi/openidea, which contains descriptions of web-based study modules developed in different projects in vocational and general education, ideas for teachers on how to use web-based learning materials and web-based learning materials.

Ideapaja www.edu.fi/ideapaja offers ideas for teachers on how to use web-based learning materials and the Internet in teaching. Anybody can share an idea or good practice by proposing it on the website. The content is divided by school level, school subject and cross-curricular themes.

Yle, the Finnish Broadcasting Company, has operated Education's Learning Gate since September 2001. It offers free-of-charge educational and informative web content based on TV and radio programmes http://oppiminen.yle.fi/. Additionally, teachers have an opportunity to interact with their colleagues. Best practices are collected yearly from schools. In 2009, ITK Juniors was the theme and different educational models for IT were sought. Below are brief descriptions of the selected teaching methods.

Journal
The content of a 4th grade Finnish course is described as a journal in a class blog. The project aims to produce and maintain Our Class' Own Journal, into which can be recorded the day's events, happenings and feelings. At first the aim was to learn how to use the journal and establish routines; later, use will be extended to a variety of purposes (e.g. physical exercise component, nature diary, main news journal or an art journal) and their integration with students' everyday life and history. A good example of small steps that incorporate IT in teaching.

Eurooppa, Wikis and Blogs
In our project we sought (and found) ways to make use of social media and contemporary learning equipment in our primary school (5th grade) humanities lessons. Our class produced six blogs, wikis, power point presentation and a traditional cardboard travel advertisement during the course. A central difference to 'normal' learning was the online cross-commenting of work, openness in publishing (all work produced was published in the open net) and the equipment, partially foreign to students.

Meeting of Cultures Project
This project implemented at the Kello School was based on the 6th grade history curriculm. 8th and 9th graders also participated in content production. The Microsoft Live@edu online tool was employed in the project, the teacher using this to plan, manage and assess work. Student groups worked in online learning environments at school and at home.

The project's final outcome is the groups' website network, into which produced and collected material was gathered. Important objectives in addition to content goals were skills related to knowledge and material collection, classification, structuring, assessment and presentation.

Traditional Foods
In our 8th grade Home Economics lessons, we realised a traditional foods project in which we made use of various media. We learned more about traditional Finnish foods, the food culture of the different areas of Finland and our own family roots. We wanted some variation to traditional Home Economics lessons by utilising contemporary media. Students collected old traditional food recipes from their relatives, making use of eg the camera and voice recorder in their mobile phone and collected these on the peda.net site. Also, we had guests visit our lessons and students themselves visited local entrepreneurs. Recipes were tried out as far as possible in the students' free time and during Home Economics lessons. Students also received their own 'Cookbooks' of the recipes. The recipes were translated into posters hung up in the school corridors. Other students could then also draw knowledge from these. In the future, the recipes may also be put on a CD-ROM, the sale of which would accrue money for class trips.

Special Education
This project was implemented at Kello High School in the beginning of spring 2009. During the project, ways to provide education support to students unable to attend school were sought. This support was realised through the use of online tools, such as SharedView and Messenger, and a computer connected drawing platform. It was a good model.

Municipal Decision Makers
High school students studied the municipal decision making process with local government employees and decision makers. Participants were divided into groups. Each group's task was to clarify and explain one elected body's or government employee's role in the decision making process; what their tasks are and what power they wield. The learning module was collected in the Ylöjärvi wiki.

Living Language
Upper secondary courses are rich in content, perhaps even crammed full of content. In the 'Text, Style and Context' course at our school we tried to find a method that would give students time to work through reading and writing

tasks in the midst of a hectic work schedule. Reading and writing are individual tasks, but we wanted to create a peer learning space. We used an open group work environment, Ning, on this course. The course threads were gathered into a collective course journal, a Google spreadsheet.

Interest Groups

The students in the Y-line at our upper secondary school functioned as a kind of political barometer in the interest group chain. They interviewed the inhabitants of our town regarding services provided and other activities. The received feedback was then 'chewed over' in panel discussions with representatives of various local council groups. The mayor responded to students' questions in a 'chat' question time. The learning module was collected in the school wiki.

In primary and secondary education there are more local and regional approaches where online services are being developed in order to guarantee the supply of a wider set of courses or even to guarantee the supply of compulsory courses in the whole area, especially in the sparsely populated areas of eastern and northern Finland.

Vocational Education

In secondary level vocational education, ICT has been deployed in various development ventures in several educational institutions for over two decades. The development ventures have often been EU funded and either collaborations between several countries or local ventures implemented in partnership with the world of work. No evaluations or comparative studies have been conducted on ICT use. Especially in The Virtual School project (www.edu.fi/viruaalikoulu, in Finnish) the vocational sector was engaged in several different virtual education development ventures regarding youth and adult education. Altogether 120 institutions were involved in these ventures. The implementations can be found on the Open Idea website www.edu.fi/openidea/ammatillinen.

A minimum goal for online studies, at least 2 ECTS in a 120 ECTS degree, was set for vocational education programmes (Development and standardisation of online education in upper secondary schools, vocational education and informal learning, 2005). A few institutions offer broader online study programmes and currently some degree programmes can be entirely completed as online studies. In the vocational sector, networks of developers have been created around a specific qualification so that students

can study parts or the whole qualification also online. Most often there is a combination of face-to-face and online learning.

The aim of online education in vocational education has been to offer students study opportunities independent of time and place, and facilitate networking with experts. Leinonen's (2008) dissertation focuses on Virtual School projects and s/he concludes that virtual education as such has not brought many changes to a teacher-centric teaching style – course textbooks and tasks are often replaced by the new technology. The student's role is that of a fairly passive recipient of knowledge and there is very little interactive study with different experts. It is impossible to construct learning processes required by active learning without pedagogic reflection (Leinonen 2008). The teachers who have engaged in deep pedagogic reflection have changed teaching practices, creating a more interactive teaching and enabling students to become active learners. Much tacit knowledge on online education in educational institutions has been established in virtual ventures through these teachers and the out-sourcing of the knowledge created in development ventures has a key significance in the establishment of online education (Leinonen 2008).

This statement holds true for the entire educational field -the exchange of experiences and receiving meaningful personal experiences promotes the taking up of online teaching in everyday work. In vocational education, online teaching is becoming an even more significant teaching method and therefore the exchanging of experiences and learning from each other has become increasingly more important.

Higher Level Education
The Finnish higher education system comprises 20 universities and 27 Universities of Applied Sciences. An important part of e-learning in higher education is the Finnish Virtual University (FVU), created in 2001 as a collaborative initiative of all the 20 universities in Finland and The Finnish Online University of Applied Sciences (VirtualUAS), created in 2002 as a collaborative initiative of all 27 Universities of Applied Sciences. Both (FVU and VirtualUAS) serve regular students and lifelong learners and fulfil a variety of different functions-learning provider, academic network, technical service and laboratory for the development of ICT-based education. The FVU and VirtualUAS have served as a collaborative forum for universities when developing their e-learning approach. The basic idea has been to integrate the educational use of ICT in teaching and learning.

Up until 2008 the FVU and the VirtualUAS functioned as separate units, but from 2008 they have engaged in close cooperation.

The Finnish Virtual University
Every one of Finland's 20 universities has its own virtual university activity. This activity includes each university's own solutions to advance ICT, which is partially funded by the Ministry of Education. The Ministry funded virtual university projects and activity for the years 2001-2006 according to performance-based funding policies.

However, universities used money granted by the Ministry of Education for virtual university activities more generally on teaching ventures. These projects included designing online courses and the preparation and publication of related learning material. Teaching projects were implemented in faculties. Their pedagogic and technical implementation was supported through various systems, often as cooperation between universities. Staff development was a component of some projects. Investing in teaching is understandable, as this is a question of the basic function of universities. A critical question is how permanent a new education practice has been achieved.

A considerable amount of staff training has been organised in universities and support services for online education developed. Development of support services included the planning of technical and pedagogic support and teacher guidance and instruction (Ministry of Education, 2007).

The Finnish Virtual University underwent an assessment in 2007 and it was noted that five years of development had resulted in:

- some degree of permanency in operations
- integration of activities
- new development actions and pilots
- enhanced skills
- networking
- more student-centric activity
- greater course selection
- creation of digital learning materials
- Organisation of support services.

The assessment indicates there are universities that have seriously taken on board the permanency of virtual education and invested in this, as well as universities in which, for example, the tenure structure indicates that little investment has been made to continue the virtual university's operations. A central objective of the FVU has been the natural integration of ICT's pedagogic use with the university's work. Progress has, in fact, occurred. Development has accelerated now that virtual education is no longer implemented with special funding from the Ministry of Education. We can also talk of blended learning ICT in teaching. Responsibility for the FVU's operations can be transferred to individual teachers who employ the possibilities afforded by ICT in ways they deem best. Some universities have operated more systematically and further possibilities of ICT genuinely considered. (Ministry of Education, 2007.)

An example of university operations is provided by the Open University of the University of Jyväskylä www.avoin.jyu.fi. It is an established part of the University, specialising in life-long learning. The Open University offers plenty of different opportunities for those intending to do academic studies through distance learning. Multiple possibilities of blended learning have been in use for many decades and over 14 000 students are enrolled on courses annually.

The Open University offers over 50 Bachelor-level subjects in Finnish from all seven faculties of the University of Jyväskylä and ten subjects entirely in English. Studies begin non-stop, and students study at their own pace following their personal learning plan. All subjects and courses available in English can be studied through distance learning.

Online study can be employed in education in a variety of ways. The web can be a tool, for example, for notification, sharing of course materials and production of common material, or a medium for student interaction and discourse. In Internet-mediated online learning, the web can function as a material bank, from which knowledge and material is shared, often in addition to other didactic activity.

The Open University's various courses have at their disposal online environments to support learning, from which students can access hints regarding study and the completion of tasks. Students are also able to watch online video recordings of lectures on the web.

The web is also employed as a tool for student guidance. Students can, for example, complete tasks on the web according to instructions given by teachers and they receive teacher feedback on the web. They may also be able to view other students' work, but there may not necessarily be any actual interaction between students. On some Open University courses students can participate in an online course or task to be completed independently in which study progresses utilising self-study material. As a tool for interaction among students, the web makes possible student discussion online either through one's own initiative or as part of the course requirements. Often online courses or tasks to be completed independently in an online environment include an opportunity for dialogue. Students can discuss, for example, issues related to study practices and learning tasks. Communication between students is best realised through actual group-based online courses, in which learning is built on collective action and interaction. In this way, web-mediated education allows group-based work despite long distances and brings a change to independent distance learning.

The Virtual University of Applied Sciences
Universities of applied sciences have aimed to offer students the possibility of approximately 30 ECTS of online studies in a 240 ECTS degree programme. The number of online courses and study flow has significantly been affected by how higher education supports its staff in online education training and, on the other hand, the course counselling students receive concerning online study. Both pedagogic and educational technology support are required and peer support offered by institutions results in the best outcomes.

Most universities of applied sciences have an online education team comprised of teachers and e-learning experts that supports teachers' online teaching and tests various tools and methods. Most universities of applied sciences also include research in these experiments and development projects. Online courses are offered at all universities of applied sciences and most institutions can offer online degrees completed entirely over the web.
 The Finnish Virtual University of Applied Sciences mediates cooperation and educational offerings of web-based education between the various universities of applied sciences.

The Finnish VirtualUAS is a cooperative network formed by Finland's universities of applied sciences, which works in a dual model-based close cooperation with the Finnish Virtual University.

The objectives include unrestricted student mobility, staff ICT expertise, and collaboratively produced diverse learning material and courses (VirtualUAS, strategic policies for 2008 – 2015). Online education at universities of applied sciences underwent an assessment in 2008, which was interested in how web-based education was currently implemented. Presentations of good practices comprised the data.

The number of university of applied sciences online courses is illustrated by the fact that of 27 institutions, 25 submitted a good practice for the evaluation (Leppisaari et al 2008). The good practices included examples of degrees completed entirely or partially online, international cooperation and student project guidance.

Interesting pedagogic solutions and didactic practices were raised in the evaluation. These included various applications in an online environment that support students' expert cognitive processes and promote collective problem-solving skills. It is, however, necessary to continue developing pedagogic models for web-based education. It is especially important to develop the purposeful discourse of groups in which a collective knowledge base is constructed.

The continuous enhancement of teachers' skills and in particular online guidance ability demands continuous resources. Students and workplace representatives need to be an integral part of the development work (Leppisaari at al, 2008).

Adult Education
There are excellent and extensive opportunities for life-long learning in Finland after the compulsory education stage. Professional skills and abilities can be acquired at vocational institutions, universities, universities of applied sciences, and through informal learning. All forms of adult education increasingly employ the possibilities offered by e-learning. Informal learning online courses include almost anything from handicrafts to languages, and social media methods are extensively utilised on different courses.

Adults also have a good opportunity to make use of courses offered online, as the majority of households in Finland have a computer and Internet connection. 83% of 16-74 –year-old Finns said they had accessed the Internet during the last three months in spring 2008.

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The proportion had risen by 4 percentage points from the previous year. The Internet is accessed regularly and often. As much as 80% of Internet users said they accessed the Internet daily or almost daily. Only five percent said they used it monthly or less frequently.

Many elderly people are daily users. As much as 60% of 65-74 –year-old Internet users said they had accessed the Internet daily during the three months of spring 2008.

Table: 2
Use of the Internet spring 2008, percentage of Internet users in age cohorts

Purpose	All	16-29yo	30-49yo	50-74yo
Sending and receiving emails	90	95	91	83
Searching for information on products and services	88	92	92	79
Banking	87	84	92	82
Browsing travel and accommodation services	70	63	75	68
Reading newspapers, magazines, etc	69	68	73	66
Searching for information on illnesses, nutrition or other health related information	62	60	66	57
Searching for information on websites of various authorities	56	54	63	49
Searching for educational courses	44	57	46	28
Listening to the radio or watching TV	40	53	41	25
Listening to or downloading music Onto a computer or other device	39	64	37	16
Reading blogs	38	53	35	28
Searching for education related information	37	60	34	18
Used instant messenger	35	69	28	12
Downloading programmes onto own computer	32	45	32	18
Job hunting or sending job applications	32	55	31	11
Writing messages in discussion				

forums or news groups	30	54	26	11
Buying second-hand goods on Auction and shopping websites	23	30	25	13
Using browser-based news services (e.g. RSS)	23	31	23	14
Internet telephone	18	19	18	16
Selling objects, products or services on auction or shopping websites	17	22	19	10
Online education	17	29	15	8
On-going subscription to an online publication or news service	14	11	17	12
Playing games online	14	31	8	4
Video negotiations/conferences	10	12	10	7
Downloading games off the Internet onto own computer	9	17	7	3
Used a peer-to-peer network to exchange movies, films, etc	7	18	5	0
Creating or maintaining own blog	5	9	4	2

When considering the population as a whole, daily access of the Internet is widespread. 66% of all 16-74 year-olds accessed the Internet daily or almost daily in 2008 (Bureau of Statistics 2009). The Internet is used for banking, reading and sending emails, purchasing, and searching for information. But, searching for educational courses and completing online courses is becoming more common (Table 2.). e-Learning is, therefore, increasingly a learning method for everyone and thus challenges schools to a better production of learning services and quality learning material.

Dissemination of the Experiences
In this chapter, in connection with e-learning implementations in all institution forms, we have noticed that the sharing of knowledge and experiences and the acquisition of meaningful practical experiences is the best way to improve one's e-learning skills. Many events are organized in Finland annually, at which it is possible to meet e-learning experts, relate one's experiences, share experiences with others and test different tools. The range and quantity of events and the large numbers of participants underscore e-learning's significance as a facilitator of skill development.

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The ITK seminar focusing on pedagogic uses of IT has been organized in Hämeenlinna, Finland for over 20 years. Approximately 1500 teachers, researchers and experts attend this seminar annually to consider pedagogic uses of ICT as well as its employment in learning support. Furthermore, the international MindTrek seminar is organized every year in Tampere, one main theme of which is the use of ICT in educational institutions.

The National Board of Education organizes the National Virtual School Conference every year. The aim of the conference is to disseminate information and experiences of web-based learning. Participating actors can discuss issues related to virtual learning, exploring and tightening collaboration possibilities between themselves.

The Virtual University of Applied Sciences and the Finnish Virtual University have organized their own annual seminars from 2000 on, and from 2009 these have merged into the one seminar. The Finnish eLearning association (www.eoppimiskeskus.fi) holds the Digital Learning Competence seminar every autumn, targeted at staff trainers and businesses. Through networking and doing together we can develop Finnish e-learning competence.

CONCLUSION

In this paper, we have described e-Learning developments in the various levels of education in Finland during the last twenty years. Pioneering teachers, trailblazers, have utilised new information technology to develop teaching.

The Board of Education has supported development through strategic emphases and special funding. Students are able to complete, for example, senior secondary school, vocational degrees, university of applied sciences degrees and some university degrees entirely over the internet. Teaching methodology at every level of education has been developed utilising information and communication technology.

The challenges, however, do not end here. Social media and the collective production of knowledge on the internet create completely new challenges for the world of education. Peer-to-peer learning is now facilitated in a powerful way through new social networking tools such as blogs, wikis, Twitter, Facebook, and social bookmarking. Learning can be socially situated in a way never previously possible.

The learner him/herself is at the centre of learning and the teacher's role is changing at all levels of education. What are required is more stronger pedagogic competence and collective activity alongside technology.

There needs to be a shift from teacher-centredness to an increasing student-centredness. The change in the teacher's role creates new demands to the administration.

The teachers need to be in-service trained quickly and simultaneously. Instead of lecturing, teachers should begin to work together with their students, that is, shift from teaching-centredness to learning-centredness and a 'one size fits all' model should be transformed into indivdual learning paths. Individual work should become doing together and learning together. For many teachers these challenges are not new and solutions have been found.

However, changes in practice and a full utilisation of information technology is not tied to an individual's ethos, but rather the passion an entire educational institution's community has for collaborative learning.

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CHAPTER-8

eLEARNING IN GREECE

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ABSTRACT

The following chapter is an effort to describe the development of eLearning in Greece. In the first part we describe the Greek educational system in general. The second part deals with distance education in Greece. Later on we address the issue of development of Information and Communication Technologies and infrastructure in Greece. eLearning Research, Lifelong Learning, Adult Training, Intercultural Education and Future Strategy are also addressed as major parts of the eLearning sector in the Greek educational system.

COUNTRY

Greece is a small country at the southeast corner of Europe, with a population of 11,2 million people. It has been a member state of the European Union since 1981, and it covers almost 132 km^2 (Gateway to the European Union: http://europa.eu). Greece has a long history, dating back to the Neolithic times. Great world civilizations have developed during the course of time, from the Minoans and the Mycenaeans to the birth of democracy, theatre and sciences during the Archaic and classical times, to the kingdom of Great Alexander and the Byzantine Empire. The Modern Greek State was formed in 1829, after more than 400 years of Ottoman

occupation. The official language is Greek, spoken by the 99% of the population while the 98% of the population is Greek Orthodox, with a percentage of 1.7% Muslims making Islam the second religion in Greece. The 7% of the population are immigrants mainly from countries of Eastern Europe, the Balkan region, the Middle East and Africa. The government type is presidential parliamentary republic and the currency is the Euro. The country's economy progresses slowly but steadily, advancing sectors such as agriculture, constructions, shipping and tourism. The service sector comprises more than 75% of the GDP (The World Factbook, http://www.cia.gov).

Administration is decentralized and the country is divided in 51 prefectures, the local administrative units. While 96% of the population is literate, the expenditures for education reach only 4.4% of GDP, which is often the reason for teachers' strikes and students' sit-ins.

Figure 1.
A map of Greece

With more than 2000 islands, Greece is a major travel destination, making tourism one of its main sources of income. It has a Mediterranean climate, and about 80% of its terrain is mountainous.

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Almost half of the Greek land is covered by forests with a great variety of vegetation. The capital is Athens with a population of 3,192,606.

EDUCATION SYSTEM

During the last 25 years the Greek state has been increasingly procuring to enhance the quality of the entire education system. This has been a consequence of Greece's induction to the European Union and the subsequent financial aid the country has been receiving, as well as the need to address contemporary needs, such as immigration, technological advancement and the globalization of the economy.

The Ministry for Education, Life Long Learning and Religions is the highest authority for Greek education, responsible for primary, secondary and tertiary education (http://www.ypepth.gr). The Greek educational system aims at creating learning environments that answer the current social and economic needs of the Greek and the European society. Corresponding to these needs, the educational system has renewed its priorities in all levels, by making pre-school education obligatory, opening all-day schools, equipping schools and Universities with informatics labs and relevant technological tools and founding intercultural and special education schools, as well as life long learning departments in the public universities.

More specifically, the introduction of technology in all educational settings has been a priority for the Ministry of Education. 3,389 secondary schools out of a total of 3,482 have already been equipped with 40,188 computers, while the Diodos action provides high internet connection with low rate for university students and staff.

All levels of education (see figure 2) in Greece are tuition-free, with the exception of some Master's degrees at some public Universities (e.g. most Master's degrees in the University of Macedonia have tuition fees). The educational system is divided in three levels, primary, secondary and tertiary. The primary level is comprised of pre-school education and primary school (Demotico), with students up to the age of 12. Secondary education includes two sublevels, lower High School (Gymnasium) and upper High School (Lyceum). Education in Greece is obligatory until the last class of lower High School. In 2009, schooling in kindergarten was made obligatory by law.

Figure 2.
Structure of the Greek Educational System
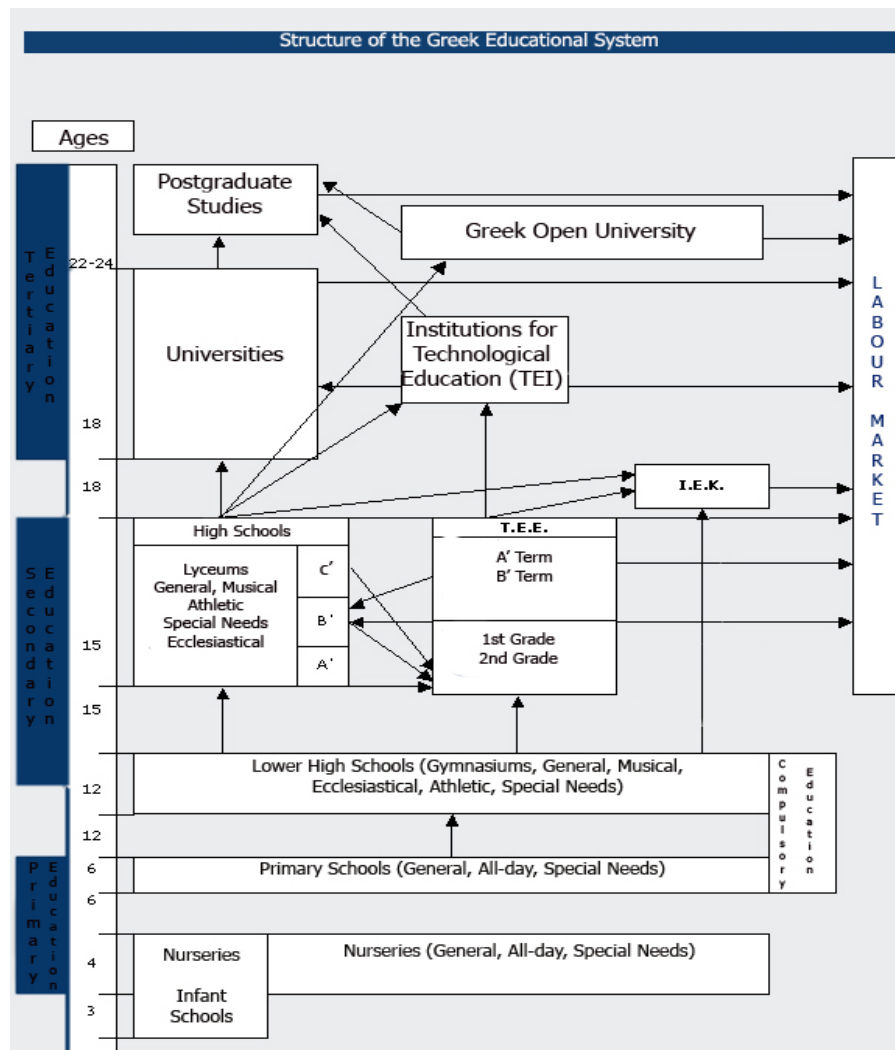
Source: Ministry of Education, http://www.ypepth.gr

Lower High School lasts from 12 to 15 years old and upper High School lasts up to the age of 18. After graduating from lower High School, which can be either General, Musical, Ecclesiastical, Athletic or Special Education school, students have a variety of options to choose from, depending on their

needs and capacities. There are general upper High Schools, Musical, Ecclesiastical, Athletic and Special Education upper High Schools, as well as Technical Professional High Schools (TEE), which focus on technical education. The most common and numerous types of lower and higher high schools are the General ones.

The subjects taught in Greek high schools are diverse, covering numerous scientific areas, from religion and philosophy to sciences and informatics. Although there has been a great effort to include all disciplines and teach a variety of skills, the curriculum fails to succeed its educational purposes. One of the reasons is the very competitive examination system through which access to the University is filtered, which forces students to focus on the acquisition of skills necessary only for success in these exams. Public high school alone is not enough for the preparation of students for these exams (Pan-Hellenic examinations), so thousands of private afternoon schools (Frontistirio) have emerged in order to teach young Greeks the specific material needed for success and consequently entrance to the University. Most students take classes for more than 11 hours per day during the last years of high school in order to achieve high scores in the final exams.

It was back in 1996 that the Ministry for National Education and Religious Matters laid the foundations of a system designed to meet the educational needs of social groups with a particular social, cultural or religious identity. The Ministry adopted intercultural education - a new form of education in Greece - as part of this policy. The aim of intercultural education is to set up and run primary and secondary classes that provide education to young people with a specific educational, social or cultural identity. In intercultural schools, the standard curriculum is adapted to meet the specific educational, social or cultural needs of the students attending them.

A total of 26 intercultural schools have been set up throughout Greece since 1996. These schools, which will continue to increase in number, guarantee equal opportunities to every student in the country, while the cutting-edge approaches to teaching and learning utilised in these schools have a positive knock-on effect on the Greek educational system as a whole. Of the 26 intercultural schools, 13 are primary schools, while there are 9 lower high schools and 4 upper high schools. A school can only be described as intercultural when repatriated Greek and/or foreign students account for at least 45% of the total student body. The educators in these schools receive

special training, and are selected on the basis of their knowledge on the subject of cross-cultural education and teaching Greek as a second or foreign language (source: http://www.ypepth.gr).

University education is divided in four types of schools: public Universities, public technical Universities, the Hellenic Open University (HOU), which is a distance education institution, and various private colleges.

Greek Universities are fully self- governed, superintended by the state and financially aided by it. There are 23 public Universities in Greece, 16 technical Universities and many private colleges. Many Departments of these Universities were founded very recently, as an action with mainly political expectations, answering a questionable need for more and more University graduates in the Greek market. Nevertheless, many of them have very low quality standards, and there are thoughts about closing down those that do not meet specific scientific and educational standards. Another alternative for high school graduates are the Institutes for Professional Education (IEK), which offer mainly technical education (http://www.oeek.gr).

Private colleges in Greece are institutions associated with mainly British and American Universities and Colleges, through a franchise system. They were not considered institutions offering higher education until the law of 2009, which gave their graduates the same professional rights as those having attended public Universities, a matter that has been raising strong disagreement by University professors, political parties and students alike.

Since 2004 the government has increased the amount of money for basic education needs. During the years 2000-2006 the Greek state has spent 960 million Euros for higher education through funds of the Operational Programme for Education and Initial Vocational Training programs, one of the Third Community Support Framework's 24 Operational Programmes (research, training and teaching funds, comprised at a 75% rate by the European Union and 25% by national funds), and there is provision for another 3,3 billion Euros for Greek Higher Education from the next Community Support Framework (2007-2013). The Greek state is the main sponsor of education with a contribution percentage of over 98%, a very high percentage compared to the European Union's average of 82.8%.. Greece is also one of only 6 countries in the European Union without University fees.

The duration of studies for the public higher education institutions depends on each Department, raging from 8 to 12 academic semesters. 42% of the University student population is inactive, namely have not graduated after the specified period of time for each Department (4-6 years), but are still enrolled in University. Greek law has been attempting to ensure high quality standards in all public Universities, by inserting forms of external and internal evaluation systems according to the European Union's standards.

During the years 2004-2005 the Greek Ministry of Education grounded an international orientation in Higher Education, founding the first International University in Thessaloniki and starting a number of joined master's programs, in cooperation with other European Universities, in many faculties of most of the Greek Universities.

In addition, departments for Life Long Education have been founded in all public Universities through a law established in 2005.

DISTANCE EDUCATION

In recent years the Ministry of Education has made some efforts to integrate distance learning applications in the secondary and tertiary curriculum. One of them, the e-Class platform for secondary schools, has already 5689 registered teachers from 2630 secondary schools. The number may be small, but the program has only been running since 2006, and the participants have been increasing. The program was initiated by the University of Athens, and its functions are typical of asynchronous distance education environments: uploading educational material and relevant sources, creation of educational exercises and evaluation tests etc. (http://eclass.sch.gr).

The main public institution for distance education in Greece is the Hellenic Open University, comprised of four Departments:

- the Department of Humanities, with 3 undergraduate and six postgraduate programs,
- the Department of Social Sciences, with one undergraduate and six postgraduate programs,
- the Department of Sciences and Technology, with two undergraduate and thirteen postgraduate programs, and
- the Department of Applied Arts, with two postgraduate programs.

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Although Open University has tuition fees for all its courses, it has been extremely popular since its foundation, offering very competitive postgraduate and undergraduate programs, as well as PhD supervision. The numbers evidence this success: 16763 undergraduate students, 11305 postgraduate students, 30 PhD candidates and 72139 applications for both postgraduate and undergraduate programs for the academic year 2008-2009 (http://www2.eap.gr).

All public Greek Universities also offer distance learning opportunities through a blended learning model. The most common practice is professors uploading the syllabi of their courses, and students downloading sources for study and also uploading their papers.

Most lectures continue to take place in the classroom, and exams are taken every semester in the University premises. Greek students show positive attitudes towards the use of new technologies in education in general, and distance education practices in general. In addition, most private colleges in Greece offer some distance education courses.

The University of Athens and Aristotle University of Thessaloniki, the two biggest public Universities in Greece, offer distance education courses through the e-Class platform, which is one of the distance education platforms mostly used in Greek Universities as part of the Greek University Net (GUNET), an initiative in which most Greek Universities participate. Asynchronous e-learning Services are those mainly supported by e-Class platform.

Aristotle University also offers distance education classes through Blackboard software. E-class platform is also used by the University of Thessaly (http://eclass.uth.gr). The University of Crete is currently working on class-web, a platform for distance education applications.

The University of Athens offers 1547 online modules through GUNET, as well as continuing education programs through a distance education platform (http://elearn.elke.uoa.gr/elearn).

The University of Macedonia offers 829 undergraduate and postgraduate courses through CoMPUS, a system for asynchronous distance education where professors can upload learning material, exercises and grades (http://compus.uom.gr).

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Distance education efforts have been accepted with enthusiasm by Greek students, although the method still needs to be further researched and applied in Greek higher educational settings (Karakirios & Kekeris, 2009). According to Papadakis, Paparizos & Rossiou (2006), the large numbers of students, combined with the vast learning material and the small number of teaching hours, result in ineffective educational results, which can be aggravated through the use of distance education methods and models.

Although students in this study hesitated to use distance education methods, it seems that a large proportion of them, measuring 61%, using the asynchronous education platform found it to be quite promising, despite the fact that they were Applied Informatics undergraduates, and one would expect more participation.

Nevertheless, the very small percentage (6%) that participated in the synchronous education initiatives (the three virtual classes offered) shows the scepticism of students, and the Greek society in general, towards new forms of communication and education.

Despite the growing interest by teachers and students alike about incorporating distance and blended education techniques, a common problem is the low quality of most such efforts.

The most common application of distance education programs consist of uploaded presentations of the course contents, with no provision for structures for interaction or student participation (Kalogiannakis 2006). It seems though that alternative educational approaches such as those realized by the introduction of new technologies in higher and secondary education are beginning to emerge and attract big parts of the Greek population.

TECHNOLOGY

Many efforts have been made during the last few years in Greece from both the public and private sector for the improvement of technology infrastructure and quality of services.

The rapid growth in communication technology and the continuous increase of internet access have affected Greek economy and the citizens' needs in many ways. As a result, education quality and learning services have been affected very positively. EETT is the National Regulatory Authority

(http://www.eett.gr), which supervises and regulates the telecommunications as well as the postal services market. EETT's institutional purpose is to promote the development of the two sectors, to ensure the proper operation of the relevant market in the context of sound competition and to provide for the protection of the interests of the end-users.

EETT is an independent self- funded decision-making body. Established in 1992 by the Act 2075 under the name "The National Telecommunications Commission (EET)", EET actually commenced its operation in summer 1995. It was primarily responsible for the supervision of the liberalized telecommunications market.

Moreover, EET was entrusted with the supervision and regulation of the postal services market and was renamed as National Telecommunications and Post Commission (EETT).

The vision of EETT is to expand and constantly upgrade communication so that Greece can participate in the Knowledge Society. EETT is working to:

- ensure catholic access in a great range of communication networks and services.
- safeguard the rights of the consumers of telecommunication and postal services.
- constantly inform the consumers of their rights and obligations.
- secure the utilisation of scarce national resources, such as the spectrum of radio frequencies and the numbering resources.
- contribute to the development of the telecommunication and postal services markets by creating a regulatory environment according to the principles of competition.

According to EETT annual publications on the internet services in Greece, there is an incredible increase in broadband connections and services the last few years. The number of Internet subscribers (Figure 3) increased considerably (38.5%) in 2008 amounting to 1,741,255 subscribers (dial-up and broadband).

The dial-up connections have been decreasing since 2005 and in 2008 they steadied slightly below 250,000. The entire market picture indicates that broadband growth does not rely entirely on the subscribers' transfer from dial-up to broadband access but also on attracting new subscribers. The

following figure does not take into account the occasional users via prepaid access cards.

Figure 3.
Internet subscribers in Greece
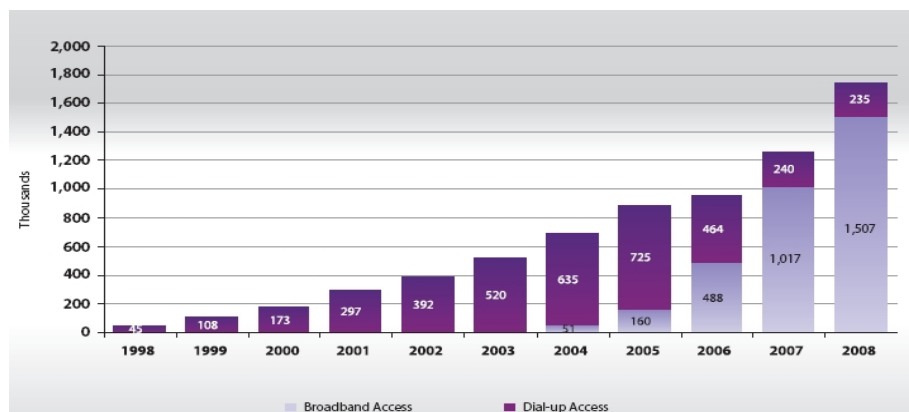
Source: EETT Market Review 2008, pp.29

The significant increase of both the number of applications and the total assigned [.gr] Domain Names persisted throughout 2008 (figure 4). The total number of Domain Names, including sub-domains (com.gr, net.gr, org.gr, edu.gr, gov.gr), exceeded the number of 250,000 at the end of the year. Figure 4 presents the progress of the total number of Domain Names for the period 1998-2008.

Figure 4.
Assigned domain names from 1998 to 2008
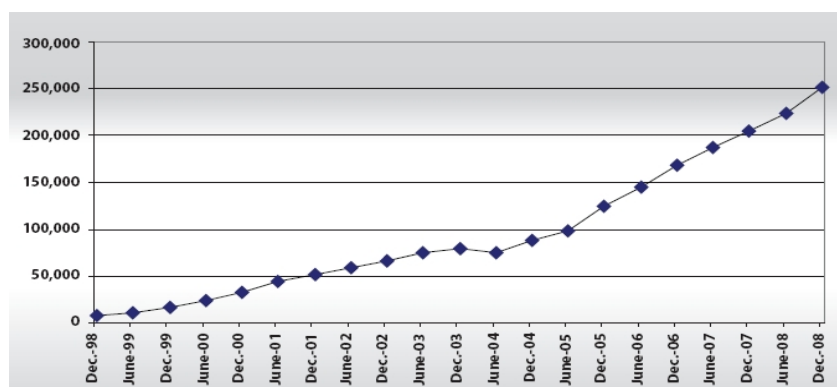
Source: EETT Market Review 2008, pp.30

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The impressive increase of broadband connections persisted throughout 2008 reaching the number of 1,506,614 at the end of the year compared to 1,017,475 at the end of 2007, having registered a 48% increase (Figure 5). The rise of the broadband penetration rate in Greece was respectively 13.4% in relation to 9.1% at the end of 2007), rendering the comparison with the rest of Europe feasible. Analytically and with regard to the broadband penetration rate, Greece was ranked on the fifth place from the bottom at the end of 2008 among the 27 EU member states, having improved, thus, its condition slightly (one place higher) compared to the end of 2007. It should be mentioned that Greece has registered the third highest increase in the broadband penetration rate for 2008 among the EU member states.

Figure 5.
Broadband connections in Greece
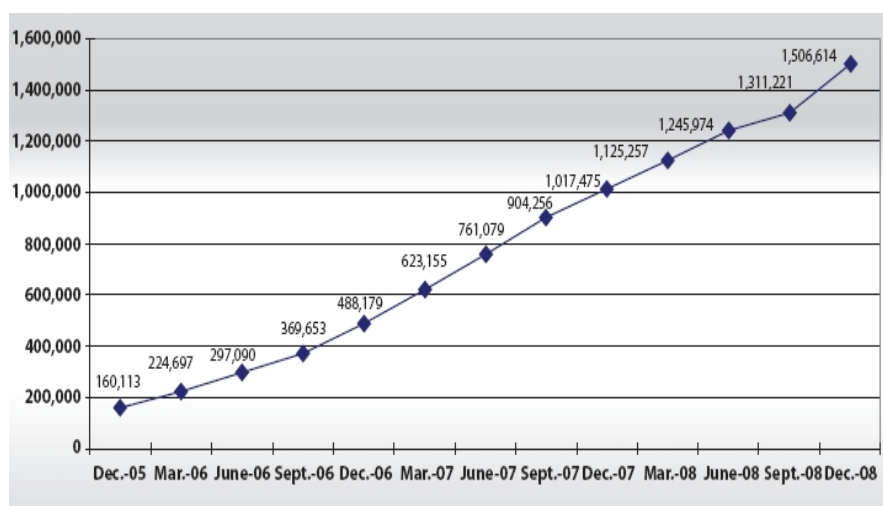
Source: EETT Market Review 2008, pp.42

The reduction of ARYS lines was significant since the percentage dropped from 21.9% at the end of 2007 to 6.3% in December, 2008. This fact indicates the tendency of alternative providers to shift their subscribers' base from Wholesale Broadband Access (WBA) to LLU. Lastly, access via other technologies is still not feasible since Greece registers the lowest score in the entire Europe, a fact that reflects the lack of alternative infrastructure in our country. The access speed of the sum total of broadband lines swung considerably since the majority of the lines corresponds to speeds equal to or

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higher than 1 Mbps (download) (99.9% while the respective percentage at the end of 2007 was 60.7%), and 32.6% of the total number of broadband lines corresponded to speeds higher than 10 Mbps (Figure 6). This fact indicates a consumers' shift towards high-speed products.

Figure 6.
Broadband lines in Greece
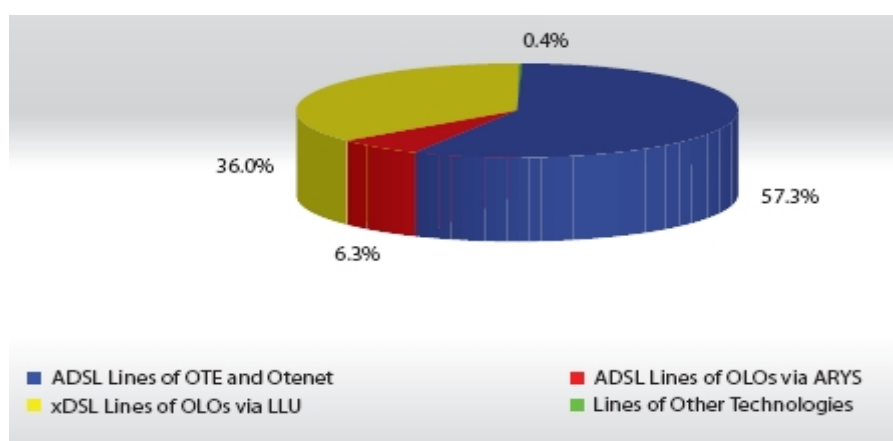
Source: EETT Market Review 2008, pp.45

In 2005 the Information Technology Committee in Greece (http://www.infosoc.gr) developed for the first time an integrated Digital Strategy for the period 2006 – 2013. The Digital Strategy 2006 – 2013 aims at the creation of all the necessary conditions for the materialization of a "digital leap" in terms of productivity and quality of life in the period 2006 – 2013. As for the next period, the Digital Strategy sets as the country's basic objective the development of Information and Communication Technologies (ICT) and of new skills. Having set the strategic goals, the Information Technology Committee, which is the highest institutional body for the planning of the strategy and for the development of IT, made the following 4 steps for the drafting of the country's digital course for the period 2006-2013

- 1st Step: Examination -identification of the source of the problems that impede the use of ICT in our country.
- 2nd Step: Analysis of the International Policies on Information Society and the New Technologies. Identification of the good examples and of the failures of the other countries.

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- 3rd Step: Study of the international and European developments in the field of Information Society (EU policy i2010, WSIS developments etc.)
- 4th Step: Setting the basic directions of the digital strategy for the period 2006-2013, always taking into account the particularities of the Greek economy and society.

One of the objectives of the Information Society is the introduction and utilisation of the Information and Communication Technologies (ICTs) to the field of education and training. New technologies, and, more specifically, the Internet, are means which if used in all the levels of education (primary to tertiary) will offer multiple benefits to the educational process.

The students of all the levels of education will have at their disposal more tools for learning and the educational process will not be restricted in the use of a sole book. Technology has the power to present the learning material and the relevant information in multiple ways (text, sound, images) enhancing motivation for learning and knowledge. An important step towards this direction will be the development of e-school and e-university. E-school is concerned with the development of infrastructures for the provision of e-services for the Primary and Secondary levels of education while e-university is concerned with the Tertiary level of education (including administrative services). The objective is to achieve a very high level of provided services while at the same time creating the conditions for easier access to these services through the Internet.

The result of this effort is expected to be a decrease of expenses through the simplification of bureaucratic mechanisms and the support of the service provision procedures through the use of Information and Communications Technologies so that the response time to the citizens' requests is minimized. At the same time, another aim is the provision of unified information services for citizens. The relevant content will be distributed in various ways, including the support of people with special needs. The e-school and e-university actions concern the development of infrastructures for the provision of e-services which include:

- The publication of texts and information packages;
- The provision of information for the interested parties with the use of electronic means, such as web sites, e-mail, fax, Frequently Asked Questions etc;

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- The possibility for electronic submission of applications, their monitoring and answering; and
- Combined services which include the provision of service for citizens (students, teachers, parents, contractors, suppliers) from centres offering unified services to different levels and fields of education.

More analytically, for the units of primary, secondary and technical-occupational education, secretarial support applications and a central base for storing data about school units will be implemented as well as a system facilitating access to selected sub-totals of the central data base. Regarding tertiary education, the applications to be implemented will support the secretarial and administrative services of all Higher Educational Institutes.

The use of new technologies in education and the networking between schools, universities as well as the academic community is expected to be a big step for the creation of knowledge based structures in every day life. Education is a privileged area for the implementation of new technologies since young people are particularly receptive to them. The benefits are expected to affect all the categories of involved users: students of all levels, teachers and academics. Therefore, upon the successful progress of the two actions -e-School and e-University- the schools and universities of the country will be modernised and effective and will provide many more opportunities than today for teachers and students as well as anyone having transaction with these institutes. Furthermore, at a long-term level the benefits will not be restricted to the educational community but will be disseminated to the whole social web.

E-LEARNING AND ICT INTEGRATION

E-learning in Greece is mostly provided by the Hellenic Open University (HOU) in Patras. However all public Universities use e-learning platforms and offer e-learning lessons in both undergraduate and postgraduate level in order to support the learning procedure. In the secondary education level the Greek Schools' Network and the Pedagogical Institute are the parties responsible for the e-learning procedures.

The Greek Schools' Network (GSN - www.sch.gr) is the educational intranet of the Ministry of Education and Religious Affairs (www.ypepth.gr), which interlinks all schools and provides basic and advanced telematics services.

Thus, it contributes to the creation of a new generation of educational communities, which takes advantage of the new Informatics and Communication Technologies in the educational procedure.

The implementation of the Greek Schools' Network is funded by the Framework Programme for the Information Society (www.infosoc.gr), in close cooperation between the Ministry of Education as well as 12 Research Centers and Highest Education Institutes, specialized in network and Internet technologies.

The current design and implementation of the Greek Schools Network focuses on providing useful services to all members of the basic and middle education community, fulfilling the following goals, among others:

- Access to telecommunication and informatics services
- Access to digitized educational material
- Distance learning, e-learning
- Enhancement of collaboration
- Information and opinion exchange
- Conduct of thematic discussions, seminars, lectures, etc.
- Access to digital library services
- Communication and Cooperation of all educational degrees
- Communication with European educational networks
- Facilitation of complementary educational programs
- Providing education to individuals with special needs or disabilities
- Inform, educate, entertain

In order to achieve the objectives of e-Europe 2005 regarding provision of broadband access to all schools, the Greek Schools Network is upgrading its distribution network by installing broadband connections (installation of 500 ADSL connections, bandwidth 384/128 kbps, during the 1st phase, in addition to more than 250 wireless links, bandwidth 10 Mbps). As far as wireless communication is concerned, 13 distinct wireless networks are in operation in the following cities: Athens (3 networks), Thessaloniki (2 networks), Kalamata, Siros, Volos, Xanthi, Kilkis, Ioannina, Rethimno and Chania.

E-Yliko (http://www.e-yliko.gr) is the official educational portal of the Ministry of Education and Life Long Learning and is actually a meeting and support place for the members of educational sector.

Useful links, educational software, articles, teaching proposals, support material and information about conferences and competitions can be found there. All these services are offered on-line to support both teachers that teach in a school classroom and the distance learning teachers.

Another critical role concerning the education and ICT implementation in education is held by the Pedagogical Institute. The pedagogical institute is an independent public organization founded in 1964. It is the oldest research and consultant carrier concerning education matters and contributes to the national education policy through the Ministry of Educational and Public affairs.

The main duties of the Pedagogical Institute are:

- scientific research, focusing on the study of matters concerning Primary and Secondary Education, as well as the evaluation of education in practice
- The processing and submission of proposals concerning Primary, Secondary, Technical- Vocational matters and the future development and programming of educational policy
- The supervision of the development of educational technology and the use of new technology in education
- The design and the implementation of new programs concerning teachers' further education
- The publication of new books for both students and teachers

The Ministry of National Education and Religious Affairs, its scientific and administrative services (the Pedagogical Institute and the Directorate for Secondary Education Studies) along with the Academic Research Institute on Computer Technology (CTI) has mobilized a significant part of social organizations (53 companies, 57 university units, 18 museums and research institutes, 385 schools, 5.500 teachers and 100.000 students) in a far-sighted program, the Odysseia-Hellenic Schools in the Information Society Programme (under the Operational Programme for Education and Initial Vocational Training funded by the 2nd European Community Support Framework).

The Odysseia Programme (http://odysseia.cti.gr) is firmly founded on a comprehensive approach towards the new technologies.

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Computer science is addressed in such a way, so that students perceive it not only as an independent scientific domain, but also as a very handy tool to be used in every day teaching, learning and communicating. Thus, it approaches and uses computer science in a manner that reflects the true spirit of the Information Society: the new technologies are not to be seen as something detached and exceptional, but as an integral part of daily life. The Odysseia programme created a number of school communities in secondary education, which integrate new educational practices in the learning process by capitalizing on Information and Communication Technologies. The Odysseia programme involves three basic lines of action:

- Training and support for teachers of all specializations: in-school, continuous and directed to the teaching practice. Teacher training is provided by specially educated teachers, chosen by the Ministry of Education, who receive further education at specifically designated university units, highly specialized in such subject areas. The provision of in-school instruction for 5500 teachers of the 385 Odysseia schools in the direct use of computers as a medium for teaching and learning is the basic goal of the core team of 125 teachers/educators, who undertake the training of their colleagues within the environment of every school unit.
- Setting up the necessary infrastructure: fully equipped computer labs, connected to the Panhellenic School Network and technical support for the schools.
- Development of appropriate educational material: development of new software and the localization or adaptation of existing, international, exploratory and multi-disciplinary educational software. In the light of international trends in education and technology, the Odysseia Programme has developed, through a series of procedures for technological and pedagogical evaluation, a set of 50 educational software packages. It has also adapted another 17 internationally acknowledged educational software products that have been translated in Greek and adapted to the Greek curriculum. All Odysseia educational software is designed to foster critical and creative thinking, help students understand difficult and abstract concepts, and improve the quality of the education process.

The **National Centre for Public Administration and Local Government** (E.K.D.D.A. www.ekdd.gr) is the Greek strategic agency for the training and education of public servants and Local Government employees.

It was established in 1983; it is a Legal Entity of Public Law and is supervised by the Minister of Interior.

The training and education procedures are utilised through cooperation with a private company called KORIMVOS (http.//www.korimvos.gr). KORIMVOS is responsible for the development of educational programs for CBT-Computer Based Training. KORIMVOS has undertaken the Project Management, the installation of Centra eLearning System with 250 anonymous licences of use in EKDDA, the provision of training services and support of Centra System. Basically it is based on real time communication.

It supports all the procedures that appear in a virtual class, with simultaneous presence of all participants, with the possibility of extending it to a fully interactive classroom, like a traditional class. The participants' capabilities in the "Virtual Classroom" include:

- Video conferencing
- Audio conferencing
- Text chat
- Training Material Presentation
- Application Sharing
- Web Browsing
- Evaluations - Tests
- Surveys
- Whiteboarding
- Teamwork (break out rooms)

Moreover, the Institution of Life Long Learning (IDEKE-www.ideke.edu.gr) under the supervision of Ministry of Education (www.ypepth.gr) and the General Secretariat of Life Long Learning (www.gsae.edu.gr) is responsible for the education of adults in many ways.

Figure 7 shows in detail the adult training structures in Greece. The main aims of IDEKE are:

- The development of appropriate technological and scientific infrastructure that would help the fulfilment of education programs

Figure 7. IDEKE Structure

Source: IDEKE (http://www.ideke.edu.gr)
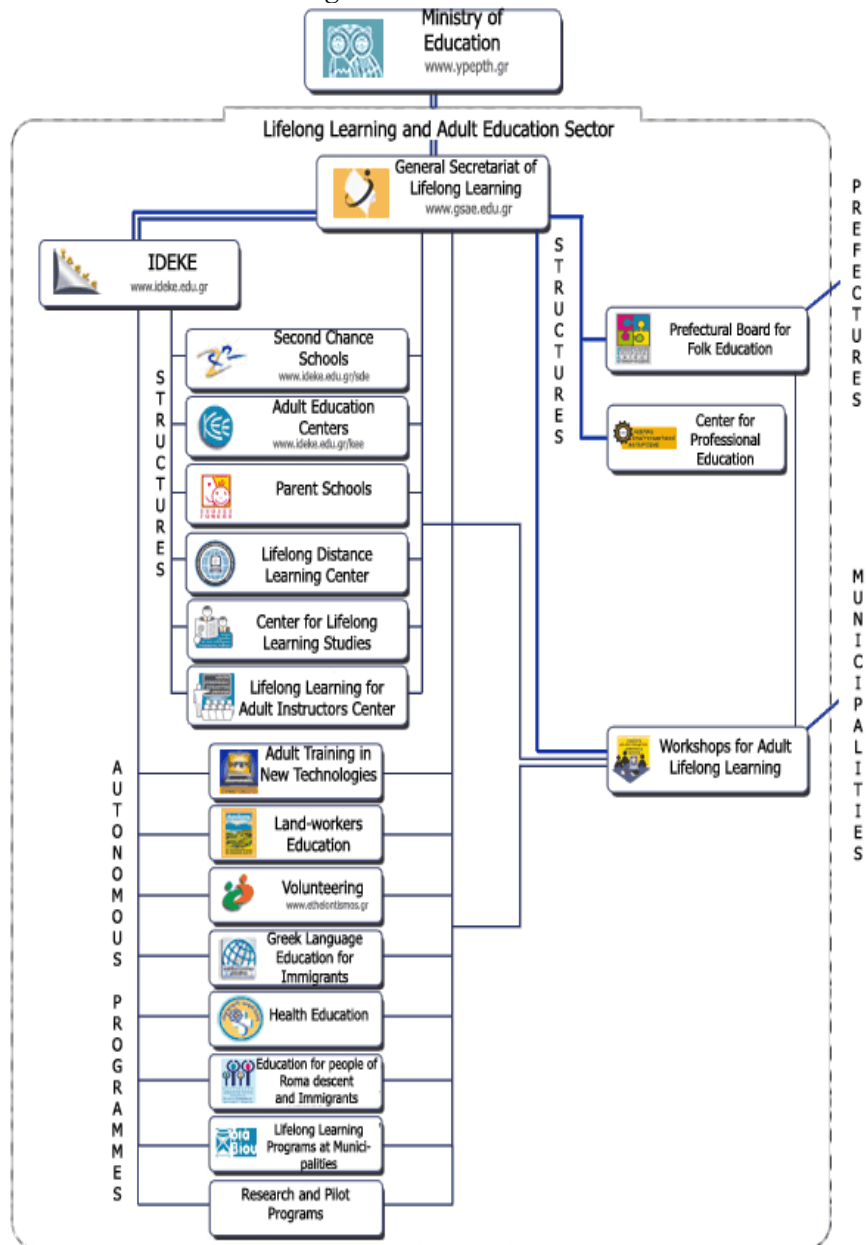
- The use of ICT in adult education
- The use of educational software and multimedia in training
- The development of the appropriate methodology for distance adult education
- Participation in European programs in the area of adult education
- Production and publishing of educational material for all levels of adult education

IDEKE through its e-learning platform (http://www.keeenap.gr) offers now six e-learning programs for adult training :

- ICT (for Lyceum graduates)
- ICT (for Gymnasium graduates)
- Economics (for Lyceum graduates)
- Economics (for Gymnasium graduates)
- Environment (for Lyceum graduates)
- Tourism (for Lyceum graduates)

All the above programs are divided in five subunits of 50 hours each. So, in order to graduate adults need almost 10 months.The HOU's (Hellenic Open University, www.eap.gr) mission is to provide distance education at both undergraduate and postgraduate level. For that purpose, it develops and implements appropriate learning material and methods of teaching. The promotion of scientific research is as well as the development of the relevant technology and methodology in the area of distance learning fall within the scope of the HOU's objectives. Like all other state universities in Greece, it is a Legal Entity of Public Law, completely independent and autonomous. It operates as a Legal Person of Public Law under the supervision of the Greek State, as exercised by the Minister of Education and Religious Affairs. The institute's headquarters are in Patras. The HOU's Senate retains the right to establish and monitor branches either locally or abroad with the approval of the Ministers of Education and Religious Affairs, Internal Affairs, Public Administration and Decentralisation and Finance.

RESEARCH AND TRAINING IN E-LEARNING

Many programmes funded by both the Greek Government and European Union are in progress at the moment in Greece, related to e-learning, life-long learning, adult learning, and further research in web based learning.

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One of the most important points is that citizens from various sectors can participate on those funded programmes and almost anyone can find a free of charge training programme (e-learning or blended learning) in order to improve their knowledge on a specific profession and furthermore gain a certificate of attendance. However, most research in the field of e-Learning and Distance learning is carried out in the relevant University Institutes and Faculties.

Research Academic Computer Technology Institute's (RA CTI-http://www.cti.gr) chief priority, due to its distinct role, is Research and Development. It is open to all research areas of Computer Science and Technology yet it focuses on certain areas of strategic importance.

Research activities aim at conducting theoretical and applied research alike. The research endeavours of the institute are motivated by the European Union's research framework and policy objectives in conjunction with the actual technological needs of the country. The principal research areas on which RA CTI concentrates are: Algorithm Analysis and Design, Advanced Parallel Computer Architectures, Networks and Distributed Computing, Natural Language Processing, Signal Processing and Digital Image Processing, Software Technology, High Performance Computing, Educational Technology and Database Management.

RA CTI places particular emphasis on the correlation between the applied research it carries out and the country's needs for technological development. The results of research and development, the ideas and prototypes generated address the services industry sector (and the associated industries such as Education, Tourism, Health, Regional Innovation and Development), as well as traditional industry sectors. All RA CTI activities are carried out by the Operational Production Units (Research Units and Information Society Sectors) which in turn are supported by the services provided by the Operational Support Units.

RA CTI, with the established expertise it has gained by its longstanding research activities in the area of Information and Communication Technologies has been a benefit to the Greek State in the process of the design and implementation of IT programs for the public sector, as part of an ongoing effort to reinforce the application of IT in the public administration sector. Its involvement in the Information Society (InfoSoc) focuses on the following actions:

- Since 1995 it successfully provides technical and scientific consulting services to Ministries and the country's public authorities
- It has been especially active in the area of education and training, implementing large projects involving the administration of training initiatives
- It has played an important regional role, being involved in projects for regional innovation and development.

RA-CTI, in order to best fulfil its role to meet the demands of the Information Society has organized its operation into Sectors that specialize in discrete objects of study, with a vertical configuration structure, administration, personnel and material & technical infrastructure, while at the same time the Sectors present a high degree of interaction not only between them, but with the other departments of the institute as well.
At present there are 9 InfoSoc Sectors at RA CTI:

- The Educational Technology Sector
- The Networking Technology Sector
- The e-Government Sector
- The Stock Market Applications & Services sector
- The Telematics Center of Western Greece, Epirus and the Ionian Islands
- The Further Education and Training Sector
- The e-Learning Sector
- The Security Sector
- The Strategic and Development Policy Sector

One of the main aims as mentioned before is the introduction and productive utilization of ICT in education and conducting applied research. In particular, drawing on the expertise it has gained in issues such as: educational software, comprehensive initiatives in utilizing ICT in the educational process at pilot stage and large-scale, technical support for the smooth operation of school computer labs, environments for distance learning, training and cooperation (e-Learning platforms, portals), etc., the sector executes projects at a national and European level as a project implementer, technical advisor, project consortium coordinator, etc.

The e-Learning sector of CTI (TeL) was established in 2003 by merging an InfoSoc sector and a Research Unit within RA CTI, with the aim to conduct

applied research and to sustain high level know-how on e-Learning. The sector focuses on research projects and the design and implementation of advanced pilot actions that concern the integrated application of ICT in real-world environments with a high degree of autonomy.

The eLearning Sector has great experience in designing and implementing innovative software for interdisciplinary subjects, including web applications for communities and collaborative work, educational games, and educational software.

The eLearning Sector currently consists of about fifteen people; researchers that have an established collaboration with CTI, skilled software engineers, and other technical staff. TeL has extensive experience in designing and implementing both R&D and integrated applied-research projects.

During the last five years, the eLearning sector has designed and implemented several R&D projects (funded by the EC: IST/IP/Palette, IST/IP/Remath, Minerva/ieus, eLearning/emuse, eLearning/e3, funded by national research funds: Archaiorama, Ellinourgimata, and some others funded by the private sector: an integrated document management system featuring secure and reliable document routing, specialized search engine and web crawler).

Its most recent product, named CoPe_it! (http://copeit.cti.gr) has been designed and developed in the framework of the IST/IP/Palette project. Adopting a multidisciplinary approach to argumentative collaboration, CoPe_it! exploits state of the art Web 2.0 technologies to support diverse collaboration types among communities of practice.

On the other hand, in the area of applied RTD projects, in the framework of the interrelated horizontal projects eOmogeneia and Isocrates, the eLearning Sector has been active in designing and implementing an integrated application of ICT. It includes pedagogical utilization, synchronous distance learning and dedicated software development for provision of information, support and advanced communication and collaboration means to teachers, schools and students of the Greek diaspora, as well as know-how transfer to collaborating universities.

The adopted approach and results had a major impact at both political and organizational levels and it is also largely appreciated by the teaching

community. The software supporting these communities has been designed and developed by the team, while its parts have been largely reused in a series of R&D projects.

CONCLUSIONS

Many efforts have been made in Greece the last years for the development and quality of educational services. New technologies offered new ways in learning procedures and Greece could not stay behind those changes. ICT, a fundamental backbone of Greece's modernization program, is one of the most advanced, although uneven, sectors in Greece. The country's many well-respected scholars and scientists have shown a strong interest in advanced ICT research, creating a valuable partnership for business and industry. Research funds flow steadily into Greek labs, and the country's potential to expand its R&D efforts is becoming recognized internationally. It is reasonable to support that eLearning and web-based learning development in Greece it is a high level priority for government policy.

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CHAPTER-9

eLEARNING IN HUNGARY

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ABSTRACT

The restructuration of Hungarian legislation yielded to restructuring of companies-ownership and to important changes in Hungarian higher education in the early 90 years of the past century. Accordingly the higher education market was liberalized. Due to technological development, eLearning applications entered to the everyday practice of universities since year 2000. For the time being mainly private-owned universities are using the eLearning technology. This is the way by means of which more services can be offered to students, accordingly it is expected that more candidates will choose universities having eLearning facilities. This chapter discusses development of the elearning in Hungary for the Millenium

INTRODUCTION

Hungary was always famous of its educational system. Universities were founded here in the early medieval. Even occidental structures were applied due to the early transfer of ideas and human beings. There was always a need for new technologies in this country. Based on the well founded evening courses in the second half of the twentieth century, new distance-learning was applied in the very beginning of years nineties. When the internet penetration attained a sufficiently high level, Hungary turned towards the eLearning technology.

Hungary was the first implementing this new technology in aiming to provide higher education in IT in Hungarian language both inside the country itself and in the neighboring countries where Hungarian ethnics are

living. That is the reason why we consider Hungary as the flagship of eLearning in East and Central Europe.

COUNTRY

Area 93.000 km2, population: 10 millions, ethnic groups: 95% Magyar, 2% Roma, 3% other. It should be noted that some 3 millions Magyars are living outside the country (the exact number of them is quite difficult to estimate), mainly in the neighboring countries. Capital: Budapest. Climate: continental. GDP per capita 15542 USD (2008).

Figure 1.
A map of Hungary

The firs Magyar tribes settled in the Carpathian Basin with the leadership of Árpád in 896. Hungary was recognized as Christian kingdom under Stephen I. in December 1000. The country was subject to attacks of Mongol tribes in the XIII.th century. However it could resist to it and maintain its independence until the XVI.th century when it became the part of Ottoman

Empire for a period of 150 years. After four centuries of co-existence in various forms with Habsburg Empire, the Austro-Hungarian Monarchy defeated at the end of WW1 and lost $2/3^{rd}$ of its original territory and about the half of its population. The WW2 defeat was followed by communist era supported by occupying soviet troops. The power-loss of soviet empire yielded to the liberation of East-European countries and the third Republic of Hungary was declared in 1989. Hungary is currently a parliamentary republic with free elections each four year. Hungary is the member of the NATO and the EU as well, currently out of euro-zone. However the introduction of euro is expected for the next decade.

EDUCATION SYSTEM

The Hungarian education system is divided into two major fields: public education (including elementary and secondary schools) and higher education (including bachelor, master and doctorial levels). The visiting of kindergarten is not obligatory excepted the year just before the elementary school. The participation in public education is obligatory between ages 6-18.

Table 1.
Hungarian education system

Duration in years	Type of School	Age
3-4	Kindergarten	3-
4/6/8	Elementary school	6-
8/6/4 or 4/5/6	Secondary school or technical college	10- or 12- or 14-
2	Vocational education	18-
3-4	BSc education	18-
2-1	MSc education	
3	PhD education	

The vocational education is relatively new in Hungary; accordingly its reputation is not so high as in other parts of Europe. From the vocational schools there is a direct access with acknowledgement of 30% of obtained credits to universities providing BSc courses.

DISTANCE EDUCATION

History of distance Education and Legislation Background
Until the last decade of the twentieth century, the Hungarian education was based on state owned education institutions. The political and economical changes in the 89-90 years yielded to important changes in the legislation system. First the Law on Assemblies then the Law on Companies founded the legal background of the new capitalist era. Next to state owned institutions an important upwind of private owned schools could be detected due to the changes of Legislations on Educations[1] in 1992 (Hungarian Parliament, 1992). However; in respect of students' numbers the private sector is a small minority in the educations field even today[11] (Hungarian Central Statistical Office, 2008). There is no special chapter of legislation dealing with eLearning. Even distant-learning is weakly detailed in the current law.

The reason is simple: Hungarian Accreditation Committee[5] (Hungarian Accreditation Committee, 2009) is strongly dominated by highly ranked staff members of traditional universities, who are more interested in maintaining of the old system. That's why a bad reputation of schools dealing with distant and eLearning is encouraged informally between representatives of educations field. In 1995 a modification[6] (Hungarian Parliament, 1995) was adapted to the LHE governing the distant learning. According to this new regulation only those schools are entitled to deal with distant learning, which provide the same courses in normal teaching.

Private and state Owned Sectors in the Education
Due to the opening of the educations field for the private sector, this field became a concurrence area for participants. The opposition may be observed not between various private companies, but between state sector and private sector. Private schools were largely authorized by Governmental Accreditation Board since 1992, but the accreditation process seems to be much more difficult for private companies than for state owned ones.

Sure that Hungarian higher education sector has too much participants (72 accredited Universities and Colleges for a population of 10 millions, in 2008) and it is time to reduce the number of schools. But the decision on closing of some schools will be made by a committee dominated by the state, that's why private schools are anxious to be victims of competitor's decision.

Natural Evolution, Changes in Business and Social Environment

When communist era was finished on the turn of 80-90 years, it yielded to immediate close of the soviet market, which represented more than 60% of the Hungarian economy. The consequence was a terrible crisis with closing industries, and ten thousands of loss of employment. Until that time the unemployment was quasi unknown in Hungary.

In the early 90s years there was no adequate social protection system to deal with the massive unemployment. It was the period of entering of the big multinational companies to the Hungarian market.

Disappearing of old soviet type enterprises and arriving of new multinational companies yielded to a completely new economy environment, which has its social effects as well. In the same time an important number small and medium size enterprises are entered to the market. No doubts, that a considerable part of SME's (according to non-confirmed estimations 60% of them) are non-operational and even unable to operate, so they are forced to close in a very short time.

The result of this phenomenon is the instability of the families' social background in hundred-thousands of cases. A very weak population, the new proprietors is the beneficiary of the new system. Both of above social categories has educational A considerable part of unemployed young people tries to enter in the higher education, which is a temporary solution for them, as not all of them deals with the usefulness of the studies, but looks for a temporary social security. Unfortunately there are some schools, which are targeting this hopeless population and supplying non-valuable knowledge, with minimum investments.

Young people originated from well-to-do families can pay for any expensive studies, even the most expensive ones quasi anywhere in the world. They will have two important advantages: graduation at a university of high reputation, having a good knowledge of a foreign language, which capacities are highly respected at the labor market.

**CHANGES AND DEVELOPMENTS
IN COMMUNICATION TECHNOLOGIES**

The 89-90 years which were the years of the political, economy and social changes in East-Europe were the years of massive penetration of IT to Hungary as well. The banks used IT even starting with the 70 years, but the

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use of personal computers changed the economy at the end of 80s decade. The internet appeared first in the governmental sector, such as big universities and research institutes, but the penetration was very fast, see the below diagram. Internet Access % (population of 14-70 ages)

Figure 2.
Internet penetration in Hungary in 2007
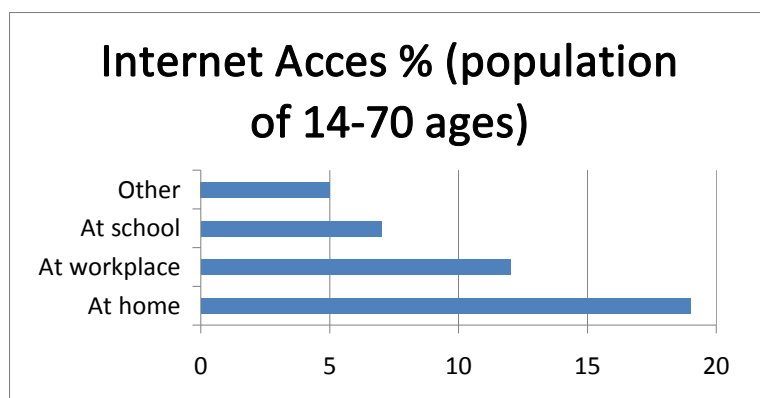
Source: (Median Market Research Institute, 2007)

In 2007 first semester some 43% of the total population had internet access of various types (Median Market Research Institute, 2007) According to non confirmed data, the authors estimate some 45% internet access rate today. The IT revolution in Hungary took place in the same time as the liberalization of the economy. In 1992 it could not be predicted that we should say "ICT" instead of "IT" in a short decade the decade. Communication aspect dominates the new technologies today. In the first decade of 21st Century such easy communication technologies as Skype, MSN an many other more professional ones are other widely used by Hungarian population. The use of professional video conference systems is expected video-conference

TRANSITION FROM DISTANT EDUCATION TO ELEARNING

Traditional Distant Education
In the first year of founding private universities (1992) even those who were engaged in the distant universities learning could organize their activity on traditional support material such as printed books, VHS video cassettes. The

content of a distant learning package distributed at the beginning of each semester at Dennis Gabor Applied University is presented on Figure 3. Figure 3. Content of a distant learning package (DGAU). The old technology used by DGAU was that of copied from the British Open University. All Hungarian participants used almost the same technology that time. No electronic components were applied in the early 90th years.

Figure 3
Content of a distant learning package (DGAU)

Blended Learning
In the very beginning of the 2000 years data storage was transferred to CD technology, which enabled course providers to distribute not only text, but all multimedia components (audio, video, animation) on discs. In this time DGAU as other schools produced multimedia applications to disseminate easily the courses. These multimedia applications were extremely useful when software use was dealt[7] (Bognár, 2004). When the technology development and the internet penetration attained the level of efficient use of eLearning technology, the participants as DGAU also displayed a reserved behavior: resisting introducing a full scale eLearning system, instead of it use of so called "blended learning" system. It was due to timidity of participants fearing of an immediate full scale change. An important factor was the fear of teaching personnel to lose of their jobs. The result was maintained of about one third of face to face courses and the remaining part was transferred to eLearning courses. Teaching staff was satisfied as the

need for face to face lectures was declared, even in those cases when the complete course could be provided by electronic facilities. This way the cheaper operation of the e-system was missed.

Full eLearning Systems
From the providers part the Full scale eLearning system needs a good learning content management system (LCMS) and a learning administration system (LAS) preferably this latter integrated in the first one. From the students part a good internet connection and good hardware is required. The telephone or other audio contact may facilitate considerably the efficiency of learning process. In Hungary the most popular LCMS are: Ilias, Moodle, IntraLearn, iLearning, XXX While ILIAS and Moodle are used in education, Intralearn and iLearning is used in corporate environment.

All system contain the following elements: content manager, test and exam functions, forum, mailing system, sometimes agenda. DGAU has tried various systems, free and not-free, and we found that there are no important differences between LCMSs and consequently we opted for free software named ILIAS originally developed at University of Cologne.

We developed the Hungarian adaptation of the software and we prepared several new applications to it. In Hungary DGAU manages a network of about 10 local universities which are using ILIAS. There is a dedicated group of developers at DGAU who deals with operation and development of the system. The same group manages a Hungarian forum for ILIAS users. In October 2009 DGAU organizes an international conference of ILIAS users. Use of LAS is prescribed by the Ministry of Education. There are two authorized systems in Hungary: ETR and Neptun.

These systems are dealing with academic administration of students and professors, overall data of schools and deal with some reduced financial aspects as well. The integration of these two LAS into LCMS is not completely solved until today. LAS should provide data for national-wide statistical evaluation. At DGAU we use ILIAS system combined with ETR. Both ILIAS and ETR are linked on the main page of

The Current Situation: Some facts about Hungarian higher education
In Hungary there are 72 authorized higher education institutions in 2009. They are subject of regular control by the Hungarian Accreditation Committee. Controls are organized each five years. A visiting committee

controls the documents prepared by the university in subject, and controls the hardware facilities (buildings, laboratories included) as well as competences of the teaching staff. The system of the higher education is in conformity with the Bologna process, that is to say the following three levels are existing: BSc, MSc, PhD.

The majority of institutions provide BSc level teaching. It is expected that 30% of BSc graduated students continues their studies at MSc level and even a more strict selection is applied for PhD studies.

The general problem in Hungary that is before modification of LHE in 2004, the structure of institutions was based on two type of schools: first provided teaching over 3 years, with Hungarian designation so called "Foiskola", very difficult to translate it to any other languages, but the most adequate translation is college, second provided teaching over five years, that is called traditionally university. This latter has much more reputation among the Hungarian population. With the new legislation the traditional universities do the same as colleges, first they provide BSc level education. In this respect there are no more differences between colleges and universities. However after entering into power the new LHE in 2004, there are certain colleges which satisfy the requirements of MSc education, and consequently they represent a hard concurrence to traditional universities. While the infrastructure of traditional universities was adapted to five years teaching a considerable reduction in students number occurred, due to the fact that only a small part of students wants to study over five years or more.

That's why a surplus of personnel number and building capacities was generated. Universities are interested in maintain of their highly skilled personnel and in efficient use of their other infrastructure in spite of the fact that Hungarian economy does not need the elevated number of MSc graduated. The need is much more important for BSc level graduated people, having good practical skills. This is very difficult to understand by people engaged in the traditional higher education, over-dimensioned in human and other infrastructure capacities.

The new participants, the newly founded (private) schools should face the elitist aspects of the traditional higher education. They should prove the same capacities in scientific research work and in education as the old universities. It is not so easy, taking into consideration that all the responsibility of running and administering the education should be carried

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out without any governmental in 2009 some 94000 students entered in the higher education in Hungary. About three quarters of them was accepted in the state-financed sector and the rest will study by auto-financing. There is no exact data, but it is expected that about the half of this latter students may have an eLearning Access in the new academic year. It is quite disconcerting that only 14000 candidates targeted the 21700 places in the MSc level education[9] (Ministry of Education, 2009).

COEXISTENCE OF TRADITIONAL EDUCATION AND eLEARNING

Even in the traditional state owned education the use of computer network for data storage and communication purposes was used since the beginning of networking in Hungary. Home-works, exam problems and support material were stored on servers since 1992 at Technical University of Budapest (TUB). In that time a distant learning center was founded at the above university. We cannot consider the teaching activity of this center as eLearning as the majority of support material was disseminated on paper at that time. However the use of the network for storage purposes was more and more frequent.

In interesting phenomenon occurred this time: independently from university administration students started to organize data exchange on external servers, sometimes with illegal purposes and methods. Without global university policy on IT use data security and respect of personal rights was a very hard problem this time. The need for professional LCMS and LAS was more and more flagrant. Some departments at TUB created their own teaching material (Budapest University of Technology, 2009) without any harmonization of other component of TUB. Only fragments of eLearning systems are used in traditional state owned universities. It can be concluded that traditional universities are not interested in use of professional elearning systems.

The situation is completely different with private universities as their organization is much more coast-sensitive than that of the state owned sector. Investment in higher education seemed to be profitable in the early 90s years and it is sure even today, but within a more difficult environment (reduction of students number, more concurrence on the market).

Investors early recognized the coast reduction possibilities in eLearning. That's why in the early 2000s they considered the eLearning as a miracle in aiming to reduce the coast of teaching. Not only investors, but eLearning specialists considered this time that eLearning may basically reduce the coasts of teaching.

Today we see it clear that to run and exploit a good eLearning system means no considerable cost-reduction for the university. A proper analysis of learning costs by is given by authors[8] (Varga and Pálosi, 2009).

CONCLUSION:
Vision of the Future

General Expectations Related To Higher Education
A massive diminution of nativity is observed in Hungary in the past decade. It is expected that in ten years the number of students in lower education will be the same as the number in HE today.

Expectations that the ratio of student's number in lower education and in HE, the absolute number of students will be about the half of the current number. It is sad for the Hungarian economy, and it is sad for the higher education's actors.

It is expected also, that the number of students who work simultaneously with their studies will increase considerably. As the future students want to obtain a usable diploma within a shortest delay the popularity of MSc type diplomas is expected to decrease, the majority of students will be satisfied by a BSc level diploma.

eLearning Related Expectations
The above decrease of student's number yields to a pitched battle for the new students between the schools. Factors which are influencing the student choice are: acknowledgment of the university, the tuition fee (if applicable), geographical access, services offered by university.

The two latest factors become more important for students who have a job while studying. That's why universities offering eLearning courses might have a little advance in collecting new candidates. Essentially private-owned universities are those, which are offering eLearning courses as they are more flexible than state-owned ones. Consequently the influence and acknowledgement of private-owned universities will

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LIST OF ABBREVIATIONS

DGAU …………………Dennis Gabor Applied University
HE ....Higher Education
IT ....Information Technology
ICT ....Information and Communication Technology
LAS ....Learning Administration System
LCMS ....Learning Content Management System
LHE ....Law on Higher Education
MAB ....Hungarian Accreditation Committee
SME ....Small and Medium Enterprise
BME ....Budapest University of Technology and Economics

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CHAPTER-10

eLEARNING IN IRAN-I
A Breakthrough to ICT-Based Initiatives
In An Educational System

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ABSTRACT

In this contribution, an overview of Iranian educational system in general and higher learning/ education in particular is presented over the last hundreds years. We mainly aim to give a brief account of the country's rapidly expanding ICT-based initiatives in the light of its actual realities, progress and difficulties by looking at the following areas: the social and historical situation in Iran, Educational system, Higher education, Distance education and particularly Virtual Institutions in Iran.

COUNTRY

Situated in south-western Asia, the Islamic Republic of Iran (previously known as Persia until 1935) has long served as a nexus for trade and culture between East and West. Iran's role as a major trade route can be traced as far back as the fourth century BC; what was known as the Persian Empire and hence, the fore-runner of the modern Iran. This was the time when Silk Road was established connecting Iran to China, Europe, Asia, and the Middle East. Known for its rich culture and abundant resources, Iran's geographic position has made it a primary link between civilizations.

As the largest nation in the Middle East after Saudi Arabia, Iran harbors in its 1,648,000 square kilometers a wide assortment of climates, landscapes, and ethnicities. Its climate is mostly arid or semiarid, and subtropical along the Caspian coast. The terrain is diverse, with rugged mountains, a high central basin with deserts, and small, discontinuous plains along both coasts. Iran is considered to have four distinct climate zones; one can ski in the northern mountains or swim in the southern waters all in the same season.

Iran is the most populated country in the Middle East with the second largest economy. It has a population of 70 million, with a growth rate of 1.5 (see http://www.payvand. com/news/04/aug/1017.html retrieved on 17 May 2009). The average population growth rate in Iran fell from 3.9% in 1980 to less than 1.5% in 2007 (cf. Vahidnia, 2007)) percent per year.

The country's gross domestic product (GDP) of $115 billion (Kousha & Abdoli, 2004). Islam is the predominant religion with approximately 89 percent (http://www.iqna.ir/fa/news_detail.php?ProdID=262182 retrieved on 08th of October 2009) of the population Muslims who adhere to Shiite Islam. Sunni Muslims in Iran constitute approximately 9% of the population, with Christians, Zoroastrians, and Jews, for much of the remaining (Hawzah, 2008).

Figure 1.
A map of Iran

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It is important to realize that Iran is not ethnically homogenous, although to the outside world it may seem to be the case. In other words, Iran is a country of diversity that has consisted of various constituents each with their own specific traits. The Persians, Turks (Azeri's), Kurds, Turkmens, Arabs and Baluchis constitute the major ethnic groups in the country. Yet despite significant differences a number of features including the shared history and culture, Islam as the majority religion, allows for a coherent treatment (understanding) of Iran (Johari, 2002; Tavassoli, Welch, & Houshyar, 2000). The official language is Persian, an Indo-European language. It is estimated that a significant proportion of the population speaks other languages as well including 25 percent Turkish (Azeri), five percent Kurdish and around four percent Arabic

Tehran, Isfahan, Mashhad, Tabriz, and Shiraz are the most populated cities in Iran. The country consists of thirty provinces that vary widely in terms of their socioeconomic development. In each province there is at least one State/ Public (Iran has a large network of public /state-run or state- affiliated) non-public/non-governmental (private) universities offering degrees in higher education.

Public universities of Iran are under the direct supervision of Iran's Ministry of Science, Research and Technology (for non-medical universities) and Ministry of Health and Medical Education (for medical schools). However, all of the higher education settings either non-public or public should pursue the Ministry of Higher Education academic regulations in their design and development of programs and syllabi). The higher education centers/ institutions are distributed across the country in a way that every province has at least a public-university and one non-public (government) higher education centers. Although a number of the provinces, which are geographically larger or more populated, have several public and non-public higher education institutions. 82 percent of the population is literate and education is compulsory through high school. Having the world's youngest population, the Islamic Republic of Iran bears the responsibility of educating more than 18 million students.

In early 2009, it was reported that more than 14 million pupils (decreasing gradually due to cutting down of birth rate from nearly 4 to 1.5 in 10 years) were engaged in schooling, and more than three million students (an increasing population due to the shifting student growth from schools to higher education) were enrolled in the universities.

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Iran has been on the world news headlines for the past three decades due to the Islamic revolution in 1979, cutting diplomatic ties with the U.S., the 8-year (1981-1989) war against the Iraqi invasion, her non-aligned and uncompromising political stance, and a continued political dissonance with the advanced industrialized nations (especially the U.S.) regarding her peaceful nuclear activities and so forth. Under such circumstances, other important aspects of the Iranian society including its scientific status have remained enigmatic to the outside world, leading to all sorts of speculative announcements ranging from marvelous to disastrous (Hamdhaidari, Agahi, & Papzan, 2006).

The EDUCATIONAL SYSTEM

Like in other nations, the education system and traditions in Iran gradually changed from traditional Maktabs that centered on the religious education to the modern educational system based on the Western mentalities (Masoumi & Lindström, 2009). These changes were facilitated through "enlightened thinkers" who studied in Western world along with the Christian missionaries (Abrahamian, 2008). However, the Western mentalities and thoughts did not spread out across the educational settings till 1921. In 1921, the modernization of the educational system was initiated by Reza Shah as a part of an overall plan to modernize Iran. Since then the educational system has been developing quantitatively and qualitatively although the struggles between modernism and tradition are still prevalent

It should be noted that Iran's educational landscape has been significantly influenced by the emergence of the Islamic Republic in 1979 in terms of ideologies and given priorities. For instance, after the Islamic revolution, educational facilities gradually have extended into many rural as well as tribal areas across the country.

Currently, the educational system in Iran is offered in three levels including –along with one year pre-school- five years primary (Elementary), three years Guidance (Intermediate), and four years of secondary education (high school). The educational system has a centralized structure and all decision and procedures are taken by the Ministry of Education. In the capital of every province, there are provincial Boards of Education to execute and control educational affairs across the province. Similarly, within each province, the educational authority is further subdivided into Districts of Education under the supervision of the Board of Education (Zamani, 2010).

According to the Ministry of Education, currently (in 2009), there are 150,000 schools offering education to 13,500,000 students from elementary to secondary school levels. Interestingly, this student population increased to more than 18,000,000 at its peak at the end of 2000. Since 2000, we have been witnessing a consistent and gradual decrease, and it had its sharp fall last year in 2008 in which we witnessed a one million decrease over one year period (from 2008 to 2009).

Higher Education

Higher education in Iran extends over 25 centuries and has been witness to a prolific history. Long intertwined with major religious, intellectual, social, political and economic movements, higher learning centers in various names have occupied a central place in the Iranian society. The first higher education center was established by King Darius of Persia during the 6th century B.C. (Iranian national commission for UNESCO, 1977).

The establishment of the Iranian higher education and technological thoughts date back to the third century A.D. (Hekmat, 1972), when 'GondiShapur' (in some texts JondiShapur) higher education centre was established before 272 A.D.), the great university of the Sassanian era, was the centre of scientific and technological activities. The "GondiShapur" higher learning center became one of the most important centers of higher learning during this period. Its status was maintained and extended some 300 years after the introduction of Islam into Persia in the 7th century A.D. (Bazargan, 2006). As Islam spread throughout Iran, religious educational settings called "*Madreseh*" with a number of variations in its spelling e.g. *madrasa (*I have used the form which is nearest to the Persian pronunciation) became the - may be the only- centers of higher learning till 19th century. In *Madreseh,* theology, law, medicine, and even algebra were taught by religious figures (Bazargan, 2006).

However, despite the long history of higher education in this ancient, modern higher education, institutions began operating as late as in the twentieth century (Levers, 2006). From the early 19th century (since 1813) the first polytechnic college and then other higher education centers/ colleges were established one by one. These initiatives in the educational arena were generally associated with certain external determinants such as the industrialization and the modernization of Western Europe, and in particular the growth of imperialist rivalries during the 19th century (Tavassoli, et al., 2000).

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Rejecting traditional educational settings and procedures, the new higher learning centers were initiated based on the European mindsets (medieval European traditions).

Similarly, the first Western-inspired University (University of Tehran) was established in 1934. The entire public system was secular and for many years it remained based upon the French model of higher education. Following the Second World War, other universities were founded in other major cities (Abrahamian, 1982).

Provincial and other national universities followed in the subsequent decades. By 1979 prior to the revolution there were about 30 state universities and higher education institutions throughout the country, which were established in Tehran and other major cities. The Islamic Revolution took place in 1979 and the universities were practically closed for nearly 2 years (1980-1982, during which the revolution and the period of the so-called Cultural Revolution took place). There was a strong desire on the part of the political system to Islamicize higher education during this Cultural Revolution.

However, the triumph of the new education lies in the fact that the revolutionary leaders neither tried nor even expressed the wish to wholly reverse the process ". . . rather they strive to use it (albeit with some significant revisions) to advance their own goals" (Menashri, 1992, p. 301).

The destructive eight-year war imposed by the Iraqi invasion were claimed to cause a severe "brain drain" with severe negative impacts on the nation's possibilities to develop in the future (Mehrdad, Heydari, Sarbolouki, & Etemad, 2004).

In the three decades that followed the invasion, the student population increased at an accelerating rate. By 1979, the total enrolment had reached 176,000 students. Although the majority of higher education institutions were public, access to them was very selective. During this period the number of applicants for admission to higher education institutions was ten times larger than the number of available places (Bazargan, 2002).

As a response to this great social demand for higher education, a Non-Public university system named the Islamic Azad University (IAU) was established in 1983. The IAU attracted many applicants/students who had intended to study abroad. The IAU has its main campus in Tehran with branches (units)

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all around the country. The growth rate of the IAU across the country was so high that within fifteen years the number of branches has increased to 357 in 2009 (http://www.iau.ac.ir/indexen.htm retrieved on 5th of October 2009). The IAU mobilized local resources and assistance for opening new units, even in remote areas.

Although the IAU has its own procedures for admission and staff recruitment, general academic planning in terms of the kind of programs, syllabi and curriculum planning are planned and decided upon at the central office by the Ministry of Science, Research and Technology. This policy was also widely enacted by Payam-e-Noor University (PNU), another 'mega-university' in Iran, during the last decade.

According to the Iranian Institute for Research and Planning in Higher Education (IRPHE) there were nearly 1.6 million applicants for higher education across the country (those who took part in the Iranian national higher education (HE) entrance examination in the academic years of 2006-2007. However, only 33 percent of these applicants were admitted to public higher education institutions in this academic year (2007) with 8.8% growth in comparison to the previous year (Institute for Research and Planning in Higher Education, 2006).

Currently there are approximately 358 higher education centers in Iran including 106 state universities, nearly 139 non-public universities and 113 colleges (mostly undergraduate) situated all across the country. Moreover, Islamic Azad University, which is a Non-Public mega-university with 357 university branches all over Iran, accounts for the education of 1,350,000 students (http://www.iau.ac.ir retrieved on 04 Nov. 2009).

There are also about 60 research institutions throughout the country making their contribution to the nation's science output. In 2008, the entire student population (both public and non-public) of Iranian higher education was approximately *three and half* millions, more than half of these students were enrolled in public universities including PUN mega-university.

It should also be noted that the proportion of non-public Higher Education institutions to public higher education settings were 51.3% to 48.7% in 2007 (see Table 1.) including PNU university as a public one (Institute for Research and Planning in Higher Education, 2007)

Table 1.
Students' population based on type of institution in 2006-7 academic years

Non- Public	**1,300,000**
Public	1,538,874
Total	2,838,874

During the last two decades Iran has experienced a significant growth in the annual student population (more than 12 percent annually). The general population of Iran has doubled since the revolution of 1979, while the numbers of universities and higher education institutions have more than tripled and student enrollments have increased tremendously i.e. more than 20 times (ISNA, 2008). What is also interesting is that the population of female students has increased dramatically during the last two decades so that 54 percent of the total number of enrolled students in the academic year 2004-2005 were females (Institute for Research and Planning in Higher Education, 2006).

Table 2.
Number and percentage of students by sector and study levels in 2004-2005

Sector / Study level	Public		Non-Public		Total
	Female	Male	Female	Male	
Associate (Two years study)	65448 (35.5%)	119114 (64.5%)	138732 (45%)	164506 (55%)	487800
Bachelor	376639 (61 %)	242926 (39%)	367709 (52%)	335595 (48%)	1322869
Master	13181 (32%)	27733 (68%)	12687 (36%)	23054 (54%)	76588
Professional Doctorate	16275 (53%)	14474 (47%)	5491 (46%)	6598 (54%)	42838
PhD	3321 (25%)	9887 (75%)	618 (24%)	2010 (66%)	15836
Total	474864 (53%)	414134 (47%)	525237 (50%)	531696 (50%)	1945931

Adopted from Institute for Research and Planning in Higher Education (2006)

As indicated in Table 2, the proportion of female students is higher than male students particularly at bachelor levels. The higher proportion of female students compared to male students in HE in the last few years, becomes even more manifest at the level of Masters and PhD, also in areas such as basic science and engineering. Despite this great boom, the rate of increase of other factors and dimensions in the higher education system, such as qualified faculty members and financial resources, has not kept pace with this increase in student population (Bazargan, 2002).

DISTANCE LEARNING IN IRAN AS A DEVELOPING COUNTRY

Distance learning and its interconnection with emerging ICT together have offered many promises to the field of education in developing countries particularly in Asia. In other words, the ever-expanding demand and increasing availability, sophistication and affordability of information and communications technology is encouraging governments to open the way for educators to reach to wider audiences of learners in a more economic manner (Jung & Latchem, 2007). Similarly, open and distance learning (ODL) is enjoying phenomenal growth in the higher education of the developing countries. There has been a surge in establishing and adopting distance, online and blended learning to serve more students in these countries during the last decades.

Along with other developing countries (such as China, Nigeria, South Africa, India, etc) Iran is turning to distance learning programs to tackle with ever- increasing student population and scarcity of infrastructure, financial, and personnel resources to help students to fulfill their educational aspirations. In other words, it is a part of larger movement among developing countries to use distance-learning techniques to reach to the surging student population with quality education which would by any other means be unreachable (Valentine, 2002). In the same vein, Asia now has more open and distance universities and more distance learners than any other region in the world.

On the whole it could be pointed out that there has been wonderful growth in distance education in terms of number of students and courses, the variety of providers, and the range and effectiveness of new technologies serving as delivery tools for learning (Potashnik & Capper, 1998). Distance education is becoming increasingly global, creating myriad new alliances as traditional educational institutions join businesses, foreign governments, and

international organizations to offer and use distance learning. Developing countries like Iran, utilizing new technologies, have new opportunities to meet the great social demand for higher education and to enhance their human capital.

Historically, from the 1970s onward, Asian governments established single-mode open universities to accommodate the large numbers of adults and school-leavers unable to gain entry to conventional universities (Jung & Latchem, 2007). Along with other Asian nations, the first Open University in Iran was launched in 1975 under the name of Azad University through correspondence courses (using hardcopies through postal services). The courses were supported with instructional radio and television programs (for a short period of time). After the Islamic revolution Payam-e-Noor University (PNU) was grounded based on the Azad (Free) University experience and infrastructures in 1987. This university branched out across the whole country very swiftly. Accordingly, in 1990, only three years after its establishment, PNU enrolled more students than any other state university in Iran; it had reached to a 'mega'-university scale within seven years of its establishment. Interestingly, in 2004, the PNU accounted for more than 14 percent (see Table 3) of the total enrollment in higher education (Bazargan, 2006). Less tuition fees in comparison to other non-public universities like IAU, alongside its flexibility in course provisions paved the ground for further popularity of PNU and its spread (see Table 3).

Table 3.
Distance Education Population and Student Population in 2003-4

Number / Academic Year	Distance Education Student Population	Student Population
2003-4	287261	1945931

 Currently, the PNU University with more than 400 university branches throughout Iran is now one of the mega-universities of the world and is also the largest state university in Iran which is offering mostly undergraduate programs. It should be noted that this figure did not include the virtual institutions (in fact virtual intuitions were lunched since 2004).

TECHNOLOGY and ICT in EDUCATION

Virtual Institutions in Iran

The Ministry of Science, Research and Technology (MSRT) in Iran has recently adopted a decentralization policy. This policy has created an opportunity for universities and other educational centers to initiate vast changes in their education and training systems. Obviously, the information and communication technology will have a significant role in these changes.

On the other hand, the growing national market may motivate virtual institutions (off-campus) to focus primarily on e-learning as a decent option. Accordingly, a large number of conventional universities struggling to utilize ICT-based initiative to introduce e-learning programs or enhance the quality of their conventional programs. Introducing and establishing these types of virtual or blended learning environments should be considered as a groundbreaking initiative in Iranian traditional higher education settings.

An increasing number of universities, educational institutions, and organizations have already launched e-learning programs or are in the process of establishing one. Among them, Shiraz University; Iran University of Science and Technology; Amir Kabir University; K.N. Toosi University; Hadith Science

Table 4:
Distribution of student population in different virtual universities during 2004-2007 academic years

Universities / Academic Year	Shiraz V.U.	IUST V.U.	Hadith Science College	Amir Kabir V.U.	K.N. Toosi V.U.	Isfahan V.U.	Shahid Beheshti V.U.	Tehran V.U.	Other Virtual Inist'.	SUM
2004	115	-	-	120	-	-	-	-	-	235
2005	317	297	180	120	200	-	-	-	-	1114
2006	320	572	252	120	110	12	-	-	611	1997
2007	507	1108	789	270	450	114	269	600	811	4918
SUM	1259	1977	1221	630	760	126	269	600	1422	8264

College; Isfahan University; Shahid Beheshti University and Tehran University as well as a few Non- governmental Higher Education Centers including Tehran Institute of Higher Education, Noore Touba Higher Education Center, etc. have established virtual campuses.

There are also various projects underway to institute e-learning centers in universities such as Sharif University of Technology; Tarbiat Modarres University and Farabi Institute of Higher Education. Along with these universities, Iran's two mega universities including Islamic Azad University with more than one million student body and Payam Noor University with about 600,000 students are moving towards ICT-based initiatives. Moreover, the Iranian Expatriates of North America, Europe and Australia have also organized an "E-Learning Consortium" and have established "International University of Iran". It should be mentioned that some of these virtual campuses like Sharif Technical University and University of Tehran are providing plenty of non-degree courses or programs for various companies and other institutions.

According to the MSRT act, the virtual universities should follow the Ministry of Science guidelines. Delivered programs by these virtual universities and centers are accredited as long as they are in accordance with these regulations. Graduates of these virtual universities are awarded official degrees. Unlike other conventional universities, virtual institutions' admissions are decentralized and it is undertaken locally by universities and based on the applicants' qualifications. However, the conditions for accepted students at these universities are almost the same as the traditional ones. In addition, applicants for these virtual universities alongside other qualifications should provide proof of financial capacity to pay for the tuition fees and the minimum required hardwares (e.g., computers for utilizing e-learning programs.

Shiraz University as a pioneer officially launched its e-learning programs in 2004 (Safavi, 2007). The number of virtual universities/ centers have noticeably increased to more than eight virtual universities and some non-governmental higher education centers including Amir Kabir Technical University; Iran University of Science and Technology; Khadjeh Nasir Toosi University of Technology and Hadith Science College in 2005, University of Isfahan and Shahid Beheshti University in 2006 and University of Tehran in 2007.

As indicated in table 4, the number of e-learning providers (virtual institutions) and the number of enrolled students have significantly increased. In January 2004, there was just one virtual institution with 115 students; while in 2007; the number of virtual students tremendously increased to eight thousands (more than 30 times in four years). In the same vein, the number of e-learning program providers has significantly increased from one virtual institution in January 2004 to more than thirteen virtual institutions in 2007. Though this figure (seven thousand virtual students) is not comparable with three and half million student body in the Iranian higher education, its swift growth could be a sign of big changes in Iranian higher education settings. The emergence of these virtual institutions could be associated with certain external and some internal determinants. In what follows, an overview of the distinctive features of virtual universities/ institutions in Iran is presented:

- Almost all Virtual institutions or e-learning centers in Iran were originated in the conventional universities. Accordingly, these virtual institutions were established on the basis of the substantial physical and human resources existing in the campus-based university. Most of them do not have specific faculty members for their virtual campuses, thus they enjoy the services (including instructor, staff, etc.) of conventional universities. In other words, virtual parts are considered as a subpart of conventional universities with different names. In some universities it is entitled as "E-learning Faculty" as in University of Shiraz, and in some as "E-learning center" as in the University of Tehran.
- Virtual institutions in Iran are developed simply to meet the high social demands for higher education. Due to the scarcity of physical and human resources the number of available places in conventional higher education settings is much lower than the real rising demand. Moreover, students are often forced to choose e-learning programs may be as their only choice for pursuing their higher education.
- The climate (the dominant culture and cultural-pedagogic dimensions) of conventional universities has been transferred to and reproduced in virtual ones. Similarly, in virtual institutions to the aim is to transfer and translate what the conventional programs and courses offer into online courseware format. Thus, it is hard to see any differences between a virtual class and its conventional counterpart except that the contents are transferred to e-contents (cf. Attaran, 2007).

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- The underpinning infrastructures of the e-Learning initiatives are centrally managed within the academic portfolio. Broadly speaking, this comprises a proprietary learning management system (LMS) at the centre, which in most of the cases is an *in-house developed* system (LMS). This LMS along with content management system (CMS) usually comprises all the requested tools and contents for design, and develops and runs e-learning courses including textual material, graphics, interactive exercises, assignment, etc.
- Programs offered by these virtual institutions are supposed to be delivered entirely online. However, in practice, there are a few face-to-face sessions for some courses such as physics, labs. In these virtual settings students are provided with pre-determined learning resources through CMS during the semester. Interactions between students and lecturers usually occur through LMS. However, there are no facilities in virtual settings for interactions among students. Due to poor technological infrastructure, even interactions between student and tutors are uneven.
- Students are enjoying a few face-to-face meetings particularly for the new students in order to introduce the programs and procedures. Moreover, all of the final exams are administered in the conventional campus format, and e-learning students like other on-campus students should take part in these exams. Meanwhile, the universities have established some central offices   all around the country to facilitate e-learning students' affairs and also to support the students locally.
- As mentioned, unlike other conventional universities the admission process in these virtual universities is conducted locally. Accordingly, eligible and interested applicants can apply for a program. Initially all of the qualified applicants are registered as "Danesh Pazier" learners. These learners are given a few courses - around 14 higher education credits- in the opening semester. Among the registered applicants, those who can accomplish these courses successfully (with a minimum score of 12 out of 20) will be declared as student.
- There are very few professors and lecturers who utilize ICT-based initiatives in their conventional courses. Similarly, a great number of teachers in virtual institutions do not engage actively in designing e-learning courses and in communicating with students. As the dean of Virtual Hadith Science College pointed out a large number of the lecturers are not familiar with e-learning system. Therefore they

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seek the assistance of a qualified Teacher Assistant (TA) to develop learning resources and also to facilitate interaction between students and lecturers.

- The tuition fees in these universities are somewhat expensive for a middle class Iranian family. For instance in Amir Kabir or IUST virtual institution accomplishing a Masters degree (MS) in technical programs would cost around 6 thousand Dollars in 2007. However in most of the developed countries, e-learning system is adopted in order to offer more affordable higher education to the lower class sectors of their societies

- Unlike other higher education settings in developing or developed countries, cultural issues and affairs are promoted along with education and research in Iranian higher education settings. Accordingly, there is a vice-presidency for cultural affairs in the administrative system of any higher education settings to respond to students' cultural and religious needs through extra-curricular cultural activities. Students in virtual environments, however, do not have the opportunity to enjoy the extra-curricular cultural activities undertaken in traditional universities.

- Nevertheless, despite the quantitative growth of virtual institutions, there is a growing concern about the quality of the programs offered in virtual institutions. In what follows, some of the outstanding virtual institutions would be more elaborated.

Shiraz Virtual Institution

University of Shiraz as one of the outstanding universities in Iran officially launched its first e-learning program in early 2004.

This University is also considered as the first Iranian University which received government approval to start a joint e-learning program with foreign universities , i.e. Queen Mary College in the University of London (Safavi, 2007).

Shiraz Virtual Institution has also been active in developing virtual laboratories to be used in e-learning programs, research activities, as well as in collaborating with industries.

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Table 4
Approximate total student enrolments
by Shiraz Virtual Institution during 2004-2007 academic years

Sex Academic Year	Female	Male	SUM
2004	84	*31*	115
2005	148	169	317
2006	145	175	320
2007	298	209	507
SUM	635	459	1259

Currently Shiraz Virtual Institution has about 1300 students (see Table 5) from all over the country and some from neighboring countries such as Kuwait and United Arab Emirates. These students are studying in various programs including: B.Sc. in Control Engineering (since 2004) Interface, B.Sc. in Electronics Engineering (since 2005), B.Sc. in Law (since 2005), and M.S. in e-Commerce (since 2005), etc.

Hadith Virtual Science College
Hadith Virtual Science College (HVSC) as the first Islamic E-college in Iran initiated its e-learning project with a Bachelor of Art program in mid 2004. This university has expanded gradually in terms of the number of programs and the extent of enrolled students. Like other virtual institutions this higher education center as a non-governmental virtual entity has a conventional campus in the southern part of Tehran. HVSC is aiming to attract a variety of students from all over the world rather than just from Islamic countries.

This Islamic e-collage provides its programs in Persian and recently in Arabic Language. It also plans to offer courses in English in the near future. To overcome the current infrastructure limitations like restricted bandwidth in the country, Virtual Hadith Science College is utilizing other technologies such as radio along with its own LMS and CMS. In other words, it tries to use an integration of radio broadcasting and the Internet that allow it to provide educational resources widely in an economic way. To this end, VHSC has signed contracts with Islamic Radio for broadcasting some of its courses.

As demonstrated in Table 6, VHSC campus has enrolled about 1500 students since 2004 from among more than three and half thousands applicants. VHSC campus has experienced a smooth growth in terms of the number of students and the number of provided programs.

Table 5.
Distribution of students in Hadith Virtual Science College
during 2005-2008 academic years

Sex Academic Year	Female	Male	SUM
2005	124	56	180
2006	164	88	252
2007(Jan)	207	103	310
2007(Sept)	331	148	479
2008	243	130	373
SUM	1024	498	1522

The reported figures (the number of students) for 2008 are limited to the first semester only. Like other higher education settings in Iran more than half (in some years more than two-thirds) of these students are female (see Figure 2).

Figure 2.
TheNumber of students based on their Sex in Hadith Virtual College
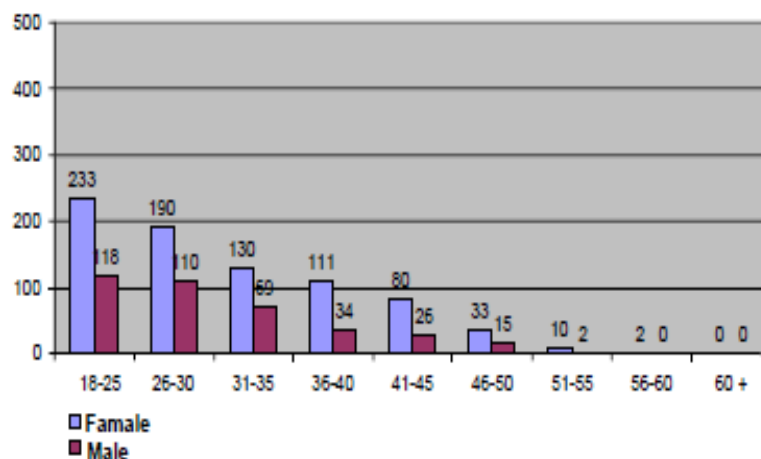
Interestingly, according the dean of this virtual college the dropping rate is less than 10 percent among students of this virtual college.

IUST virtual Institution
Iran University of science and Technology (IUST) as one of the well-known technical universities in the Middle East has established its own e-learning programs in late 2004 with a master program in "Information Technology". This virtual campus is located in IUST conventional campus in the northeast of Tehran. Currently, more than 2000 students are studying in IUST virtual campus. These students are pursuing their studies in two bachelor programs and two masters programs.

As indicated in the following figure the student population has increased significantly during these years (i.e. from 2005-2008).

Table 6
Distribution of students in IUST virtual campus
during 2004-2007 academic years

Sex Academic Year	Female	Male	SUM
2004	-	-	-
2005	102	195	297
2006	179	393	572
2007	405	703	1108
SUM	686	1291	1977

As demonstrated in Table 7, the number of female students has significantly increased along with the male student population in technical fields of study. IUST virtual campus is utilizing a home-developed platform including LMS and CMS for running their programs and assimilating of the conventional class environments on the net.

Along with this, due to bandwidth limitation in the country, learning resources are given to students through other ways like CD.

DISCUSSION AND CONCLUSION

Virtual institutions in developing countries face major challenges which can threaten the very survival of these institutions. Poor accessibility along with posing traditional mindset to the new artifact could be accounted as the foremost obstacle in having successful e-learning environments in these countries. Similarly, the existing telecommunications systems are inefficient and also expensive to use, so higher education institutions are unlikely to place too much reliance on them for teaching, support, or information searching.

In other words, accessibility in terms of the fast, cheap and with good quality access to the Internet is not feasible due to the problems related poor infrastructures, dependability, and most importantly negative attitude of political gatekeepers to this phenomenon (some gatekeepers consider Internet as threat than opportunity). Accordingly, the experience of getting

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online could be different in terms of where you are, in which this experience can be slow and painful for e-learning students in Iran.

That is the reason why most of the virtual institutions use Compact Disk (CD), and radio delivery methods. Consequently, such circumstances prevent producing or using interactive media and providing higher quality education for students.

Swift growth of the tools and applications of the Internet and rapid access to data have provided a good foundation for developing *interactive* multimedia-based educational software. However, bringing on and posing traditional mindsets (i.e. instructivist) to the e-learning environments in terms of its design and use make this new initiative (e-learning) vulnerable to be merely transfer of knowledge (e-teaching) rather than constructing of knowledge (e-learning).

As it seems is the case in the Iranian virtual institutions. In these virtual settings, there are great efforts made to relocate and transfer conventional universities' educational procedural climate to virtual ones. In other words, converting concrete contents to e-contents seems to be the only difference between traditional on-campus programs with their virtual (off-campus) counterpart**.**

In the same line of the thoughts, the programs are strongly based on the lectures electronic presentations transferring the given contents. As a result it can be expressed that, to initiate a successful e-learning environments in developing countries as in Iran, the shifts in the technological aspects should be aligned with shifts in educational climates and epistemologies. Situating learners in their "cultural frame of reference" (Lave & Wenger, 1991), the changes in educational settings can be carried out in multi-level, involving changes of individuals, institutional activities and practices, as well as technological tools and infrastructures.

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CHAPTER-11

eLEARNING IN IRAN II

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ABSTRACT

This chapter reviews the efforts made to integrate ICT in the Iranian educational system and addresses the issues related to e-learning in pre-tertiary and higher education. The development of ICT in Iran began at the beginning of the millennium with a plan called TAKFA. Although the ICT infrastructures have developed considerably in the last decade and the number of internet users increased, the e-readiness of Iran is not at the proper level; Iran rank in e-readiness is 68 (out of 70 countries) with the average score of 3.4 (out of 10). It shows Iran should still take drastic measures to integrate ICT in different aspects of daily life, including education.

Like other countries, Iranian educational system is confronted several challenges, such as increasing demand for higher education due to the explosion of population, the reduction of state funds, rapid development of ICT and globalization. For facing the challenges, Iranian universities use e-learning methods as an alternative approach. Some government-run and private universities have launched new e-learning and virtual program.

Although many initiatives have taken into account to integrate ICT in educational system, such as developing ICT departments, increasing the bandwidth of the universities, developing a scientific network, national network of schools equipping schools to computer centers, etc., there are still some challenges on the way of e-learning in Iran, such as the lack of an official domestic guidelines and standards, an adequate governmental supervision, low bandwidth, high price of connectivity, etc. For optimum use of ICT capacities for e-learning in Iran, cultural, political, and technical and policy issues should be taken into consideration.

COUNTRY

Iran (Persian/ایران) is the 18th largest country in the world with 1,648,195 km². From the 6th

After 1979 Islamic revolution, it called officially the Islamic Republic of Iran. Its population is more then 73 million (Statistical Center of Iran, 2009) with 1.1% annual growths. Iran has a young population, more than 70% under 30 (Word Bank, 2009). Its capital, Tehran, is one of the biggest cities (with more than 14 million inhabitants) in the world.

Iran has a special geostrategic position. Iran located in Western Asia and called as a bridge between the Middle East and Central Asia. Caspian Sea, the largest inland body of water in the world, in the north, and the Persian Gulf and strategic strait of Hormoz, as the most important oil producing region in the world, have increased the geopolitical importance of Iran.

Iran bordered in the north by Armenia, Azerbaijan, Turkmenistan, Russia and Kazakhstan; in the east by Afghanistan and Pakistan; in the south by Oman, United Arab Emirate, Bahrain, Qatar, Kuwait and Saudi Arabia; and in the west by Iraq and Turkey. The topography of Iran is extremely diverse with all geographic regions, including jungle, forest, desert, mountains, and plains.

Although Iran is generally part of the Middle East and is among the Muslim Arab countries, Iranians are noticeable differences in race, history and language, and even its attitude to Islam, with their neighbors. The official language of Iran is Farsi and the race of Iranians is Aryan. Iran is one of the oldest civilizations in the world which has about 8000 years of history including a 2500 proved monarchy.

The official religion in Iran is Shi'a. Iran is the only country in the Islamic world whose population is overwhelmingly Shi'a, unlike most Muslim countries.

Figure1.
A map of Iran

(University of Texas Libraries, 2002)

Iran is an ethnically diverse country (Hassan, 2008) and home to various religious. Most ethnic groups are located in borders of Iran with its neighbor including Kurd in the west, Azeri in the North West, Turkmen in the north east, Baluch in the south east and Arab in the south and the south west of Iran. These ethnic groups have their own cultures and languages and therefore, in addition to Persian, Turkish, Kurdish, Baluchi, Turkmen and Arabic are the prevalent languages in some parts of Iran. Iran is one of the largest reserves of petroleum (8.5 percent of the world total) and gas (the second largest reserves with 14.8 percent of the total) in the world. With an oil and gas-rich economy, oil and gas are the most principal industries and exports of Iran (UNDP, 2009). Iran is very rich in other natural resources including minerals, such as iron, copper, marble stones. The rich and cultivable lands along with appropriate weather in some parts of Iran make a suitable condition for agriculture and animal husbandry development. In 2008, Iran's GDP growth was 6.3% and GDP per capita $12,800 (Word Bank, 2009). Although the government has traditionally dominated on all

sectors of the country including industry and business, privatization has been announced as one of the main policies of the country in recent decades. In addition, due the rapid growth of population and having a young population, the unemployment rate is high, 12.5% (Word Bank, 2009)

EDUCATION SYSTEM

The educational system of Iran is managed under three ministries: the Ministry of Education (MoE), responsible for pre-tertiary education, the Ministry of Science, Research and Technology (MoSRT) and the Ministry of Health and Medical Education (MoHME), responsible for higher education (HE). However, the MoE also has some post-secondary programs such as primary and guidance teachers training centers (colleges) and Higher Institutes of Technical and Vocational Education. After the Islamic Revolution, a council titled the Supreme Council of Cultural Revolution was established to direct and supervise the cultural, educational and research policies. The administration of Iranian educational system is showed in figure 1.

After the Islamic Revolution in 1979, Iranian educational system has undergone fundamental changes both qualitative and quantitative. The increase, or in more accurate word, the explosion of population in 1980s increased demand for education and brought serious pressure on the educational system. As far as qualitative changes are concerned, moving from a secular toward a religious regime caused fundamental changes in goals, objectives and methods of education. According to Iranian constitution, education is compulsory, unit the end of guidance school, and free, even in HE; but for promoting the quality and increasing the capacity, the government allowed the private sector to invest in educational institutes, both in pre-tertiary and HE, in the past two decades. In addition, for tackling new challenges, e.g. increasing demand for education, the structure of Iranian educational administration has changed, e.g. expansion of distance education both in pre-tertiary and HE and establishment of applied-science and private universities. More details of Iranian educational system are illustrated in figure 2. Although some measures have been taken into account to reduce co centralization in recent years, Iranian educational system is highly centered. Nearly all aspects of educational system, such as curricula, text books, finance etc, managed by government. In addition, instruction is content-cantered with emphasis on rote memorization and acquisition of factual knowledge. Furthermore, teaching and learning are test-driven in all

levels of the educational system. Most of teachers' efforts are focused on preparing students to pass exams for entering to special schools, and finally Kunkur (a competitive university entrance examination hold in Iran).

Figure2.
Administration of Iranian Educational System
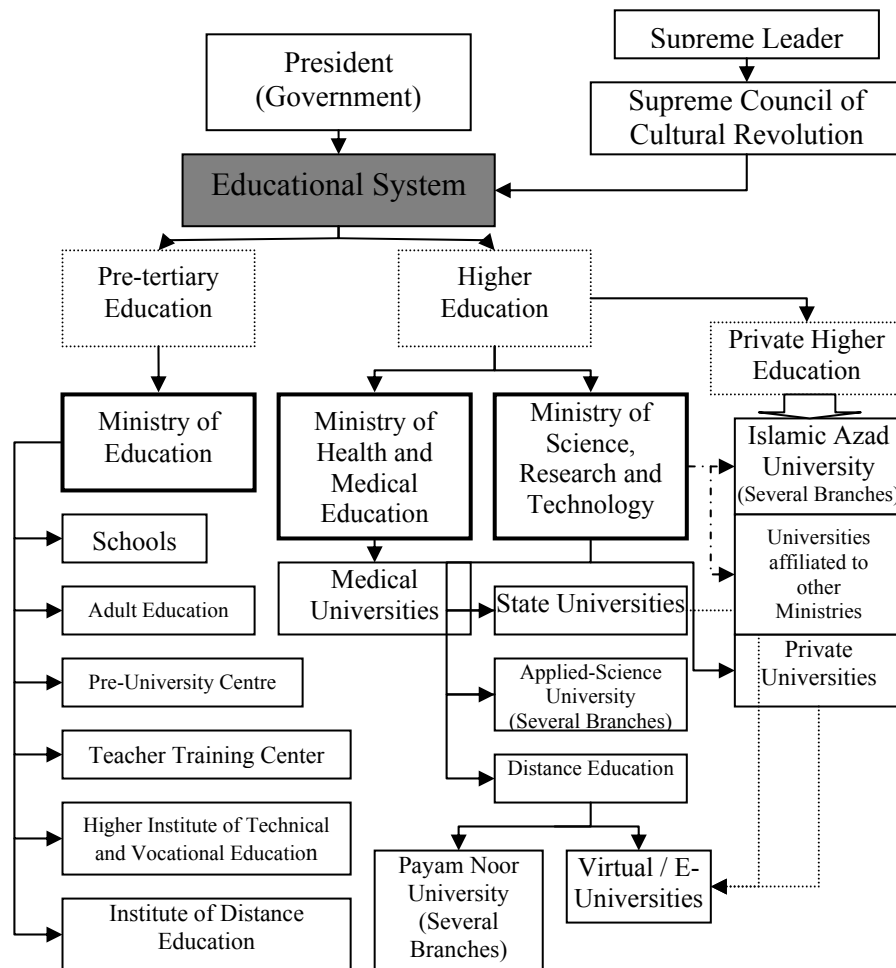
The MoE employs the highest number of civil servants in Iran with around 50% of the total. More than 14.5 million students were enrolled in 149605 schools with more than 650000 classes in 2009. In past three decades,

Figure 3.
Iranian Educational System

PhD

4
3
2
1

Master Degree

2
1

Professional Doctorate

Bachelor Degree

6	Medicine, Pharmacy, Density, Veterinary Medicine
5	
4	
3	
2	
1	

Associate Degree

Universities & Higher Education Institutes

Associate Degree

2	Colleges of Further Education affiliated to MoE	Higher Institute of Technical and Vocational Education
1		

University Entrance Exam (Kunkoor)

Pre-University Certificate (90 Unites)

1 year (18)	Pre University Program	Pre-University Centers

High School Diploma (90 Unites)

2 years (16-17)	Theoretical	Technical & Vocational	Work & Knowledge	Secondary School	Technical and Vocational Centers affiliated to Ministry of Labor and Social Affairs	Secondary Degree Technician's Certificate
1 year (15)	Common Year: First Grade of Upper Secondary (32 Unites)					Secondary Degree Technician's Certificate

3 years (12-14)	Guidance (lower secondary) Education	Guidance School	Compulsory

5 years (7-11)	Primary Education	Primary School	Compulsory

1 years (6)	Pre-School	Non-compulsory / Private
2 years (4-5)	Kindergarten	

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Iranian government has paid special attention to educational system. Most indicators of the education system have improved dramatically, e.g. educational converge from 23% to more than 90%, ratio of girl to boy from .38 to .47 (almost equal), literacy from 47.5 to 87%. One of the significant improvements is in gender equality. Various educational indicators, such as access to early childhood care and education, participation in primary, secondary, and HE, and adult literacy rates, shows a considerable progress made towards gender equality in Iran over the last decades (Mehran, 2003).

Like other countries, Iranian HE is confronted several challenges such as the reduction of state funds, rapid development of information and communication technologies (ICT) and globalization. In addition, "brain drain" is also a crucial phenomenon in Iran. According to the International Monetary Fund (IMF) Iran had the highest rate of brain drain among 90 countries in 2006. Although there is not a formal report, the brain drain rate is estimated more than 150,000 every year. Due to the fact that most people who leave the country are educated, the economic loss of brain drain is very high and estimated at $50b or higher a year. Unsuitable social and political conditions, lack of resources, high rate of unemployment are among the reasons of brain drain.

DISTANCE EDUCATION

The distance education (DE) has had a significant progress in Iran during last two decades, especially with regard to the increasing demand for HE. The history of DI in Iran goes back to 1970s and establishment of Azad (free) University of Iran (AUI). The purpose of AUI was to have a different curriculum from other Iranian universities based on DI methods. To this end, AUI prepared many books with equal design and size and many educational film and audio tapes. AUI started its activities officially in 1977 with awarding some scholarships to a number of distinguished Iranian graduates to continue their studies in aboard. AUI recruited its first students in academic year 1978-79, but it was shortly closed due to the revolution.

For better understanding of the official policies of DI in Iran, the history and structure of PUN should be reviewed. After the revolution, the first serious step to develop a DE system was the establishment of PUN in 1987. Five fields in 27 centres under the names of University of Abu Rayhan Biruni and AUI were reorganized under new university, PUN. At the beginning, the PUN presented courses for people who were employed and not be able to

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attend in official classes on working days. These courses were completely distance, based on hardcopies, or semi-attending, with some face-to-face classes. There was not a unique technology for delivering the courses. Students read the textbooks and took part in exams. With increasing demand for HE in 1990s, the goals of PUN were changed and obtained more found for inaugurating new branches across the county. In this stage, the target audiences of PUN was not only employees but also all the young people demanding for a place in HE. In recent year, PUN expansion has been accelerated again to fulfill the goals of the Fourth National Development Program of Iran. According to this program, 30% of Iranian youth between ages 18 and 24 should have a place in HE. To achieve this goal, MoSRT invested on PUN throughout the country. At the moment, PUN has more than 500 branches in Iran and six branches in other countries. In addition, 30% of students' population is studying at PUN in around 7000 undergraduate, 150 master and 28 doctorate programs. Unlike other state universities, PUN students have to pay a tuition fee.

Although there are some types of educational technologies, such as TV programs, educational CDs and DVDs, video and audio cassettes, offline learning materials etc., the method of DE used in PUN is old-fashioned, based on hardcopies. The common method is that students read specific textbooks published for each module and then take part in exams at the end of the semesters in one of PUN branches. For each module, there are some problem-solving classes (eight sessions) at weekends. With opening several branches throughout the country, it seems PUN is far from its main purpose to provide just DE. It seems the best word for describing current status of the university is semi-attending university. Although there are a few virtual or TV-based programs, nearly all PUN course are presented as a kind of semi-attending courses.

The governmental body for pre-tertiary DE in Iran is the Institute of Distance Education (IoDE). This institute is affiliated to the MoE and established in 2004. IoDE has more than 1700 branches inside and outside Iran and covers more than 500,000 students. In addition to the branches managed by government, IoDE headquarter has invited private sector to invest on new branches of IoDE under government supervision. IoDE has a plan to inaugurate 800 new branches to cover more than one million students till 2011. The main target audiences of IoDE are students and adults who leave abroad or have to work but are interested to continue their studies, and students who prefer a self-directed education.

The main purpose of IoDE is to provide a part or whole of subject matters taught in public education with emphasis on learning through visual or audio courses. IoDE applies different methods of DE, including textbooks, educational media (such as educational software), educational guidance, tutorial classes and continuous evaluation. For students outside of Iran, IoDE utilizes internet as main media, e.g. online classes. Within the rules and regulations of the Iranian DE system, IoDE awards a high school graduation certificate to students who finish their study successfully.

Another significant development in DE occurred at the beginning of the new millennium with expanding the ICT. The facilities offered by ICT was a suitable solution for Iranian government to reduce the heavy pressure of youth population demanding HE. With more than 20 million pupils, every year many new places should be created in Iranian HE sector. Most Iranian pupils are planning to pass university entrance exam and get an acceptance from a university. Due to the limited capacity of the universities, only a portion of school graduates were able to enter to the universities. In this situation, along with the expansion of PNU, a solution for Iranian HE policy makers were using the advantages of ICT and developing virtual and electronic courses and universities.

In 2001, Tehran University launched a website for presenting e-learning course. This initiative followed by some other prestigious universities with establishment of E-learning or virtual faculty or unit, to develop electronic courses for their regular students and/or to present new program based on e-learning methods. On the other hand, in order the complete use of ICT advantages to tackle new challenges in the area of globalization, MoSRT welcomed enterprise in DE and virtual institutes of HE. At the moments, several distance and virtual private universities are active in Iran.

TECHNOLOGY

With more than 72 million people, Iran is a suitable market for ICT. However, Iran has a state economy and most of fundamental infrastructures, including ICT, are under the control of the government. Internet in Iran has a 15-year history and made rapid progress in last decade. According International Communication Union (ITU), Iran had 23 million internet users including 300,000 broadband users in 2008 (www.itu.int/ITU-D/icteye/Indicators/Indicators.aspx# retrieved on 28.12.2009), but the latest survey conducted by Internet World State (2009) showed, with about 32

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The government body responsible for developing ICT policies and strategies is the National ICT Agency (NICTA). NICTA has the overall responsibility for ICT initiatives and presented Application Plan of Information and Communication Technology, called TAKFA (an acronym of Farsi words representing the Iranian National ICT Agenda). TAKFA was the overarching ICT development plan for Iran and was designed under the supervision of Supreme Council of Information & Communication Technology (SCICT) as the highest decision making body in the area of ICT policy making in Iran, between 1999 and 2002. Significant funding was allocated for ICT development in note 13 of government public budget between 2001 and 2004. Many believe these years were golden period for ICT development in Iran.

TAKFA has around seven strategic axes, including Government, Education, Higher Education, Services, Commerce and Economy, Culture and Persian Language, ICT industry through SME empowerment. A schematic of TAKFA'S development is presented in figure 4 (for more details see: TAKFA, 2002). TAKFA's vision statement is: "*Powerful Iran in the 21st century through knowledge centric ICT*" with mission statement of:

> *"Employing ICT to transform national opportunities and resources into national wealth, power and pride towards sustainable national development so that Iranian citizens are empowered to achieve their full potential in life" (Jahangiri, 2004, p 43).*

The general framework of TAKFA consisted of five major parts:
1. **Infrastructure:** Access, Security, Data Centers, Regulations, and Law
2. **Commerce and Economical Services:** eCommerce, eBanking, eMoney
3. **Government Services:** eServices, eGovernance, and eGovernment

4. **Human Resource Development, Cultural and Social Programs:** Human Recourse Development & eEducation, Culture in digital environment
5. **Employment and Industry:** Industrial development, high tech jobs, Industrial parks, and SME development

In addition, each major part was divided into subdivisions. Overall, forty national projects and 110 subprojects in the action plan were defined. A summary of TAKFA main and secondary objectives, policies and plans were (TAKFA, 2002):

Figure 4.
Schematic of TAKFA'S development
(Source: Jahangir, 2004, p. 37)
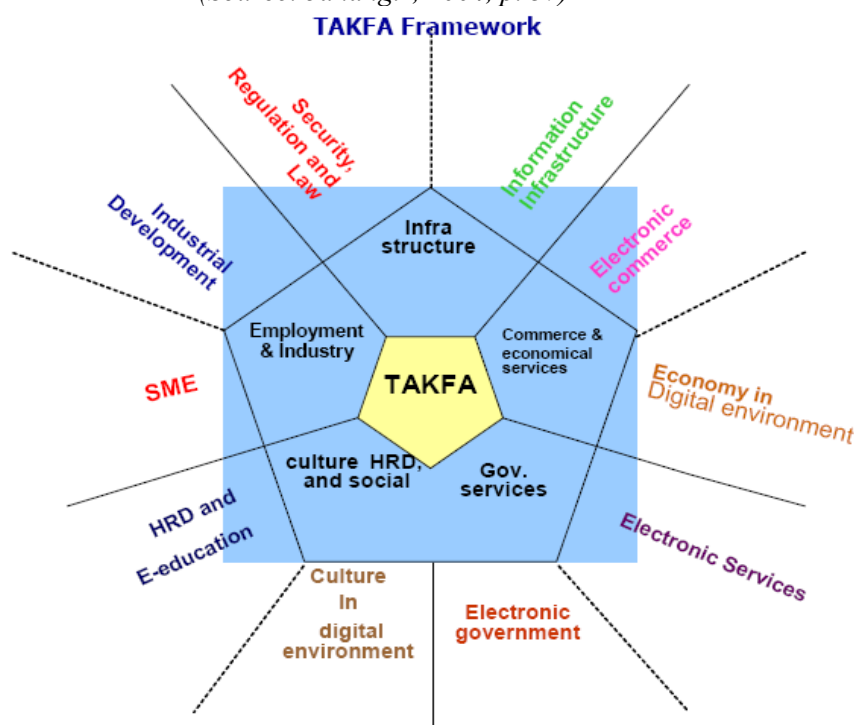
Main Objectives of TAKFA:
1. Creation of infrastructure of Iran's information and communications know-how (network, law and security)

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2. Compilation and application of comprehensive system of communications and information.
3. Development of productive employment.
4. Promotion of average level of skills in the know-how of communications and information (individual and institutional).
5. Performance of flagship projects.

Secondary Objectives of TAKFA:
1. Increase in the capability of national economy.
2. Increase in the national productivity.
3. Promotion of private sector's participation in the ICT market.
4. Groundwork for entry into the international market of ICT.

Policies of TAKFA

Implementation
- Assignment of the role of planner and implementation manager to the public sector, and prevention of expansion of state supervision in the implementation.
- Assignment of maximum implementation of operations to private sector.
- Use of international consultants and contractors in flagship projects at national level, and reliance on domestic ICT industry in the provincial flagship projects.

Investment
- State investment in the creation and strengthening of infrastructures of ICT sector.
- Encouragement of creation of ICT products through participation and aid of the private sector.

Use of Credits
- Use of credits for projects of TKFA plans, with priority to leading projects.
- No parallel investment with the Communications Co. in the creation of data network.
- Expenditure of credits for decreasing access expenses and increasing the potential of public access to communication and information know-how.
- Creation of Persian environment and development of economic applications based on it in the network.

Geographical Situation
- ▪ Application plans at two levels, i.e., national and provincial (in case of financial participation by the provinces) shall be carried out simultaneously.

Leading plans
- Plan for electronic government (system, virtual network, law and security).
- Plan for promotion of communication and information know-how application in education, and expansion of digital skills of Iran's manpower.
- Plan for expansion of communication and information know-how application in higher education.
- Plan for expansion of communication and information know-how application in health, treatment and medical education.
- Plan for expansion of communication and information know-how application in economy, commerce and trade.
- Plan for expansion of culture and knowledge of ICT, strengthening of Persian script and language in computer environment.
- Plan for expansion of active SME in the communication and information know-how by creating growth centers and ICT know-how parks.

Iran had delay in developing a comprehensive plan for ICT policy and strategies in the beginning of the millennium. Therefore, shortly after approving TAKFA, a big increase in activities and initiatives for decreasing the ICT gap began; For example, copyright law, protections and guarantees regarding foreign investment, easier and more suitable methods for awarding contracts, a regulation that states that all national projects must be awarded to consortiums of Iranian and foreign companies etc. Meanwhile, more than 1,600 projects had been officially submitted (with a total value of over US$ 2.7 billion) to promote the ambiguous goals of TAKFA. The project covered different dimensions of ICT development, e.g. consultancy, concept development and feasibility studies, creating infrastructures in organizations, completion of projects defined in the past and human resource development (Seadeghnezhad, 2003).

Some educational incentives of TAKFA were:

- Developing a science network (universities and research institutes)
- Developing a growth network (Ministry of Education's schools)

- Creating a national information portal (i.e., creation of a web for all executive bodies and dissemination of relevant information through such a web)
- Developing ICT in schools, creating digital libraries,
- Developing remote control medical services (Sedeghnezhad, 2003).

On the other hand, the development of ICT infrastructures in different fields was one the main goals of the Fourth National Economic, Social and Cultural Plan of Iran (2005-2009); these fields were: industry, business and marketing, foreign investments, small and medium enterprise, supporting productive and entrepreneurs plan, knowledge society, educational program, science and technology parks, vocational skills, health and culture. After presidential election in 2005, a new government came to power and some official priorities changed. However, some new initiatives were proposed. One of these initiatives was TASMA plan (an acronym of Farsi words representing Production and Organizing of Electronic Context of Iran). In TASMA, the road map for producing and organizing of e-context was identified and the responsibility of the governmental bodies was determined. There is not any official document for evaluating the results of TASMA.

On the other hand, launching another plan for ICT development was announced in 2008. This plan titled TAKFA2 or ITSMI (an acronym of Farsi words representing Information Technology Strategy Master-Planning for Iran). According the news, an advisory council consists of Iranian experts and a foreign consultant was appointed to prepare the plan. However, there is not any official news or documents about the performance of the advisory council. Although there are still some barriers and weaknesses, the network infrastructure has been rapidly developed throughout Iran in last decades and, consequently, the number of internet users has increased remarkable in recent years. In addition, the price of a personal computer is relatively fair and the number of families owning a PC has growth rapidly. However, the price of internet services is relatively high and the bandwidth for home users is low (maximum 128 kb) in comparison with other countries.

From the beginning of ICT development, there has been some speculation regarding the cultural risks that internet imposes on the Iranian conservative society. For reducing the risk of internet, a range of measures were been taken into account, from filtering to establishing a national network of internet. At the moments, the government has a strong filtering system that blocks many unethical and political website. In addition, the national

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network of internet has been proposed to provide a secure environment for youth. Some experts believe the establishment of a national network of internet is not realistic and, in fact, it is a kind of huge intranet. One of the main targets of the national network of internet is schools. At the moment, more than 6000 schools have access to internet via the national network, but for covering all schools, a considerable fund needed. With all efforts made so far, it seems there is a huge gap between Iran and developed country in e-readiness. E-readiness is the ability to use ICT to develop economy and to foster welfare. According the last figures, the rank of Iran in e-readiness was 68 (out of 70) with score 3.43 (out of 10), including: connectivity 3.50, business environment 4.22, social and cultural environment 5.23, legal environment 3.00, government policy and vision 2.65 and consumer and business adoption 2.48 in 2009 (EIU, 2009).

E-LEARNING AND ICT INTEGRATION

The use of ICT, in particular e-learning, has encouraged by the government of Iran during last decade and a great deal of fund has been allocated to achieve this goal. Use of ICT facilities for promoting the quality and the quantity of education was one of the important aspects of ATKFA. MoE, MoSRT and MoHME submitted several projects to develop and integrate the ICT infrastructures in the educational system.

MoSRT, as main governmental body for HE, established a strategy committee to integrate ICT in HE and use the facilities offered under TAKFA in 2002. Figure 5 shows the structure of the committee.

In addition, the structure of MoSRT was amended to fit with new goals and missions predicted for Iranian HE sector in new millennium. The initiative that MoSRT has taken into account to integrate ICT in HD are:

- Developing ICT departments at ten leading universities in order to train the required manpower in the field of ICT
- Increasing the bandwidth of the universities
- Developing a scientific network
- Developing internal network of the universities and research institutes
- Developing educational management system (SAMA)
- Developing digital libraries
- Developing virtual universities

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Figure 5.
Structure of TAKFA Strategy committee of MoSRT

Secretariat of TAKFA Strategy committee

Committees

Research & IT Development	Information	Administrative Automation	Virtual University	Network	Education
E-Learning	Information System of Ministry	MIS	Developing Software	Scientific Network	Curriculum Development
E-Research	Information System of Universities	EIS	Developing E-Context	Intranet of Universities	Operating Curriculum
E-Knowledge			Digital Library	Developing E-Recourses	
Technology Transfer				Security of Scientific Network	

- Developing administrative automation system
- Distributing computer among universities, in first step more than 15 thousands computer delivered

At the beginning, e-learning was limited to general courses for in-university students, but gradually a number of virtual universities have launched. At the movement, a large number of universities, institutions of higher education and vocational training organizations have launched e-learning programs or

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virtual branches. Examples of e-learning units affiliated to states (government run) universities are:

- E-learning Centre, Tehran University: www.utec.ut.ac.ir retrieved on 28.12.2009.
- Faculty of E-learning, Shiraz University: www.reisu-fars.com retrieved on 28.12.2009.
- Virtual Education Graduate College, AmirKabir University of Technology: www.aut.ac.ir/virtual-aut retrieved on 28.12.2009.
- Virtual Learning System, Ferdowsi University of Mashhad: www.vu.um.ac.ir/login.php retrieved on 28.12.2009.
- E-learning Center, Iran University of Science and Technology: www.elearning-iust.ir retrieved on 28.12.2009.
- Office of Free and E-learning, K. N. Toosi University of Technology: www.kntu-elearning.ir retrieved on 28.12.2009.
- E-courses, Shaid Behehsti University: vu.sbu.ac.ir
- Faculty of E-learning, Sistan and Baluchestan University: www.eusb.ir retrieved on 28.12.2009.
- PUN: www.pnu.ac.ir/Portal/Home/Default.aspx retrieved on 28.12.2009.

In addition, MoSRT welcomes private investment on virtual universities. Some examples of such universities listed below:

- Virtual Faculty of Hadis Sciences: www.vu.hadith.ac.ir retrieved on 28.12.2009.
- Farabi Institute of Higher Education affiliated to International University of Iran: www.iuiedu.com & www.farabi.ac.ir retrieved on 28.12.2009.
- Iranian Internet University: www.net2university.com retrieved on 28.12.2009.
- Birjand Virtual University: www.vu-birjand.ir 28.12.2009.
- Mehre Alborz Institution of Higher Education of: www.mehralborz.com retrieved on 28.12.2009.
- Noor-e-Touba Non-profitable Institution of Higher Education: www.nooretouba.ac.ir retrieved on 28.12.2009.
- Imam Khomeni Virtual University: www.ikvu.ir retrieved on
- Sahand University of Technology: www.vu-sahand.com retrieved on 28.12.2009.

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Although outstanding efforts and progress has been done, there are still some challenges on the way of e-learning in Iran. Firstly, despite the importance of standards is recognized, no official domestic guidelines and standards for e-learning published so far. In addition, there is not an adequate governmental supervision and appropriate guidelines on e-learning throughout the country. Furthermore, there is not any specific policy regarding to virtual universities.

In pre-tertiary education, as announced by Iranian education minister in UNESCO conference (Haji, 2004), prompting learning and teaching by utilizing ICT has been one of the top priorities in last decade. To achieve this goal, the structure of MoE has changed to fit with new missions. Figure 6 shows some deputies and units of MoE related to developing ICT in pre-tertiary educational system.

Figure 6.
A part of MoE structure related to developing ICT
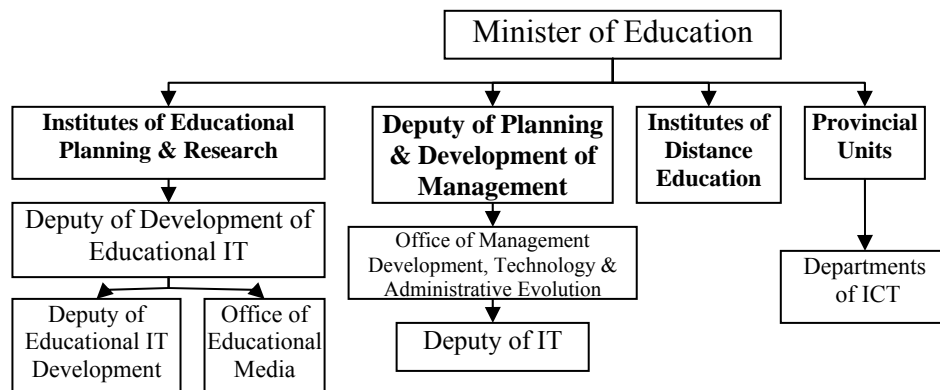
At the beginning for a rapid integrating ICT in educational system, MoE pursued some goals, such as established computer centers in schools, hold continuous training programs for managers, teachers and students to apply ICT in educational situations and produced the suitable e-content for students. In order to achieve these objectives the following measures accomplished:

- Equipping schools to computer centers
- Training:
  - General IT literacy (ACDL Program) for managers, staffs and students.

- Advanced IT literacy for managers, teachers and IT staffs
- Integrating ICT in curriculum.
- Producing e-content
- Informational databases for:
  - MoE headquarter and its affiliated institutes and offices
  - Schools / Teachers
  - Learning Materials and Textbooks
  - National Informational Database of MoE
- Services: as part of Iran e-government for increasing e-readiness including: student registration, financial affairs, buying textbooks etc.
- National Network of Schools (Intranet): to provide a secure network for schools around the country.

In 2007, Supreme Council of Education, as highest policy-maker body for pre-tertiary education, published the official "*document of ICT development in education*". This document is a road map and explains principles, vision, missions, strategies, policies and requirements for ICT development in education. The vision for ICT integration in education is:

> *Extensive utilization of ICT to Change the educational system to a learning and inquiring organization that offers equal educational opportunities in teaching-learning environment based on knowledge and Islamic culture.*

In order to achieve the above vision, the following missions and strategies suggested:

- **Mission** providing a learning-teaching environment based on ICT in education system with emphasis on:
  - Empower the human resources of education system with relevant utilization of ICT
  - Reconstruction of the curriculum planning system with relevant utilization of ICT and production of dynamic e-content
  - Comprehensive and balanced development of inquisitive student with purposeful utilization of ICT
  - Providing necessary facilities and provisions for access to communication and information networks in all levels of educational system

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- Providing space and standard equipment in all education centers affiliated to educational system on the basis of ICT technical criteria
- Establishing organizational and management system based on ICT in order to achieve learning goals
- **Strategies** Culturalization and creation of appropriate background for utilization of ICT in educational system
  - Re-engineering of the management system and the organizational processes in all levels of the educational system in the basis of ICT, and change in educational methods and programs of human resources training and development
  - Use of scientific and research capacities of the country
  - Change in educational programs and curriculum in all academic levels and teacher training programs with appropriate utilization of ICT
  - Increase opportunities for denationalization of ICT related services
  - Standardization of space and related equipment related to ICT in education system
  - Development of the national network of schools
  - Development of e-learning content in Persian
  - Create and develop educational and research activities under the network

With a youth population and increasing demand for education, in particular in the higher education and vocational sector, the prospect of e-learning in Iran looks promising.

However, like most countries, with the lack of proper standards and supervision, there is not any proven evidence to evaluate the effectiveness of e-learning programs in Iran.

The lack of a quality assurance inspection, a set of appropriate standards for producing e-content and delivering mechanism are the major drawback of Iranian e-learning system.

Although a special consultant committee established in 2002 to provide standards and regulations for domestic e-learning program and some project defined, e.g. frame word and national virtual university, the committee has not published any report about its performance so far.

CASE STUDIES

Many private and public incentives have been done during last decades in area of e-learning in Iran. For example, National Network of Schools (NNS), or as called ROSHD (Farsi equivalent for development or growth), has been established by MoE as one of the components of training packages to help students to achieve the educational goals (see: www.roshd.ir retrieved on 28.12.2009.).

The main axes of NNS are strengthening, deepening and completing all school programs and related activities. NNS goals are: producing programs and activities to complete the formal educational programs, creating a reference network of education, providing equal educational opportunities to realize educational justice, improving the educational quality (both methods and contents) throughout the country. NNS has several free services including: Encyclopedia, FAQ, question and test, email system, virtual and electronic textbooks, Roshd magazines (monthly journals published by MoE for different levels and subjects, e-library counseling and psychological services, a bank of educational software, news, etc. NNS audiences are: students (preschool, primary, guidance, secondary, Pre-university), teachers, educational staffs (principal, deputies, instructor, counselor, librarian, etc.), parents, MoE employees in its headquarters, exceptional students, teacher training students.

Some types and methods of e-learning that used in Iranian educational system summarized below: (the links of the universities that used as example, presented in pages 12):

- Some institutes are completely virtual and most of their educational programs presented via ICT, e.g. Virtual Faculty of Hadis, but most of the universities use e-learning as a method for delivering their traditional courses.
- Some traditional universities present some of their courses electronically for in-university students, e.g. Ferdowsi University of Mashhad. In this case, students have two options: traditional (face-to-face) method or e-course.
- Some traditional universities have launched new virtual programs and courses by establishing virtual faculties, units or departments, e.g. Shiraz University.

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- Most universities have launched their e-learning courses in some fields that do not need laboratory, workshop or field activates, e.g. management and theology, but a few universities have some more complicated courses like engineering, e.g. Shiraz University, Amir Kabir University of Technology. In this case, students have to attend at the University for some Modules.
- Although midterm exams, quizzes, and home works might be done through LMS system or other electronic options, e.g. email or chat, in all virtual universities and e-learning courses in Iran, students have to attend at the universities for final exam. There is not any online assessment.
- There are many companies offer LSM in Iran and some universities use LSM for delivering and managing their courses. However, some universities use free and open sources tools, e.g. email or chat messenger provided by Yahoo or Gmail.

ISSUES AND CONCLUSION

The following issues should be taken into consideration in connection with optimum use of ICT capacities for e-learning in Iran:

Cultural issues
Some Iranian people and authorities do not have a positive view on internet. They believe the negative aspects of the internet are more than its positive ones. For some people, internet is a tool that causes some social deviations. In Iranian society, Islamic values are respected and some people believe using internet weakens their beliefs and cultural values.

Political issues
After revolution, the tension between Iran and some western countries has been increased. Some foreign countries and anti-government groups use internet as a media against the Iranian government. In this situation, the government has taken some measures, including filtering the websites, filtering some words for searching through search engines, and decreasing the bandwidth and speed of download.

Although the government measures are not against academic uses of internet, the consequences of the measures have a direct effect on e-learning and uses of ICT in education.

Policy issues

There are not clear standards, regulations and legislations regarding to the use of ICT in education and e-learning. Therefore, it seems some measures should be taken into account, for example: a strategic planning, a set of standards for different aspects of e-learning (e.g. producing contents), a quality assurance program, a supervisory body, and regulations for accreditation etc.

Technical issues: Although the ICT infrastructure has developed rapidly, there are still some technical barriers. Most users connect to internet via dialup services and the price of internet is relatively high. Even some universities have problem in their network and do not have high bandwidth.

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CHAPTHER-12

eLEARNING IN IRAQ

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ABSTRACT

Empowering distance education's is crucial for Iraq after decades of traditional learning. Iraqi people need the knowledge and competence to compete in an increasingly technology-driven world economy. Iraq needs new models of education facilitated by educational technology. Some of the most promising new educational approaches are being developed through e-learning and virtual schools. This is an exciting, creative and transforming era for students, teachers, administrators, policymakers and parents. It's time for Iraqi higher education entities to keep abreast of this quite revolution. This conceptual and roadmap paper, presented at the Iraqi Higher Education conference to be held in Kurdistan / Iraq, on December 2007, tries to promote the Iraqi higher education entities, via utilizing distance learning or education eLearning strategy considerations.

COUNTRY

Formerly part of the Ottoman Empire, Iraq was occupied by Britain during the course of World War I; in 1920, it was declared a League of Nations mandate under UK administration. In stages over the next dozen years, Iraq attained its independence as a kingdom in 1932. A "republic" was proclaimed in 1958, but in actuality a series of strongmen ruled the country until 2003.

The last dictator was Saddam Hussain. In his reign territorial disputes with Iran led to an inconclusive and costly eight-year war (1980-88). In August 1990, Iraq seized Kuwait but was expelled by US-led, UN coalition forces during the Gulf War of January-February 1991. Following Kuwait's liberation, the UN Security Council (UNSC) required Iraq to scrap all weapons of mass destruction and long-range missiles and to allow UN verification inspections. Continued Iraqi noncompliance with UNSC resolutions over a period of 12 years led to the US-led invasion of Iraq in

March 2003 and the ouster of the Saddam Hussain regime. US forces remained in Iraq under a UNSC mandate until 31 December 2008 and under a bilateral Security Agreement thereafter, helping to provide security and to support the freely elected government. In October 2005, Iraqis approved a constitution in a national referendum and, pursuant to this document, elected a 275-member Council of Representatives (CoR) in December 2005. After the election, Ibrahim al-JAAFARI was selected as prime minister; he was replaced by Nuri al-Malika in May 2006. The CoR approved most cabinet ministers in May 2006, marking the transition to Iraq's first constitutional government in nearly a half century. On 31 January 2009, Iraq held elections for provincial councils in all provinces except for the three provinces comprising the Kurdistan Regional Government and at-Ta'mim (Kirkuk) province.

Figure 1.
A map of Iraq

Officially Republic of Iraq, republic (2005 est. pop. 26,075,000), 167,924 sq mi (434,924 sq km), SW Asia. Iraq is bordered on the south by Kuwait, the Persian Gulf, and Saudi Arabia; on the west by Jordan and Syria; on the north by Turkey; and on the east by Iran. Iraq formerly shared a neutral zone with Saudi Arabia that is now divided between the two countries. Baghdad is the capital and largest city.

Iraq's only outlet to the sea is a short stretch of coast on the northwestern end of the Persian Gulf, including the Shatt al Arab waterway. Basra and Umm Qasr are the main ports. Iraq is approximately coextensive with ancient Mesopotamia and has a great ancestor in history. The southwest, part of the Syrian Desert, supports a small population of nomadic shepherds. In the rest of the country, life centers on the great southeast-flowing rivers, the Tigris and the Euphrates.

Nearly 80% of the population of Iraq is Arabic-speaking, while over 95% is Muslim (Sunni and Shiite) in religion. There are about twice as many Shiites as Sunnis, the latter sect being more numerous throughout the majority of Arab countries. The hilly uplands of North Eeast Iraq are primarily inhabited by Kurds , who are largely Sunni Muslims; other large minorities include Turkomans (Turks), Armenians, and Assyrians (Nestorian Christians).

Most of the country's once large Jewish population migrated to Israel in the early 1950s. As a result of the insurgent and sectarian fighting that occurred following the U.S. occupation of Iraq in 2003, an estimated 1.6 to 2 million Iraqis had left Iraq by the end of 2006, mainly to neighboring Jordan or Syria; a similar number had relocated within Iraq. Among those who have left are an estimated two thirds of Iraq's Christians.

Iraq has been highly dependent on foreign economic aid in recent years, from both Western and Arab countries. The country also has a severe labor shortage. The Baghdad Railway, long an important means of communication, is declining in importance in favor of travel by road and air. There are international airports at Baghdad and Basra, and a state-owned airline operates within Iraq and abroad.

Table 1.
Iraq GDP

	2002	2003	2004	2005	2006
GDP (US$ bn)	19.0	12.7	25.5	34.7	40.3
Real GDP growth (%)	-14.2	-35.3	46.5	3.7	1.9

Iraq is a parliamentary democracy governed under a constitution that was ratified in 2005. The president, who is head of state, is elected by the Council

of Representatives. The government is headed by the prime minister. The bicameral legislature consists of the 275-seat Council of Representatives, whose members are elected by proportional representation, and a Federation Council, whose membership had not been defined as of late 2007. Administratively, the country is divided into 18 governorates. However it still has occupied by American troops and there is a prediction for finishing this occupation by 2011.

DISTANCE EDUCATION AND IRAQ

Generally, Distance learning and education, is a field of education that focuses on technology and instructional systems design incorporated in delivering education to students who are NOT physically "on site" to receive their education. The historical evolution of distance education has been in four main phases, each with its own organizational form derived from the main form of communication. These are in summary Correspondence systems are originated at the end of the 19th Century, and is still the most widely used form of distance education in less developed countries. Based around a study guide in printed text and often accompanied by audio and video components such as records and slides, interaction in the correspondence method is by letters and other written or printed documents sent through postal systems.

Educational television and radio systems are using various delivery technologies, terrestrial, satellite, and cable television and radio, to deliver live or recorded lectures to both individual home-based learners and groups of learners in remote classrooms where some face-to-face support might be provided. Some systems offered limited audio or video-conferencing links back to the lecturer or a moderator at a central point.

This model is still widely used in dense-population and rural areas within countries such as India. For Iraq, this option was the ONLY available one for more that 3 decades, but with Limited approach: Secondary schools. It was NEVER aimed for Higher Education (HE). Multimedia systems are encompassing text, audio, video, and computer-based materials, and usually some face-to-face learner support delivered to both individuals and groups. In this approach, which is that used by the open universities, instruction is no longer an individual's work, but the work of teams of specialists; media specialists, information specialists, instructional design, and learning specialists. Programs are prepared for distribution over large numbers of

learners, usually located across a whole country. For Iraq, this option started to be deployed with limited resources and applications in HE entities during the last 15 years, synchronized with the global IT deployments. It was limited because due to many reasons, probably the most important one is the UN sanctions time on Iraq (1990-2003) which brought highly negative consequences in lack of hope, opportunities and departure of many HE skilled academics aboard. The HE system at that time faced potential negative circumstances. Internet-based systems are in which multimedia (text, audio, video and computer-based) materials in electronic format are delivered to individuals through computers, along with access to databases and electronic libraries, and which enable teacher-student and student-student, one-to-one, one-to many, and many-to-many interactions, synchronously or asynchronously, through e-mail, computer conferences, bulletin boards, etc. For Iraq, this has slightly started in partnerships with global HE entities. The aim was hoped to be great, but with deteriorating security circumstances and killing of many Iraqi HE academics, a new wave of HE skilled academics immigration have been observed which lead to very low income of fruitful results.

Current Global Scenarios
Dual Mode
Universities are that have extended educational activities to provide off-campus programs as well as on-campus programs simultaneously. For Iraq, this is planned currently, in partnerships with esteemed western HE institutions. The trigger have NOT started yet due to current nation transition circumstances; i.e. security. The starting point could also be the relatively sophisticated neighbor countries like Turkey.

Single Mode
Universities that dedicate all of their activities to the unique purpose of distance education. Again, for Iraq, this is planned currently, in partnerships with esteemed western HE institutions and regional expertise. The trigger have NOT started yet due to current nation transition circumstances; i.e. security.

Virtual
Local universities are that aims to provide world-class education without boundaries and internationally accredited degrees by being affiliated with reputed online universities in order to offer their programs to students from the Arab region so that students do not have to leave their countries to study

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abroad. Again, for Iraq, this is planned currently, in partnerships with esteemed western HE institutions and regional expertise. The trigger has NOT started yet due to current nation transition circumstances; i.e. security and lack of good IT/telecommunications supporting infrastructure.

Advantages of Distance Education for Iraq
For Iraq, this is a totally Win-Win case, after decades of being isolated form the global HE, especially that are Iraq is one of the pioneer regional nations that established the HE institutions; for e.g. University of Baghdad was established in 1921 with basis of UK HE curriculums.

ICT IN IRAQ

In the past two years there has been a significant effort to reinforce reconstruction and development work as emphasized by processes surrounding the International Compact for Iraq (ICI). But sectarian tensions, violence and continued displacements of persons within Iraq and its neighboring countries have prevented Iraqis from enjoying a sense of progress or even hope that the situation will change for the better. Political milestones achieved to date have not yielded the anticipated impact on the quality of life for the general population, let alone its transformation to the Information Society.

There remain daunting challenges in the provision of basic services, respect and application of the rule of law, systematic human rights, transparency and accountability within governmental institutions and policies, and real transition to democracy and economic prosperity. Before 2003, Iraq suffered immense hardship due to continuous external conflicts, which rendered the country lagging in almost all economic and social domains; not excluding ICT. The government's involvement in mobilizing oil revenues for security and military support on the one hand, and for the Oil-for-Food programme, on the other, prevented Iraqi's from acquiring the quality of life prevalent in other major oil-producing countries.

Although security remains at immense low levels, Iraq has succeeded in developing and advancing its ICT sector particularly with respect to telecommunications. However, its IT achievements, though noteworthy, but remain incomparable to telecom advancement. The present profile is an overview of various aspects of ICT development in Iraq with highlights on strategies, policies, infrastructure and connectivity. In October 2003, three

companies were awarded GSM licenses to operate the mobile phone services in north, mid and south Iraq: Asiacell, Iraqna, and MTC Atheer; respectively. Since the beginning of 2006, the three operators became national, thus extending their services throughout Iraq]. Korek Telecom and SanaTel operators remained regional each covering a discrete area within the Kurdistan region in north Iraq.

The Ministry of Communications announced its plans in February 2005 to bid for two nationwide Wireless Local Loop (WLL) networks in partnership with Iraq Telephone and Postal Company (ITPC). The licenses were awarded in 2006. Additionally, and as part of the Ministry's plans to develop its fixed network infrastructure, seven fibre-optic loops (DWDM) are to be established covering all Iraq and connecting its cities.Investments in communication networks have been quite high. As an example, four national licenses have been awarded by the CMC to provide WLL in Iraq to the following entities: Trade Links Logistics, General Trading and Construction, Munir Sukhtian Group (MSG) and Iraq Telephone and Postal Company (ITPC) In the information technology domain, the Ministry of Planning and International Development (MOPID) changed the name of the Central Statistical Organization (CSO) to the Central Organization for Statistics and Information Technology (COSIT) with the intention of creating an entity in MOPID responsible for a national ICT policy. However, COSIT continued as a national statistical agency with little or no change in its work plan to embrace ICT. Iraq Communications and Media Commission (ICMC and later named CMC) were established in 2004 as a regulator for the telecom and media sector with the objective "to encourage investment and discourage state interference". Therefore mobile learning could be one solution to progressing distance learning.

Role of Internet
The Internet has attracted the attention of university academics to the idea of distance teaching in a way that no previous technology managed to do. Together with the pressure from new competitors for student enrollment, this enthusiasm for technology explains the growing number of traditional universities that are converting to dual mode status. Such universities usually teach the same curricula for distance students as for their residential students and subject the students (but not always) to the same entrance requirements and examinations. The success and expansion of single mode open universities on the one hand, and the transformation of traditional universities

to dual mode universities on the other, are important contributions to the diversification and development of higher education systems.

The Ministry of Communications plans to install new 280,000 dial-up lines and 500,000 ADSL lines before the end of 2007. Fibre to the Home (FTTH) service is currently being planned for implementation through Japanese funding, which will be used to supply 860,000 homes with FTTH [7]. The GoI is also pursuing wireless broadband (WBB) options, 20% of which will be Evolution Data Only (EV-DO) which can reach download speeds of 2.4 Mbps. On the national level, the WiMAX spectrum will be developed using new technologies. WiMAX is already available in the Ministry of Interior with a wide spectrum used primarily for security purposes. It is also planned to be introduced at the Ministry of Health for use in demonstrating operations to medical students. There are also long-term plans to attract investments for the establishment of an Internet City in Baghdad. This could also supported with mobile learning.

ICT in Education and Training
The Iraqi Commission for Computers and Informatics (ICCI) has formulated a number of projects to improve the status of ICT in all universities across Iraq as the ICCI is commissioned by the Ministry of Higher Education. The ICCI has succeeded in establishing a total of 110 computer centres and 37 Internet centres in universities. Universities have also been beneficiaries of IT equipment through ESCWA's Iraqi Networking Academies (INA) project. See the frame below for more information. Four ICDL training and testing centres have been accredited by ICDL GCC in each of Sulaimaniya, Karbalaa, Baghdad, and Basra where the latter was established as part of the Iraq Reconstruction and Development Programme. The training courses offered by the MTCCs are also based on the ICDL courses derived from internationally recognized courses such as those of Microsoft, Oracle and Cisco.

eLearning
The Ministry of Education (MoE) has expressed interest in promoting the use of ICT in education including e-learning applications. The Ministry currently possesses an e-gate used primarily for compiling job-opportunities and submissions. However, plans are under progress to establish e-enrolment services before the end of 2007. During 2007, ESCWA embarked on an ICT for Education in Iraq project in cooperation with UNESCO. The project is designed to build sustainable capacity in Iraqi MoE for the continuing quality

improvement of teaching and learning are focusing on the use of Information and Communication Technologies (ICT). In order to improve the ICT literacy and skills of the MoE staff, teachers, and students, the institutional capacity of the MoE will be enhanced to design, develop, and distribute a variety of e-Learning resources, and accompanying program of teacher professional development to implement such resources. As part of their services, the MTCCs established by ESCWA in north and south Iraq provide ICT training based on the ICDL curriculum. Trainers employed were trained by ESCWA in cooperation with UNRWA on delivery of such material.

Additionally, ESCWA has developed software packages for computer-based vocational training on a number of subjects; namely, agro-food processing and quality control as well as basic accountancy. These packages aim to build the skills of rural community members with view to increasing employment opportunities.

Summary Findings of Policy Makers
Some major findings are summarized here.

- Most of respondents are declared that their education levels are accredited. When their paid tuition compared with regular universities these programs are slightly less.
- When asked education and experiences level of teachers, responders are indicated that the majority of junior college instructors have at least a master degree in the subject they teach, and the majority of university professors have a PhD in their area of expertise.
- Distance education teachers should have comparable experience. Instructors who are assigned too many students have less time to work with people who need help.
- Most online classes are require that students have access to a computer that is has the ability to run up-to-date multimedia, MSword
- Some online schools offer chance to complete a degree in less time. Some students are even able to finish an entire year early.
- While some schools let students complete tasks at their own pace, others require that students participate in virtual class sessions and have specific deadlines for assignments.
- A higher graduation rate demonstrates higher levels of student contentment and success.

Iraqi policy makers should take ultimate care of these FAQ's due to the eagerness of students to join the proposed HE scenarios with international standards. They should support the student's fees, make visible subsidies programs and select the best practices from well-known international programs. Iraqi policy makers and HE council should do their best to address these challenged issues. One of the fastest solutions is to start these programs in safe areas around the country where these programs gain the right success. The Iraqi HE council is supposed to take prompt actions to recommend the fastest but most successful approaches of implementations. Again, such programs can be deployed in safe zones around the nation.

Road Map
Part 1: Policies, Institutional Frameworks and Business Models
(Understanding ICT-based lifelong learning needs):

- **Strengthen Leaderships**
    - Invest in leadership development programs to ensure a new generation of tech-savvy leaders.
    - Retool administrator education programs to provide training in technology decision making and organizational change.
    - Develop partnerships between higher education entities and the community.
    - Encourage creative technology partnerships with the business community.
    - Empower student's participation in the planning process.
- **Innovative Budgeting**
    - Consider a systemic restructuring of budgets to realize efficiencies, cost savings and reallocations. This can include reallocations in expenditures on textbooks, instructional supplies/space and computer labs.
    - Consider leasing with 3-5 year refresh cycles.
    - Create a technology innovation fund to carry funds over yearly budget cycles.
- **Improve Instructors Trainings**
    - Instructors have more resources available through technology than ever before, but have not received sufficient training in the effective use of technology to enhance learning.

- Instructors need access to research, examples and innovations as well as staff development to learn best practices.
- **Support E-Learning and Virtual Universities**
  - Provide every student access to e-learning.
  - Enable every teacher to participate in e-learning training.
  - Develop quality measures and accreditation standards for e-learning that mirror those traditionally required for course credit.

Part 2: Open Access/Open Educational Practices and Resources
Establish partnerships with high esteemed with related E-Learning and Virtual Universities:

- **Enhance Internet Access**
  - Evaluate existing technology infrastructure and access to Internet to determine its current capacities and explore ways to ensure its reliability.
  - Ensure that Internet is available all the way to the end-user for data management, online and technology-based assessments, e-learning, and accessing high-quality digital content.
  - Ensure adequate technical support to manage and maintain computer networks, maximize educational uptime and plan for future needs.
- **Move towards Digital Contents**
  - Ensure that instructors and students are adequately trained in the use of online content.
  - Encourage that each student has total access to computers and connectivity.
  - Consider costs and benefits of online content, aligned with total academic standards, as part of a systemic approach to creating resources for students to customize learning to their individual needs.
- **Integrate DATA Systems**
  - Establish a plan to integrate data systems so that administrators and educators have the information they need to increase efficiency and improve student learning.
  - every student

The Iraqi HE council should start a campaign with related stakeholders; government, think tanks, business community, and other experts. The

integrated approach should be a best policy paper of such roadmap. When published, the roadmap should find its way for implementation.

Regional Examples/Case studies
The following table summarizes some of the preceding regional Arab higher education institutions that have adopted and supported their distance learning with an eLearning programs.

Table2.
Regional case studies dealt with eLearning

Local Institution	Type	Country
Cairo University	Dual mode	Egypt
Alexandria University	Dual mode	
Assiut University	Dual mode	
Ain Shams University	Dual mode	
Balqa'a University	Dual mode	Jordan
German Jordan University (GJU)	Dual mode	
Open University of Libya	Single mode	Libya
Continuing Education University	Single mode	Algeria
Al-Quds Open University	Single mode	Palestine
Damascus University	Dual mode	Syria
Syria Virtual University (SVU)	Virtual	
UAE national University (UAEU)		UAE
Zayed University	Dual mode	
American University of Sharjah (AUS)	Dual mode	
American University of Dubai (AUD)	Dual mode	
Arab Open University (AOU)	Single mode	KSA, Bahrain, Jordan, Lebanon and Egypt. HQ is in Kuwait.

The Iraqi HE council can make use of regional expertise in related areas due to similarities of overall nation's components.

CONCLUSION

Can it work for Iraq? Will elearning be successful? What's needed?
The Arab region has witnessed a remarkable increase in the distance higher education domain over the past two decades. Iraqi s left behind due to know reasons.

A key current challenge question: Can it work for Iraq in this time?

Yes it can work for Iraq Higher education entities and institutions because Iraq:

- Have the nationwide geographical distributed HE infrastructure that can be used as a nucleus for accommodating online distant learning programs. No need to build new buildings. Infrastructure includes and NOT limited to:
    - 20 Government universities
    - Educational legacy among students who are ambitiously willing to enhance their learning and state-of-the-art abreast in technology.
    - Excellent HE educational staff that can implement such programs with high degree of professionalism.
    - Excellent governmental budget resources with a possibility of private-public partnerships scenarios**.**
- Can build partnerships with other international universities.
- Can take advantage of regional online distance learning educational programs that have been already deployed in some neighboring countries, Jordan, UAE, Lebanon, Kuwait and KSA.
- Can enhance safeguarding the Iraqi education assets and resources (students, instructors and buildings) form terrorist attacks by providing online courses that can be attended from home when security goes bad. Only the final exams attendance needs to be physically located in the HE building, according to international DL models. However, there should be a flexibility to override this condition, if needed, to safeguard such programs if threats are still persisting.

The Iraqi Higher Education council should prove that the answer is: "Yes", it can work for Iraq. It's time for action.

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CHAPTER-13

eLEARNING IN ISRAEL
A Case Study of Technology in Distance Higher Education: The Open University of Israel

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ABSTACT

This chapter describes the transition from traditional, on-campus delivery to technology-based higher education in Israel. It reviews the higher education arena in the country and offers an updated and concentrated summary with special focus on distance education as is practiced at the Open University of Israel. Various aspects of technology usage and e-learning models are described, including collaborative learning, on-line video and OCW. The review draws from the vast experience gained in over a decade of e-learning experimentation and model-development and is based on user-experience surveys and faculty interviews.

COUNTRY

The country of Israel is a democratic state that resides on the eastern coast of the Mediterranean Sea. It was founded on May 15th, 1948 after the end of the British Mandate over Palestine, and is neighbored by Lebanon, Syria, Jordan, Egypt and the Palestinian Authority. The total land area of Israel is 20,770 km^2, and it has an average population of 7.46 million people (based on the Central Bureau of Statistics, 2009; http://www.cbs.gov.il/), leading to a population density of 356.8 #/km^2. The population is dominantly Jewish (5.63 million) with a large Arab minority (1.51, mostly Muslims) and 0.32 millions Christians and other religions. The two official languages in Israel are Hebrew and Arabic. Israel is defined as a Jewish state and although secular in governance, it holds firmly to religious values such as no work, transportation or commerce in the Sabbath and on religious holidays. There is freedom of religion and sacred places are kept by law. The capital of Israel

is Jerusalem, where the Parliament (Knesset) and government offices are located. The other two major urban centers are Tel-Aviv, with its business and financial centers, and Haifa, as the largest port-city and major industrial hub. The Human Development Index (HDI) of Israel is 0.935 (number 27 in the world). Based on IMF data, the nominal GDP of Israel is 215,727 billion $, with a per-capita GDP of 29,671$. The Israeli economy is strong and boasts a robust high-tech industry, with the 2nd largest number of Technology start-up companies in the world (2008). Despite limited natural resources, Israel is largely self-sufficient in food production due to intensive development of the agricultural and industrial sectors (major imports are fuel, grains and beef).

Figure 1.
A map of Israel (UN website)

Being a religious center for three major religions, Israel has a significant tourist industry, due to its perception of a "The Holy Land", which ensures a flux of pilgrims and tourists visiting the various historical and sacred sites.

Israel is a major cultural center with numerous theaters, film festivals and a young and active cinema industry. It is also a publishing powerhouse, with over 4,000 new titles published annually, selling ~34 million books. There are 49 publishers registered in the Israeli Publishers association, 12 of which are located in the capital Jerusalem.

EDUCATION SYSTEM

Education in Israel is compulsory from kinder-garden to high-school age. The State Education Law, passed in 1953, established five types of schools: state secular, state religious, ultra orthodox, communal settlement schools, and Arab schools. Based on UN statistics, Israel has the highest literacy rate in the Levant, and in 2009 there were ~771,000 pupils in primary schools, and additional ~611,000 in high schools (460,909 pupils registered in Jewish high-schools and 149,310 in Arab high-schools). After 12 years of study, pupils are required to undergo matriculation exams in order to receive a high-school diploma, which is a prerequisite for continuing into the universities (except in the Open University which has an open admission policy as described below).

The usage of ICT in the Israeli formal education system is growing rapidly, following the recommendation of a special expert commission in 1998 to enhance science literacy in schools. The Centre for Educational Technology (CET; http://www3.cet.ac.il) is a leading non-profit organization that develops special software and technology based programs for the Israeli K12 system.

The higher education system in Israel is managed by the Council for Higher Education (CHE) (http://www.che.org.il/english.aspx) which is an independent legal entity, headed by the Minister of Education of the Israeli government. By law, the CHE has an autonomous Planning and Budgeting Committee (PBC) that receives its budget from the government and in principle is responsible for allocation of resources to the institutions. There are 8 public universities; 6 universities teach towards all academic degrees: Tel-Aviv University, the Hebrew University of Jerusalem, Haifa University, Bar-Ilan University (in Ramat-Gan near Tel-Aviv), Ben-Gurion University

of the Negev (in Be'er Sheba) and the Techniyon (in Haifa). The Weizmann Institute of Science (in Rehovot) teaches only toward higher degrees, while the Open University of Israel – which has a nation-wide coverage - does not offer PhD programs. In addition to the major universities, there are 34 academic colleges (13 private and 21 public) and 24 Teacher Training institutions. Based on the official statistics, in a general population of over 7.46 million (09/09), the total number of students registered for all degrees in the academic year 2009/10 is over 280,000, an increase of 3.7% compared to the year before (CHE report). This increase is only a third of the annual growth rate in the mid 90s, which was 8.7%. Approximately 37% of registered students study on-campus in the major universities, the rest attends colleges and other institutions.

The largest growing sector in the higher education system in Israel is the academic colleges, which now enroll almost 50% of all undergraduate students. This tendency is reflected in the decline in the share of students studying for first degree at the major universities, which now stands at 40% (compared to 85% in the early 90s). Another clear growth trend is the steady flux of students registered for MA programs in private collages. Of these, 74% are seeking MBA degrees, a popular program for business oriented people who are already employed in the Israeli job market. The number of PhD students in Israel now stands at 10,300, representing an increase of 18% since 2004.Even though there is a growing demand for higher education in Israel, the number of senior faculty in Israeli universities and academic colleges now stands at ~4300, a pronounced decrease of 8% since 2000, when there were 4684 full-time positions. In parallel, the numbers of junior faculty dropped from 2312 to 1905 (18%). This decline echoes the economic difficulties faced by Israeli universities, a result of major cuts in government funding.

There are also three national infrastructure facilities that serve the higher education system. **The Inter-University Computing Center** (IUCC; http://www.iucc.ac.il/; MACHBA in Hebrew) was established by the CHE and is supported through its BPC. It is in charge of national academic communication infrastructures, digital information services, learning technologies and grid computing infrastructures. The IUCC is tasked with promoting and facilitating cooperation among its member institutions in computing and ICT issues, as well as between research institutes and organizations dealing with research and instruction, which share these common interests.

Under the IUCC operates the Centre for Digital Information Services (CDIS or MALMAD) which was established in 1998 as a public entity in charge of purchasing, licensing and provision of information services for universities and colleges in Israel. The CDIS makes available digital resources for researchers and scholars, and all university libraries are sharing joint access and subscriptions to digital collections and publications. The Israel Center for Learning Technologies (MEITAL) is also operating under the IUCC and focuses and the dissemination and implementation of new ICT into the higher-education system. The MEITAL acts as an umbrella organization under-which joint projects and shared experiences are transmitted throughout the community. It has become a professional network for ICT practitioners in HE and its annual conference showcases the achievements in all academic institutions in the country in the usage of ICT. The research fund of the MEITAL supports mostly young researchers in small projects, which are to be shared among the entire HE system through an Open-access repository.

DISTANCE EDUCATION

The Open University of Israel
The Open University of Israel (OUI) is the largest public university and academic publisher in Israel. With more than 45,000 students, it offers 650 courses in all major disciplines, except law and medicine. The university is an open-admission, equal opportunity, distance-teaching university, with campuses around Israel. Since its establishment in 1974, the OUI has published over 500 academic titles in all fields of knowledge, and prints more than a million copies annually. These books constitute the largest and most comprehensive collection of university-level textbooks in Israel, especially adapted to the needs of distance learners and they service not only OUI students, but also undergraduate students in all major universities and colleges in the country. The books and the accompanying course materials (study guides, assignments, audiovisual, multimedia and web-based) are delivered to OUI students and are used for independent study.

The Open University of Israel was initially based on the classic model of the Open University of the UK (Guri-Rosenblit, 1999); From its inception, it was tasked to adopt an "… open admission policy, aiming to open the world of higher education to all, irrespective of age, sex, place of residence or occupation, in order to enable every individual to realize their academic ability". The Open University credo, as stated in the charter given by the

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Ministry of Education of the Government of Israel was to reach populations that were unable to enroll in traditional higher education offered by on-campus universities. The official decision by the Israeli Government to establish a national Open University was taken in 1973, following the recommendation of a special expert committee appointed 2 years earlier. The erection team started working in 1974 on a few courses, and enrollment of students began in the fall semester of 1976.

The Open University was authorized by the Council for Higher Education to confer Bachelor's Degrees (BA) in 1980; in 1982, the first 41 graduates received their degrees. By the academic year 1987/88 the Open University had nearly 11,000 students in 180 courses from the Humanities, Social Sciences, Natural Sciences, Mathematics and Computer Science. By 1993, the number of students reached over 20,000, and 300 courses were offered.

The number of graduates rapidly increased and in 1994, 405 graduates received their BA degrees. The trend of rapid increase in the numbers of offered courses and registered students, reaching 600 courses and over 40,000 students in 2006.

The numbers of graduates in BA and MA programs at the OUI in the last decade is shown in Figure 2.

Figure 2.
Number of students graduating in BA (blue) and
MA (red) programs at the Open University in the last decade.
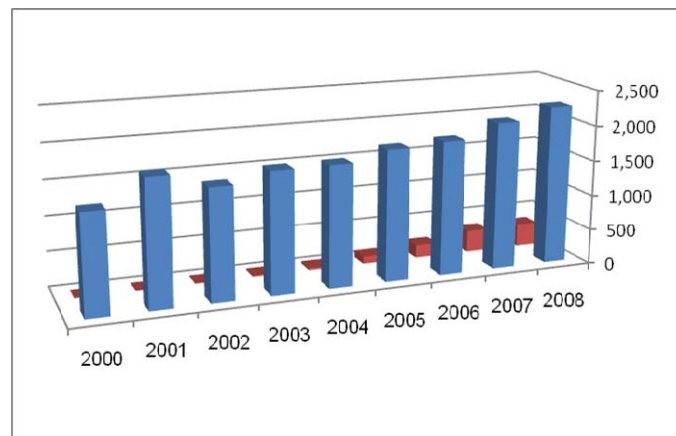
Along the years, the demographics of the Open University student body changed, and from an average age of 33 in the early 80s, in 2008 it was below 28. Students are spread all over the country, and ~5% reside outside of Israel.

The typical student profile is young adults, mobile and fully-employed, which are already on the job market and seek to gain an academic degree while working.

There is a small component of high-school children, which study toward a degree even before or during their matriculation studies. The computer literacy of Open University students had been regularly increasing, almost in parallel with the drop in the average age.

By 2008, over 90% of OUI students had broadband internet access either from home or the work-place and were fully versed with any Office or internet application.

The Basic Distance Teaching Model
The central component of any course offered by the Open University is a printed text-book, written by senior faculty members of the university (or from other Israeli universities; this mode of collaboration was important for ensuring high-quality books, as noted by Guri-Rosenblit, 1999; p. 207), with a clear format intended for self-study. Such a book should (in principle) contain the didactic apparatus that enables self-paced learning.

Books contain summaries, exercises, examples, self-tests and solutions, aiming to encapsulate and replace class-room interaction as much as possible.

The concept of "Professor-inside-the-book" was prevalent in the early courses developed, which were mostly introductory level (Holmberg, 1995).

In some courses, the textbook was adapted and translated from a foreign language; since normally such books lack the self-study structure, a suitable study-guide was developed, to add the missing pedagogical component and additionally to give a local, relevant perspective. As the number of courses offered by the university increased, new types of books evolved, and

presently there are 7 different types of courses being developed and taught (Table 1.).

The traditional yard-stick for the amount of material included has been "a study unit", equivalent to 100 printed pages that are to be self-learned within a week. As the model of the text-book evolved, that measure has become obsolete and it is much harder to quantify the content a-priori based on the number of pages only. Rather, it is the syllabi of he courses that determine the amount of self-study hours that need to be dedicated by the students.

Table 1:
Course types developed at the OUI

Type of course	Major Component	Supplementary materials
"Classic" OUI textbook, basic self-learning material	Text-book comprised of 10-12 units, with the full didactic support	Assignments, study guide
Partial, hybrid model	Combination of several study units and other components	Video lectures, Study guide, Compilation of essays and papers
Translated Course	Text-book adapted from a foreign publisher, includes full didactic support	Study guide, assignments, special study unit with local (Israeli) aspects
Non-textual course	A full set of recorded video lectures	Detailed study guide, assignments
Fully on-line text-book	e-book with enriched multimedia capabilities	Online support and study guide
Compilation course	Essays or translations	Study guide and assignments
Laboratory/Field course	Detailed instructions, web-based support	Study guide and assignments, technical information

In addition to the text-book, students receive a study guide that contains the basic instructions and time-table for advancement along the semester. Such a study-guide may contain assignments, exercises and additional learning

materials, and is an essential and crucial component for pacing the study along the semester. The basic layout of study and the success requirements are clearly spelled out.

INTRODUCTION OF ICT

From its inception, the Open University relied on varied means for disseminating and delivering learning materials to its students. This desire and task is clearly written in the Constitution of the OUI, which was adopted in 1986: "The Open University's goals are….to promote research and development of learning materials and innovative teaching and learning methodologies, including models for personal tutoring, by various [technological] means of communication (such as: mail, telephone, radio and TV broadcasts or computers) in meetings with students or in any other way it sees fit". This mission-statement was a clear indication of the need to explore novel ways for teaching and to develop technology-based capabilities. It required the creation of two separate in-house IT centers: first, a strong Computer Center, which was tasked with creating both the physical infrastructure (computers, servers, bandwidth etc.) and the needed software. Second, a special center for evaluating the usage of IT, and specifically of learning technologies, in its distance education practices. The SHOAM center (established in 1995) focuses on the integration of information technologies into the basic teaching paradigm. The Center was tasked with the development, evaluation, research and integration of technology-based integrative pedagogical solutions to meet the various needs of academic courses offered by the university. The aim of adopting IT was in line with the desire to become a national leader in the usage of learning technologies, by providing a higher quality and more effective learning experience to its faculty and the varied and geographically dispersed student population.

Administrative Services
In 2000, the senior management of the Open University decided that the entire administrative services which are required by students will be offered on-line and free of charge. The reasoning at the time was twofold:

- Economic, saving the need for huge amounts of printed mail, and
- Ideological, interactive online services improve access to and availability of academic and administrative information, and provide student-oriented updates transmitted in the format chosen by the

student. A third, hidden motive, was to gain prestige in the competitive higher-education arena in Israel.

This process was completed after an initial pilot period for a limited group of students, where the interface-design and technological requirements were identified. A robust technical support-center for faculty was introduced, in order to ensure a smooth transition from analog practices to a "digital university". This support center proved to be vital in the dissemination and integration of IT into the work-flow of the university, as could be expected (Rogers, 2003). The information that a student needs – be it academic, administrative or technical - comes from the various OUI computerized systems and from course websites via RSS applications and SMS messages. The course website links students to varied online services such as: **a virtual library** with electronic periodicals and online databases; **an online assignment system** for submitting assignments through which students can also track feedback and grades; **"Sheilta"** (Hebrew for "query") a fully interactive online service through which students receive personal information and core administrative services: monitor grades, view current study status and payments, register to final exams and track study materials mailed to them. This system is password protected and is highly secured, as it contains academic, personal and financial information. Each student gets a personal username and password, which are to service him/her along the period of studies, and through a single-sign-on (SSO) application it enables a private access to all IT services.

Figure 3.
The increase in number of annual SSO entries by OUI students. The pilot phase in 2001-2002 included only a small number of students, and the wide release was during 2004/5. At present, 95% of students use the system regularly.
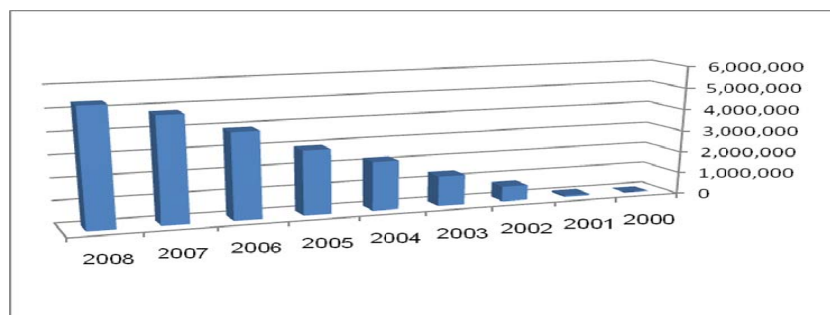
Since the penetration level of ICT in Israel was relatively quick, the adoption rate of this system was fast, as evident from the number of annual SSO entries in Figure 3. Guri-Rosenblit (2003) had identified 8 paradoxes in the implementation of technology at higher-education institutions.

In Paradox #7, it is claimed that *"[While] the developments of the new ICT are very fast….the human capacity to adapt to new habits and new learning styles is very slow, and research in academia necessitates a perspective of time and reflection"*. A partial disprove of this assertion is given in the following example of performing a technological "cultural change" by the introduction of the on-line assignment submission system in 2002. This system enables students to submit files of their assignments, which the tutor can download and check of-line, grade and upload the marked version. The process is transparent and students can monitor the progress. Although the benefits were obvious, the dissemination became a slow process that necessitated overcoming considerable internal objections and a pronounced lack of desire to abandon the old snail-mail based model that was in use at the time. There were various excuses by junior faculty (who are in charge of marking and grading assignments), among which were the lack of home-computers, the reduced flexibility (one has to be on-line to download the submitted works) and the difficulty in reading large quantities of text of the computer screen, which necessitated printing large amounts of assignments, at the tutor's expanse. The turning point was a decision by OUI management to allow at least one tutor and each course to check all the on-line submitted assignments (Figure 4.).

Figure 4.
The increase in number of courses using the on-line submission system.

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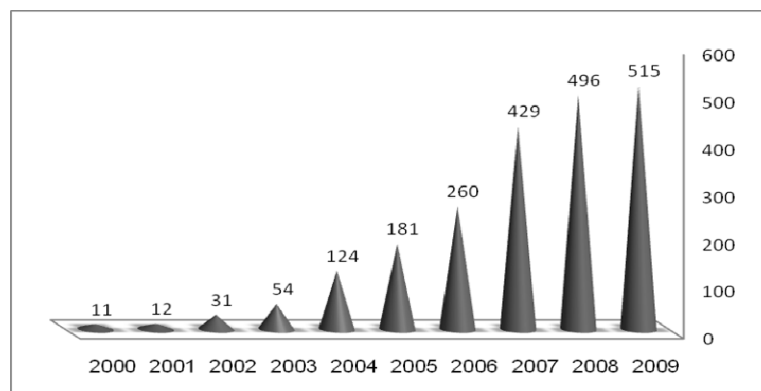
Since students preferred the online mode, in many courses most of the work shifted to a few tutors, who received a substantial additional income (being rewarded for grading assignments). This created an obvious incentive for the other tutors to join and use the system, and in 2006/7 school year the number of courses almost doubled.

The students satisfaction is monitored by periodical surveys conducted annually, and so far the majority of users reports positive attitudes toward the usage of ICT. No real "Digital Divide" emerges and it seems that computer literacy is no longer an issue, and technology is transparent and its usage ubiquitous. This is slightly different compared to the situation reported in the ECAR report in US campuses (Salaway et al., 2008), where there are gaps in the adoption of technology.

The Migration From Traditional To A Blended Model
The OUI was the first in Israel to develop its own, Hebrew-based online learning management system (LMS) already back in 1996. The adoption of e-learning technologies is usually dictated by the pedagogical goals of the university and the students' needs. As a direct consequence of being a distance-teaching university, the usage level of the course websites at OUI was expected to exceed any emerging usage modes in on-campus universities, and this required a robust infrastructure from the early stages. Since no commercial LMS was available at the time, the OUI decided to develop it own brand, and thus be self-reliant and able to tailor-make the LMS as the faculty (and students) need. The process is described in section 5.2.1. As evident from the research literature, implementing a new e-learning technology in higher education institutions is a complicated process (O'neill et al., 2004).

The focus of many studies was on the transformation which was required from the university in moving from traditional face to face teaching to online teaching (Garison and Anderson, 2003; Hergaty et al., 2005; Nichols and Anderson, 2005; Goodyear et al., 2001). There is no "magic formula" for a successful transition. As a desired goal, the sustainable embedding (Sharpe et al., 2006) of a new learning technology in any higher education institution demands a complex set of changes and transformations in the micro and the macro level (Wallace, 2007). The success depends on the willingness and capability of the academic staff to embrace the new technology, and on the ability of the institution to manage and coordinate the process of implementation in a holistic approach (McPherson, 2002; Nichols, 2007).

It demands the development of a detailed, multi-dimensional institutional strategy, to cover all aspect of implementation: technological, pedagogical as well as organizational (e.g. administrative) aspects (Koper, 2004). A key success factor was the establishment of a central pedagogical-technological expert center, to support both faculty and students in the usage of on-line applications. This center strived to continuously update and to innovate the blended model of distance education. Figure 5 describes the structure and inter-relations between the Center and the OUI faculty. Each technological application was first tested on a small number of courses, and was carefully evaluated. Only mature and stable applications were distributed large-scale for all the courses.

Figure 5.
The inter-relations between the Shoam center and the academic stuff.
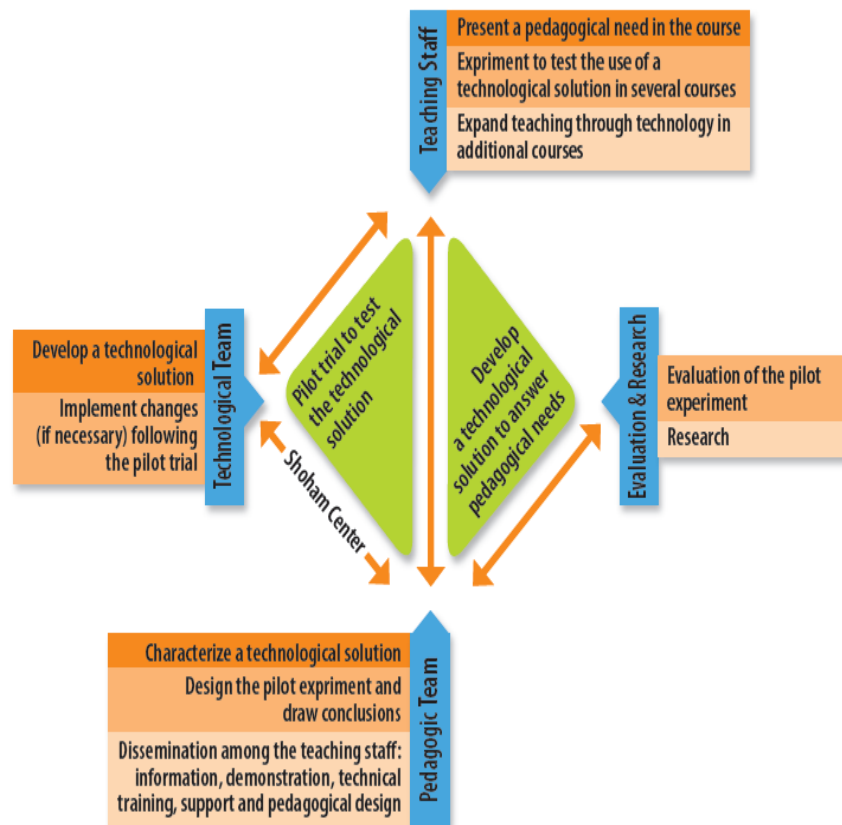
Indeed, during the initial experimental stage (1996-2000), only a few courses were eager to utilize on-line technologies, and those "early adopters" experimented with the technology and the pedagogy. The number of courses with on-line components increased steadily and over a span of just 5 years (2001-2005), the entire roster of courses offered at the OUI went on-line (admittedly, with a varying sophistication level). This transition was facilitated by a nation-wide move orchestrated by the CHE, who in 1999 allocated a special budget for introducing learning technologies into Israeli universities (Kurtz et al., 2007). The material reward given to practitioners was a motivational factor to faculty and helped bridge the "chasm" often found between the early and late majority when a technology is introduced into the organization (e.g. Rogers, 2003).

A recent study (Guterman et al., 2009) investigated the relationship between the beliefs, attitudes and motivation of academic stuff with respect to the integration of technology into teaching processes and their self-reported changes as a result of the move to a blended model (Bonk, 2006). The results showed that the "belief index" in the potential of technology integration into teaching was higher than the "skepticism index"; and the enhancing (internal and external) factors underlying the decision to implement technology outweigh the inhibiting factors. Such a positive approach was, nevertheless, accompanied by reporting an insignificant change in teaching practices, and the main changes in the learning and teaching interaction related to aspects of communication with students (more intensive and more extensive), and learning materials (students are exposed to a richer variety and more updated materials).

The OPUS Learning Management System
Each course at the Open University has its own website to which the academic staff uploads various learning materials such as lecture notes, briefs, presentations, and enrichment material. Communication tools are embedded within the course website and offer chat capability for synchronous interaction and also discussion groups where students can interact by posting questions and queries, for which the course staff answer and discuss a-synchronously. Such applications allows them better contact with the academic staff and better access to learning materials, and an opportunity to collaborate from a distance (Harasim, 2000, Hiltz, 1990). The complex development process of the OPUS LMS started in 1997 and required a meticulous interface design, system and scalability considerations, and relied on a commercial of-the-shelf software engine on which a set of

specific applications was developed. The OPUS system was the first Hebrew-based LMS in the higher-education arena and for that matter in the entire educational system (apart from the Snunit project at the Hebrew University of Jerusalem, which was more of a Portal-type data base). Nevertheless, when the Inter-University Computation Center issued a support proposal for implementation of LMS in all Israeli universities and colleges (1999), no other university in the country chose to adopt it (even though it was offered for free by the OUI).

The OPUS LMS did not become a commercial product in the Israeli educational market, even though a considerable amount of work was invested. Somehow, the transition to online blended-teaching was not accompanied by a "product approach".

As mentioned above, the OUI has a robust Hebrew-based homegrown LMS and it offers a rich variety of online learning models, including Web 2.0 applications. The OUI uses a hybrid (blended) pedagogical model (Bonk et al., 2005) which combines distance asynchronous tutoring with face-to-face sessions, some by video broadcasting to classrooms in study centers and to students' homes via their broadband web access.

The unique combination of learning technologies with high-level academic materials offers a unique and successful model for higher-education.

Video-based Teaching
The most intensively used asset for synchronous teaching is video. At the introduction stage (1998-2004), video-lectures were based on satellite technology and were transmitted to 20 specially equipped video classrooms across Israel.

The tutor was at the central video studio on the main university campus and students could watch the lesson on a television monitor in the video classroom, and communicate with the tutor using a telephone that was part of the system. It was a traditional synchronous, semi-symmetric video lesson (one-way video, two-way audio).

The lessons were recorded and were available to students on video cassettes for loan at OUI libraries. On average, about 40% of the registered students attended the live lessons in the physical classrooms.

In 2004 the rapid advance in cellular infrastructure and the decline in cost, the OUI created an IPVPN network to replace the expensive satellite. Since that transition, and due to the reduced costs, the number of courses broadcasted rose steadily to over 75.The introduction of broadband internet enabled the transmission of synchronous lessons as live video stream on the web. Initially, only few students used this option and the majority preferred attending the physical classroom, but over time, it became the preferred viewing option. At the end of the spring 2007 semester, the OUI cancelled the video classrooms and transmitted all video lessons solely over the Internet. The lessons are also available as VOD through the course's website. In addition to 5 video studios, the OUI has 5 video conference classrooms (located in Jerusalem, Haifa, Tel-Aviv, Jerusalem and Be'er-Sheba) that enable synchronous, symmetric and interactive distance education. These lessons are also transmitted over the Internet. Based on usage statistics, most students seem to prefer skipping the live lesson, either in video classrooms or at home. The preferred mode is viewing the recorded lecture at the time and place convenient for learning. On the one hand this offers a great advantage to the learner, but at the same time it poses serious difficulties to the teacher, who faces an "empty classroom", albeit a virtual one, when no students are present during the live session.

Figure 6.
The total number of video-hours watched by OUI students since the spring semester of 2007, along the week of the semester. Note the clear maxima near the last weeks, when final exams take place.
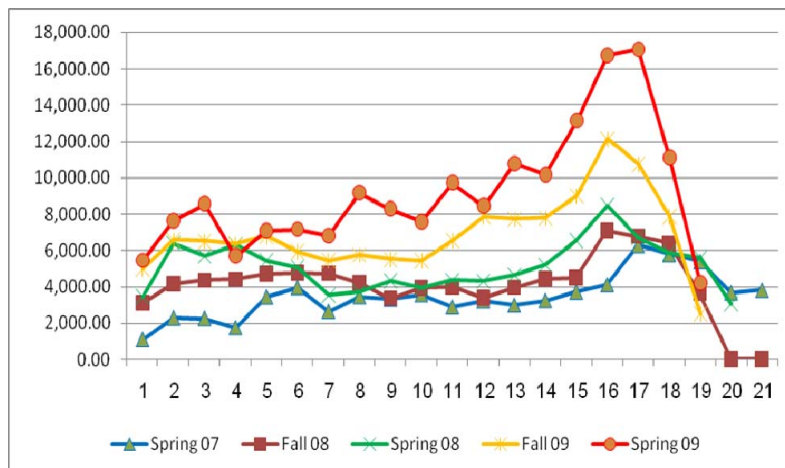
Figure 6. clearly demonstrates the usage patterns of video assets embedded into the teaching habits. Students use the recorded lectures in growing manner, with a steep increase toward the final weeks of the semester. The recorded tutorials are perceived as a useful asset for rehearsing the course material, enabling students to revisit old lectures and review necessary parts again and again.

Table2:
Components and requirements of on-line tools used
for synchronous and a-synchronous tutoring

#	Components	Capabilities	Requirements
1	Course web page for a-synchronous interaction, the center for all the course activities	Course texts, assignments, self- test questions (and responses), Q&A sessions, message board and forum for discussions and interaction, administrative information, Links, recorded lectures (components 2-4)	Internet access, LMS user passwords for registered users
2	Live on-line lectures by teachers to remote students, voice only (application dependent)	Shared application (power-point presentation), live lesson via voice-over-IP (no video). Lessons are recorded for re-viewing	Broadband Internet, Application software, microphone, speakers
3	Live on-line video lectures, one-way video, two way voice/text interaction	Full video of teacher and learning tools. Students can respond by text-messages via chat-room in the course web-site. Lessons are recorded for re-viewing.	Broadband Internet, any standard video media-player
4	Live Video Conference, two-way video and audio	Complete lecture and full interaction, all teaching tools available. Smart-board for electronic tools.	Video-Conference infrastructure, ISDN or higher
5	Personal tutorials and support (either voice only or voice + video)	One-on-one tutorials, two-way video and audio	Broadband internet, MS Windows operating system

Collaborative Learning
Wikis are collaborative writing tools (Aguar et al., 2004; Bruns and Humphreys, 2005; Lamb, 2004), and as such, they are suitable for use only in courses where collaborative learning could be effective.

Nevertheless, they possess an innovative and revolutionary potential in terms of pedagogy. The change required of the university in this respect is quite dramatic, moving from distance web-assisted self learning to online collaborative learning.

There are clear measures we used for evaluating the success in implementing the use of Wikis (or any new technology, for that matter). **Diffusion** is measured in terms of quantity: how many users, courses or faculties have adopted the new tool (Rogers, 2003, Nichols, 2007). **Sustainability** is measured in terms of time, and continued use. Sustainable embedding of e-learning is indicated by the number of courses that made the use of the technology an integral part of their course's learning environment, and for a long period of time (Sharpe et al, 2006). The OUI's wiki project was a good example of a successful implementation of a new peripheral technology (Salmon, 2005) and the derived innovative pedagogies in a higher education institution. It was flexible, quick and it required little prior arrangements which are often encountered during the development of new software. The project began with a small group of "wiki pioneers" and was then extended into a large-scale project that eventually became an integrated part of the OUI arsenal of learning technologies. A successful implementation must act in all the dimensions simultaneously in order to achieve good results, a quick and sustainable diffusion and high level of student achievements and satisfaction.

This process can serve as a model for the implementation of innovative technologies in other educational/ learning institutes.

The Chase Research Center for
Integration of Technology in Education
In order to promote theoretical and practical research among the Open University faculty, staff and students, in the area of instructional technologies and their integration into educational systems the Open University established the Chais Research Center. It is an umbrella internal consortium of researchers which provides a platform for cooperation among researchers within and outside the Open University, who are interested in the study of instructional technologies and their integration. The Center acts as a cohesive factor for practitioners, developers and researchers and conducts on-going academic activities, together with the Shoam center. There are 70 faculty and junior faculty members who regularly take part in the activities of the center.

The annual Chais conference is considered the best in the country for research in learning technologies, with a specific emphasis on higher education. All the lectures presented at the meeting, as well as those presented in public seminars are recorded and made available for the general public at http://www.openu.ac.il/research_center_eng/events.html. This interaction between theoreticians and practitioners is a unique advantage the enable the OUI to keep a leading edge in the usage of ICT in distance higher education.

OPENING EDUCATIONAL RESOURCES

The Open University was the first academic institution in Israel to join the worldwide trend towards providing free access to study material and knowledge for the public good. The Hebrew-based OCW portal (http://ocw.openu.ac.il) was named Pe'er (acronym for "Opening the Treasures of the Mind" in Hebrew); it offers free access to many of the OUI's academic textbooks in electronic format (e-books) and some also in full audio version in MP3 format or stream format; free access to course materials and reusable learning objects (RLO) (Polsani, 2003); recorded video-lectures and a plethora of lecture notes, lesson plans and lesson summaries, interactive exercises, sample tests, digital photo albums, presentations and other web-based materials. The project was sponsored by a 3-year grant from the Rothschild Foundation.

Online eBooks
A unique aspect of the OUI project, compared to other OCW efforts, is the "Open Books" component that transformed 55 OUI course textbooks into electronic versions, amounting to some 110 volumes or 30,000 pages. These books are fully transformed from print to digital format and had OCR recognition. Readers can browse through the book, select the reading display format, search for texts, topics and terms within the book, and add personal comments to the books.

Thus each time the users return to the book, they get their "own" copy. The e-books cover the major academic fields taught at the OUI (sciences, humanities, economics and education), most of them in Hebrew and some few in Russian and Arabic. The e-books can only be viewed on-line and cannot be downloaded or easily printed. Some books are enhanced by video lectures given by the authors or by other content experts.

Audio Books

Some of the e-books include a full audio version (in MP3/stream format). This version allows users to listen to the books via the Internet or to download them to their personal computers and listen to them on mobile players. Audio books are recorded at the OUI's audio studios and narrated by professional narrators skilled in radio recordings. Prior to recording, careful consideration is given to the best way to narrate the book: how to describe pictures referenced in the text; how to read tables, some of them complex, to ensure the listener's understanding of the data displayed; how to treat footnotes so their narration will not interrupt the listening sequence and impair understanding; how to describe diagrams in the text; how to pronounce terms and names specific to a knowledge field with which the narrator is unfamiliar, etc. Preparing an audio version along with voice editing also entails correcting narration errors, removing background noise, adding bookmarks displaying the table of contents, etc. In order to increase the exposure to this mode of delivery of academic content, the OUI had published the audio books as Podcasts for download and stream through a national commercial website (http://www.icast.co.il).

IPR Issues

One of the major issues that are confronted when transforming printed books to e-books and publishing them on the Web is the IPR (intellectual property rights). A large part of the project's budget was dedicated to accommodate the costs of IPR requirements, and even the availability of resources was sometimes insufficient to overcome the resistance of copyright holders to digitize and publish certain items which they own. This forced replacement or deletion of the object (picture, text) from the e-book version. Upon registration for books viewing, we require only basic user information (age, gender, profession, geographic location), and the resulting user database is available for research on usage patterns of specific objects and for user statistics. The Open University uses the Creative Commons license for some books and for the learning materials to which it owns the intellectual property rights (IPR).

User Satisfaction

The Pe'er project was a pioneer and "ice breaker" in the Israeli higher-education system. It offered a new model for ownerships of knowledge, by sharing its intellectual assets freely. A user-satisfaction study conducted by Epstein et al. (2009) showed that most users expressed satisfaction with the quality of the content (59%) and the site interface (77%). Clearly, the e-

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books are very popular (85%) as well as the video lectures (64%), though the audio books are less popular (47%) maybe due to the fact that the public in Israel is not yet aware for this technology (the audio-books market in Israeli is nearly non-existent).

Most of the visitors are self learner (48%) and it similar to the MIT results of their survey (Carson et al, 2006) (figure 3). By the term "Self Learner" we include persons not registered in any formal learning institution, "Educators" are teachers and lecturers and "Learners" are pupils and students registered in a formal institute. The similarity in the user distributions in both projects was surprising because MIT OCW (http://ocw.mit.edu) has different goals and users from OUI's *Pe'er*, and mainly the substance of the two institutes is different.

But as the results show the characteristics of the users are similar. Most of our users are young people between the ages of 22-34 (46%) of which a dominant fraction is male (63%) (Figure 7.).

Figure 7:
A comparison of user-type distribution based on respondents classification, between the OCW project at MIT and the Pe'er project at the OUI.
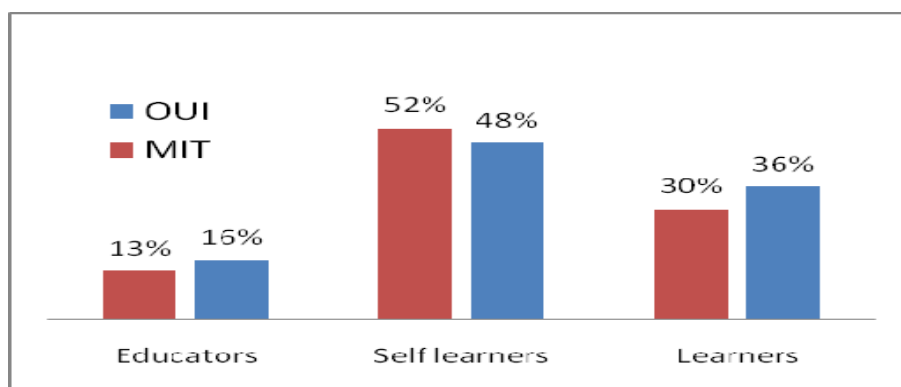
OUTSTANDING ISSUES

Students in the Former Soviet Union
The Open University had a joint project with the Jewish Agency, in which 22 courses were translated to Russian and offered overseas to students in Russia and other former Soviet Union republics. At its peak, ~8000 students

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studied toward a degree in Jewish Culture Studies (they are not included in the CHE statistics). This project enabled students to learn where they lived (St. Petersburg, Moscow or Irkutsk in Siberia), based on the distance-education, self-study model with decentralized academic services. The students had to take the same exams as their Israeli counterparts, and the tests were graded by Russian-speaking tutors.

This project allowed students who immigrated to Israel in the course of their studies to continue learning in their mother-tongue even in Israel – a flexibility that enabled continuous, un-interrupted studies and a better chance for graduation.

Students in the Arabic-speaking Sector
In the 2009/10 autumn semester, there were 3000 students from the Arab speaking population in Israel, a number that expresses a steady increase of ~15% per year in the last 4 years. Due to the fact that the text books and tutoring were offered in Hebrew, the attrition rate of Arab-speaking students was relatively high. In order to overcome such inherent difficulties, the OUI now allows the first courses to be taught in F2F session in Arabic, and exams are also given in Arabic (though assignments and tests are in Hebrew).

Additionally, special study centers near major Israeli-Arab population centers were opened, that offer tutoring and counseling to the students. In an effort to enhance success rates in the first course taken by Arabic-speaking students, several text-books are being translated to Arabic. These will also be freely available on the web, through the OCW project.

CONCLUSION

Higher education is considered a prerequisite for participation in the Israeli job market and there is a growing demand for academic degrees.

The Council for Higher Education of the Ministry of Education monitors and controls the budget of public higher education institutions and allows the operation of private colleges as well. Technology is now a basic requirement and most students have sufficient computer skills.

Even so, the basic teaching model in on-campus universities and college has not undergone a significant change. The only exception is the Open University which is the single distance-teaching institute in the country. The

usage of ICT at the OUI is now an integral part of the teaching methodology, and new and innovative models are being experimented.

The experience gained and lessons learnt from the integration of e-learning into the existing teaching model at the OUI serve as a benchmark for the entire higher education system in the country.

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Prof. Dr. Yoav YAIR

Yoav YAIR is an atmospheric and space physicist and leads a research team for studying thunderstorms, lightning and their effects on the atmosphere. Another field of research is science education with emphasis on astronomy and the Earth Sciences. Prof. Yair is also an expert on educational technology, having worked as software designer and educational program developer at the Centre for Educational Technology (CET) in Tel-Aviv for 15 years. His main interests in this field are scientific visualization and desktop virtual reality. At the Open University of Israel, in the period 2004-2009 Prof. Yair headed the Centre for Technology in Distance Education (SHOAM), tasked with developing, testing, disseminating and evaluating learning technologies for usage in distance education. In this capacity he was responsible for introducing new technologies into the Open University, with emphasis on the academic usage of the OPUS Hebrew-based LMS, of video broadcasts and synchronous voice-over-IP systems, as well as collaborative tools such as Wikis and Blogs. Prof. Yair leads the Open Courseware effort at the Open University of Israel, with a new initiative to open complete e-books and audio-books on-line for free usage by the general public. In 2009 he was appointed Dean of Development and Learning Technologies, in charge of course and book design and production, including ICT and publishing. He participated in many international conferences presenting and chairing sessions. He was the editor of the 2003-2006 Chais national conference proceedings on technology in academic studies which took place in Israel. He also wrote several textbooks for the K-12 Israeli education system and was a software designer of several educational software and websites. Prof. Yair published numerous papers in atmospheric sciences and on the usage of technology in science and distance education. He now leads new projects in mobile e-books for academic courses.

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CHAPTER-14

eLEARNING IN JORDAN
Challenges facing e-Learning in the new Millennium

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ABSTRACT

Many challenges have taken place in the ever-growing and mobile society and today's constant and rapidly changing technology and resource. The explosion of web-based technologies and internet provides a new trend for educational systems to introduce new teaching and learning environments. In response to the fast development in Information and Communication Technologies (ICT), e-learning was adopted by many universities around the globe as a way of improving and supporting their teaching-learning activities and making education accessible for all society members. Hashemite Kingdome of Jordan took e-learning initiative in its vision since 1998, and progressed rapidly since that time. Infrastructure has been upgraded for this purpose. Issues related to adopting and supporting e-learning such as training, e-course development for both k12 education and higher education has been progressed. This Chapter describes the issues and barriers associated with integrating e-learning into Jordan educational system. We discussed Jordan successful e-learning experience and case studies including infrastructure, ICT integration, attentions, training, readiness and awareness, and challenges facing e-learning in Jordan.

COUNTRY

The Hashemite Kingdom of Jordan, is an Arab country in Southwest Asia. It is located in the Middle East, Northwest of Saudi Arabia, South of Syria, Southwest of Iraq, and East of Israel and the Palestenian National Authority. The area of Jordan is 89,556 sq km (34,578 sq mi). It is a modern Arab nation. The Kingdome has been home to many successive civilizations. Each

introduced new elements into the country's religion, language, and architecture. According to the 2004 estimation, Jordan population is 5,611,202. They are predominately Muslim with a sizable Christian minority. Also, there are Circassians, and a much smaller group of Chechens. Jordan also has a small Armenian population.Jordan values its diverse population. All of Jordan's ethnic and religious groups have full freedom to form and participate in their own clubs, associations, schools or places of worship.

Ethnic groups are also free to teach their own languages. The tradition of tolerance and appreciation for diversity has long been a characteristic of Kingdome of Hashemite Jordan and it has helped to provide a stable social foundation on which to build the country.

Figure 1.
A Map of Jordan

Jordan has both Mediterranean and desert climates, the Mediterranean climate prevailing in the North and West of the country, while the majority of the country is desert. In general, Jordan has warm, dry summers and mild, wet winters, with annual average temperatures ranging from 12 to 25 C (54 to 77 F) and summertime highs reaching the 40 C (105-115 F) in the desert areas. Jordan is a marvellous country with many historical and natural places for visit. Such as Petra, the Nabatean city, which means "stone" in Greek. It

is one of the new Seven Wonders of the World. Petra city carved out of solid rock. In order to best time to enjoy the atmosphere of this ancient wonder, visit in early morning - sun rise or late afternoon–sun set when the sandstone rock glows red with quiet grandeur. Also, the Dead sea The lowest point on earth, lying some 400 meters below sea level. The Dead Sea is part of the Syrian-East Africa Rift Valley; The water in the dead sea is concentrated with salt and minerals. Black mud of the Dead Sea enriches the skin with therapeutic minerals. It is the world's largest natural spa. Another place is Jerash, The fascinating city; located 48 km north of Amman, The drive will take you less than an hour, but will take you more than 3000 years back in time. It is one of the largest and most well preserved sites of Roman architecture in the World outside Italy.

Figure 2.
Fantasy of Jordan

| *Petra* | *Jerash* | *Dead Sea* |

Jordan is a country with inadequate supplies of water and other natural resources such as oil. Because of its unassuming natural resources, Jordan has focused on developing its human potential. Turning necessity into asset, The Kingdom has bolstered its economic and social viability by advancing the well-being of its citizens. Jordan has long concentrated on improving its educational and health standards, thereby strengthening a rising tide which lifts the general quality of life for Jordanians and the Jordanian economy. In

spite of the discouraging political and socio-economic challenges it has faced, Jordan has made rapid strides in developing its people. Jordan has close relations with the West and is a key player in the global political scene.

EDUCATION SYSTEM

The education system in Jordan deals with third of the total population in the country. 75% of the Jordanians are under 30 years of age. So, any type of development either economically or politically or socially should hit schools and universities. The government of Jordan has given great attention to education. Jordan has the most advanced and developed education system in the Arab world. Its educational system is of international standards and its secondary education program is accepted in world-class universities. Education system of Jordan has improved consistently since the mid-1900s (USAID, 2009). Round 8% of the annual budget is dedicated to education. Jordan has the third lowest illiteracy rate in the Arab world. The primary gross enrollment ratio has increased from 71 percent in 1994 to 98.2 percent in 2006.Transition rate to secondary school, during the same period, has increased from 63 percent to 97 percent; and transition rates to higher education have varied between 79 to 85 percent of secondary school graduates (World Bank, 2009b).

Jordan has given good attention to education in particular. It is ranked 90 out of 177 in the Human Development Index (United Nation, 2006).Despite strained resources, the Ministry of Education developed highly advanced national curriculum and many other nations in the region have developed their education system using Jordan as a model. The Jordanian Ministry of Education is now making it mandatory for students to be computer literate and able to apply their studies in computers to their regular studies, most especially the scientific and mathematical courses.

The education reform process starts in the mid of 1990s and was accelerated under His Majesty King Abdullah II in early 2001 with a vision to make Jordan the regional technology hub and an active player in the global economy. The National Vision and Mission for Education, as developed and endorsed in late 2002, state the desired direction for general education in the country. The use of modern technology, computers and networks has been increasing in Jordan public and private Universities. It becomes a must and it is supported with the royal vision. It acknowledges the potential of e-learning to impact on learning outcomes for all students and the work habits of all university staff.

"we have followed a path that will allows the technological revolution to harness our available talent into productive sectors that can fuel and sustain economic growth." H.M. King Abdullah II, the World Economic Forum, Davos, Switzerland , 2000.

"By empowering our youth through this education initiative, Jordan and its World Economic Forum partners can create a dynamic and practical model of public-private partnership in the area of ICT that can ignite the engines of growth for future generations in Jordan and the region." H. M. King Abdullah II, the World Economic Forum, Dead Sea, Jordan, 2003.

The present structure of the Jordanian educational system comprises formal and non-formal systems. The non-formal system includes preschool education, which is enrolled by children at age of four, and it is run by private sector. Also, vocational training, which is administrated by the ministries of Labor, Industry, and Defense is a non-formal education.

The formal education consists of two phases: first phase is 12 years of education, 10 of them are compulsory primary education and 2 are for the secondary education, this phase is under the management of ministry of education and it is free. The statistics shows that the gross primary enrollment rate is 95.7% and the gender parity index for gross enrollment ratio in primary education is 0.98 It is also one of the few Arab countries that have very small disparity in primary school attendance rates among urban and rural areas. In 2007 there were 91 percent females enrolled in secondary education compared to 88 percent of males (UNESCO, 2007). At the end of this phase students sit for the general national secondary examination (Tawjihi) and those who pass are awarded the Tawjihi Certificate, which is the academic stream qualifies students for universities entrance.

The second phase is the higher education phase either 2 community colleges study or 4 years university study. In years between 2000/2001 and 2006/2007, Jordan has seen an increased demand for higher education with enrollments growing at an annual rate of 14 percent from 77,841 to 218,900 students. Women comprise a large percentage of Jordan's higher education attendees, of the university and community population. Jordan has 10 public universities and 12 private ones. Since 2000 to 2006, enrollment in 12 private universities grew by about 18 percent annually from 36,642 to 55,744. In 2013 the projection for the number of students entering university

is 92,000 (World Bank, 2009b). Also, few of the public and private universities provide postgraduate degrees for the master and doctorate levels.

The government has provided every village and community with schools, which enables citizens in poor and remote areas to gain access to education. Also Jordan has a high quality educational system which makes 10 percent of the students attending Jordan's universities are foreign students.

Figure 3
Enrollment rates by education levels in Jordan, 2007.
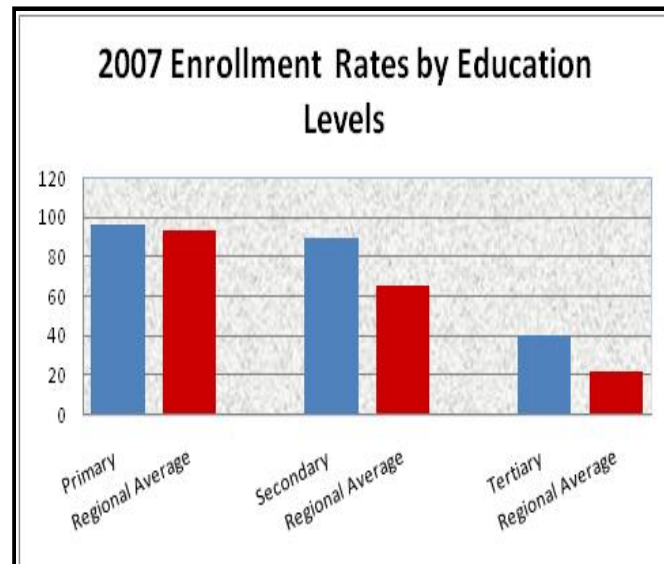
(Source: UNESCO, 2007)

The main problems which the Jordanian educational system is facing are the quantitative expansion and an imbalance between the university and community college systems.

Along with this, Jordan seeks to improve the quality of its teachers, books, curriculum and facilities and encourages enrollment in the community colleges, in order to better match the country's educational system with its labor market, which currently suffers from a shortage of mid-level vocational skills.

DISTANCE EDUCATION

Distance Education is an innovative development in education that uses technology to facilitate learning without the limitations of time or place. It has emerged as a necessity to meet the challenges posed by the development of information technology and its potential for greater access to knowledge. Distance education and E-learning technologies in general are becoming more visible in schools in many parts of the world. Today, Internet-related technology initiatives are spread in the region, mainly Saudi Arabia, Kuwait, Egypt, Jordan, and UAE (Alsunbul, 2002, Market Wire press, 2009). We began to see a lot of e-learning initiatives in the Arab countries-particularly in the Middle East but it still facing a lot of challenges (Abouchedid, 2004).

Jordan, like many other countries, has started to study the adoption of e-learning in its educational system. The e-learning strategy of the Ministry of High Education and Scientific Research focuses on the blended learning and it never addresses the distance learning issues. Distance education is not yet accredited in Jordan educational system. Efforts and committees at national level were conducted to study the rules and regulations of adoptions and accreditation of distance learning. In July 2008 the Higher Education Accreditation Commission announced the rules and regulations for accrediting blended learning as a first step (http://www.mohe.gov.jo). These regulation put 60% of the learning process should be traditional mode and 40% for synchronous and asynchronous learning using technology. This is actually challenged the public and private universities to go further of their systems towards e-learning.

Almost all the universities start updating their regulations and upgrading their infrastructure for this purpose. Even some of them go further than that as they establish distance education departments and programs, but these are not accredited by the Accreditation Commission and the Ministry of Higher Education.

The national e-learning strategy for higher education highlights the following strategic goals for adopting e-learning in Jordan universities (MoHESR, 2007):

- Enable institutions to adopt e-leaning and facilitate widening access to learning.

- Support institutions in their strategic planning with a holistic approach to embedding e-learning in their system.
- To assure the quality of e-learning and its impact on students' teaching, learning and assessment experience.
- Create a culture and awareness for e-learning.
- Establish a robust integrated virtual learning environment.

There is no framework or regulation to govern distance learning practices in Jordan. As I mentioned distance learning is still not accredited both degrees and course delivered through distance learning. So, no students join these programs for this reason.

TECHNOLOGY AND ICT

Jordan has a very well and reliable infrastructure for Information and communication technology. Jordan is already well endowed with telecommunications infrastructure. Telephone services and internet is available almost all over the country. Based on the recommendation of the 2002 educational forum, The Ministry of Communication and Information Technology finished connecting all the schools in the kingdom to the internet. In 2003 a national broadband learning and education network was launched and based on that in 2005 the ministry finished building approximately 5000 KM of optical fiber and several thousand IT network devices to create one of the most advanced educational networks. Now around 3200 public schools and 75 Knowledge Stations are connected to the internet. Knowledge stations have been established nationwide and trainings have been provided to more than 70,000 people since 2001.

A lot of Improvements in student computer ratios along with better Internet access in schools have been attained to achieve a superior quality of education. Global initiatives on low cost PC programs are a major opportunity for improving PC penetration through provision of affordable equipment. e-Government has been launched and given a priority in the government and many e-Services have become operational and the e-Government portal was launched. 114 public centres equipped with advanced computers and internet distributed all over Jordan to provide internet and e-services to Jordanian (McConnell International, 2002).

Jordan Universities are interconnected to the internet via 155Mbps link. The Jordan universities have robust, reliable network infrastructure up to the

advanced standards. Also, all Jordan universities are connected to centralized integrated e-library system.All the schools have well equipped computer labs, around 150 thousand computers, valued 200 millions, distributed to the schools in average 1 computer for every 6 students.

Currently, more than 1650 schools are equipped with PCs, networking and basic peripherals, in more than 1724 labs. Some schools have video conferencing facilities. All public schools connected to the Internet. Another issue that we should highlight here is the human resource development and training. The Ministry of Education conducts training packages for teachers in ICT. The ministry has around 22 well equipped labs for training distributed all over the country for ICDL, provide free services for teachers. The ministry conducted (ICDL, WordLinds, MCSE, MOS, Cisco, Winises, and Eduwave) training programs. Almost all the school teachers have the ICDL certificates. Also,The ministry allows school teachers to attend high diploma programs in Information and Communication Technology in Education (ICTE) in Jordan universities under its expenses. The ministry trained around 33 thousand teachers for ICDL certificates, 11 thousand on other international certificates, 5 thousand on Intel program for future education, 700 on WordLinds and network management.

Also, in order to taken long strides into incorporating ICT into education, Jordan through the MoICT launched an initiative entitled: "Laptop for every University Student", to be as a new prerequisite for freshman students in affordable and sustainable ways, Not more than 15 JD per month. This initiative aims to support the usage of ICT tools in the educational process by providing a laptop for each student in the Jordanian public and private universities at an affordable cost along with wireless technologies and internet access and a four years' maintenance. The target is to have 40,000 laptops in all over the kingdom through this initiative.

E-LEARNING AND ICT INTEGRATION

As we mentioned earlier, the royal vision towards using technology in all sectors. Education is one of the most important sectors in Jordan as it concern 70% of population. Jordanian government has to ensure that the quality of education and level of skills imparted can help the new generation

to compete effectively nationally and internationally. The national development strategy stressed on the importance of developing the educational sector and confirm the General Education Plan 2003-2008 [ref. 2].In this section we will provide some information related to the development of education sector and integrating of ICT in education.

As a whole, education in Jordan is considered an investment in the future. Educational television was introduced on a limited scale in Jordan beginning in 1968. It provided programs for secondary schools, primarily in such fields as mathematics, the sciences, and English. In 1997, the MOE produced 30 programs for grades 1-5 and 36 programs for grades 5-7.

In 2003, the ministry of education led Jordan to become the first Arab country that took clear steps in adopting true e-learning to its students by deploying EduWave system at Jordan main data center to serve 1.2 million school students in Jordan. In July 2003, the government of Jordan launched the Education Reform for the Knowledge Economy initiative. This five-year, $380 million program, developed with USAID assistance, is one of the most ambitious education reform programs in the Middle East and North Africa region to date.

The goal of the program was to re-orient the education policies and programs in line with the needs of a knowledge based economy. The program focuses on school level implementation and teacher quality. Also, it will strengthen the institutional capacity of Ministry of Education in policy, strategic planning and monitoring and evaluation, and improve teacher employment, utilization and professional development policies and implementation. The program will also fine tune the curriculum and student assessment to ensure alignment with the knowledge based economy (World Bank, 2009a).

A very important project is the CIDA project. These 10 Million projects come to assist the Jordanian government in the integration of information and communication technology (ICT) in the national education system. CIDA support provided the Jordanian E-Learning Coordination Unit with equipment, training, and professional development in the areas of curriculum and material development, training delivery, change management, monitoring, workshop delivery, and communications. First phase of the project raised the awareness among senior officials and administrators of the Ministry of Education and the Ministry of Information and Communication

Technology of the wide range of ways in which ICT could be used in the schools and introduced them to various Canadian experiences in this area. Second phase is directed at developing the capacity of the Ministry of Education at the policy and operational levels to integrate ICT in public schools. The third phase is related to e-learning in Jordanian schools (http://www.moe.gov.jo).

One of the most important projects is the Jordan Education Initiative project (http://www.jei.org.jo). This project is totally related to e-learning and lifelong learning opportunities in Jordan educational system. This project is an ambitious e-learning project developed out of a global local, public-private partnership that aims to improve education in Jordan through effective use of ICT. 17 local companies, 17 global companies and 11 governmental and nongovernmental establishments participate in this initiative. It has four main objectives (McKinsey & Company, 2005):

- Improving the delivery of education to Jordan's citizens through public-private partnership.
- Unleashing the innovation of teachers and students through the effective use of ICT
- Building the capacity of the local information technology industry
- Creating a model of reform that can be used by other countries

This initiative started in 2003 at the World Economic Forum in the Dead sea. There is support for the project at all levels of the Jordanian government. Since education is tightly integrated into the planning process. It represents an opportunity to improve the lives of Jordanians and serve as a model for educational reform around the world. The desire to build a knowledge economy and expand educational opportunities through technology in Jordan is another reason for success of this project. Building a knowledge-based economy that will enable Jordanians to become entrepreneurs and participate in ICT industry is one of the priorities of the government.

The activities of this initiative include infrastructure and providing classrooms with the needed equipments, Application training and pedagogical training for teachers and administrators and e-content development of curriculum for K-12. 100 Discovery Schools in Jordan has been chosen or the program. The e-content for Mathematics, curriculum is finished and is being used in the Discovery Schools. The development of Arabic language, Science, English language, Civic Education, and

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Geography curriculum is in process. The Jordan Education Initiative is the most comprehensive initiative regarding the enhancement of the human capital and the integration of the education system with ICT.

The Ministry of Education in cooperation with UNESCO continue to reform its educational system, with emphasis on the incorporation of ICT in teaching and learning and eventually sustainable infrastructure for lifelong learning.

Regarding developing human resources CyberLearning is a non-profit organization providing trainees with high quality online courses in IT and management, in conjunction with a state-of-the-art Learning Management System (LMS) that allows for customized tracking, reporting and assessing.
Also, Intel® provides two programs supporting education in Jordan materialized. The I-Lab, based at the University of Jordan and the Intel Teach to the Future Program. Intel® – Teach to the Future is a worldwide effort to orient teachers and students for effective use of technology in the classroom. Intel Teach to the Future programs are critical in the training of teachers competent with ICT capabilities to increase e-Literacy in Jordan. With Intel Teach to the Future Program, 22000 teachers have been trained so far out of 55000 and 5000 are planned to be trained annually going forward (http://www.moe.gov.jo).

The mission of the Jordan Education Initiative fits with Jordan's vision for the future of education. It will create a model for effective Internet-enabled learning that can be replicated and implemented in other countries in the region.

CASE STUDIES

In this section we will brief some of the cases related to e-learning in Jordan. We will brief on the Hashemite University and Amman Ahliya University Cases in Higher education, Arab Open University Case in blended open education and using of EduWave system in K-12 level.

EduWave
EduWave (http://www.moe.gov.jo, http://www.ibm.com) is a learning management, instructional management, schools management, and content management system that provides a single, integrated resource for e-learning. The system integrates financial and management information

capabilities for schools management with curricular and classroom management. EduWave allows teachers to access curricular material and monitor student performance and attainment and gives online access to curricular content, school related information and student attainments to parents. EduWave, the comprehensive K-12 e-learning platform in Jordanian schools, has been deployed in over 3,000 schools in Jordan, some 1.2 million students, over 50,000 teachers and some 5,000 administrators. The system has been adopted by the Jordanian government as its core national e-learning platform.

The Hashemite University Case
E-learning concept is needed academic institution in Jordan universities in order to support their teaching-learning activity that is based on technology. Hashemite University took this initiative in its vision since 2003. First step toward this was the implementation of the Learning Management System, Blackboard. Latter HU has moved further by creating and integrating the world class comprehensive e-learning environment with the latest tools and technologies like, asynchronous content capture tool, online synchronous delivery platform, desktop content authoring tool and online assessment tool. The existing technology infrastructure, the establishment of the e-learning center, and the accreditation of the e-learning center show the university readiness and awareness to move forward in the use of educational technology. HU has the only accredited and well equipped e-learning center in Jordan (Al-Adhaileh & AlKhasawneh, 2007a). The HU e-Learning Initiative has the following plans of action which are translated into practices and research packages:

- Creating standard of excellence for e-learning.
- Extend the learning process to rural areas at national level and regional level.
- Hastening e-learning networking and cooperation at national and regional levels for training, and resource sharing.
- Evaluation and e-learning quality assurance.
- Overcoming barriers to learning.
- Mine the pattern of student usage of the e-learning system to serve as a feedback for improvement process.

For infrastructure and e-learning Environment, HU combines the best tools to facilitate the adoption of e-learning in its learning environment. The following tools and technologies are incorporated for the development of

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state of the art e-learning center to offer world class user friendly online delivery. The e-learning center provides specialized infrastructure for e-learning and qualified trainers for LMS and other e-learning technologies and tools. In HU, there is a reliable computer network serves broadband connectivity, fiber-optic backbones interconnect offices and departmental blocks in the University. Local Area Network (LAN) connects all university buildings and provides, at least, one network outlet in each office. The adopted LAN technology is Gigabit Ethernet with date rate 1 Gbps over fiber-optic cables between buildings, and 10/100 Mbps over UTP CAT-6 cables to desktop. The University is connected to the world through 18Mbps fiber-optic through Jordan University Network (JUN). HU provides its students with 7 opened-free labs with 900 PCs distributed through the university campus. These labs are mainly for browsing the internet, e-courses and conducting online examinations. Also, there is an opened –free lab with 200 PCs in the e-learning center dedicated for browsing the e-courses only. Beside what we mentioned there is computer labs dedicated for each faculty and it is opened for students. In general, the university has around (3000) PCs distributed between labs, faculty staff, and administration. Also, under the initiative of Ministry of Communication and Information Technology 2000 laptop computers distributed to HU students at very low price. HU constantly follows the trends, innovations and new services concerning the core activities of e-learning. HU provide blended e-learning courses specially for the compulsory requirement courses. HU provides services in e-learning beyond the border. Currently, HU is providing online courses to 17 community colleges in Saudi Arabia in computer science using virtual classroom systems (Al-Adhaileh & AlKhasawneh, 2007b).

Arab Open University - Jordan Branch Case
The Jordan Branch (http://www.aou.edu.jo) was established in 2002. The Branch started its operation in June 2002 in Amman. The Arab Open University (AOU) aims to establish itself as a leading institution of open learning, offering opportunities for independent study and creating a forum of lifelong learning.AOU extensively uses technical media, including printed materials, radio and television broadcasts, video and audio cassettes and CD-ROMS, computer-based learning and multimedia labs and telecommunications.

Also, a two-way e-communication which allows learners and instructors to interact through E-mail, teleconferencing, telephone, etc. Typically, a

student registered in a course would receive a package that contains printed material, audio-visual aids (video tapes, audio cassettes), and perhaps, compact discs (CD-ROM). The printed material comprises a comprehensive content of readings and a schedule of term assignments. The e-learning system of education adopted by the AOU is blended e-learning not distance learning and distinctly different from study-by-correspondence. AOU uses Learning Management System (LMS) to manage and provide the learning-teaching activities.

Al Ahliyya Amman University Case

Al Ahliyya Amman University (http://www.ammanu.edu.jo) is the first privately university to be established in Jordan. It was established in the year 1990 and currently it is composed of seven colleges grant bachelor's degrees in 25 programs. AAU Supports the educational process with the means of modern technology, and building a model of education and e-learning through the establishment of E-Learning Center of Excellence at the University. The center is well furnished with e-learning software and applications and the needed hardware. It provides its services inside the university. The center will provide excellence in learning and teaching and create an active online learning environment to enhance teaching-learning activities on one hand. A fully integrated e-learning solution based on a comprehensive state-of-the-art online learning platform is deployed to ensure a successful learning environment

ISSUES CHALLENGES AND BARRIERS

Despite Jordan, showing impressive improvement in its education system. E-learning and distance learning experience is immature in all Jordanian Universities and schools. There are still some challenges facing e-learning.

e-learning need commitment and leadership support from universities' managements. This is followed with the need for huge investments to be made to provide the needed infrastructure (software and hardware) and content. Another important issue is the accreditation, regulations and policies. A framework of regulations and policies should be a recent study on school utilization indicates that the number of Ministry of Education students is expected to increase by 124,634 between 2008 and 2013. So, additional 3,360 classrooms will be needed during this time period to accommodate the rise in students.

Also, there exists concurrently excess capacity – morning and evening sessions- and wide-scale overcrowding of the schools (World Bank, 2009b). The government budget for spending on higher education needs to increase to cater to the rising demand for higher education. Money transfers to universities have declined from JD 60.4 million in 2004 to JD 52.6 million in 2007 and JD 45 million in 2008 (World Bank, 2009a).

There is no motivation system to make teaching staff implement e-learning. The large workload of teaching staff and the lack of education technological proficiency for the development of e-learning, beside the cost of course creation. personal theories about teaching are formed early in life implicitly, and do not change easily

There are problems related to connectivity and affordability issues causing low PC penetration and insufficient Internet access. In Jordan Knowledge Stations are good tools to overcome these problems.

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CHAPTER-15

eLEARNING IN KAZAKHSTAN

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ABSTRACT

In the Republic of Kazakhstan held a large-scale informatization of education is held in the following areas: regulatory support, info-communication software, software, content and staffing. In the system of higher and secondary education, individual universities, institutes, colleges, schools are actively implementing distance learning. Means Of distance education are educational portals, network technologies CRMS, LMS, digital educational resources, electronic textbooks.

E-learning has had wide development at the expense of electronic textbooks which are considered as applied programs of interaction of subjects of educational process.

Electronic textbooks are developed for high school practically in all subjects and on all classes in the Kazakh and Russian languages; their translation into English is planned. In electronic textbooks integration of pedagogical and information-communication technologies are provided.

Efficiency of e-training depends also on the level of readiness of teachers, therefore in Kazakhstan training courses are held for teachers on use of electronic textbooks, network technologies, interactive boards in educational process.

COUNTRY

The Republic of Kazakhstan is an independent country in Central Asia. The country has a diverse landscape of which 25% of its area is made up of steppes, deserts and semi-deserts, as well as mountains, seas, lakes and rivers. It is the 9th largest country in the world, with an area of approximately 1,049,150 sq. miles. However, with a population of about 15 million people, Kazakhstan has one of the lowest population densities in the world (only 5.5 people per sq. km.).

Figure 1.
A map of Kazakhstan

Its population is as diverse as its geography as there are more than 100 different ethnic groups harmoniously living together in the Republic. These groups comprise Kazakhs, Tartars, Ukrainians, Uzbeks, Germans, Uygurs, Dungans, various Korean ethnic groups and many others. (http://akorda.kz).

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Kazakh is the official language of State. However, Russian is also widely spoken and used in official meetings and documents of State institutions and local administrative bodies. Astana is the capital of Kazakhstan. Administratively, the Republic is made up of 14 regions. Within these regions are 84 cities (of which 39 come under the direct Republican and regional administration), 159 districts, 241 settlements and 2,042 rural counties. The national currency is the Tenge (the exchange rate, correct as in August 2009 is 150 tenge to US$1). Kazakhstan has been classified by the World Bank to have an average level of revenue. At the end of 2008, its GDP per capita was US$8450 (or 1033,100 Tenge) (http://www.nac.gov.kz/eng/).

EDUCATION SYSTEM

On 27th July 2007, decree No 319 called "Regulatory laws on Education) was promulgated by the Government, to formalize the system of education in Kazakhstan, into pre-school education, primary/elementary education, basic education, general secondary education (comprising general academic and technical and vocational education), post-secondary education, tertiary education and post-graduate tertiary education.

Pre-School Education and Learning
Pre-school education and learning is conducted in families as well as in pre-schools for children from one to six or seven years old. The stage of education is aimed at protecting and strengthening physical and mental health, and the development of individual abilities. In 2008, there were 269,319 children enrolled in 1,773 pre-school establishments (of which 180 are privately owned), with another 55,052 children in 1990 mini-centres. The children come under the care of 26,805 tutors. Pre-school education is available and provided to 35.6 % of all children within the age group 1 to 7 years old.

Elementary, Basic and Secondary General Education
Elementary, basic and secondary general education starts from the age of seven for children. They are enrolled into the 1st grade in general educational institutions (comprising normal schools, classic schools, grammar schools, lyceums, and special profile schools) delivering a standard curriculum at the primary, basic general and full secondary education levels.

In 2008, there were 7,848 government and 115 private schools providing secondary basic education. A unique characteristic of the education system in the Republic of Kazakhstan is the concept of small schools, where student numbers are typically between 10 and 100, and where multi-grade teaching and learning is practiced. Such schools have between 2 to 10 teachers. There are 4,303 small schools in Kazakhstan. Currently, the system of education in Kazakhstan is being revamped into a 12 year programme.

Technical and Vocational Education
Technical and vocational education is provided through vocational schools and technical colleges and lyceums. At the start of the academic year in 2008, there were 324 of such institutions providing vocational education, of which 298 were state owned, and 26 were privately ran.

Post-secondary Professional and Vocational Education
Post-secondary professional and vocational education is conducted in colleges or schools on a meritocratic basis after the completion of basic education. In 2008, there were 610,458 students studying in 542 of such colleges (208 were managed by the state and another 334 were privately ran).

Higher Education
Higher education is available to all citizens of Kazakhstan who have completed secondary education. Vocational higher education programs are provided in institutions such as universities, academies, institutes and specialist institutions (e.g a conservatory). In 2008, there were 144 high schools (55 state and 89 private), with a total enrolment of 633,814 students. For higher education, Kazakhstan follows the Bolonsky process, and has a three-level model for education ranging from bachelor's degree, to master's and doctoral studies leading to PhD.

Doctorate qualifications generally require three years of study. A transitional period from 2006 to 2010 has been provided to allow for the implementation of two parallel systems of certification for scientific and pedagogical doctoral candidates.

The two systems are the post-Soviet system which regulates postgraduate study particularly for doctoral studies, and the system of professional education through doctoral studies (PhD). This running of two parallel systems was endorsed for implementation through the issue of decrees,

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"State Program of Development of Education in the ROK for 2005-2010" and "Concept of Development of Education in the RK up to 2015".

Supplementary Education
Supplementary Education is available within the framework of each stage of education. Supplementary education is be funded through republican or local regional budgets, or paid for by students studying in private institutions. There are 574 institutions providing supplementary education within the system of secondary general education.

DISTANCE EDUCATION

Distance education was formally defined as a form of learning on 7th June 1999, through the promulgation of a Government gazette entitled "The Law of RK on Education". However, this definition was revised in another gazette dated 27th July 2007, where distance learning as a separate form of education was excluded. In this gazette, article 11 on "The challenges of education", distance learning was re-defined as a technology that contributes to the rapid adaptation of vocational education to the changing needs of society and the labor market.

Since then, the Ministry of Education and Science has also promulgated state standards regulating for example, the basic requirements for hardware and software to be used in distance learning, basic requirements of distance learning, and rules regulating the education process.

In universities, instruments to implement distance education were subsequently developed, in the form of concepts, programs and action plans. The successful implementation of distance learning is dependent on the availability of information and communications technologies. Considerations such as the availability of interactive information and educational environments provided on the basis of high-speed Internet connections are critical factors.

Today, Kazakhstan has a completely sovereign and competitive telecommunications network which was implemented through a large-scale state project called the National Information Super-Highway (NISH). The total length of the NISH is about 11,500 km, of which 9,600 km of optical-fiber communication lines (OFCL) have been laid. Presently, all large cities of Kazakhstan are connected via digital channels. The implementation of the digital telecommunications infrastructure of the country is now close to

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completion. This outcome is also the basis for the successful implementation of one of the most important of state projects, the establishment of e-government facilities. Because of the availability of high speed internet connectivity, distance learning is fast becoming a necessary and complimentary component for higher education.

An example is the Karaganda State Technical University distance learning programme that was implemented by the Regional Center for Distance Education and Technology (RTSDTO), for the learning of students through remote terminals.
Currently 1305 students are enrolled in the RTSDTO. Not surprisingly, distance learning concepts are also widely used in Karaganda State University named after E.Buketov. In this university, part-time students use distance learning technologies for higher education in 53 specialties, while located in 5 remote branches in Aktau, Temirtau, Balhash, Petropavlovsk and Kokshetau.

Other examples of such wide spread use of distance learning include the Kazakh-Russian University. This university has students from 17 cities all over Kazakhstan (eg. Almaty, Astana, Atyrau, Balkash, Kostanay, Taraz, Turkestan, Ust-Kamenogorsk and Ekibastuz). In South Kazakhstan State University named after M.Auezov, as many as 4,670 students are engaged in 26 specialties through distance learning. Distance learning is also used in studies involving specialized subjects like the development and exploitation of oil and gas fields, by the Institute for Advanced Studies in KazNTU named after K. Satpaev.

As far back as 1999, in KazUMOMY named after Abylai Khan, 162 students specializing in international tourism as part of the Tempus Tacis project "Silk Road", were already using distance learning concepts. The project was implemented with the participation of foreign universities, such as the Free University of Brussels (Belgium), Graduate School of Tourism in Balearic Islands (Spain) and University of Southern Region of Kazakhstan (TarGU by Dulati and YUKGU by M. Auezov).

Other universities in Kazakhstan that have made use of distance learning concepts are the Kazakh Economic Academy named after T. Ryskulov (since 1999), East Kazakhstan State Technical University (with a Virtual Institute created by D. Serikbayev in 2004), Kyzylorda State University by Korkyt Ata (which has a remote enrollment of 172 students), and the Kazakh

National Agro-technical University named after S.Seifullin with 484 students.

The number of students involved in distance learning programmes in Kazakhstan has rapidly grown since 2002, following the implementation of projects like the "Satellite Channel for Distance Learning (SCDL)" within the framework of the "Distance Learning for Rural Schools" project jointly managed by IITE, UNESCO and RCIE from the Ministry of Education and Science[10]. At present schools from 7 regions of Kazakhstan subscribe to the SCDL. These schools receive educational programs and curricula through SCDL (1 hour in Kazakh and 1 hour in Russian) from the best of teachers in Almaty, as well as leading scientists from around the Republic, thus providing opportunities for students to interact with the programs' authors. Students are presently receiving 40 hours of educational video material per month.

Telephone and internet queries are managed through NCI's distance education portal (developed using "Modular Object Oriented Digital Learning Environment (MOODLE)" http://moodle.nci.kz). This portal was developed as part of a pilot project called "Distance education using informational and communication technologies in secondary schools in remote regions" implemented by REIC under the guidance of the Cluster Bureau of UNESCO in the city of Almaty. The goal of creating and linking education facilities to the Internet is achieved through a strategy that causes a need to develop websites in agencies. In Kazakhstan, going into, and using the site of MES RK (http://edu.gov.kz) is now part of everyday work life. Hence, the establishment of school sites will similarly propel the development of internal information and education environments.
Given time, the development of these virtual environments should naturally expand into the fields of education and cognitive activity for pupils. Consequently, an environment that encourages the continuous improvement of skills and professional self-improvement of teachers would prevail.

Currently, all universities in Kazakhstan have their own portals and websites. These portals are used for the dissemination of information, as well as the monitoring of educational processes. A distinctive feature of portals that have won over universities is the inclusion of application software within an interactive environment that is designed specifically to enhance the teaching and learning processes.

TECHNOLOGY AND ICT

Kazakhstan's policy for the provision of ICT is underpinned by a need to "computerize" the system of education, as well as a desire to be linked to the world through the Internet. To this end, it is not surprising to learn that for all curricula requiring elements of ICT, the availability of internet connectivity is assumed, together with the provision of computer peripherals. Hence, in 2009, 98% of all schools, including 97 % of rural schools, were connected to the Internet. However, while connectivity has been achieved, the quality of the Internet connection remains low. In Kazakhstan, connection to the Internet may be achieved through the following means

- Switched connection through modem by analog and analog-digital telephone networks, with an upper traffic limit of 56 Kbps;
- Switched connection through ISDN (Integrated Services Digital Network) at 384 Kbps;
- Switched connection through ADSL (Asymmetric Digital Subscriber Line), which allows data transfer at rates up to 9 Mbps in direct execution, and 1 Mbps in reverse direction by common telephone lines;
- Connection to frame relay, with channel capacity expanded, if required, to 2Mbps. There are also connections via cable television networks, by dedicated lines and through radio-modem.

Despite the many methods of connection to the global Internet, technical obstacles abound to hinder the efficiency and effectiveness of the linkages. The key problem is the existence of obsolete analog stations along connecting paths. These stations cause extremely slow traffic, which in turn, creates barriers to access to Internet-related resources, including those that are used in educational processes. Nevertheless, the problem is recognized. A Government initiative, *"Program for Decrease of the Digital Divide"* published for 2007/2008, targets to further open access to information resources for all citizens in Kazakhstan, regardless of their place of residence or social status. Included in this initiative, are the following drivers of change:

- decrease of tariffs for access to Internet by telephone as well as dedicated lines;
- provision of free Internet access for schools;

- decrease of tariffs for unlimited broadband access to the Internet through Megaline and Hit;
- development of telephone and optical fiber networks in Kazakhstan;
- development of wireless access to the Internet (Wi-Fi).

Key to all issues is the cost of Internet access. In recent years, although tariffs have declined by 2 to 3 times, Internet access in Kazakhstan remains costly. This problem is being addressed following the creation of a network operating center KazRENA (NOC). KazRENA is a scientific and educational network of universities and research institutes in Kazakhstan. Since 2003, members of KazRENA include more than 70 research institutes, and higher and secondary special educational institutions from 9 cities in Kazakhstan, with more than 120,000 users. With technical support from the Scientific Committee of NATO, within the "Partnership for Peace" framework, KazRENA was equipped with modern satellite equipment that provide Internet access for SHDSL and WIMAX at speeds ranging from 64 Kbps to 4 Mbps. The Center provides the means through which interactive academic exchanges and networking can be attained, both within Kazakhstan and abroad. A work center has also been established at KazNTU named after Satpaeva.

From this center, wireless access zones using Wi-Max and Wi-Fi will be created to provide for local scientific and educational networks as well as related education facilities. Similarly, access to Internet resources through mobile communications will be made using WAP technology. The overall plan is to achieve a wide scale implementation of wireless network technology using Wi-Max and Wi-Fi technologies in all areas and districts from 2009 to 2011. Technologies for the creation of the necessary infrastructure in universities should be selected based on ideals and principles that support open systems that provide for the Open Source Community world-wide, and in the case of commercial systems, technologies provided by leading brand names. Open source software systems are already in use in many schools of higher education in Kazakhstan. Such systems include RedHat Linux, FreeBSD, Gentoo Linux, OpenOffice, Incskape, Toad, Gimp, Moodle, Java, JQuery, Apache,Sendmail, MySQL, Squid and Postfix. These schools also make use of complimentary programs and systems from recognized technology leaders. Systems used include the following:

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- Operating platforms and systems like Microsoft Windows Server 2003/XP/Vista and UNIX;
- Utilities like Winrar, Nero and WinZip;
- Antivirus software like Dr Web, Kaspersky, Norton Antivirus, Panda and Nod 32;
- Programming languages and databases from My SQL, Prolog, Visual Basic, Borland Delphi, Borland Pascal, C++, C++ Builder, JavaScript, HTML, Macromedia Flash, PHP and MSDN;
- Graphics and multimedia software like BS Player, Adobe PhotoShop, CorelDraw, Maya, Toonboom, Corel Draw GRAFICS SUITE X4, AutoCad, Windows Media Player and Adobe PhotoShop CS3;
- Office software such as MS Office, Deform, Abbyy, Adobe Reader and Fine Reader;
- VoIP applications, instant messaging, web browsers like Internet Explorer, Skype and Opera;
- Dictionaries and translation software from Izet, Tilmash and Promt;
- Administrative and management software such as 1C Accountancy, Lotus and SAP.

Schools have also moved on to implement specialized network technology software for the sharing and multiple use of resources through the Internet and local networks. In Kazakhstan, widespread network technologies such as CRMS, Microsoft Netmeeting, LMS, CMS, LENS, ERP, CRM, PMS and TMS.

E-LEARNING AND ICT INTEGRATION

Regulations to guide the establishment of informatization and educational resources in schools are promulgated by the Ministry of Education and Science as well as individual universities. Standards for configurations, functions, content, design and documentation of electronic educational media are also issued by the Ministry of Education and Science for tenders. Similarly, universities in Kazakhstan have their own instruments to govern the establishment and creation of digital educational resources.Schools in Kazakhstan have considerable experience in the areas of development of digital educational resources for delivery from CD, and online and broadcast technologies. All universities also have content that are translated for web-based delivery. For example, in the Kazakh National University named after Al-Farabi, Karaganda State University named after.Buketova, Kazakh

University of International Relations and World Languages named after Abylaikhan, content of subjects have been translated for Internet use, according to the promulgated syllabi.

In universities alone, 6751 digital books, 690 electronic machines and taskbooks, 941 multimedia tutorials and virtual laboratories, 13,648 test programs have been created. Another 58 e-books and virtual labs have also been created for the specialised "Development and exploitation of oil and gas fields" programme. There is a tremendous push to develop digital interactive multimedia educational resources especially for leading universities as KazUMOiMYa named after Abylai Khan, K. KazNTU named after Satpaev, VKGTU named after Serikbayev, CARGU named after E,Buketov and KarGTU.

These universities have found these resources to be useful and relevant for the teaching and learning processes. To overcome an acute shortage of such resources, the Ministry of Education and Science have launched a strategic plan covering the years 2009 to 2011, to create 2380 e-books and digital training programs for subjects on professional and specialized curricula at national level.

For vocational education, tenders called by the Ministry of Education and Science focused on the development of 41 e-books in the areas of education, transport, construction technology, equipment and machinery, technology products and consumer goods, food processing, services, specialty arts and culture, general engineering, aeronautical engineering, electricity and thermal power generation. The overall need for educational publications particularly on subjects of a professional and specialized nature, is about 2780 units, in the Kazakh and Russian languages.

45 e-books for colleges have also been identified for development following tenders called by the Ministry of Education and Science. The books cover subjects ranging from education, agriculture and forestry, construction and utilities, food processing, technology products and consumer goods, economic specialization, services, general engineering, electromechanical engineering, technology and mechanics, oil and gas, metallurgy, life sciences, power and transportation engineering, surveying and mapping, security, computer science and computer engineering. Besides books, colleges would also be procuring electronic teaching systems, e- case studies

systems, administrative systems and e-libraries. E-book demand in colleges total 7455 units in the Kazakh and Russian languages.

In schools, 100% of content have been converted into digital interactive programmes, for all levels in the Kazakh and Russian languages.

Kazakhstan actively encourages an infusion of a multitude of technologies, each of which has to work with the other in an integrated manner. The wide use of digital media also requires the development of new pedagogical methods, and significant funding for related scientific-pedagogical research. For this reason, successful winners of tenders for e-materials, have also to specify the corresponding values and outcomes for research and development requirements in the use of digital interactive media for teaching and learning. Hence, this transformation and renewal of educational content into digital form, requires not just the development of the software environment but also the eventual accumulation of pedagogical methods based on the cognitive abilities of schoolchildren working with PCs. Ultimately, the goal is to merge and integrate traditional teaching and learning methods with ICT-based approaches and materials.

An example of this requirement could be seen in 2005 and 2006, within the framework of a Kazakh-Singapore project. In this project, ST Electronics together with RCIE from the Ministry of Education and Science, developed and commissioned the on-line multi-media educational program "MERITs" for the learning of the Kazakh, English and Russian languages from the 2nd to 11th levels. New sequencing of topics and methods of subject delivery were examined in the course of delivery of the orogrammes. Digital materials were also created from the syllabus for junior schoolchildren. In 2004, for example, cognitive game and testing programs for levels 2 to 6 were created. In 2005, intellectual games to enhance creative speaking and world outlook focusing on the historical legacy and birthright of the Kazakh people, for levels 2 to 6, were created in the Kazakh and Russian languages.

CASE STUDIES

Surveys supporting sociological research were conducted as part of a project, "Remote training in CIS countries", by the National Centre of Informatization (NCI) and IITE UNESCO, to understand educational requirements and possibilities. The surveys were conducted throughout the following regions:

- Southern Kazakhstan in the Almaty and Almaty Region;
- Western Kazakhstan in the Uralsk and West Kazakhstan Region;
- Northern Kazakhstan, in the Kostanaj, Ore and Kostanajsky area;
- East Kazakhstan in Ust Kamenogorsk and the East Kazakhstan area;
- Central Kazakhstan in Karaganda and the Karaganda area.

In each of the given regions, surveys were conducted using questionnaires containing 22 open and closed questions. About 1500 (representing 21.4% of those selected) respondents were surveyed.

The introduction of modern ICT into the education system is an important watershed in the evolution of the education system of Kazakhstan. ICT, when applied purposefully, changes not only the quality of the education process, but also enhances productivity in, and changes the character of learning (i.e. it allows learning to be transformed from the verbal to functional pedagogies). The concepts implemented through the many programs have found support in many pedagogical researches conducted in the scientific school of G.K.Nurgalieva.

These researches cover the following areas:
- distance learning (Dzhusubalieva D, 1997);
- E-methodological systems (Kurmanalina S., 2002);
- E-research systems by R.C. Bekturganova in 2004;
- Principles in the design of e-books by A.I. Tazhigulova in 2000;
- Technology of modelling of e-books by A.S. Kadyrova in 2000;
- Preparation of teachers in the use of e-education material by S.I. Ferho in 2004;
- Methods of distance training in the higher vocational system by Z.M. Tusubaeva in 2004;
- Use of ICT for the learning of the English language in a comprehensive school by A.B. Nurova in 2007;
- Use of ICT for professional orientation by O.Z. Imangozhina in 2002;
- Use of ICT for the monitoring of initial vocational training by A.Z. Arystanova in 2003.

Data from each of the researches point to the fact that e-books made significant impact on their progress of learning. More significantly, e-books enhance the learning process as students are challenged to

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better understand the purpose and problems associated with a given subject. At the experimental schools of NCI, it was further established that the progress of students, working with e-books, was increased by 2 to 3 times. The effectiveness of learning was intensified by a factor of 3, as 80% of graduates of these schools passed Uniform National Testing (EHT) examinations with results better than the national norm. More details of the research and surveys may be found on NCI's site (www.shop.nci.kz). Such outcomes are only possible because of the pedagogical architecture of the digital media used. 1The media, or e-books, reflect the overall learning processes and functional methods of teaching. This link has been noted by a renowned academician of the Russian Academy of Education, Professor Z.I. Vasileva (Vasileva Z., 2007)

Researchers are in constant search of ways of link processes of teaching and learning to results. The architecture of e-books is such that specific pedagogies govern the way the author creates objective conditions for the realization of learning goals and objectives for self-learning and self-improvement. In the course of learning using e-books, the student undergoes situations during which he has to decide on a choice, make estimations, conduct searches and create projections as part of the process of self-education and self-realization. These outcomes and other scientific and pedagogical researches on matters related to the informatization of education, are thoroughly discussed and documented in the doctoral dissertation council of KazUmOiMjA named after Abylai Khan and NCI.

Another research project, "ICT in Basic Education", was commissioned by the Asian Development Bank (RETA No 6275), covering 6 countries, namely Azerbaijan, Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan and Uzbekistan. The author of this chapter, G.K.Nurgalieva, was the national facilitator in Kazakhstan. Participants of the project recognised that the introduction of ICT in education is a complex issue, which requires attention across many areas besides addressing questions on maintenance of schools with computers. A common problem experienced by all participating countries is the lack of attention by governments on understanding the requirements to have domestic digital educational resources and the preparation of teachers to use ICT in the pedagogical process[8]. Governments have a tendency to focus only on the strategy of implementation in terms of hardware, and the associated financing requirements. In the case of higher

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education in Kazakhstan, the current conditions, problems and development prospects were studied through a review by IITE UNESCO covering CIS countries around the Baltic and Central Asia.

Experts from these countries, including the author of this chapter representing Kazakhstan, addressed the Headquarters of UNESCO and program committee of the World Conference of UNESCO on Higher Education, the following issues regarding the development of ICT in higher education:

- Formation and development of legislative and standard legal requirements to cover the use of ICT in higher education;
- Maintenance of principles of accessibility and availability of electronic educational resources, especially to persons with special educational requirements;
- Improvement of quality of vocational training of students through the use of ICT, and the development of remote and cross-boundary training;
- Professional training to ensure the effective implementation of ICT;
- Introduction and enhancement of the use of ICT in management of schools at national and high school levels;
- Creation, distribution and assistance in the use of open source for educational materials and resources, and the use of free software in higher education;
- Creation of multilevel systems for the monitoring and certification of competence in the use of ICT;
- Expansion of multilingual Internet resources for co-operation in education and science, and support for the creation of a multilingual glossary.

Experiences of ICT implementation in education in the Republic Kazakhstan were shared at 4 international forums by the Ministry of Education and Science, NCI and IITE UNESCO (the forums were held in Almaty in 2001, 2003, 2004 and 2006). In addition, these experiences were highlighted to interested audiences at a session of the board of the publishing house "Education" in Russia (2003), at international conferences and Microsoft seminars involving IITE UNESCO, ABD, Institute of Open Formation at the Soros Fund (Prague in 1999, Moscow in 2001 and 2002, London in 2005, Singapore in 2006, and Manila in 2007).

ISSUES

Related to the computerization of schools, is the problem of computer literacy of the general population of Kazakhstan. For children, the operation of the computer comes naturally and quickly. Within days, children can be taught to use but also to learn on their own, the computer and its programs. However, the implementation of computer literacy for teachers, as well as the professional community and general population, is a more difficult problem. To this end, the Government of Kazakhstan has initiated a program, "To decrease information inequality", which is aimed at achieving training in ICT for 25% of the population within 3 years. The program will be focused on the outcomes of the training, which will cover 600,000 students of in the final year of high school, graduates of schools, professional schools and colleges (who will have to pass tests conducted annually (http://www.compobuch.kz) in independent or on-line modes.

Employers will also be obliged to check to ensure that successful job applicants have passed these tests and have received the equivalent state certificates. However, despite this effort, the problem with teachers' remains, as not all teachers will receive the necessary training. For teachers, this need for training and upgrading must be continuous and ongoing. Just as technologies change and improve, teachers should be similarly upgraded in knowledge and skills to use them in the education process. Over the past few years, there has been a wide scale implementation of computerization in schools in Kazakhstan. Even the most remote of rural schools, with student population of just 10 to 50 persons, have at least one to two computers. In the case of bigger schools, 1 computer is available for every 21 pupils. This computerization of schools is ongoing and is implemented annually in phases. Besides the provision of hardware and software, the computerization program of schools also involves equipment maintenance both at the workplace, as well as the homes of students.

The computer, for the process of implementation to be successful, should be available on a personal basis to students and teachers. Parents of students are beginning to understand that the computer is not that expensive a tool, as its importance in everyday life and preparation for the future overshadows its cost. Personal computers are also necessary for teachers. The majority of teachers do not own computers. As there is no financial support for teachers to acquire computers, it is inevitable that students will be more prepared for the advent of computers in their lives than teachers. Access to the Internet,

for schools is a separate problem altogether. Despite the intervention of Government, KazakhTelecom continues to react slowly to implement changes in pricing and accessibility as the Internet service provider enjoys a position of monopoly. This situation must change as the Internet represents a global network from which educational resources may be harnessed. What then may be other necessary questions to be answered to further enhance our use of the Internet?

- Firstly, would be the type of information for education to be accessed.
- Secondly, is the possibility of control over the resources that may be accessed.
- Thirdly, is the availability of Internet access that is of a high quality, low cost and high bandwidth to cater for simultaneous use by one thousand students at each school.

These are three basic questions to be addressed before we can make further inroads. Today the Internet in schools is but a model. It is only capable of giving students a limited introduction to the world of information in the Internet. And for many schools, even such limited access is a luxury.

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CHAPTER-16

eLEARNING IN KYRGYZTAN
E-Learning and ICT Development In Education
In The Republic of Kyrgyztan

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ABSTRACT

This chapter documents on the research study conducted in the Kyrgyz Republic. The implementation of learning technologies in developing countries is as much a journey as a destination. Our case study focuses on two specific phases in this journey: planning and implementation. Initial planning and carefully analysis of implementation, with attention to the challenges for teaching staff and students, can mean the difference between success and failure. The adoption of new technologies in a country with a long Soviet legacy, and a characteristic Central Asian culture based on oral tradition, defies indeed economics. The evolution of telecommunications, in general, and ICTs applied to education, in particular, in the Kyrgyz Republic is on the rise as official statistics show. However, it is not technological but economic resources that pose more problems (CAICT, 2005). This is especially the case of more isolated and distant regions like Karakol. From own research, we came to observe some of the differences in terms of resources between a university located in the capital and another located in the far-east of the country. Once a virtual platform has been installed, successful change requires a focused approach, with a systematic assessment of the current situation and a well understood implementation strategy. The analysis on distance education from Aida Aidakyeva (2007) is particularly relevant in this context.

COUNTRY

Kyrgyzstan is a landlocked mountainous country located in the middle of the Central Asian region. This particular geographical situation gives to Kyrgyzstan some geo-strategic advantages. The country evolved from a proud nomadic culture surrounded by the natural beauty of mountains, lakes

and rivers. Kyrgyzstan was formally annexed to Russia in 1876. Thereafter, in 1936, became a Soviet republic and achieved independence in 1991 after the collapse of the USSR.

Figure 1.
A Map of Kyrgyzstan

After the USSR dissolved, the country had to find its own way to establish its own identity and State organization. Several steps were done after the country gained the independency within the country's national strategy and in the transition process of moving towards a free market economy. Transition toward a free market economy brought with it a severe reduction in production output and thus a devastating economic decline throughout the nineties.

Today the GNP in the Kyrgyz Republic remains precarious. The per capita GNP of Kyrgyzstan is the second lowest in the region, after Tajikistan, at $1,860 USD (PPP) (UNESCO, 2008). Its annual percentage growth is 2.7% per annum, which is half of its rate of 5.4% in 2000 but up from the decline of -0.2% in 2005 (World Bank, 2008). The following is the state statistic information provided in the Country Development Strategy 2007-2010.

Cotton, tobacco, wool, and meat are the main agricultural products, although only tobacco and cotton are exported in any quantity. Industrial exports include gold, mercury, uranium, and natural gas and electricity. Kyrgyzstan has been fairly progressive in carrying out market reforms, such as an improved regulatory system and land reform. Kyrgyzstan was the first CIS country to be accepted into the World Trade Organization. With fits and starts, inflation has been lowered to an estimated 7% in 2001, 2.1% in 2002, and 4.0% in 2003. Much of the government's stock in enterprises has been sold. Drops in production had been severe after the breakup of the Soviet Union in December 1991, but by mid-1995 production began to recover and exports began to increase.

Table 1.
Key economic indicators of the Kyrgyz Republic, 2000-2005

	2000	2001	2002	2003	2004	2005
GDP, real growth (%)	5.4	5.3	0.0	7.0	7.0	-0.2
Inflation, (%)	18.7	6.9	2.0	3.1	4.1	4.9
Unemployment, (%)		7.8	8.6	8.9	9.0	9.7
Current transitions account, (% to GDP)	-5.7	-1.6	-3.1	-4.2	-3.4	-8.3
Wide moneys growth, (%)	12.1	12.2	35.1	34.5	33.6	17.6
Primary budget deficit, (% to GDP)	-6.9	-4.4	-5.1	-4.3	-3.4	-4.2
Foreign debt, (% to GDP)	102.0	94.15	114.5	104.2	95.5	77.1

Kyrgyzstan has distinguished itself by adopting relatively liberal economic policies. The drop in output at the Kumtor gold mine sparked a 0.5% decline in GDP in 2002, but GDP growth bounced back to 6% in 2003. The

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government has made steady strides in controlling its substantial fiscal deficit and aims to reduce the deficit to 4.4 percent of GDP in 2004.

The government and the international financial institutions have been engaged in a comprehensive medium-term poverty reduction and economic growth strategy. Further restructuring of domestic industry and success in attracting foreign investment are keys to future growth. The development of a networked economy in Kyrgyzstan faces the following problems: the lack of appropriate laws, local companies do not see the Internet as a business instrument; undeveloped payment technologies and low level of people's trust towards the banking system; narrow digital market; general undeveloped state and high prices for delivery services.

Nationwide demonstrations in the spring of 2005 resulted in the ousting of President Askar Akayev, who had run the country since 1990. Subsequent presidential elections in July 2005 were won overwhelmingly by former Prime Minister Mr. Bakiyev. Current concerns include: privatization of state-owned enterprises, expansion of democracy and political freedoms, reduction of corruption, improving interethnic relations, and combating terrorism.

EDUCATION SYSTEM

Kyrgyzstan inherited the old soviet educational system which during the soviet time was managed by the Moscow's centralized policy. One of the main steps was creation of functional Ministry of Education with the capacity to establish education policy as well as to oversee the provision of education and to ensure its quality. The process of reorientation of the educational system in accordance with the demands of society was and is an important necessity.

Education has always been counted among the most important social priorities in Kyrgyzstan. The first decade of independence of Kyrgyzstan turned out to be a period of implementation of educational experiments and of time, when face difficult replacement tasks of authoritarian and centralized system to the system based on democratic principles and on pluralism of values.

According to the Constitution of the Kyrgyz Republic, the Law on education and a series of national educational programmes the main principles and objectives that are identified in the area of education are the following: to

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ensure equal access to education; to update the content of educational and learning technologies; to improve quality; to use resources more effectively and efficiently; and to make management democratic - as indicated in its strategic development for 2007-2010.

The current educational system is composed of 11 years of primary and secondary education. A 12th year is under discussion. The higher education system is composed of six years to complete higher education (BA and MA) finishing students their studies at the age of 23, Medicine and a few other disciplines last up to 7 years.

At present moment Kyrgyz HEIs are in transition to the European system of a bachelor level of three years plus a Master Level of 2 years following the European system based on Bologna although most of the universities still provide 5 year-programmes with Master level as additional studies. Some problems are visible during this transitional process. Poor information about course outcomes, absence of a qualifications framework and inconsistence in the implementation of the Bologna process are some outstanding issues. In this sense, one of the most important concerns is that curricula in most universities suffer from overloading and irrational hour allocation.

Thus, the incoherence of the curriculum should be the object of scrutiny. In many respects it remains poorly structured and does not reflect students' needs. In principle, most existing curricula are not adapted to expectations of potential employers at all. With the exception of economics, business, and a few other courses, curricula are taught in the same manner as in the beginning of the 90s.

The contents of courses have undergone little change. The labor market and the educational services are in many respects isolated from each other.

The existing state educational standards are too rigid and do not allow new approaches to developing academic programmes. The new reform to shift from a maximum curriculum standard to the minimum one aims at improving existing curriculum through establishing required minimum standards at central level while developing additional curriculum in accordance with the market and community requirements.

There has been an introduction of principles leading to improvement/ optimization of curriculum based on implementation of the National

Curriculum on specific areas. Over the past decade, new subjects have been continuously added to curricula that have traditionally been crowded with a multitude of subjects; all with few teaching hours allocated. The problem with this "additive approach" to curricula reform lies on the fact that it has merely added rather than revised or replaced learning content.

DISTANCE EDUCATION

Kyrgyzstan has about 50 Universities which is too many for such a small country. Educators, politicians, and students agree that this big number of higher education institutions inflates the quality of education - thousands of young people graduate with degrees each year but they do not have proper preparation for the real job market and cannot find employment according to their specialization. Many experts agree that instead of a large quantity of Universities the country needs an educational system with a stronger emphasis on vocational training, retraining and improving qualification of existing specialists where distance education technologies should be applied selectively in the coming years.

A well documented review on the initiatives on distance education has been done by Aida Aidakyeva (2007) and is available online. According to her a few innovative distance education projects in Kyrgyzstan have been initiated and supported by international organizations. One of the first distance education projects was conducted in Kyrgyzstan in 1999 with the support of IREX and UNESCO in partnership with local television. Kyrgyz National TV channel provided its airtime for a course on informatics and computer science; additional information complimentary to the course was posted on the Internet. After three months students could take a test online. Other distance education projects are evolving rather slowly in Kyrgyzstan compared to neighboring Kazakhstan and Russia where economies are booming and the government is supportive of such initiatives.

Distance education in Kyrgyzstan is still not officially recognized as an educational method - current definition in the law is vague and it does not differentiate between distance education and so-called education by correspondence, a fact which according to local partners impedes its future growth and prevents many Universities from officially enrolling students in their distance education programs. Another problem is lack of distance education experts - designers and tutors of e-courses.

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According to Gajewski, NATO expert in the region, one of the most important questions is the proper choice of a target group, ideally with high motivation to learn and appropriate methods of e-learning. One such exemple is an e-training course being developed now by NATO for 11 countries, including Kyrgyzstan, for the first contact psychologists dealing with victims of natural catastrophes, wars, terror acts.

Within the project in Kyrgyzstan participating clinics will be connected to the Internet portal on the Silk network to provide professional help to individuals and communities affected by terrorism or disaster.

Gajewski emphasizes the importance of taking into consideration the language problem (content not only in Russian and English, but also Kyrgyz) and mentality, traditions, religion of target groups when developing e-training modules for similar projects.

The goal of creating and linking education facilities to the Internet is achieved through a strategy enhanced by NATO and the European Commission within what has been called the Virtual Silk Highway Project. Within this frame, a Central Asian Research and Education Network (CAREN) would group the national research and education networks (NRENs) already established in each country by providing them international internet connection in high capacity and access to European and worldwide research networks like GEANT and TEIN. Hence, universities and educational establishments may benefit similarly of the development of internal information and education environments and e-learning activities.

Currently, only a few universities in Kyrgyzstan have their own portals and websites. These portals are mainly used for the dissemination of information. The inclusion of application software within an interactive environment that is designed specifically to enhance the teaching and learning processes is not a distinctive feature of the portals that are functional in Kyrgyz HEIs.

The participation of two HEIs of the Kyrgyz Republic, KEU and IKSU, in a previous Tempus project -TOHOSTCA- have served to perceive the problems and challenges they have to face to deliver successfully learning technologies. Our observations and assessments are concluding in the sense that the mechanisms that facilitate and contribute to provide a successful experience with learning technologies, like infrastructure development and educational and training programmes, are not fully in place yet. Relations with external funding bodies have proved beneficial in order to gather the necessary hardware and software, and it can be said that the amount and

quality of equipment is considered to be a good enabler condition. Although a part of the teaching staff and student population is literate enough to successfully deliver and participate in e-learning activities, findings show that there is a need to translate plans into action in both institutions to provide the necessary training to the less e-literate population.

Another problem is the big digital divide in Central Asian countries caused by insufficient access to information and communication technologies. CAREN for example addresses this problem in the sector of higher education and research, with indirect implication on other sectors like medicine, statistics, meteorology etc.

The level of use of modern technologies in these sectors is lagging behind, and due to high costs of internet connection, the exchange of information with the outside world and the potential for distance education is rather limited.

TECHNOLOGY AND ICT

Kyrgyzstan's underpinning policy for the provision of ICT was laid by former President Mr. Askar Akayev when in a meeting at the World Economic Forum in Davos that Kyrgyzstan had chosen to become an information society. The government has thus given high priority to the promotion of information technology in Kyrgyzstan.

The first step was the KR Government resolution No. 697 titled Approval of the Information and Communication Technologies Development Programme in the Kyrgyz Republic (8November 2001). In March, 2002 the President of the country (Askar Akayev at that time) signed the National strategy on «information communication technologies for development of the Kyrgyz Republic» which continues to be implemented.

According to the strategy there are three priority spheres –the electronic government, electronic formation and electronic economy. Driven by a need to "computerize" the system of education, as well as a desire to be linked to the world through the Internet, the measures adopted include computerization of schools and universities, development of telecommunication network and other infrastructure, and establishing training programmes for human resources development.

The "National Strategy Information and Communication Technologies for Development in the Kyrgyz Republic" sets out main priorities, objectives and tasks, main principles, provisions and directions of the national ICT policy.
The National Strategy is viewed as one of the important areas for development within the framework of implementation of the Complex Development Framework up to 2010.

The main priorities of the National Strategy are:

- public administration and local self-government (e-governance) - effective, transparent and accountable public administration through utilization of ICT;
- Education - human capacity building and training of staff in ICT;
- Electronic economy (information business, electronic commerce, regional business center in Central Asia).

According to the above mentioned strategy the main tasks in this area would be:
- integration with the world information community;
- eradication of digital (informational) inequality;
- human capacity building and maintenance of cultural heritage;
- development of democracy;
- building of the competitive economy;
- development of the legal basis for the information society;
- promotion, in line with CDF, a fair society that provides for a stable human development and social security, access to quality educational and health services for all citizens;
- formation and development of human capacity for the integration of the Kyrgyz Republic with the global informational economy;
- improvement of the public administration mechanism for the development of the ICT market;
- increase in the investment - related attractiveness of ICT area; development and implementation of new ICTs;
- informatisation of monitoring and management in the public health system.

The first telecommunication project in Kyrgyzstan at the end of the 90s vastly improved the telecommunication infrastructure in the country.

A digital telecommunication network – which employs a standard-A satellite earth station, SDH and PDH digital microwave links, digital-switching exchanges and SDH fibre-optic transmission- were created in 2000. The digital microwave backbone has made it possible to connect the different regions with each other and have, even for rural subscribers, easy access to the rest of the world.

Table 2.

Kyrgyzstan, Internet World Stats, Internet Usage and Population Statistics

YEAR	Users	Population	% Pen.	GDP p.c.*	Usage Source
2000	51,600	5,377,484	0.1 %	US$ 410	ITU
2005	280,000	5,377,484	5.1 %	US$ 450	ITU
2007	298,100	5,436,608	5.5 %	US$ 440	ITU

Source: Internet World Stats, http://www.internetworldstats.com/asia/kg.htm
Note: Per Capita GDP in US dollars, source: United Nations Department of Economic and Social Affairs.

There are several commercial Internet service providers in Kyrgyzstan. Competition among these Internet providers helps establish better service and lower market prices, besides linking more computer users and providing them access to Internet. Private computer companies in the country provide computer assembly and maintenance services. Such companies create new jobs and train young people in the use of IT.According to Opennet (opennet.net) recent liberalization of the telecommunications market in Kyrgyzstan has made Internet affordable for the majority of the population. This access remains largely unfettered.

However, an emerging regime shift toward more restrictive policy, dependence upon Russian and Chinese Internet connections, and political instability pose problems for clear and continual access to Internet in Kyrgyzstan.

The privatization of both telecommunications and services, driven by the foreign investment and financial assistance, has resulted in an increasingly competitive Internet sector.

This has caused access fees to decrease, which in turn has made the Internet affordable for the average Kyrgyz. In 2005 the number of ISPs increased to thirty-eight, although only seven of these have an external Internet connection.

Two of the seven ISPs—KygyzTelecom (KT) and SaimaTelecom—own the infrastructure they use. The others rent lines and cables from the state-controlled top-tier KT.

The state has a major stake (50 percent) in Elcat, another top-tier ISP. The majority of ISPs connect by satellite to the Russian portion of the Internet.

In addition to its major Russian connection, KygyzTelecom has built external connection ports to China and Kazakhstan.The Internet Traffic Exchange Point (IXP),6 shared by the ISPs with external Internet connection, runs the local traffic. The international Internet bandwidth in the country is 76 Mb/s,7 and the most popular means for Internet access is through dialup connection. A private company, AsiaInfo, controls the country's top-level domain ".kg". In 2007, there were around 1,500 top-level domain names registered in the Kyrgyz Internet zone.

In the frame of a running project, under the umbrella of the CIS Regional Initiatives projects, the ITU in collaboration with the Government of Kyrgyz Republic intends to establish an Interactive Multimedia Digital Broadcasting Networks as a pilot to be replicated in other CIS countries. The main objective of this pilot project is to assess the impact of an IMDB services including digital television, internet and other information society services within an identified area in Kyrgyz Republic.

Regarding the use of open source software systems by educational establishments in Kyrgyzstan, we have observed that despite some initiatives and trainings with moodle and Dokeos, there is still a long way to go. UNDP has actively supported the use of these technologies and the mission of Mr. Semenov, UNDP International ICT Consultant (USA) in 2005 was to create conditions for effective use and development of «open source» technology (software program with open code) in Kyrgyzstan. After meetings with representatives of leading private companies, representatives of governmental structures, universities, NGO and international organizations goals and common interests, related to use of these technologies were identified.

The main result of the mission would be creation of an independent structure, ensuring development and implementation of specific projects on «open source» and development of professional services in this field.

As computers have progressed and developed so have the types of operating systems. Below is a basic list of the different types of operating systems and a few examples of operating systems that can be found in Kyrgyzstan.

GUI - Short for Graphical User Interface, a GUI Operating System contains graphics and icons and is commonly navigated by using a computer mouse like System 7.x, Windows 98, Windows XP and in some cases Windows Vista. Multi-user and multiprocessing -A multi-user operating system allows for multiple users to use the same computer at the same time and/or different times and the operating system capable of supporting and utilizing more than one computer processor. Linux, Unix and Windows 2000 are often used.

In HEIs and schools we can also find complimentary programs and systems from recognized technology marks. Systems used include the following:

- Operating platforms and systems like Microsoft Windows Server 2003/XP/Vista and UNIX;
- Utilities like Winrar, Nero and WinZip;
- Antivirus software like Dr Web, Kaspersky, Norton Antivirus, Panda and Nod 32;
- Programming languages and databases from My SQL, Prolog, Visual Basic, Borland Delphi, Borland Pascal, C++, C++ Builder, JavaScript, HTML, Macromedia Flash, PHP and MSDN;
- Graphics and multimedia software like BS Player, Adobe PhotoShop, CorelDraw, Maya, Toonboom, Corel Draw GRAFICS SUITE X4, AutoCad, Windows Media Player and Adobe PhotoShop CS3;
- Office software such as MS Office, Abbyy, Adobe Reader and Fine Reader;
- VoIP applications, instant messaging, web browsers like Internet Explorer, Skype and Opera;
- Dictionaries and translation software from Izet, Tilmash and Promt;
- Administrative and management software such as 1C Accountancy, Lotus and SAP.

Despite many of these technologies are largely available, from our experience and interviews with ICT managers, telecommunication and

equipment costs are seen as major barriers in the implementation of e-learning. This is supported by the CAICT report (2005) which addresses the impact of telecommunication costs on daily income for Central Asian countries (see Figure 2. below).

Figure 2.
Cost of connection in relation to % of daily income, GDP per capita, 2005.
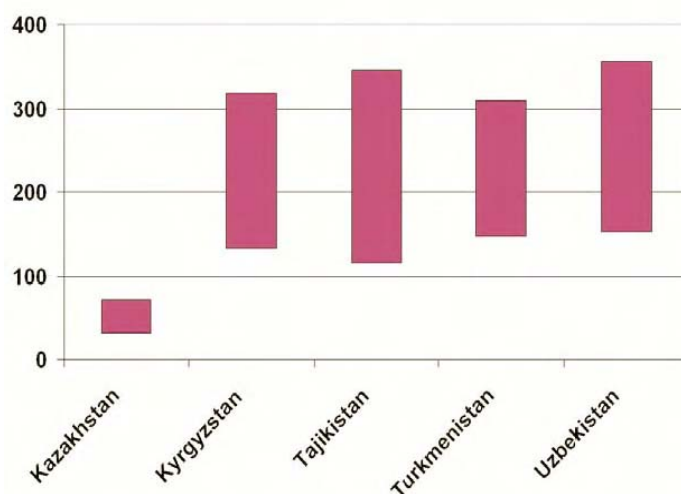
Other issues that may have a major impact in educational institutions is the lack of backup support once the equipment was in use, lack of financial resources and lack of organizational infrastructure.

E-LEARNING AND ICT INTEGRATION

Rapid developments in information and communication technologies (ICT) in recent years have resulted in significant changes in the way the world operates and communicates. This in turn has had an impact on educational needs, both in terms of the content and the delivery of educational services, and there has been increasing pressure on decision-makers to acquire new technologies.

At the same time, forms of ICT are multiplying with an increasing array of ICT options for decision-makers to choose from when integrating ICT into education.

Kyrgyzstan's exploration of the use of computer-based technologies in schools has been largely dependent on funding from international donors and external investment. In 1996 the mass computerization of schools began with funding from the Asian Development Bank with some 100 kits, each with 12 work stations in a local network being provided to schools. Over the next three years, the number of computers in schools expanded as with donations either by foundations or by the private sector. Active steps were taken to expand this process in 2000 with a further 1,450 computers provided with Ministry of Education and foundation funding (UNESCO, 2005).

This dependency means that once the funding expires the possibilities for maintenance and improvement of the systems dwindle. The expansion of computer use in the classroom generally is constrained by a number of factors like limitations in the telecommunications infrastructure, for example, few ISPs are available in rural areas, costs are high and senior staff in schools is not persuaded of its value.

Moreover, there is a shortage of teachers with an appropriate specialty and lack of support services in remote areas. There is also a lack of an appropriate qualification structure for these teachers; a training system was included within the ADB project but not funded. In fact, in 2002–03, there were only 1,345 teachers of informatics in 2,029 schools which included 1,694 middle schools. Meanwhile few teaching materials are available in Kyrgyz and available software, for example about programming and algorithms, does not match the demand.

According to Hillari Perraton (UNESCO, 2005) access to the Internet would require considerable recurrent expenditure, on top of that required for other uses of computers, estimated at US$ 1.2 million per annum if 1,700 schools were connected. In considering human resource development it is necessary the improvement of educational management systems and the development of an Internet educational portals. By implication these moves are needed earlier in developing national readiness for the wider use of the technologies than school-based programmes.

E-learning methods and the use of information and communication technologies in education and training have changed the way of learning and teaching, providing a fundamental contribution in their processes of innovation and reform.

Through the integration of new technologies, education and training have become more accessible and more flexible, offering opportunities to all and at all educational levels.

Nevertheless new technologies and their integration in the education and training systems are not yet integrated in the Kyrgyz educational panorama. While the focus in Western countries is now placed on the methodological and pedagogical implications linked to their use for learning and teaching purposes in Kyrgyzstan we can argued that they are yet in a first stage of development. It will be needed that educational authorities see the integration of new technologies and education as a social process, offering better opportunities to collaborate with other learners, to facilitate interaction with the content, receive guidance from teachers and tutors and to support accessibility for people with disabilities of having time, age, space constraints.

The programs and projects observed until now are related to human resources development based on ICT usage and development of these resources in the ICT sphere and other projects based on ICT education with wide usage of network and telecommunication technologies. The goal of the national strategy of the Republic of Kyrgyzstan is the development of human resources and development of state professional community potential, the integration of Kyrgyzstan in global informational economics, and the increase of ICT sector participation in the gross domestic product of Kyrgyzstan and in sum the building of an information society in Kyrgyzstan.

In the National ICT Strategy 3 priority directions were emphasized:

- E-Government ;
- E-Education ;
- E-Economy.

Among the components of E-Education we can observe:

- Infrastructure (telecommunication, computer equipment, local, corporate and global Networks)
- Target groups of users (students and school students, directors and managers, adults, old men, other groups)
- Subject and contents of education

- Electronic education providers (schools, universities, educational and consulting firms in ICT sphere)
- Lawful regulation (laws, decrees, government documents, departmental acts, regulating process of creation, introduction and operation of ICT systems)
- Processes and technologies of education management

CASE-STUDIES

E-centers in Rural Areas

In Kyrgyzstan, entrepreneurially-run Internet Centers have become nodes for online learning in rural communities, with close to 10,000 Kyrgyz students and jobseekers taking advantage of "microvouchers" for Internet skills development and for onsite and online courses. Without the advantage of oil revenue or other marketable natural resources, Kyrgyzstan's development has been modest in comparison to resource-rich countries such as neighboring Kazakhstan.

A recent initiative by Microsoft developing e-centers microvouchers for HEIs is unique in several ways. While these centers are developed as a donor-supported pilot initiative with USAID funding, they were planned from the start within a for-profit framework. Rather than being established within local NGOs or local institutions, they were set up within existing cybercafés, based on a competitive tender process. E-Centers reversed the traditional path of not-for-profit telecenters charging for services to become financially sustainable by starting with profitable cybercafés and increasing their capacity to provide high-value services such as videoconferencing, e-Learning, and others geared to serving the needs of economically depressed rural areas with high unemployment rates.

The e-Centers leverage the high demand for "infotainment" services such as computer games and other forms of online entertainment, which are highly profitable and allow the operator to pay staff and overhead costs. e-Center services, offered separately (in a different room), were funded initially by USAID. Microstipends or vouchers, used for training purposes, were distributed in the community to stimulate demand for the new services. Most training starts with basic computer literacy and guided access to training courses in Internet- and multimedia-related services such as macromedia web design and other digital media skills now in demand. e-Centers also offer

web-based certification for accounting courses and other business capacity-building skills.

This training is unique in Kyrgyzstan because it seeks to create 21st-century skills and potential and offers a nontraditional source of revenue into which rural communities can tap. The initial success of the project has attracted additional support from the International Telecommunications Union (ITU), which has allocated resources to open 16 additional e-Centers. The ITU-funded e-Centers follow the USAID-funded pilots' structure and will add an e-Government pilot component.In this sense, the e-Government component is intended to increase government transparency in rural areas and establish online resources and applications to improve delivery of government services in rural areas, including permits, tax filings, government information, and distribution of social benefits.

Institute of New Information Technologies
The Institute of New Information Technologies under the Kyrgyz National University of Construction and Architecture is one of the members of the KRENA. It is using the technology provided by the Virtual Silk Highway project to tryout some distance education applications. The Institute designated one conference hall to be equipped with projector, cameras, television sets, screens, and fast Internet connection for conferencing using video.

In 2006, two students from the University went abroad on exchange programs. In order to graduate from their home Institute without coming back to Kyrgyzstan they defended their theses distantly. The defense was organized via videoconferencing and students presented their thesis projects from the USA and Germany to a panel of professors in Kyrgyzstan in an interactive session. It proved to be a useful and interesting experience which can be repeated. Occasionally, the Institute conducts interactive videoconferencing sessions with German and French Universities for selected groups of students. However, according to the instructors of the Institute, one of the difficulties is that few students know these languages well enough to benefit from the lectures of foreign scholars. Also, due to the time difference many students cannot attend live lectures late at night.

In 2003, the Institute became an academic affiliate of Moscow State University of Economics, Statistics and Informatics by means of the distance teaching infrastructure. Today this Kyrgyz affiliate enrolls about 100

students. They start their education offline while attending a series of obligatory lectures in the Institute and later they continue with taking courses online. The Institute provides them with literature, electronic books and assignments via Internet. The workload and list of subjects can be selected individually. In principle, a student can complete the program in three years instead of the traditional five years.

According to Kerinbek Osmonov, Director of the affiliate, this project is possible due to the fast Internet connection which the Virtual Silk Highway provides. With this bandwidth their students also have a possibility to attend lectures of professors from Moscow via videoconferencing but so far not many of them have expressed a desire to do so. "Distant education requires certain intellectual level and preparedness, motivation from students which is not always there, unfortunately." Osmonov commented. The advantages of distant education for students are obvious. Distance education costs less, about USD 260 per year while standard education costs about USD 450 per year. Also, there is no minimum number of students needed for the course to take place - if just one person wants to study a specific subject in a semester he or she can enroll.

The Institute is considering new programs on distance education to be organized for students from the United Arab Emirates and Kazakhstan who would like to receive a Russian diploma but cannot afford to study in Moscow or Saint Petersburg. They could easily stay and study at an accredited Russian affiliation in Kyrgyzstan where living expenses are much cheaper and the education itself costs less.In general, according to Beishenbek Ukuev, Director of the Institute of New Information Technologies, distance education could contribute to the solution of many problems in Kyrgyzstan. More young people from rural areas who traditionally leave home after high school to study in the capital Bishkek or abroad would be convinced to stay. The country could stop losing its educated specialists if they had an opportunity to integrate into the world's intellectual community while being in Kyrgyzstan.

Main Issues Regarding ICT in Education
As we have seen before there are three main problems regarding the ICT usage in education and training process. Although there is sufficient number of ICT specialists, they are not distributed evenly across the country. Furthermore, ICT specialists' training programs would increase of quality if their education would be according to market requirements. Among the

educational specialties linked with ICT that we can find in universities today are computer science and computer facilities, Informatics (applied), applied mathematics and informatics, informatics (for future teachers on informatics), telecommunications, automation and control, electronic devices design and technology, electronics and microelectronics. However, it is often the case that technologies advance much faster than curriculum in HEIs. Therefore, students learn systems and theory that becomes easily obsolete.

Regarding the training of ICT specialists, from the research conducted in two HEIs of Kyrgyzstan –Issykul State University and Kyrgyz Economic University- several appropriate observations could be well applied to other institutions. The evidence suggests that teachers and students are motivated to use computer-based technologies in the classroom. In contrast, there is not enough support at institutional level. One of the reasons is that, within the educational reform, the focus has been more generally paid for end-users to acquire basic ICT skills like word processing or windows applications. Furthermore, there seems to be little understanding and discussion about the possibilities of learning technologies for the improvement of quality in education. For example, DOKEOS is seen as a nice example in practice. Teachers attend to the train-the trainer sessions and they practice with their own curricula. The discouraging feature is that HEIs do not support training as part of their workload. Moreover, not all ICT specialists do understand about pedagogic principles and it is difficult to find pedagogues that understand correctly the principles behind the application of LMS or VLEs.

Consequently, a clear conclusion is that more training from countries with true specialists is needed. In this sense Dr.Toktobek, one of the ICT managers at KEU, commented: 'it is necessary to organize monthly training for ICT teachers in Europe for elimination of lacks'. From the different reports we received (i.e. swot analysis, project outcome reports, etc.) Kyrgyz partners acknowledged the improvement on knowledge of different issues related to learning technologies after the introduction of Dokeos.

They reported that this platform may increase the cooperation between teachers and students, students have the opportunity to download course information during non academic hours, Dokeos facilitates the improvement of learning quality of students and most important Dokeos and other similar technologies allows them to implement the principles of the Bologna declaration. Conversely, they were experiencing a lack of knowledge in computer technologies for teaching and learning, lack of teachers and

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students' time because of the academic process and administrative tasks, some problems with the language platform and some technical problems after the training sessions due to a poor management of the system, albeit they strengthen the technical base. At KEU there were not great results after their own organization of training workshops but they were trying to take some measures in order to implement Dokeos. Other issues are common trend in Central Asian region like those related to the problem of computer literacy of the population with special emphasis in the literacy of the teachers. Additionally, low salaries, lack of incentives from institutions and lack of motivation render the task even more difficult. It is our opinion that for HEIs, one of the most effective ways to develop ICT capabilities is to concentrate on international projects that leverage their limited resources and create the much needed preconditions and favorable environment for developing virtual learning environments and enhance learning technologies.

We observed from our samples that participants have some skills to use computers, they have a good attitude towards technology, they want to learn and to improve but they need some improvement and organizational support. For teachers, this need for training and upgrading must be continuous and ongoing. Just as technologies change and improve, teachers should be similarly upgraded in knowledge and skills to use them in the education process.

CONCLUSION

During recent years the Kyrgyz Republic has made considerable although uneven progress in the development of IT infrastructures, and in the modernisation of state education. Problems with ICT development for education in the Kyrgyz Republic have demonstrated the need to move away from a one-sided policy of just developing communications and information technologies, a technological boost, to the formulation of a wider educational strategy that integrate technology with academic practices.Given that -to a higher or lesser extent - technological opportunities are already available, main educational directions could include the formation of an interconnecting information space between HEIs; and the development of information resources, data bases, knowledge and information infrastructures, which could be used by both institutional structures and end-users as well. These directions will draw upon a carefully planned and organized effort from a top-down policy level.

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CHAPTER-17

eLEARNING IN LATVIA
Dimensions of E-Learning Education
In Latvia

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ABSTRACT

Sustainable development of country largely depends on education which is one of the most important dimensions of development. E-learning is working towards achieving sustainability in human development by providing educational opportunity to the people across the country and abroad. Many significant measures have been initiated by the Latvian government in the direction of taking the education to the people of all segments of the society. The Latvian institutions need to have a competitive strategy so as to provide quality education at an affordable cost.

This makes Latvia as a special case of investigation wherein a network of over 30 universities and higher education establishments are providing access to education in several languages including Latvian, Russian and English. Challenge and competition in the education sector have presented a new situation where institutions are now viewed as conglomerates and educational programs as educational products.

To achieve sustainable and quality oriented education in e-learning, the present chapter attempts to make an analysis of e-learning experience of Latvian universities and overview strategies for improving delivery of academic programs and quality assurance in support services for Latvian and foreign students.

The chapter contains brief description of Latvian education system and the findings of a study institutional corporations and the emphasis in the study is on the implications of increasing use of Information and Telecommunication

Technologies (ICTs) for teacher and trainer training in Latvia. The study describes current Internet penetration, current government initiatives to promote the use of ICTs in education and training for the benefit of all individuals, the current supply of ICT-based forms of education, and more generally the implications of ICT-based forms of learning for teachers and students.

The chapter discusses the bilingual situation presented in Latvia and related problems regarding e-training courses development as well. Because of this, Latvian society must consider their entire policy towards bilingualism in the educational system. Brief information is sent about the current financial model for Latvian education.

Then topic on the contribution and the situation of distance education in Latvia follows. Starting with historical facts the chapter cover also current state of e-learning activities in Latvia. This overview contains the description of e-learning education framework in Latvia including computers and Internet usage in education. Most resent policy measures at national level are discussed and medium term plans 2007-2013 are evaluated.National or International e-learning content suppliers, e-learning Technology Suppliers, e-learning service suppliers are briefly discussed.

hen an attempt is made to estimate the Latvian e-learning market size and its characteristics. After all the applications of e-learning in Latvia educational system by study levels is observed. At the end of the chapter an author's forecast for e-learning education as a future of Latvia is represented.

COUNTRY

Latvia is the central country of the Baltic States (Estonia, Latvia and Lithuania) and is located in North-eastern Europe on the east coast of the Baltic Sea. Area: 64,589 sq.km or 24,937 sq.miles. Latvia is bordered by Estonia to the north, Russia to the east, Lithuania to the south and the Baltic Sea to the west. Its strategic location has made it an international crossroad for trade, commerce and cultural exchange since ancient times.

Population: 2, 270,00 (urban: 66%, rural:32%). Ethnic composition: 59% Latvian, 28% Russian, 3.7% Belorussian, 2.5% Ukrainian, 2.4% Polish, 1.4% Lithuanian, 3% other nationalities. Official Language: Latvian. English and Russian are widely spoken throughout Latvia, while German, French and the Scandinavian languages are also frequently heard.

Figure 1.
A map of Latvia

Latvia's weather features a temperate maritime climate, with mild summers, moderate winters and frequently high levels of humidity and precipitation.Production sectors are information technologies, chemical and pharmaceutical industries, electronics, mechanical engineering, timber and construction, food processing, textiles, fishery and agriculture.

Latvia's three major ports of Rīga, Ventspils and Liepāja service a wide range of global shipping needs. Ventspils is one of the busiest ports in the Baltic Sea region and one of Europe's leading ports in terms of cargo turnover. The countries of the EU remain Latvia's main trading partners (78%), while trade with CIS countries (12%) continues to expand. Wood and metal products, machinery, electrical equipment and mineral products are Latvia's main exports.

Expenditures of the Latvian General Government Consolidated Budget for Education were 7.1% of GDP in 2007 and 7.8% of GDP in 2008. The Latvian Budget for 2009 due to crisis situation considers reduction of total expenditures on education.

Largest Religious Confessions: Evangelic Lutheran, Roman Catholic, and Russian Orthodox. Since the 16th century Reformation, the Lutheran church http://www.li.lv/index.php?option=com_content&task=view&id=12&Itemid=1058) has played a leading role in Latvia.

EDUCATION SYSTEM

Latvia has traditionally had one of the highest per capita ratio of students in the world. The state guarantees free primary and secondary school education and offers scholarships for higher education. Foreign students from EU countries pay the same fees as permanent residents of Latvian, and degrees from Latvian educational institutions are recognized internationally. Doctorates can be received in the social sciences, natural sciences, and law, as well as technical and humanitarian sciences. Latvia also has state-financed ethnic minority schools or classes where courses are taught in Belorussian, Estonian, Hebrew, Lithuanian, Polish, Roma, Russian and Ukrainian.

The organizational model of the Latvian educational system may be found on the web site of Latvian Ministry of education and Science (http://izm.izm.gov.lv/education/education-system.html).

Latvian education system is administered at three levels - national, municipal and institutional. The Parliament (Saeima), the Cabinet of Ministers and the Ministry of Education and Science are the main decision-making bodies at a national level. The Ministry of Education and Science is the education policy-making institution that also issues the licenses for opening comprehensive education institutions and sets educational standards along with the teacher training content and procedures.

Five-seven year old children have to participate in pre-school programmes provided by general education establishments or kindergartens as a part of the compulsory basic education. The objective of the pre-school education is to foster general development of children and their readiness to enter primary stage of the basic education.

Nine-year single structure basic education (primary and lower secondary education according to ISCED) is compulsory for all children from the age of 7. The curriculum is determined by the national basic education standard. The Ministry of Education and Science supervises and determines the content of the final national examinations. Pupils, who have received evaluation in all subjects of the compulsory education curriculum, national tests and examinations, receive a Certificate of the basic education (apliecība par pamatizglītību) and a statement of records (sekmju izraksts) that qualify them and serve as a screening criterion for admission for further education and training in secondary level educational programmes. In case a pupil has

not received evaluation in any of the subjects or centralized national tests and examinations, he/she receives a school report (liecība) giving the right to continue education and training in basic vocational education programmes.
Special schools or special education classes within general education schools provide education for children with special needs that correspond to their individual health condition.

The structure of special education is very similar to that of the mainstream education providing opportunities for persons with special needs to attain knowledge in general education subjects as well as general skills with strong emphasis on applicability of the acquired knowledge and skills in order to facilitate social inclusion.

There are two types of secondary education programmes: general secondary and vocational secondary education and training programmes. When admitting students to the secondary level education, schools are free to hold entrance examinations according to the basic education standard, except in those subjects for which students have already received a Certificate of the basic education.

General secondary education programmes, irrespective of the profile, may be combined with a national minority educational programme by inclusion of the minority's national language and subjects related to national identity and its integration into the Latvian society.Upon graduation students have to take at least 5 centralized national examinations, the content and procedure of which are determined by the Ministry of Education and Science and approved by the Cabinet of Ministers.

A Certificate of the secondary education (atestāts par vispārējo vidējo izglītību) is awarded to all students, who have received a positive assessment in all subjects according to the chosen profile and the national examinations and a certificate of the passed centralized exams and their scores, providing the right to continue education in any higher-level education programme.
If the student has not received an evaluation in one or more subjects or national examination, he/she receives a school report (liecība).

Different vocational education and training programmes are developed and offered for all branches of the national economy of Latvia. The National Standard of the vocational education and the Occupational Standards determine the curriculum/content of vocational education programmes.

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Majority vocational education schools in Latvia provide 4 and 3 year vocational education and training programmes and only some programmes are designed for the basic vocational education and training purposes.

The admission procedure is not centralized: each higher education institution has its own admissions board and criteria. From the year 2004 the entrance examinations are replaced by the results of the national centralized secondary education examinations.

The system of higher education in Latvia is binary since the Law on Education Establishments sets a difference between academic and professional higher education but it is not strictly institutionalized.

Universities and other institutions of higher education mostly run both academic and professional programmes. There can be distinguished three groups of programmes: academic programmes leading to academic degrees, professional programmes based upon a standard of the first academic degree thus making graduates eligible for further academic studies and the applied professional programmes oriented towards higher professional qualifications but not providing background for direct admission to further academic studies.

Academic higher education programmes are based upon fundamental and/or applied science; they usually comprise a thesis at the end of each stage and lead to a Bachelor's degree (Bakalaurs) and Master's degree (Maģistrs). Duration of Bachelor's programmes may be 3 or 4 years at different institutions. The 3-4-year Bachelor's degree is considered as a complete academic qualification. Master's degree is awarded after the second stage of academic education and requires at least 5 years of university studies.

The Law on Higher Education Institutions and the Law on Vocational Education and Training stipulate a two level professional higher education – the first level of professional higher education or college education (2-3 years) leading to professional qualification Level 4 (diploms par pirmā līmeņa profesionālo augstāko izglītību), and second level of professional higher education leading to qualification level 5 (2-3 years). Having mastered a programme of professional higher education, students are awarded a professional qualification or a professional Bachelor's degree that can be followed by a further 1-2 years of professional Master's studies.

The Master's degree (Magistrs) of higher professional education is awarded if the total duration of studies is at least five years.There can be the so-called "short" second level professional higher education study programmes (1-2 years), where qualification is obtained on the basis of the previously acquired first level professional higher education or academic Bachelor's degree. In total the duration of professional qualification Level 5 study programmes is not less than 4 years after secondary education and not less than 2 years after college education.

Master's degree or the equivalent (graduates of 5-6 year professional higher education programmes in Law and Medicine can continue education at postgraduate level directly) is required for admission to doctoral studies (Ph.D.). Doctoral studies last 3-4 full-time years. They include advanced studies of the subject in a relevant study programme (or an equivalent amount of independent research while working at a university, research institution, etc.) and a scientific research towards doctoral thesis. Publications in internationally quoted scientific journals are required before public defense of the doctoral thesis as an integral part of a study programme. The Council of Science appoints Promotion Council and sets the procedures for award of Doctor's degrees.

Educational achievements are assessed in a ten-point system: 10 with distinction (izcili), 9 excellent (teicami), 8 very good (ļoti labi), 7 good (labi), 6 almost good (gandrīz labi), 5 satisfactory (viduvēji), 4 almost satisfactory (gandrīz viduvēji), 3 weak (vāji) 2 very weak (ļoti vāji), 1 very very weak (ļoti, ļoti vāji).

Adult education includes all types of formal, non-formal and informal education including further and interest education, professional upgrading and in-service training. It is provided to satisfy needs in lifelong education process to support personal development and competitiveness in the labour market regardless of person's age and previous education.

The tuition at pre-school, basic and secondary education in a state or municipality founded educational establishments is funded from the national or municipal budget. Private educational institutions may set a tuition fee for providing education.

In higher education programmes the state covers tuition fees for a certain number of students' places, according to the State Procurement in the

respective academic year. Each higher education institution may set a tuition fee for the rest of students' places. All students are entitled to a state credit for their studies in any higher education programme.

Foreigners or non-citizens pay for their education in accordance with the agreement concluded with the respective educational establishment. In cases when foreign citizens study in Latvia under an exchange programme and an equivalent number of Latvian students study abroad, the foreigners' studies in Latvia are financed from the budget resources of the Republic of Latvia allocated to the respective institution of higher education. The tuition fee for the citizens of European Union countries shall be determined and covered according to the same procedure as for the citizens and permanent residents of the Republic of Latvia.

Free mobility is of the most importance to the Latvian universities. In general, universities encourage the mobility of academic staff and students. Many universities organize exchange programmes, workshops and summer schools in co-operation with universities abroad. The major problem for the mobility is funding, so far composed of limited university resources.

Latvia is a country in transition from the former system dominated by all kinds' prohibitions to a new democratic one. As language is viewed as a key to cultural identity, Latvians are adjusting their key to a new door to freedom and identity by removing all taboos, including the language–related ones, with eagerness and speed. Special attention was paid to the acquisitional aspects of Latvian, contemporary models of bilingual education. Evaluating pedagogical literature, it has been ascertained that some disunity of opinions and discrepancy prevails. Frequently the role of foreign experience is a subject of overstatement, and domestic values are nearly lost. During the transitional period from being part of the Soviet Union, with Russian as the official state language, to an independent state within the European Union, with special language policies supporting minority languages, Latvia has developed reasonable principles of bilingual education.

The challenge for teachers of both Latvian as a second and Russian as a first language is enormous. In the future, other bilingual situations will present themselves in Latvia as well. Because of this, Latvian society must consider their entire policy towards bilingualism in the educational system (Protassova, 2002).

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DISTANCE EDUCATION

In mid-nineties Distance Leaning was introduced in Latvia. Implementation of modern distance education methodology and technology in education system was an important step to open education for all. In early nineties telecommunication and data networks were not very well developed in Latvia, but now situation is improving very fast. Computers with internet connection and CD drive are becoming widely accessible in schools, universities, municipalities, libraries and elsewhere. Electronic technologies flexibly combined with other tools can greatly improve access to education and quality of learning as well.

At the beginning of 2004/2005 school year, 100% of higher educational establishments and colleges, 98.1% of vocational education establishments and 99.9% of comprehensive schools had computers, while 100% of higher educational establishments and colleges, 97.1% of vocational education establishments and 93.4% of comprehensive schools had internet connections. Number of computers per 100 students was 5.6, while the number of internet connections amounted to 4.2 per 100 students.

Several institutions in Latvia are working in these directions in different combinations (Latvian University, Riga Technical University, Transport and telecommunication Institute etc.).

There are also other advanced electronic tools and applications tested such as: videoconferences, audio and video streaming, virtual or tele-laboratories, but these are not widely used in practice in Latvia. Open Distance Learning (ODL) and e-learning were introduced in Latvia concurrently.

At the beginning of 1994 Board of Distance Education was officially created at the Latvian Ministry of Education, Science and Culture. Phare Multi – Country Program on Distance Education facilitated the process of introduction ODL in Latvia. In 1995-1996 was created a structure for ODL development in Latvia.

There were established 3 operational ODL Centres at universities (ODL Centre atUniversity of Latvia, ODL Centre at Riga Technical University, ODL Centre atDaugavpils PU) and one regional support centre at Liepaja Academy of Pedagogy. Daugavpils and Liepaja are regional centres located about 200 km to South-East and to West from Riga, accordingly.

In 1995 in the framework of Phare Program was developed ODL Development Strategic Program for 3 years. The Program was approved by ODL Board and till the end of Phare program was implemented.

In 1999 was developed next step Strategic Development Program under the title ''Virtual University of Latvia''. It was approved but not maintained with requested financial support. In 2000 this program elaborated as a project was includes in E-Latvia Program but again without financial support. In December 18, 2001 Cabinet of Ministers (Government) discussed this issue and delegated to Ministry of Education and Science the responsibility to elaborate this project as a Concept of Virtual University.

In 1998–1999 in the framework Tempus project Flexible Learning Strategy in Latvian Higher Education was developed and published in a booklet. It is aimed to foster development of continuing education and lifelong learning related activities in universities and other HE institutions. In next similar projects some course materials were developed and implemented in learning process (REPORT, 2005). Concluding this part we can say that there are several state level policy papers on development of ODL but these initiatives have not got appropriate financial support from the state to be implemented. Still HE institutions are active in implementing modern technologies in education and in particular regional institutions are quite successful in this respect.

The first full study program in online format in Latvia (Kiscenko, 2001) was designed and copy rights owned by the School of business administration Turiba in 2002. Designers were Oskars Onzevs, Inese Varslava, Doloresa Medne, Lasma Svike. Content was provided by the lecturers from the School of business administration Turiba.

In 2003 at Valmiera University College Learning Content Management System for education and vocational training in Latvia was set up. The project was sponsored by GTZ-Gesellschaft für Technische Zusammenarbeit and targets the efficient production of eLearning content and interactions of the course participants. Hoffmann & Reif Consultancy, HOFFMANN+ LIEBENBERG were creators of the BBZV -Vocational Training Centre in Valmiera (LMS, 2009).

At the beginning of the 2004/2005 school year, 72.4% of all pedagogical employees at comprehensive day-schools had knowledge on IT, 35.8% used

internet on a regular basis, and 24.4% regularly used internet for preparation of teaching materials.

According to the survey "Development of information and communications technologies in education" carried out by the social and market research centre "Latvijas Fakti", pedagogues consider the insufficient number of computers and lack of financing as the main obstacles to integration of ICT into education, while the interest of teachers and state support are mentioned as contributing factors. In the last years no finances from state budget are granted for acquisition of new computers and replacement of outdated computers, hence there is a risk that the attained level will be lost gradually. At present, computer parks are mainly replenished and renewed from local government funds.

In 2004 computer training for adults was provided by 78 institutions where the number of persons to be trained was 9.7 thousand (REPORT, 2005).

TECHNOLOGY AND ICT

According to the data of the Latvian Central Statistics Bureau (CSB) survey "Computer and Internet Usage in Households", 57% of all households (households where at least one person in the age of 16–74 years lives) had computers and 53% of households had Internet connection in 2008. 63% of inhabitants used a computer on a regular basis (within the last 3 months) (persons in the age of 16–74 years) and 61% of inhabitants used Internet. 40% of all households had broadband Internet connection. In order to get access to Internet, desktop computers amounting to 42% were most used by households, as well as mobile phones with Internet capabilities amounting to 20% (LRSTAT, 2008, LRSTAT, 2009).

In January 2008, 93% of all companies having 10 and more employees had computers, 86% of such companies had Internet connection and 41% of companies had their own Internet website. 54% of companies having 10 and more employees used Internet for communications with the public and local government institutions. 31% of all employees of companies used computer on a regular basis, while Internet was used regularly by 27% of employees.

At the beginning of 2007/2008 academic year, the number of computers per 100 full-time students at higher education institutions and colleges was 13.5, (9.7 per 100 students at professional education institutions, but 8.2

computers at comprehensive schools). 100% of higher education institutions and colleges, 89% of professional education institutions and 99.6% of comprehensive schools had Internet connection.

According to the CSB data, the share of ICT1 sector within GDP reached 5.5% in 2007. In 2007, 3077 companies operated in the ICT sector in Latvia, which employed 25 562 persons, company turnover reached LVL 2.7 billion, staff costs – LVL 167 million. The value added of ICT production reached LVL 29 million, provision of ICT services – LVL 644 million. The external trade balance of ICT was negative: LVL -360.9 million, because the imports exceeded exports considerably, which were LVL 508.1 million and LVL 147.2 million respectively.

Computerization of the education system since 1997 in accordance with contracts entered into by the Ministry of Education and Science (MES) implemented the Latvian University of Latvian Education Computerization System Project. The project provided for the development of teaching materials, greater use of IT tools to improve teaching effectiveness, teacher training, working with IT, computer teacher professional skills development, educational management software development and implementation of the education system of IT infrastructure management. Overall, investing in the project, more than 13 million lats (18 million EUR), the education system has made significant achievements in various fields, but it still exists and is facing significant challenges in each of these areas.

The developed software provides overall management of functional requirements. The software user interface follows the best practices in similar applications development as well as internal standards for common viewing software, forms, etc. elements of design. The end user evaluation of the management software (usability needs of schools, convenience of use and the most topical issues, user training) is generally good and satisfactory.

2004/2005 training in general education for 100 students was on average 6.9 computers, which were used in teaching. This figure is two times less than the EU average. In addition, the computers of those only 23% have a satisfactory capacity (IBM PC Pentium III or capacity equal to or more powerful) and 43% - partly satisfactory (IBM PC Pentium II, Celeron or Pentium equivalent in terms of capacity). The remaining 34% is morally and physically outdated and practically unfit for normal training process. At least one work station to any general education institution, but the 101 school,

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where students learn compulsory subject Informatics is just outdated computers. Obsolete software is also standard. Mazskaitlīgo ICT available in schools due to the busy hours of computer teachers in other subjects actually has little opportunity to use their school datorparku hour delivery.

Very uneven and on average they have insufficient access to computers at universities and colleges. Large public universities are also 6,5-7 computers per 100 students. Latvian National Defense Academy every student has his own computer, and Jekabpils Agrobiznesa college - 33 computers per 100 students, while the Latvian School of Sport Education - 1.8 computers per 100 students. Private universities and colleges have an average of 5 computers per 100 students.

Educational institutions Libraries, which could serve as an important information resource center, is insufficiently secured by computer equipment. 798 general and professional education institutions libraries are available to users with only 655 computers.Satisfactory broadband internet connection (512kbps or more) is only 33% of education authorities and partly satisfactory connection (128kbps-512kbps) -19% of education institutions, while 47% of educational institutions not connected to today's requirements, but 45 schools internet connection is available. Only 60% of education institutions libraries are provided an Internet connection. Individual schools connected to the quality or stability is assessed as unsatisfactory.Now all Latvian biggest Higher Educational establishments widely use different e-learning technologies and tools.

The University of Latvia is using Moodle (WebCT CE 4 support for LU e-learning environment was canceled on the 26 of January, 2008) in its E-University project.

The University of Latvia maintains the localized copy of Open Source Learning Management System (LMS) Moodle. Translation has been carried out by University of Latvia, Riga Technical University and company Tilde, based on work of: Girts Ozolins (girts@pic.lv) and Ivan Ribakov (see http://www.lu.lv/e-universitaate).

The Distance Education Study Centre (DESC) in Riga Technical University (RTU) was founded in the framework of PHARE Multi-Country Cooperation project in Distance Education. The Centre is a structural unit of RTU and was founded in 25 June 1997 by a resolution of the RTU Senate.

The aims of the Centre are to develop life long learning and distance education in Latvia and to research eContent/e-learning related knowledge society technologies.

The other functions of the centre are: o administers a PhD program "E-learning technologies and management"; organizes the development and adoption of e-learning / distance learning courses in Latvian universities: to manage the delivery of e-courses that involve the academics of RTU as well as those other higher education institutions. Now RTU is using Moodle (moving from BlackBoard) product. New projects are started, including Interactive and Internet TV usage for educational purposes.

The Director of RTU Distance Education Study
Centre is Dr. Atis Kapenieks

Transport and telecommunication Institute (TTI or TSI in Latvian) supports e-learning as a part of academic study process during more then five years. Responsibility for the Moodle system maintenance and users support has the TTI IT Departments. The TTI on-line study team (Anatolijs Ressins, Aivars Muravjevs, Lev Fainglos, Konstantin Nechval and Nadezda Fila) is leaded by professor Boriss Misnevs. In 2008/2009 study year there were more then 140 registered e-learning courses for 14 accredited academic programmes. TTI has no dedicated distance only programme and implements different types of blended learning. Several professional e-learning courses are accessible for TI students at TTI IT Acadmy (see http://e.tsi.lv).

College of Business Administration (Biznesa vadības koledža) is providing first level Professional higher education in the form of distance education. The duration of studies at CBA is 2.5 years.

At the moment the number of students at College of Business Administration is more than 1350. It is the only distance education college not only in Latvia but also in the Baltic States. The Headmistress of College of Business Administration: the Doctor of Economics, the Doctor of Philology, the Head of Latvia's Distance Learning Centre, the European Union distance education and adult education expert Ineta Kristovska (see http://www.bvk.lv/en).

There are no real e-learning content market in Latvia so far and therefore no demand for content suppliers exists.Most universities develop their own e-learning content and web-based courses, while some are also involved in larger-scale projects. We also see that the diversity of cultures is reflected

within the e-Learning materials (Russian and Latvian). For example, *Turība* developed its own LMS; however, at the moment this is outdated, and they are researching options to develop or acquire a new system. (Kiscenko 2000, Kiscenko, 2002)

At the moment, two major Latvian R&D projects are supported by the European Regional Development Fund (ERDF). Liepaja Academy of Pedagogy is working on innovative solutions for programme engineering games to develop knowledge society skills. RTU, and more precisely, their Distance Education Study Centre (DESC), is working on research into mLearning (mobile learning) possibilities in Latvia.Some companies also provide ICT training both online and offline.

This is mainly aimed at companies that want to improve employee ICT skills. It is possible to obtain an ECDL certificate along with many other certificates acknowledging skills for different programmes and systems. The biggest provider of these courses is the Baltic Computer Academy (BDA), which provides both online and onsite trainings.

European Funds are the biggest source of finance for e-learning development in Latvia. Projects related to e-learning are often supported by the ERDF or the ESF. They have been the source of resources for projects for almost all target audiences. Many formal education institutions have modernized their equipment, thus introducing aspects of e-learning only due to available support. European Funds have also financed R&D projects in RTU DESC and Liepaja Academy of Pedagogy, as well as some projects organized by NGOs (Kalis, 2008).

Those companies that want to develop their own computer-based courses can buy ready-developed frameworks that have to be filled with content. Some universities use Blackboard or WebCT technologies, but it is also possible to use original applications developed in Latvia. The best-known is ETeacher Pro, a computer-based education information system developed by SIA Insolentia (see http://www.insolentia.lv).

This is a tool for computer-based course development, organizing and controlling use of the courses, testing and analyzing the results of users, as well as assessing the impact of courses. It also provides a localized solution. Apart from English, this application is also available in Latvian and Russian (Kalis, 2008).

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E-LEARNING AND ICT INTEGRATION

Schools
E-learning is not yet very popular in elementary and secondary schools in Latvia, mostly because of lack of facilities and teachers' own education in this sphere. Elementary and Secondary schools play an essential role in ensuring digital literacy among young people. The mandatory "Informatics" programme has been introduced in both elementary and secondary schools. In secondary schools, the programme is in line with European Computer Driving License (ECDL) standards. In this programme, students learn how to use computers, the Internet, and the most common programmes such as Word and Excel.

The use of e-learning itself is highly dependent on initiatives of schools themselves. So far, 144 schools in Latvia have joined the eTwinning network (E-TWINNING, 2009), while the 20 ongoing projects are financed by the European Commission. Sometimes teachers also encourage use of ICT in the learning process, e.g. to use the Internet to search information on a subject, or to use LIIS resources. The Latvian Education Informatization System (LIIS) project covers the whole information grid: education content, management, information services, infrastructure and user training at several levels – schools, school boards and Ministry of Education and Science. (LIIS, 2009).

Technical Education and Vocational Training
According to highly positive Eurostat data about e-learning in Latvian enterprises, e-learning in workplace training in Latvia substantially exceeds the level of e-learning in workplace training in Europe. Approximately 29% of all were enterprises used e-learning in workplace training in 2005 – slightly less than in 2004 (EUROSTAT, 2005). By comparison, the average EU figure was 21%. As much as 55% of all large enterprises used it, while a considerable part – 29% of Small and Medium Size Enterprises - also used it as a tool for training. However, the same Eurostat data show that only 6.0% of employees used the Internet for educational courses related to employment opportunities; the corresponding EU average was 10.6% (EUROSTAT, 2009).

A good example of e-learning used in the workplace might be a course provided by the Baltic Computer Academy (BDA) to the Treasury of the Republic of Latvia. In this course, trainees learn basic use of computers,

which they do from their workplace. The Treasury covers half the tuition fee, which is a good incentive for their employees, who can also plan their own time. Educators in the BDA also provide on-line assistance. This way the groups can be bigger, scattered around Latvia, and, especially with the support of their employer, workers can access an affordable ICT literacy course. (Kalis, 2008).

Higher Education
E-learning development has also brought some higher education institutions closer, enabling cooperation. Results of such co-operation were highly visible at the end of 2006 – seven higher education institutions – RTU, LU, the Latvian University of Agriculture, Ventspils University College, Riga Technical College, Daugavpils University, and Rezekne Higher Education Institution -received European Social Fund (ESF) support for 27 projects related to improvements in infrastructure and quality of studies. These projects will mainly introduce modern technologies along with approaches to learning using these technologies, allowing students to take full advantage of e-learning. The total budget of the 27 projects is LVL 4.37 million (EUR 6.24 million), with 75% ESF financed, and the remaining 25% by the Latvian government (Kalis, 2008). Some numbers from Eurostat (Eurostat, 2009) may be used to describe situation with part-time students who are most interested in usage e-learning approach. More than 30 % of students in Latvia are part-time students. In Sweden, just over half of students are part-timers.

But there are five countries where the share of part-timers is null or negligible (Greece, France, Italy, Cyprus and Turkey).Four higher education institutions offer accredited web-based distance education programmes as a means for distance education. These institutions are Hagen Distance Learning University, Riga Study Centre, Turība, ViA, and the Business Management College.

The first full study program in online format in Latvia (Kiscenko, 2001) was designed and copy rights owned by the School of business administration Turiba in 2002. Courses could be found in www.studijas.lv. It is a professional study program in Latvian for 4 year studies. There are altogether 40 study courses (subjects) and 120 tests during years of studies. In all courses final examination is face-to-face.Program covers subjects from the field of Business Administration, Advertisement Administration and Financial Accountancy.

The graduates of Business Administration programme can enter MBA (Master Business Administration) without examinations.Turiba is using its own developed virtual learning environment. The learning environment is designed to comply with the needs of pedagogical approach and at the same time taking into account limited bandwidth and ICT skills of learners. At College of Business Administration you have a great opportunity to get first level Professional higher education in the form of distance education.

The accredited distance study programs are: „Organization and Management of Institution Work" – the qualification office administrator „Commerce" – the qualification marketing and business specialist „Personnel Psychology and Human Resource Management" – the qualification personnel specialist, Accountancy and Financial Planning" – the qualification financial specialist.

Lifelong Learning
A national programme the Development and Implementation of a Lifelong Learning Strategy has been developed and approved within the framework of European Social Fund. The programme will provide education planning in line with regional economic development plans to reduce social and economic disparities. Regions will have an opportunity to get the necessary support for the development of human resources.Latvia, as an EU member state, has undertaken obligations to implement the goals set in the Lisbon strategy, and by 2010, together with other EU member states, create the EU economy which is the most competitive and dynamic in the world. The current situation in the Latvian and EU labour market requires lifelong learning and improvement of professional skills, and this process is being more and more supported both by the state and employers. When implementing a national programme Development and Implementation of a Lifelong Learning Strategy aimed at the development of lifelong learning, a uniform state strategy for lifelong learning and its implementation programme will be developed; organizational, informative and educational support for the development of lifelong education programmes in regions will also be provided (Claster, 2009). The national programme the Development and Implementation of a Lifelong Learning Strategy includes seven projects:

- the development of a lifelong learning strategy and action plan (a national level project);• regional lifelong learning support system development and capacity strengthening projects (6 similar regional projects covering the whole territory of Latvia).

The implementation of these projects will ensure cooperation among education institutions, adult education centres, local governments, employers and trade unions to promote education accessibility, quality of adult education services and competence of local governments, to plan the development of human resources in line with economic development perspectives of local governments. The most important task of regional project coordinators is active involvement of all regions in project activities, as well as the provision of informative, educational, organizational and technical support to promote activity of regional lifelong learning coordinators. The mentioned activities will ensure the creation of a functioning lifelong learning cooperation network. At the same time there is no regulated requirement on life long learning in Latvia. But continuing education centers of universities and private training centers serve also as life long learning centers (Kalis, 2008).

RESEARCH AND TRAINING IN E-LEARNING

The portion of e-Learning education in total education demand of Latvian education system is gradually increased. Latvian universities provide new educational technology environments for the students. Blended learning and Internet TV is considered as the most important learning setting for Latvain Universities in the next years. Computer based technologies will remain the most dominant learning environments for the next ten years. The Internet will be the main teaching setting in the coming ten years in Latvia by increasing Internet based trial exams, Information Management Programs and Internet based drill and practice software.

In Latvia, the most probable case for companies dealing with e-learning will be the approach used by businesses working with open-source software – most revenue will be generated by services. The main reason for this is that the market is too small to hope for large-scale sales of a standardized product. For example, in the case of eClass, all revenue at the moment is generated by SMS notifications to parents about grades and other news about their children in school, with DEAC providing an administration package to schools free-of-charge.There are still many issues to consider; how to prepare the e-learners for self-managed, collaborative, technology-based learning; how to train faculty in the new technologies, methodologies and research practices; how to persuade politicians and administrators to write legislation and bills that will support open education; how to improve the technological infrastructure and services'.

Most research in the field of eLearning and Distance learning are carried out in the form of master or doctorate research or by individual academics. See publications by Latvian University, Riga Technical University and Transport and Telecommunication Institute academic staff (for example, http://www.tsi.lv/?id=6&lang=en&ct=2&cid=6&r=2961&top=0) Distance Education Study Centre (DESC) in Riga Technical University (RTU) was founded in the framework of PHARE Multi-Country Cooperation project in Distance Education. The Centre is active in and promotes international research and development in eContent related projects. The RTU DESC team has since 1998 implemented more than fifty eContent/eLearning development and research projects that promote the priorities of knowledge society technology development. These include:

- Multimedia eCourse development for open distance learning with audio, video and interactive technologies;
- Research into learners' satisfaction of eCourse delivery;
- Research of learners' behavior using open public courseware;
- Regional development projects with inclusive and innovative applications of mLearning and tLearning;
- Provide leadership to Latvian universities to develop an eLearning network,
- To create knowledge management solutions for public organizations;
- To design high quality multimedia courses on basic skills (IT, business, communications and English);
- To develop innovative life-long-learning approaches;
- To promote open source principles for advanced courseware.

The Director of RTU Distance Education Study Centre is Dr. Atis Kapenieks (http://www.vu.lv). The other functions of the centre are: to administers a PhD program "E-learning technologies and management"; organizes the development and adoption of eLearning/distance learning courses in Latvian universities: to manage the delivery of e-courses that involve the academics of RTU as well as those other Latvian higher education institutions.

CONCLUSIONS

The Latvian education systems have been globally changing during the mid 90s, when the internet services were introduced and adopted information, communication and educational technologies for develop teaching and

learning processes with an aim of providing contemporary education on demand to the learners.

In Latvia, the most probable case for companies dealing with e-learning will be the approach used by businesses working with open-source software – most revenue will be generated by services. The main reason for this is that the market is too small to hope for large-scale sales of a standardized product.

There are two main challenges here. One of them is Public-Private Partnership – how to create a synergy between the government vision of the direction of e-learning development and the actual execution of e-learning projects by companies. How much should be invested by the government and how to find mutually beneficial co-operation opportunities? Another problem is connected to R&D. Many companies are neglecting R&D because they cannot afford to invest money now for higher future profits due to cash flow problems and risks. In order for Latvia to really become an innovative knowledge economy, it is important to find the best way to support companies willing to do R&D.

There is no regulated requirement on life long learning in Latvia. But continuing education centers of universities and private training centers serve also as life long learning centers.

Developments about identity, or more precisely, verification of identity, in the future might be much more interesting. At the moment almost all e-learning courses that issue credible certificates require that at least the final exam is taken on-site, instead of the Internet.

This could be changed by developments in identification systems, such as the electronic signature that started working in Latvia in September 2006, as well as wider availability of web-cameras, which should allow monitoring of the testee. At the moment this still poses considerable uncertainty, but systems to solve these issues can and should be developed (Kalis, 2008).

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CHAPTER-18

eLEARNING IN LEBANON

Patterns of E-learning Development in Lebanon's Mosaic Educational Context

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ABSTACT

This chapter is set to trace the development of e-learning in schools and higher educational contexts in Lebanon utilizing information obtained from policy papers, national reports, journal articles, and national statistics. In addition, three case studies are presented as examples of e-learning development in higher education.

While this chapter shows the prism favoured by education policymakers to integrate e-learning in educational contexts, it depicts numerous obstacles that confine its integration to certain contexts and targets, often reverberating the digital divide. The documented obstacles, however, did not detract this chapter from exploring possibilities for e-learning integration in educational contexts in Lebanon.

As the topic of e-learning continues to attract the attention of practitioners, policymakers and researchers, this chapter attempts to make an incremental contribution to e-learning experiences from a Lebanese context-dependent perspective.

INTRODUCTION

Complex historical antecedents gave today's Lebanon a predominant multi-confessional character that made it distinguishable from its neighboring states. The social fabric of the country represents a patchwork quilt of 18

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different Christian and Muslim religious sects that represent the main actors of Lebanon's controversial, often disputatious political arena. Political affairs are generally regulated by various political power-sharing formulas defined by informal or formal pacts[1] , and acknowledged by the country's influential confessional communities. The political system is described as consociational, i.e., a 'fair weather model' (Hanf, 1993) or a sort of 'live and let live' (Bashshur, 1988) pattern for multi-communal coexistence.

Lebanon's consociational model has clear implications on its educational system in that it is structured into private and public institutions which pronounce the country's social mosaic and thereby accentuates diversified educational policies and practices. Amidst this diversity, the development of e-learning in higher educational institutions[2] represents a focal point for consideration, particularly in light of existing gaps in students' access, the digital divide among these institutions and regions, and the staunching support of higher education to traditional styles of pedagogy in education. Other areas of concern pertaining to the development of e-learning relate to culture and infrastructure.

These concerns, however, do not rule out documenting important e-learning developments that took place in higher educational institutions in Lebanon over the last two decades. Therefore, e-learning development in higher education in terms of obstacles to implementation and opportunities for greater use in teaching and learning is the subject of this chapter. Although the focus of this chapter is on e-learning in higher education, reference to the use of Information and Communication Technologies (ICTs) in the education practice in schools will be offered as well in order to provide a panoramic picture of e-learning integration in Lebanon's formal educational landscape.

This chapter is set to share the Lebanese experience of e-learning development with policymakers, managers, practitioners and researchers from different geographic regions and cultural backgrounds. Although the extant research on e-learning conducted in Western contexts (e.g., Benson et al, 2002; Banks & Ainley, 2003) are replete with examples of opportunities and constraints for e-learning development, there is no *a priori* reason to suggest that research findings reported in Western educational contexts are generalizable to Lebanon, neither is there a suggestion that findings obtained from the Lebanese experience are applicable world-wide.

Rather, findings reported in this chapter seek to provide an incremental contribution to the understanding of e-learning development as a context-dependent phenomenon and as an experience in its own right.

The data collected for this chapter came from the following sources: policy papers, national reports, journal articles, Websites of selected higher educational institutions, the Center for Education Research and Development (CERD), and other relevant sources.

In addition to this introduction, the chapter is structured as follows: higher education in Lebanon in terms of history, sector, and access; government policies and planning for ICT in administrative and financial sectors, in schools and in higher educational institutions; and case studies of e-learning development in higher education.

The last section draws on lessons learned from e-learning development in Lebanese educational contexts. These lessons can be useful to education policymakers, practitioners, and researchers interested in e-learning issues with implications on teaching and learning.

COUNTRY

Lebanon lies at the eastern end of the Mediterranean Sea bordering north of Israel and west of Syria. The estimated population is 4 million and the extent is 10,452 Square Kilometer.

Like its people, the geography of Lebanon is diversified since it has coastal areas, fertile plains and mountains. Lebanese mountains run parallel to the western coast and cover most parts of the country, while on the eastern border with Syria there is the Anti-Lebanon Range. Between the two lies the fertile Bekaa plain that represents the main agricultural area in the country (retrieved on 27.01.2010 http://www.infoplease.com/ipa/A0107710.html). Historically, the geographic location of Lebanon made it a repository of Western and Eastern cultures as well as a magnet for minority groups.

Historical chronicles (see Salibi, 1965; Hitti, 1957) show that towards the Seventh Century A.D., both Christian and Muslim Shiite minorities fled religious persecution from neighbouring countries and sought sanctuary in Lebanon's rugged and impassable mountains.

Figure 1.
A map of Lebanon

The agglomeration of minority groups gave today's Lebanon a predominant multi-confessional character that ensued in a complex political system characterized by internal fragility and external vulnerability to powers meddling in its internal affairs.

EDUCATION SYSTEM IN LEBANON

Educational institutions in Lebanon are of three types: schools, higher educational institutions, and vocational education and training institutions. These institutions are divided along private and public sectors of education. Schools are of two types: private, which includes philanthropic and foreign schools and public schools which are funded and supervised by the state (Bashshur, 1988). However, officially, schools in Lebanon are of three types. Public (non-fee paying), private (fee-paying) and private subsidized by the government.

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The administration of public schools is centralized and is run by the Ministry of Education (Legislative Decree number 10832, October 9, 1962). On the other hand, private schools are run either by confessional communities, or private association and individuals as legitimized by Article 10 of the Lebanese Constitution of May 23, 1926 and by Decrees number 7962 May 1, 1931 and number 7000 October 1, 1946.

The new framework for education in Lebanon[2] structures the new and current national curriculum into four main cycles. Preschool education is at the lowest educational ladder and includes kindergarten. This cycle is followed by basic education, which is structured into two cycles: six years of primary education, and lower secondary education that lasts for three years. This latter is sub-divided into two options: general education and qualification module-based vocational training. Moreover, primary and lower-secondary education makes up basic education which is normally completed by a student at the age of 15. There remain two main options after the successful completion of basic education. These are: general secondary education leading to the Baccalaureate with four mainstream educational options, namely, socio-economic, humanities, life sciences and general sciences. In addition, there is a separate option which is technical education and vocational training offered for those who would consider vocational education. After 12 years of schooling, students are eligible to apply to higher education.

Higher Education in Lebanon
This part describes the historical development of higher education, sectors, and students' access. A noticeable characteristic of Lebanon's higher educational system lays in its diversity of educational models which pattern either after the American credit-system of higher education, the French, or the Arabic one. The establishment of higher educational institutions in "Petite Liban" or Mount-Lebanon[3] goes as far back as 1866, i.e., 54 years before the declaration of Greater Lebanon by the French mandatory authorities in 1920, 77 years before Lebanon's independence in 1943, and 93 years before the establishment of the state-run university, the Lebanese University (LU). In order to provide understanding of Lebanon's higher education, it is worth tracing the genesis of its historical development having implications on its current characteristic features.

Bashshur (1997) classified the historical development of higher educational institutions into three phases. The first phase, dubbed the colonial period

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which was incepted under the Ottoman administrative reforms known as *Al Tanzimat* (1839-1876)[4] (Salibi, 1965) that took place under the subsequent reigns of both Rashid Pasha and Ali Pasha, higher educational institutions were established by American and British Protestant missionaries as well as French Jesuit missionaries in 1866 and 1887 respectively. These institutions aimed at socializing Lebanese students along Western cultural lines and to find a niche for Western cultural and political presence in the Levant.

The second phase, called the national period, witnessed the founding of the Lebanese national university in 1959; the first state-run university after Lebanon's independence in 1943 and the private Beirut Arab University (BAU) in 1962. These institutions pronounced the drive towards Arab nationalism as a reaction against the legacy of Western colonial influence over Lebanon. The third phase, known as the war-period of 1975-90, marked the splitting up of almost every higher educational institution in Lebanon due to war conditions. During war-time, the splitting of schools and higher educational institutions in Lebanon into branches reflected and pronounced the divisive alignment of the Lebanese along confessional and ideological lines (Khashan, 1992). Bashshur (1988) has concisely described the role of education during that period as a *Mirror of a Fractured National Image*. A fourth phase can be conceived, which is the post-war phase that has been marked by the mushrooming of numerous private higher educational institutions. These institutions were established by either confessional authorities or commercial entities benefiting from freedom of education promulgated in Article 10 of the Lebanese Constitution of 1926. To elaborate, although Article 10 gave confessional communities a constitutional right to run their own private schools provided they did not infringe on public order, private higher education benefitted from the government's *laissez faire* policies and practices robustly rooted in Article 10 of the constitution. *Laissez faire* policies and practices gave impetus to the widening participation of private stakeholders in establishing private higher educational institutions.

Private higher educational institutions sought to cater for the growing number of high school graduates creeping into higher education benefitting from the tendency of parents to place their youngsters in 'private' educational hands (Abouchedid, 1997) as well as from the sharp decline of the academic standards of the non-fee paying Lebanese University as a result of severe shortage of funding meshed with administrative decay and external political meddling in its internal academic affairs (El-Ameen, 2004).

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Sectors

According to the official Website of the CERD[5], there are 37 private higher educational institutions and one public, i.e., the Lebanese University. However, by looking at founding decrees of higher education institutions, we found 42 institutions of which 41 were private and one public. In the private sector, there were 18 universities and the rest 23 were either colleges or institutes. There are structural differences between the private and public sector in terms of students' access, facilities, and quality of education.

Access

Based on statistics obtained from Center of Educational Research and Development (CERD) for the academic year 2006-07, a total of 160,364 students were enrolled in higher education excluding technical and vocational institutions. Considering the population size of Lebanon, the average number of students enrolled in higher education would be 4143 per 100,000 habitants. This average is one of the highest in the Arab region. In addition, the average enrollment rate in education for the 20-24 years age group was 29.7% during the academic year 2006-07 (Kasparian, 2003). However, based on the population size and age group, these two averages remain below those averages in developed countries such as Europe and North America, and less than averages in newly-industrialized countries such as South Korea. Although access to higher education in Lebanon is high compared to Arab states with no significant differences of access between males and females, yet there are discrepancies in access by sector (private, public) and region (among the six governorates).

Access by sector

The number of students enrolled in higher education during the academic year 2006-07 was 160,363, of whom 45% were in the Lebanese University and the rest 55% were in private higher educational institutions. These figures represent a decline by 3% in students' enrollment in the Lebanese University compared to the year 2001-02 which was 59% as opposed to 41% in private institutions, due to decline in the academic standards of the Lebanese University and the establishment of a number of new private higher educational institutions in 1996.

Access by region

In Lebanon, there are six regions or governorates. The Beirut and Mount-Lebanon governorates constituted almost one century ago "Petite Liban" or

Mount-Lebanon, where most educational activities during that period took place. The remaining governorates were annexed to Mount-Lebanon by the French authorities in 1920 and are considered disadvantaged areas and described by many (e.g., Khashan, 1992) as a poverty belt surrounding Beirut and Mount-Lebanon regions. Discrepancies in the rate of enrollment in higher education are evident with respect to geographical locations. According to statistics obtained from CERD for the academic year 2006-07, the enrollment rate for the 20-24 years age group reaches 37.6% in Beirut and 36.8% in Mount Lebanon and drops down by 27% in the North and South and by 21% in the Bekaa plain and Nabatiyeh to the south of the country.

Facilities
Studies that assess availability of technology equipment and facilities in higher educational institutions in Lebanon are scant. Available information suggest that private higher educational institutions enjoy better facilities such as libraries, laboratories, and technology equipments than the public sector, namely the Lebanese University, which operates under derogatory administrative constraints and financial cutbacks. The lack of facilities in the public sector is considered as a main obstacle to capitalizing education on modern styles of pedagogy, and thereby nourishes the adherence of this sector to obsolete styles of pedagogy with little technology use, library resources and laboratory facilities rendered available for students' learning, experimentation and research.

More recently, the Lebanese University conducted a self-study of its work[6]. The self-study report pointed to several quality problems including weakness of reference documents that provide frame works for its work, weakness of data bases and the limited use of available resources to a stagnant bureaucracy, the submission of the university in its decisions to authorities and political influence, lack of professional development for its faculty members scarcity of human and material resources, weakness in teaching and assessment practices. It is worth mentioning that many recommendations were made in the last decades to develop and reform the university by the league of full time professors, or independent academic associations and international organizations (PNUD/UNESCO, 1995).

Quality
There is a bald catalogue of criticism against stagnant curricula, lingering teaching techniques and obsolete educational policies that rendered the

process of learning and teaching nearly inefficient. The most noticeable criticism has been charged against the remarkable failure of higher educational institutions to contribute to the process of social change in the context where they are embedded, by remaining mostly traditional in face of the recent impressive breakthroughs of ICTs in teaching and learning (Kramer, 2000). In fact, criticism of higher educational systems in Lebanon and Arab states is currently leading to greater interest in quality education and evaluation. One of the emerging needs in Lebanon is to assure quality of education, particularly in absence of national frameworks and standards for quality assurance in higher education[7]. Assuring quality education in higher education encompasses, among other things, the use of original styles of pedagogy that can be facilitated by ICT use in teaching and learning. The next part details the government's policies and planning of ICT.

GOVERNMENT POLICIES AND PLANNING OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

With the conclusion of the protracted 1975-90 war, Lebanon has embarked upon a policy of national reform in stipulation of the Charter of National Reconciliation known as the Ta'ef Accord, signed by Lebanese parliamentarians in 1989. Formal initiatives to integrate ICT in Lebanon took two shapes: the first was to integrate ICT in the administrative, business, and financial sectors, where the second targeted educational institutions, particularly schools.

In the public administration, business and financial sectors
ICT integration in the Public Administration was first established under the National Administrative Reform Program (NARP). The Office of the Minister of State for Administrative Reform (OMSAR), established in 1993, was given responsibility of leading e-government initiatives through technical assessments, preparation of specifications, and outsourcing functions. According to Baroud (2006), in 2002, OMSAR assisted by the United Nations development Program (UNDP) expanded its targets to the formulation and mainstreaming of a national e-Strategy which sought to expand ICT as a tool for enhancing decision-making capacity in government, promoting a citizen-based administration, increasing digital inclusion, as well as enhancing coordination and linkages with other UNDP/civil society/private sector programs in the area of ICT. Other ministries have initiated actions pertaining to ICT integration such as the Ministry of

Finance, Public Work, Industry, Economy of Trade, and the Ministry of Telecommunications.

These ministries have been the principal actors for promoting ICT in the public sector through the gradual implementation of the initial steps with the help of international organizations and governments such as the World Bank, the UNDP, and the EU. Policies that sought to integrate ICT in the public sector were accompanied by initiatives undertaken by the private sector.

Among these initiatives was the publication of almost all newspapers electronically with free access, main TV stations are present on the web with integral retransmission of their daily newsreel, IT companies organize and conduct training programs targeting their staff and some of their customers to introduce ICT; teaching in many reputable and leading institutions of higher education started to shift their styles of pedagogy from teacher-centered to student-centered learning as facilitated by ICT use.

In line with the various strategies, policies and actions taken to integrate ICT in the works of public sectors, there has been an observable development of ICT infrastructure, growth of PC owners and Internet users. As for e-learning penetration, available statistics show a fluctuating perpetration from 2005 to 2007 (figure 2. below).

Figure 2.
E-learning penetration
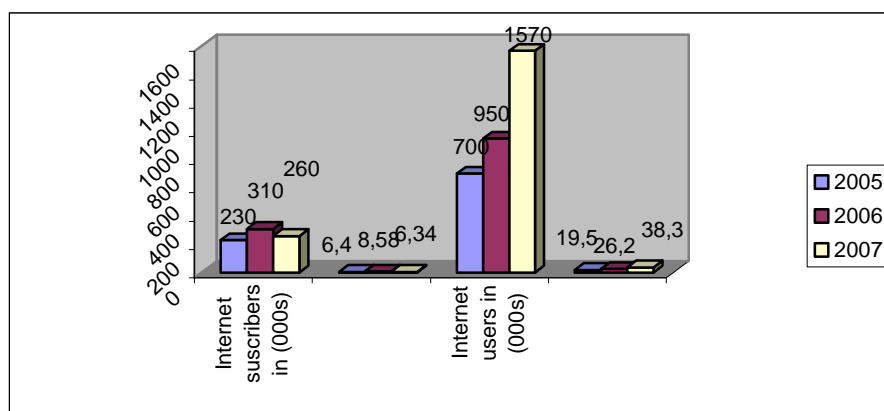
Source: *International Communication Union* (ICU), 2008.

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In schools

According to statistics provided by CERD, during the academic 2006-07 there were 2812 schools in Lebanon which accommodated 917,877 students. Figure 3 and figure 4 show the distribution of these schools by sector and students.

Figure 3.

Distribution of schools by sector

1040 — Private fee-paying
1393 — Public
379 — Private subsidized by the government
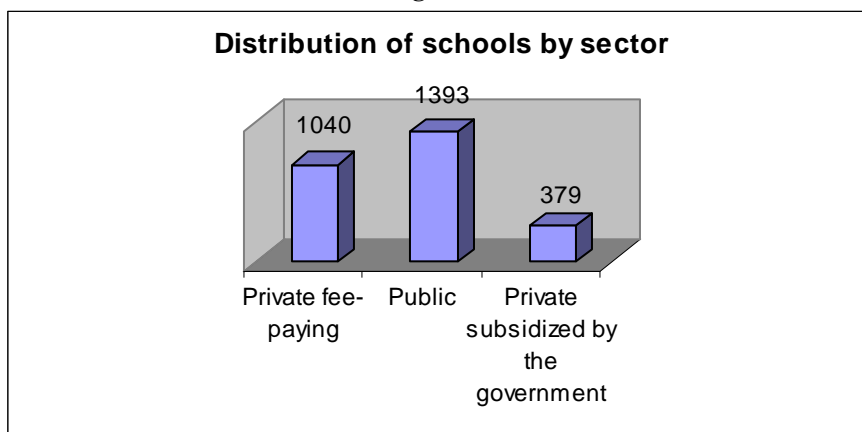
Source: *CERD, 2006-07*

Figure 4.

Percent of student distribution by sector

51% — Private fee-paying
36% — Public
14% — Private subsidized by the government

Source: *CERD, 2006-07*

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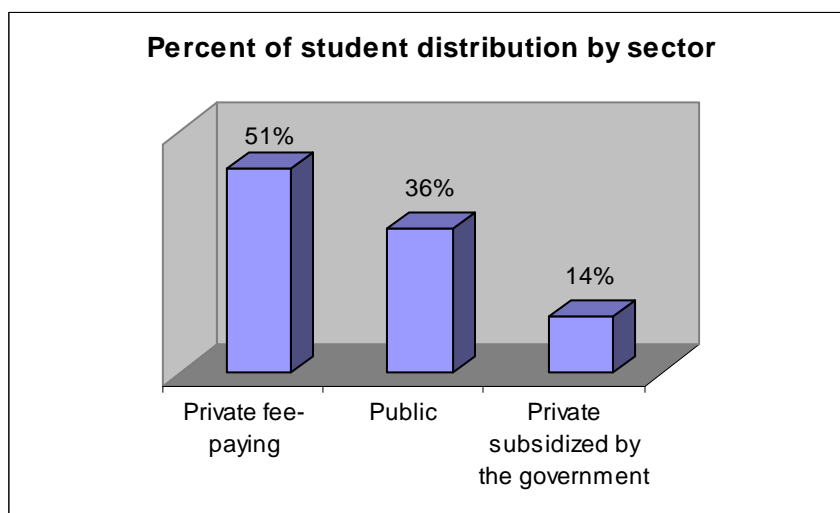
The majority of schools in Lebanon are public. Because of the degrading physical conditions of these schools and their declining educational standards, parents opt to enroll their children in the private sector.

Only 14% of students are enrolled in the private subsidized schools since they do not have a complete educational ladder.

According to the law all schools in Lebanon should follow the prescribed national curriculum. In 1997, a new national curriculum was introduced in Lebanon to replace the 1968 curriculum, i.e., after 29 years of stagnant education in schools. One of the significant achievements of the new curriculum was the introduction of Information Technology (IT)[8] as an instructional subject emphasizing the teaching of the most common computer skills and concepts, and encouraging the use of computers in teaching/learning other subjects.

The IT was to be offered for one hour per week to Third Cycles (Grade 7 through 9) of basic education and throughout the various sections of the Secondary Cycles. After assessing the degree of success of IT courses, teaching of IT was extended to all educational cycles of basic education which constitutes 12 years of pre-university education.

However, due to lack in ICT teachers and proper IT administration and maintenance of the ICT labs and equipment, ICT in teaching was not introduced as a mandatory material nor considered as part of the official national examinations and it became at the school's own assessment and capabilities to apply the curriculum.

Only 20% of public schools have incorporated IT in their curriculum (MEHE, 2008). As for e-learning, in the early 2000, a project called SchoolNet[9] was established (retrieved on 27.01.2010 http://www.schoolnet.edu.lb).

This project is considered the first of its kind being an education portal that aims at interconnecting all public and private schools and establishes libraries connected with the MEHE over a stable telecommunications infrastructure with a gateway to the global Internet. One of the objectives of this project is to provide a knowledge-based society by providing continuing education through multimedia learning, facilities and resources.

The ultimate goal is to expand the SchoolNet coverage to cover all public and private schools over direct communications connections.

Although this project is still in the implementation process, it sounds quite ideal being detached from the grim reality in schools characterized by severe shortage of ICT facilities and rampant digital divide across public and private schools and between regions.

In fact, evidence points to the existence of a digital divide among schools and regions in Lebanon that makes the integration of ICT in the teaching and learning processes both inequitable and inadequate due to shortage of facilities and lack of proper ICT administration and maintenance.

Further, the lack of teachers' knowledge and skills in using ICT in teaching is yet another obstacle that deters students from accessing the opportunity for active learning as facilitated by ICT use in the education practice. The sections below shed light on the digital divide and teachers' knowledge and skills in ICT use.

The Digital Divide

As part of the ICT policy initiative, computers and communication networks (Intranet and Internet) were introduced gradually into both private and public schools.

However, a digital divide which denotes that there is a disparity in terms of access to the information about and subsequent use of ICT (Choudrie et al., 2009) was evident in the distribution of ICT facilities across private and public schools with the former having more technology equipment and facilities than the latter.

In order to measure digital divide between private and public schools, we calculated the average student-to-computer ratio by using the ISCED level 1-3 equation provided by UNESCO institute of measurement[1]0. The following equation was used: $(\sum LC \Big/ \sum CP)*100$ where LC is the number of students and CP the number of computers. The most updated figure on students' enrollment in schools was for the academic year 2006-07 as provided by CERD. The number of computers was provided for the same academic year by CERD excluding computers in the semi-subsidized schools.

Therefore, analyses were limited to the public and private fee-paying schools. Table 1. shows the distribution of ICT facilities in public and private schools.

Table 1.
Distribution of Technology Infra-structure in Schools (CERD, 2007)

	Private (1040 school)	**Public (1393 school)**	**Difference**
Computers	17,542	9,779	7,763
Servers	310	268	42
Printers	1,845	1,016	829
Hubs	852	410	442
UPS	4,918	4,809	109
Scanners	606	450	156
LCDs	498	236	262
Modem-fax	931	395	536

From table 1 and the number of students enrolled in the private and public sectors in all educational cycles, excluding those in the semi-subsidized schools, every 33 students have access to one computer (33:1) in other words, only 2.6% of students have access to one computer, whereas in the private sector every 27 students have access to one computer (27:1), or 3.3%. Although the ratios provided neither represent a measure of actual use of computers in schools nor of time spent by students in using computers, they still represent a slight divide in students' access to computers between private fee-paying and public schools. In addition, student-to-computer ratio sharply fall behind comparative ratios for the year 2007 in the United States of America which is 3:1 and are similar to those in Russia (33:1) and emerging states such as Serbia whose student-to-computer ratio is (33:1) (Voogt, 2008).

Compared by governorate, discrepancies appear in the school-computer average between private and public schools. The highest discrepancies appear in Beirut and Mount-Lebanon governorates while the gap between public and private schools narrows in the rest of the regions, mostly inhabited by communities from low socio-economic backgrounds (see figure 5).

Figure 5.

Average of computers by school in governorates in public and private schools
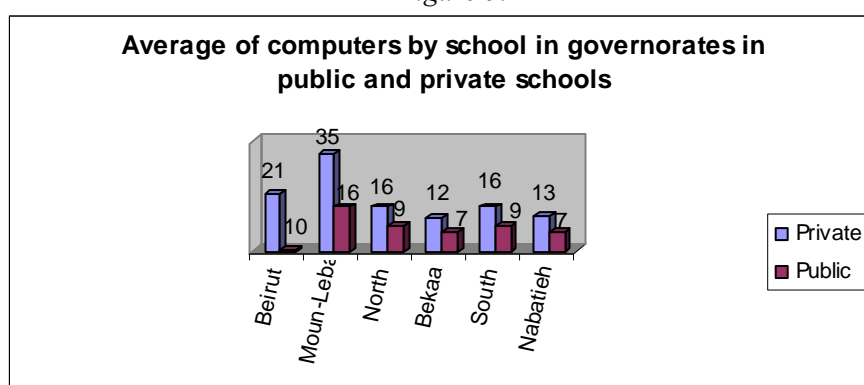
Source: *CERD, 2006-07*

Teachers' Knowledge and Skills In ICT Use

Since the implementation of the new national curriculum of 1997, schoolteachers received training on ICT to develop their information and technology skills and apply them in their teaching in the classroom. However, because more than 56% of schoolteachers in Lebanon do not hold university degrees and hence lack the adequate preparation for using modern and innovative styles of pedagogy in the classroom, they remain unqualified to capitalize on modern teaching facilitated by ICT. Besides, due to the lack of ICT facilities and poor maintenance of existing ICT equipment in schools, the use of technology for pedagogical purposes in schools remains deficient.

In higher education

In Lebanon, the concept of virtual universities does not exist due to restrictive rules and regulations in which the licensing of distance learning or on-line learning programs is not granted by the MEHE. However, some piecemeal initiatives have been undertaken for on-line learning programs/distance learning degrees in a very limited number of higher educational institutions. Some universities have engaged themselves with affiliations with universities abroad such as the "Ecole Superieur des Affaires" (ESA) whose graduates would attend courses in the university campuses in Lebanon and then receive their degrees confirmed from the affiliated university (as is the case European School of Management in France).

In addition, the Lebanese University has also established masters program in affiliation with the Toulouse University, through which students receive their lectures from Toulouse University's faculty members, who visit Lebanon on semester basis. However, due to the unstable political conditions of Lebanon, particularly after the July war of 2006, faculty members from the Toulouse University were not able to visit Lebanon.

In order to allow the initiative to be completed as agreed, and to overcome the lack of security in the country, a video conferencing set up has been established in the Lebanese University to allow faculty members from Toulouse University to deliver their courses to the LU students from distance[1]1.

A similar case was observed at Notre dame University-Louaize (NDU) in Lebanon during 2005. Particularly, in the wake of the assassination of former Lebanese Prime Minister, Rafic El-Hariri, Lebanon was ignited with blasting demonstrations that ruptured into massive student uprising that captured the international community interested in Middle Eastern affairs.

This uprising has disrupted substantially the higher educational system for the academic year 2005-06. Higher educational institutions have lost so many days that faculty members have scraped up to cut down on the curriculum and assign extra-sessions to the extent that students were requested to attend more than 7 lectures per day. The coalescence of hyper-political changes -a mood of extensive politicization of students- brought the university sector to a halt.

To overcome the unpredictable disruptions of regular classroom attendance, a number of NDU faculty members delivered their lectures to students through the Blackboard (Bb) which is the Virtual Learning Environment (VLE) used by the University.

Thus, VLE served an as an alternative media for teaching in higher education surmounting political conflict that jeopardized students' completion of their educational programs (Baroud, 2008).

Apart from the adoption of VLE by many higher educational institutions during political crises in Lebanon, the ICT use in the form of blended learning is common place in these institutions. In addition, the teaching methodology in some of the leading universities in Lebanon is also

changing, involving a shift in the teaching methodology from teacher-centered learning to student-centered learning, utilizing ICT technologies. In the section that follows, three case-studies of the use of ICT in three private higher educational institutions in Lebanon that pattern after the American system of education are presented.

CASE STUDIES

The three studies described below are based on data collected by the authors from desktop search and available research articles.

The American University of Beirut (AUB)

The American University of Beirut (AUB) which was established in 1866 by American Protestant missionaries is the oldest higher educational institution in the Arab region. AUB is considered as a leading higher educational institution that is modeled on the American system of education and uses English as medium of instruction.

According to Souto-Silva (2005), AUB invests heavily in ICT for teaching and learning across all faculties at the university. Although the university is the oldest in the region, the use of ICT in its educational programs is considered as new compared to the age of the university. During the year 2000-2001, the university established the Academic Computing Center (CCC) which was responsible for providing teacher-training on the use of ICT in teaching. Continuous training aimed to equip faculty members with ICT tools for use in their teaching and scholarly activities and particularly research since the institution relies heavily on research for hiring, firing and promotion of faculty. Firstly, access to computers and software such as PowerPoint, Word, and Excel, FrontPage, and Internet facilities were provided to all faculty members, students and staff members. The use of these tools was made primarily to facilitate teaching and learning. In 2002, training developed to include the Blackboard (Bb) with emphases on synchronous and asynchronous learning to facilitate learning and research among students and faculty members.

A recent survey on the use of ICT at AUB conducted by Souto-Silva (2005), showed the general satisfaction of faculty members and students with the use of the various forms of technology in teaching at the university. However, the study showed that a large number of faculty members were skeptical about the utility of Bb and other tools in achieving course objectives. In addition, the survey pointed to a main question as to whether the use of technology is

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enhancing students' learning and therefore, achieving desired competencies such as critical thinking among students.

The Lebanese American University
The Lebanese American University (LAU) was founded in 1835 by American Presbyterian missionaries as the American School for Girls. In 1924, it was expanded to include a two-year junior college program. Three years later, the college broke away to become the American Junior College for Women. In the early 1970's, the College began accepting a limited number of men into selected programs. In recognition of this changing reality, the College once again changed its name to the Beirut University College (BUC). BUC became fully co-educational in 1975. In 1994, the Board of Regents granted BUC permission to change its name to the Lebanese American University. In 2008, LAU housed 7214 students (http://www.lau.edu.lb/about/facts retrieved on 27.01.2010).

Like the American University of Beirut, LAU capitalizes on technology-based teaching, learning and administration. All students, faculty members and staff have full access to Internet facilities, email and computers that are used in teaching, research. In addition, the university has an e-reserve system which facilitates online registration. At present, the university uses WebCT as a course management tool in addition to Bb in teaching and learning. However, the use of Bb is not mandatory since the university is traditional in teaching although some blended courses are offered occasionally (Majdalani et al., 2005).

Further, faculty members have access to e-Pack which is a set of online course material developed by Bb content partners (publishers) to simplify the process of creating and designing courses. e-Packs make it easy for a course instructor to start teaching online without having to design a course from scratch. Moreover, e-Packs provide instructors with fully customizable course materials around which to build their courses. An e-Pack may contain text, multimedia, sample syllabi, lecture notes, glossaries, and quizzes (http://webctmt.lau.edu.lb/webct/RelativeResourceManager retrieved on 27.01.2010).

Besides, the university employs video-conferencing for communication between its three campuses and also for communication with other educational institutions outside Lebanon. Despite the use of technology at LAU, very little is known about ICT applications in pedagogy and whether

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technology deployed on campus serves students learning performance and outcomes.

Notre Dame University-Louaize (NDU)
The information presented for NDU were excerpted and synthesized from a pilot study conducted by one of the authors of the present study as part of his Ph.D. dissertation on e-learning development in Lebanon.

The development of the *VLE* at Notre Dame University-Louaize is relatively fresh since the University itself was established in 1987. The University structure is based on the American-credit system of education and has seven faculties. These are: Humanities, Sciences, Engineering, Architecture Art and Design, Political Sciences, Business Administration and Economics and Nursing and Health Sciences. As of 2009-09 academic year, NDU housed 6000 students enrolled in undergraduate (94%) and in graduate (6%) programs.

With the tremendous expansion of the student body at the University over the years, and based on the need to take advantage of the recent technological advances in education, the NDU's administration has considered to enhance its learning and teaching processes through using *VLE* in the curriculum.

The Fall of 2001 marked the official inception of the *VLE* at the University; the objective was to provide a flexible learning environment to students and to support learning at the University. With the inception of the *VLE* at the University, many faculty members and students have been attracted to the learning opportunities provided by computer technology.

One of the opportunities provided was to offer training to both students and faculty members on the use of technology for the purpose of learning and teaching. As a result, specialists from the Division of Computing Services at the University trained 100 out of 200 full time faculty members. In addition, the majority of students at the University received training.

The training focused on the use of *VLE* to support the teaching and learning process in traditional classrooms. At present, about 71% of faculty members use *VLE* in teaching while the rest are hesitant to use it due to their reluctance to post material on-line, particularly examinations, due to what they report as confidentiality and security issues. In order to gain

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understanding of the development of e-learning at NDU in terms of barriers to implementation and opportunities for a greater use in the educational practice at the University, a semi-structured interview was conducted with 14 academic administrators who comprise Vice-Presidents, Deans, Chairpersons and Directors.

The interviews were conducted in a mood of institutional unrest marked by preparations for change in the leadership at the university, i.e., the election of a new president followed by new appointments. In addition, while the study was conducted, Lebanon was undergoing social and political crises following the assassination of former Lebanese Prime Minister and the unexpected withdrawal of Syrian forces from Lebanon after more than 30 years of military presence. The main interviewing results showed awareness of the uses of technology in education such as software demos, PowerPoint presentations, Internet, programming and lab demos introduced in classroom teaching. This awareness was also substantiated with respondents' call for additional training, provision of equipment in all classrooms, faster access to the Internet and wider accessibility to computer labs. As for future scenarios for implementing e-learning at the university, a Dean said that "all subject and learning activities are encouraged but the use of technology in any area should be studied in order to see its benefits before implementation".

In connection with this, a number of respondents called for adequate budget provision for e-learning, inducing attitude change as well as clarity of vision and tolerance based on a better understanding of education. Another Dean said: "…a good start may be to collaborate and to do research; unfortunately at NDU none of them is applicable for the time being". Another similar view emerged when a Chairperson said "Don't waste your time, if your recommendations wouldn't be looked at, and precise budget for the product is not established". These views, however, did not rule out the importance and timely need for implementing e-learning at the University. As a respondent said:

> *NDU is realizing more and more the importance of e-learning. There is an increased awareness of the positive role of e-learning among faculty/staff and students in teaching and learning. The administration must integrate e-learning in all aspects where it can be used to make a difference. I think we need to motivate our people to use e-learning.*

> *After two years of the pilot study, NDU has made significant trudges into the use of technology in teaching and learning processes and a culture of endorsement for greater use of ICT has permeated the entirety of the behavioral structure of the University. These changes have allowed the University to move slowly, though, from the stronghold of traditional education to a more vibrant interactive learning environment facilitated by ICT use.*

Despite these developments, meager financial resources allocated for ICT, inadequate assessment of the pedagogical benefits generated from ICT use in teaching and learning, and delaying bureaucracies are still considered challenges to full-fledge integration of ICT in the educational practice at the University.

CONCLUSION: Lessons Learned

A number of lessons can be derived the Lebanese experience in e-learning development and ICT use in education in schools and higher educational contexts. At the school level, one of the obstacles facing the contribution of education to building an information society is the delay and slow pace of equipping public schools with computer laboratories and internet access. Another obstacle is the lack of qualified teachers to use ICT in teaching and learning. The lack of ICT equipment and their maintenance deter the integration of ICT in the education practice in schools. Even if equipment is made available, the greatest obstacle will be how to use the ICT in teaching in such a way as to make technology an effective tool that aids students in learning, both in school and at home, and not just in locating information but also in answering questions, choosing relevant information, and constructing knowledge through individual and group efforts.

Thus, the contribution of schools in Lebanon to building an information society remains limited as evidenced in the current IT curriculum which covers only the development of basic skills. In addition, the IT in the curriculum does not aim to develop knowledge, attitudes, and skills needed for handling information or for using information and communication technology in acquiring knowledge in various subjects and domains.

At higher educational institutions, the use of e-learning is mostly blended since the MEHE does not recognize university degrees carried out through distance education, nor does it license distance institutions. While the

majority of higher educational institutions use ICT in education, strong bureaucratic barriers to change are evident among academic administrators and education decision-makers. These decision-makers point out those fiscal pressures on colleges and universities has been increasing in recent years, which is forcing campuses to reduce expenses, particularly on ICT infrastructure. Only higher educational institutions that enjoy a relative wealth being supported by external funding agencies, alumni, student tuition fees and other sources are capitalizing on the latest advances in ICT. However, the outcome of implementing ICT on students' learning in higher educational institutions is still unclear due to the distinct paucity of evaluation and assessment studies on ICT use in teaching and learning in Lebanon's higher educational landscape.

Explanation Notes

[1]   These include the 1926 constitution, the Franco-Lebanese treaty of 1936, the National Pact of 1946, and the Ta'ef accord of 1989 which is a national reconciliation agreement that ended the Lebanese civil war.

[2]   Through this paper we use the term 'higher educational institutions' since the Lebanese Legislative decree of 1961 classified these institutions into universities, colleges and institutes.

[3]   The New Framework for Education in Lebanon is an official policy document of the Ministry of Education and Higher Education. It details objectives, content and outcomes of the new curriculum.

[4]   Mount-Lebanon was a semi-autonomous territory of the former Ottoman Empire.

[5]   The *Tanzimat* are administrative reforms that aimed at organizing various aspects of Ottoman social and political life.

[6]   http://www.crdp.org/crdp/Arabic/ar-creation/a_crdp_cre.asp retrieved on 26.01.2010

[7]   The Self-Study Report of the Lebanese University (2004) (In Arabic). Lebanon: The Lebanese University Publications.

[8]   Vision Document (2007). The Lebanese Association for Educational Studies (LAES), Beirut, Lebanon.

[9]   IT is used instead of ICT to comply with the terminology employed in the national curriculum.

[10]   Cited in the Background document of the Firth Regional Workshop on Information Society Measurement. Rio de Janeiro, 6th-8th April, 2009.

[11]   Economic and Social Commission for Western Asia (ESCWA), United Nations, 2009

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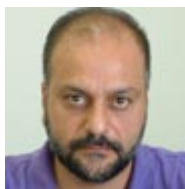
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CHAPTER-19

eLEARNING IN LITHUANIA-I

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ABSTACT

This chapter contains the general information about Lithuania: country description, overview of economical and financial issues, description of education system in Lithuania, case study. The chapter presents the overview of eLearning in Lithuania and the special attention paid on experience in eLearning field at the department of Construction Economics and Property Management of the Faculty of Civil Engineering of Vilnius Gediminas Technical University (VGTU).

COUNTRY

Lithuania, officially the Republic of Lithuania (Lithuanian: *Lietuvos Respublika*) is a country in Northern Europe, the southernmost of the three Baltic states. Situated along the southeastern shore of the Baltic Sea, it shares borders with Latvia to the north, Belarus to the southeast, Poland, and the Russian exclave of Kaliningrad to the southwest. Lithuania is a member of NATO and of the European Union. Its population is 3.6 million. Its capital and the largest city is Vilnius. This year (2009) Vilnius is European Capital of Culture.

During the 14th century, Lithuania was the largest country in Europe: present-day Belarus, Ukraine, and parts of Poland and Russia were territories of the Grand Duchy of Lithuania. With the Lublin Union of 1569 Poland and Lithuania formed a new state, the Polish–Lithuanian Commonwealth. The Commonwealth lasted more than two centuries, until neighboring countries

systematically dismantled it from 1772 to 1795, with the Russian Empire annexing most of Lithuania's territory. In the wake of the First World War, Lithuania's Act of Independence was signed on 16 February 1918, declaring the re-establishment of a sovereign state. Starting in 1940, Lithuania was occupied first by the Soviet Union then Nazi Germany. As World War II neared its end in 1944 and the Nazis retreated, the Soviet Union reoccupied Lithuania. On 11 March 1990, Lithuania became the first Soviet republic to declare its renewed independence.

Figure 1.
Lithuania in Europe map

Prior to the current (2008/9) financial crisis, post-Soviet Lithuania had one of the fastest growing economies in the European Union. Lithuania became a full member of the Schengen Agreement on 21 December 2007. In 2009, Lithuania celebrated the millennium of its name (Wikipedia, 2009). Lithuania in Europe map is shown in Figure 1. Recent historical highlights:

- 1009 the first time Lithuania mentioned in written documents
- 1941 Lithuania have been occupied by Soviet Union
- 1990 Lithuania re-establishes its independence, the first Soviet republic to do so
- 1991 Lithuania is admitted into the United Nations
- 2001 Lithuania is admitted into the World Trade Organisation
- 2004 Lithuania is accepted into European Union and NATO

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Since Lithuania declared independence on 11 March 1990, it has maintained strong democratic traditions. In the first general elections after the independence on 25 October 1992, 56.75% of the total number of voters supported the new constitution.

There were heavy debates concerning the constitution, especially the role of the president. Drawing from the interwar experiences, many different proposals were made ranging from a strong parliamentary government to a presidential system similar to the one in the United States. A separate referendum was held on 23 May 1992 to gauge public opinion on the matter and 41% of all the eligible voters supported the restoration of the President of Lithuania. Eventually a semi-presidential system was agreed upon.

The Lithuanian head of state is the President, elected directly for a five-year term, serving a maximum of two consecutive terms. The post of president is largely ceremonial; main policy functions however include foreign affairs and national security policy.

The president is also the military commander-in-chief. The President, with the approval of the parliamentary body, the Seimas, also appoints the prime minister and on the latter's nomination, appoints the rest of the cabinet, as well as a number of other top civil servants and the judges for all courts. The judges of the Constitutional Court (*Konstitucinis Teismas*), who serve nine-year terms, are appointed by the President (three judges), the Chairman of the Seimas (three judges) and the Chairman of the Supreme Court (three judges).

The unicameral Lithuanian parliament, the *Seimas*, has 141 members who are elected to four-year terms. 71 of the members of this legislative body are elected in single constituencies, and the other 70 are elected in a nationwide vote by proportional representation.

A party must receive at least 5% of the national vote to be represented in the Seimas. Lithuania is situated in Northern Europe. It has around 99 kilometers (61.5 mi) of sandy coastline, of which only about 38 kilometers (24 mi) face the open Baltic Sea and which is the shortest among the Baltic Sea countries; the rest of the coast is sheltered by the Curonian sand peninsula. Lithuania's major warm-water port, Klaipeda, lies at the narrow mouth of the Curonian Lagoon (Lithuanian: Kursiu marios), a shallow lagoon extending south to Kaliningrad. The main river, the Nemunas River,

and some of its tributaries carry international shipping vessels (Wikipedia, 2009).

Lithuania is located in the geographic centre of Europe and has common borders with Poland, Latvia, Belarus and Russia. Lithuania territory of 65,300 sq. km. 70% of its lowland plains and hilly uplands are arable and 27.6% - forested. Lithuania's 722 rivers, more than 2,800 lakes and 99 km of the Baltic Sea coastline. Lithuania is ~3.34 million. (83.5 % ethnic Lithuanians) (Statistics Lithuania, 2009). State Language belongs to the Baltic family of Indo-European languages. Principal religion is Roman Catholics. The map of Lithuania with neighbors countries and largest towns is shown in Figure 2.

Figure 2.
The map of Lithuania

Largest cities of Lithuania are: Vilnius (capital) 542,782, Kaunas 358,111, Klaipeda 185,936, Siauliai 128,397, Panevezys 114,582. Total population ~3.34 million people (Statistics Lithuania, 2009). Several sizable minorities exist, such as: Poles (6.3%), Russians (5.1%), and Belarusians (1.1%).

The indicators describing economic conditions are: Gross Domestic Product (GDP), the inflation rate, the unemployment rate, the employed population by kind of economic activity, the average monthly gross earnings in the whole economy (LTL), and the population by educational attainment.

The average monthly gross earnings are defined as wages and salaries before taxes and statutory social insurance contributions payable by the employee. It includes wages and salaries for work done or time worked, fringe benefits, extra payments, regular and occasional bonuses, payments for free time (vacation, idle-time which is not an employee's fault, other statutory free days). Severance pays and compensations, fines for postponed earnings, dividends, social benefits, meal vouchers, other compensations (for tenancy, public utilities, monthly commuter tickets, etc.), non-repayable loans for construction of housing, sick leave allowances, and other payments of the State Social Security Fund are excluded, etc. (Statistics Lithuania, 2008). Table 1 shows the main economic and social indicators for Lithuania (1 Euro= 3,4528 LTL, July, 2009).

Table 1.
The main indicators of economic and
social development (annual) in Lithuania

Indicator	2003	2004	2005	2006	2007	2008	2009[*] April
Annual average population, thous.	3,454.2	3,435.6	3,414.3	3,394.1	3,366.2	3,354.7	3,343.5
Unemployment rate, by labour force survey data, %	12.4	11.4	8.3	5.9	4.3	5.9	-
Inflation (in December, year-to-year basis), %	-1.3	2.9	3.0	4.5	7.3	10.9	-
Average monthly gross earnings of employees in the whole economy, LTL	1,072.6	1,149.3	1,276.2	1,500.2	2,052.0	2,319.9	-
Gross Domestic Product at current prices, LTL million	56,804	62,587	71,200	81,973.6	77,939	60,265	-

Source: Economic and Social Development in Lithuania.Statistics Lithuania. Vilnius, 2008. 179 p., *Statistics Lithuania, The main Lithuanian indicators, internet access: http://www.stat.gov.lt/lt Retrieved on 26.04.2009

As illustrated in Table 1, the average population and the unemployment rate has decreased in recent years. The main reason is a high level of emigration, especially after the EU accession in 2004 (May 1st). The current rate of inflation is very high, and it prevented Lithuania from joining the euro area in 2006.

Gross Domestic Product has increased and influenced the average monthly gross earnings of employees.

The employment of Lithuanian population by type of activity is shown in Table 2.

Table 2.
Employment in Lithuania by type of activity

Type of activity	2003	2004	2005	2006	2007	2008
Total work force (thous.)	2,319.9	1,620.6	1,606.8	1,588.3	1,534.2	1 614.3
Agriculture, hunting, forestry and fishing (%)	17.9	15.8	14.0	12.4	10.4	–
Industry and construction sectors (%)	28.1	28.2	29.1	29.7	30.7	-
Service and commercial sectors (%)	54.0	56.0	56.9	57.9	58.9	-

Source: *Statistics Lithuania* (2007, 2008)

Table 2 shows that, in general, the total amount of labour force has decreased, and the distribution of labour force by sectors is different. The increase is noted in industrial and construction sectors.

The situation reflects the main trends of the EU economy. The general overview of labour force in Lithuania is shown in Table 3.

	2006	**2007**	**2008**
Unemployed, thousand	89.3	69.0	94.3
Labour force, thousand	1 588.3	1 603.1	1 614.3
Unemployment rate, %	5.6	4.3	5.8
Employed	1 499.0	1 534.2	1 520.0

EDUCATION SYSTEM

According to Invest in Lithuania, Lithuania has twice as many people with higher education than the EU-15 average and the proportion is the highest in the Baltic.

Also, 90% of Lithuanians speak at least one foreign language and half of the population speaks two foreign languages, mostly Russian and English or Polish. Vilnius University is one of the oldest universities in Northern Europe and the largest university in Lithuania.

Kaunas University of Technology is the largest technical university in the Baltic States and the second largest university in Lithuania.

Other universities include Kaunas University of Medicine, Lithuanian Academy of Music and Theatre,Vilnius Pedagogical University, Vytautas Magnus University, Mykolas Romeris University, Lithuanian Academy of Pysical Education, Vilnius Gediminas Technical University, The General Jonas Zemaitis Military Academy of Lithuania, Klaipeda University, Lithuanian Veterinary Academy, Lithuanian University of Agroculture, Siauliai University and Vilnius Academy of Arts (Wikipedia, 2009). The Lithuanian higher education system is shown in Figure 4.

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Figure 4.
The Lithuanian higher education system

LIETUVOS AUKŠTOJO MOKSLO SISTEMA
LITHUANIAN HIGHER EDUCATION SYSTEM

DISTANCE EDUCATION IN LITHUANIA

In 1993, Lithuania joined the PHARE Multi-country Programme for Distance Education. The Minister for Education and Science issued an order

to establish the Lithuanian Centre for Extramural Education (LNSC), which is responsible for implementation of the programme in Lithuania. EU funds for pilot activities within the PHARE Multi-country Programme for Distance Education were first granted in 1995, when LNSC and EC signed an agreement for the first (pilot) year in Lithuania. In 1996, the programme was extended for another two years. The results of this programme in Lithuania may be briefly described as follows:

- universities, other higher education establishments, the Parliament (*Seimas*) and the Government now are more aware of the significance of modern distance education for the development of Lithuania;
- the first group of lecturers for modern distance education was trained;
- the first two modern distance education centers were established in Kaunas University of Technology and Vilnius University, as well as three student support centers in Vilnius Gediminas Technical University, Vilnius School of Electronics and Kaunas School of Technology;
- the first modern distance courses prepared in Lithuania were launched.

The expansion of the distance education network is also funded by the Lithuanian national budget. The investment programme of the Government of the Republic of Lithuania "Development of Distance Education in Lithuania" was launched as early as in 1998; the programme covered creation of the infrastructure for distance education video conferencing: it was planned to expand the network of modern distance education classrooms in Lithuania, as well as to prepare laboratories and studios with versatile equipment (Targamadze, et al, 1999).

Currently, Lithuania uses the Academic and Research Network LITNET, which opens a door to the state-of-the-art world of IT and information repositories. It is the source of the newest information; a tool used by scientists, students and schoolchildren in their work and studies; as well as an important ground for testing and use of leading edge information technology. LITNET is a technological media with the best set of features for distance education.In the current age of knowledge, the future of Lithuania strongly relies on the levels of IT penetration, human

competences, as well as on the ability to learn continuously and to make use of the IT potential.

Schools undergo extensive computerization and get access to Internet; libraries also get more computers. Such prerequisites facilitate use of IT in education and implementation of the principles of lifelong learning.The said goals inspired the programme "Information Technology for Science and Higher Education 2001–2006" (ITMiS). The programme consisted of three main closely interrelated parts dedicated to creation of the Lithuanian Higher Education and Research Information System (LieMSIS), the Lithuanian Distance Education Network (LieDM) (see Figure 5.).And the Lithuanian Academic Libraries Network (LABT).

Figure 5.
Lithuanian Distance Education Network (LieDM)(Rutkauskiene et al, 2003)
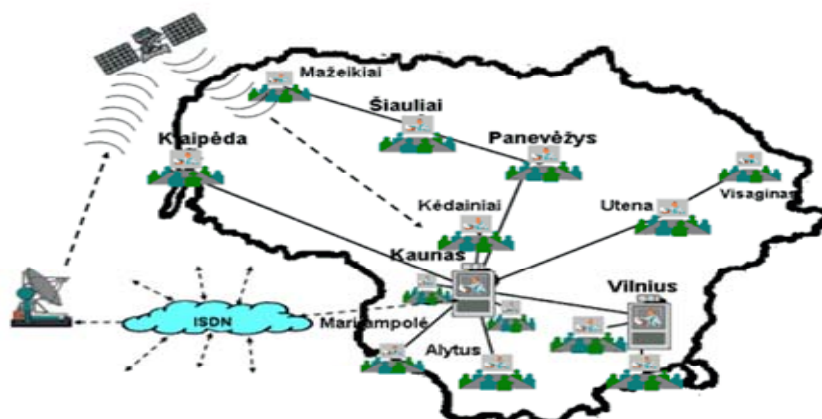
The Lithuanian Distance Education Network (LieDM) is the main distance education infrastructure in Lithuania open to public at large; it enables universities, colleges, vocational schools and other education and training organizations to render distance education services. The video conferencing network developed in Lithuania during the LieDM project facilitates development of a joint system for education support throughout Lithuania.

A distance classroom can communicate with any other Lithuanian or foreign institution with the help of either Internet or ISDN. The events streamed via the LieDM network can be used as sources of both information and

education throughout Lithuania. They are, for instance, various recorded workshops, conferences and meetings, or presentations, examinations and lectures. Geographically, the LieDM network covers the entire territory of Lithuania (see Figure 5., though it is more developed in our cities, which have more universities, institutes and colleges, as well as are home to bigger numbers of students and teachers. The LieDM network includes:

- three video conference studios;
- seven video conference mini studios;
- three regional distance education centres;
- 18 distance education classrooms;
- 10 online distance education classrooms;
- 340 computer workstations;
- a professional studio for production of video, audio and multimedia materials (Trinkunas et al., 2008).

The aim is to further develop Lithuanian Distance Learning Network LieDM and support its activity, create information technology based and integrated e-learning space, providing possibilities for every Lithuanian citizen to learn as well as retain and develop competences all life long despite the dwelling place.

Programme implementation seeks:

- to support and develop e-learning infrastructure;
- to develop e-learning technical possibilities in institutions;
- to create and support virtual environment for teacher-student work and collaboration.

Having completed the tasks for the implementation of Lithuanian e-learning infrastructure development, a flexible distance learning system will be created that would include service supplier and user support parts, would provide Lithuanian lecturers and teachers, scientists and researchers, students and pupils as well as the entire society possibilities to use e-learning services and make a contribution into the implementation of life long learning principle, decreasing the difference between the town and the country (Lithuanian Virtual University, 2009).

Creation and development of the portal "Lithuanian Virtual University (LVU)" (http:// www.lvu.lt/app) is part of the programme of the Ministry of

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Education and Science of the Republic of Lithuania "Lithuanian Virtual University 2007–2012", which carries on and expands activities of the previous programmes and attracts new institutions to such activities.

About LVU programme
The programme of Lithuanian Virtual University continues the implementation of the programme „Information Technologies for Science and Studies 2001-2006".

And it is devoted to science and studies. The main aim of the programme LVU is to expand information infrastructure of Lithuanian science and studies, applying available resources, which attempts:

- to develop effective and coherent, available and continuous educational system and provide conditions to study all life long;
- to ensure the quality of educational system while integrating into the common European educational space;
- to prepare specialists of the highest quality;
- to carry out research;
- to ensure possibility for Lithuanian citizens to obtain knowledge, skills and qualifications that would allow to adapt to quickly changing conditions of life and work;
- to expand the programmes for involving the disabled or people with special needs into information society applying the possibilities of information technologies.

The programme is made up by four closely related sub-programmes such as;

- Promotion of E-learning Processes in Virtual Environment"(EMSaS),
- Development of Lithuanian E-learning Infrastructure" (LieDM)",
- Development of Lithuanian Science and Study Information Integrated Environment"(LABT)", and
- Development of Planning, Management and Self-service Infrastructure for Lithuanian Science and Studies" (LieMSIS) (Lithuanian Virtual University, 2009).

Distance Learning Programmes and Courses,
Proposed By Universities and Colleges in Lithuania
The programmes and courses are shown in Table 4.

Table 4.
Distance learning programmes and courses, proposed by universities and colleges in Lithuania (all information from various cources collected by authors)

Education institution	Programmes	Courses	Name of programmes or course	Applied virtual learning environment
Lithuanian Virtual University	-	50	1. Applied statistics and etc. See more: http://www.lvu.lt/app ?service=external/ind ex&sp=2683&sp=222 2	WebCT, Moodle
Kaunas University of Technology	2 (Master) 1 (special studies)	12	1. Information Technologies (3 specializations) 2. Distance learning Information technologies 3. Pedagogy Courses: 1. Distance learning and etc. See more: http://emtc.ktu.lt/cms/ emtc/app?service=ext ernal/index&sp=1985 &sp=1965	WebCT, Moodle, Black Board Vista CE6
Vilnius Gediminas Technical University	4 (magistro) 3 (equalizing studies/courses)	21	1. Construction Economics and management 2. Real Estate Valuation and management (3 specializations) 3. Business management (3 specializations) 4. Business Processes Management Technologies	IBM Workplace Collaboration Services Learning Space

			5. Business and Management Administration (3 specializations) Courses: 1. ANM insfrastructure and etc. See more: http://irma.vtu.lt/lspace/central.nsf	
Mykolas Romeris University	2 (bachelor)		1. Law and Management 2. Social Work	Moodle
Siauliai University	1 (bachelor)	-	1. Education	Moodle, Learning Space
Vilnius Law and Business College	5 (bachelor)	-	1. Business management 2. Finance 3. Accounting 4. Tourism and Hotel Management 5. Law	WebCity

CASE STUDY: E-LEARNING At The Department of Construction Economics And Property Management Of The Faculty of Civil Engineering of Vilnius Gediminas Technical University (VGTU)

Results of Three Research Works on E-Learning With a Special Emphasis on the Change of Economic Conditions

The e-learning courses at the Department of Construction Economics and Property Management of the Faculty of Civil Engineering of VGTU were introduced in September of 1999. 27 students from all over Lithuania were accepted into the Real Estate Valuation program. Most of them were people working in the real estate sector.

Over the period of four years this study program has been renamed once (in 2001 its name was changed to "Real Estate Valuation and Management") and its content and scope have also been subjected to changes.

Since 2003 the Real Estate Valuation and Management program contains two major subjects:

Figure 6.
Variation in the number of students in e-learning programs
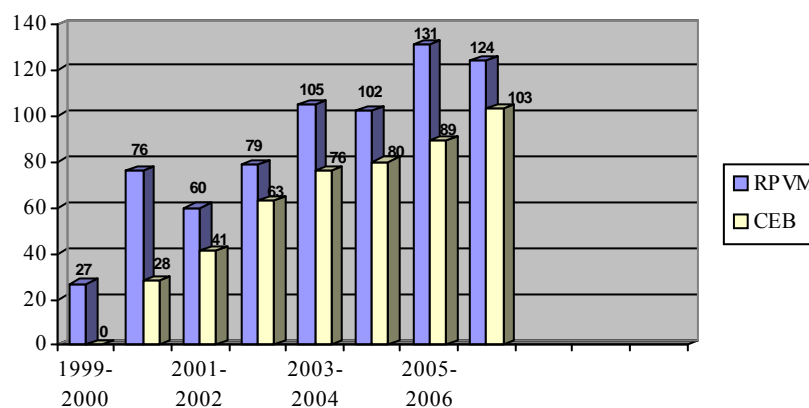
Real Estate Management and Internet Technologies and Real Estate Business. Since 2000 students can enrol in Construction Management e-learning course selecting Construction Economics and Management as a major subject (Web-site of e-learning of VGTU).

All program materials are available as printed program notes which are enhanced, where appropriate, to take advantage of modern teaching techniques and delivery mechanisms.

 In particular, the following media are used in specific modules: electronic format of the textbooks, video, computer software, computer learning systems, computer conferencing, computer networks, 'face-to-face' contact.

The choice of media is often relatively easy to make because for much of the time, local constraints, questions of accessibility and of cost virtually dictate the media through which learners will have to work.

Accessibility is vitally important to any learners who have to use self-instructional materials. Study materials are prepared with reference to Great

Britain, Germany, the USA and other countries' experience (Kaklauskas et al, 2002).

The present Chapter analyses the problems of the learning process, the social, economic, moral issues related to the labour market integration of trained professionals. At the present time the e-learning division of the Department of Construction Economics and Property Management has 211 graduate students from Lithuania. The variation in the number of students in e-learning programs (Real Estate Valuation and Management (RPVM) and Construction Economics and Business (CEB)) are shown in Figure 6.

Analysis of Questionnaire–Based Survey Results
In order to clarify a number of issues related to the study process (first and foremost the student motivation, efficiency of advertising, reactions of social environment, etc) the 3 survey researches were conducted. The first research has been fulfilled in 2003 year, before accession to the EU. 125 respondents took part in a questioning. The results of first research were published in scientific journals and proceeding books (Rimkuviene and Lepkova, 2004; Lepkova and Rimkuviene, 2006).

The second research has been fulfilled in 2006 year, after accession to the EU. 86 respondents took part in a questioning.

The third research been fulfilled in 2008, when the economic recession was occurred. 73 respondents took part in a questioning.

There were two main differences in fulfilled research works: application of new questioning technology and changed economic conditions, which influenced the results of user responses.

Currently at our Department we are exploring the implementation of virtual learning space –Moodle.

The questionaire–based results are received by using Moodle and additional scripts, programmed and applied to the Moodle learning space.

The results of the second and third research works are available in the VGTU website dedicated to distance learning (see Figure 7) (Web-site of e-learning of VGTU, 2008)

Figure 7.
The research of distance learning: a fragment of the results
"Information about studies" (Web-site of e-learning of VGTU, 2008

1 dalis. Informacija apie studijas.

1. Kodėl pasirinkote būtent šią studijų formą ? (Pažymėkite visus tinkamus variantus).

Response	Average	Total
Galimybė įsigyti gretutinę specialybę.	39.1%	34
Geras profesinis parengimas.	10.3%	9
Gero darbo gavimo galimybės ateityje	27.6%	24
Naujas studijų metodas.	40.2%	35
Patogi studijų forma neatitrūkstant nuo darbo.	86.2%	75
Rekomendavo kiti.	10.3%	9
Other: galimybė suderinti žinias su praktika	1.1%	1
Other: idomu	1.1%	1
Other: norėjau studijuoti NT	1.1%	1
Other: panašus darbo pobūdis	1.1%	1
Other: tiesiog patinka ši sritis	1.1%	1

The special attention will be paid on the problems of social, economic, moral issues. The respondents were asked to answer the questionnaire which contained the following three main parts:

1. Information about the respondent;
2. Information about the studies;
3. Social and economic aspects of studies.

The following is an analysis of the data obtained through questionnaire-based survey.

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The Comparison of the Results of Research Works

Comparison of distribution of respondents by age is shown in Figure 8. The age of respondents ranged between 21 and 55 years.

Figure 8.
Distribution of respondents: comparison by age groups, %

	21-25	26-30	31-35	36-40	41-50	51 y.
2003	40,8	19,2	12	12,8	10,4	4,8
2006	31,5	17,4	16,6	17,5	14,7	2,3
2008	56,2	28,8	4,1	6,8	2,7	1,4
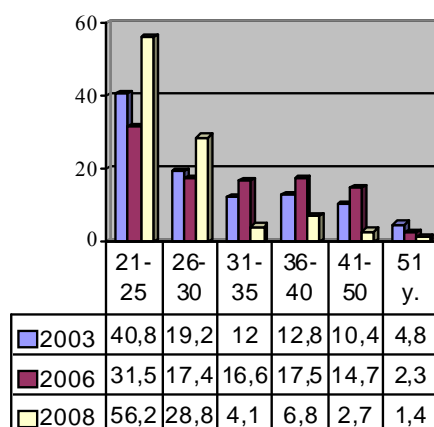
As illustrated by Figure 8, the students enrolled in the distance-learning course are people of different age groups (6 groups in total). Figure 9. shows the distribution of respondents by type of employment.

Figure 9.
The distribution of respondents by type of employment, %

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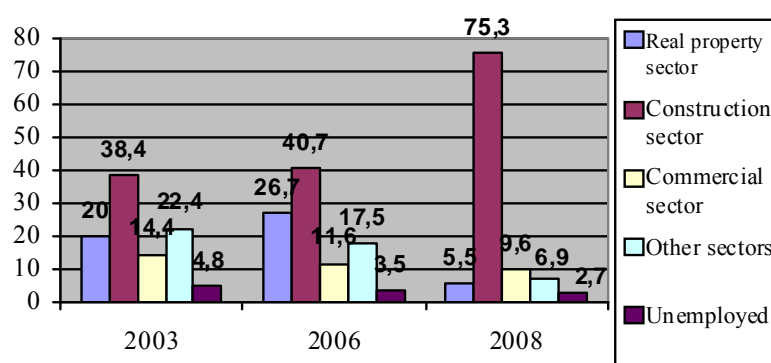
Figure 9. shows that the majority of respondents are employed in the sectors of construction and real property. Such situation is caused by the growth of the respective sectors, and the need of labour force to gain the qualifications in these areas.

Figure 10

Distribution of respondents: comparison by motives of studies, %
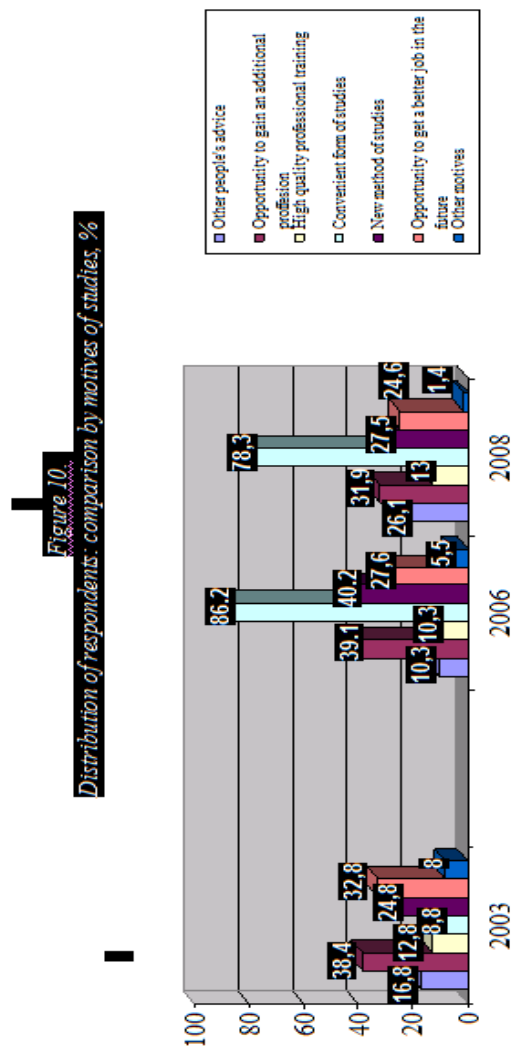
The distribution of respondents by motives of studies is shown in Figure 10. As illustrated by Figure 10, the number of respondents who selected the answer "convenient form of studies" is one of the major differences between the research works.

The increase of 9.8 times is noted. It shows that the quality of the distance learning has also improved (more advanced technologies, introduction of the synchronic learning). Students had the opportunity to choose more than one motive of studies.

We have reached the part dealing with very important economic problems.Just like education establishments of other countries, Vilnius Gediminas Technical University takes tuition fees for the distance learning courses.

Therefore, during the research, students were asked to specify the source of financing, and to evaluate the size of the tuition fee and the cost of studies. The distribution of respondents by the source of financing is compared in Figure 11.

Figure 11.
Distribution of respondents: comparison by the source of financing, %

F
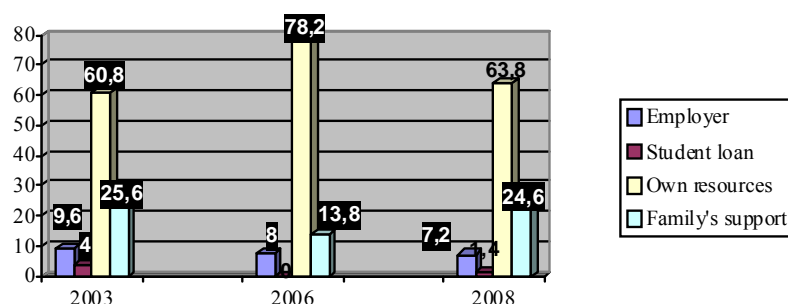
Figure 1. shows that the majority of students have jobs and pay for their studies themselves. Family support is the second popular choice, whereas employers paid for studies of rather few students. The first research revealed that some students took student loans, but this form of financing has lost its popularity today, because too little money can be granted. Figure 12. compares respondents' opinion about the level of tuition fees.

Figure 12.
The comparison of respondents' opinion about the level of tuition fees, %

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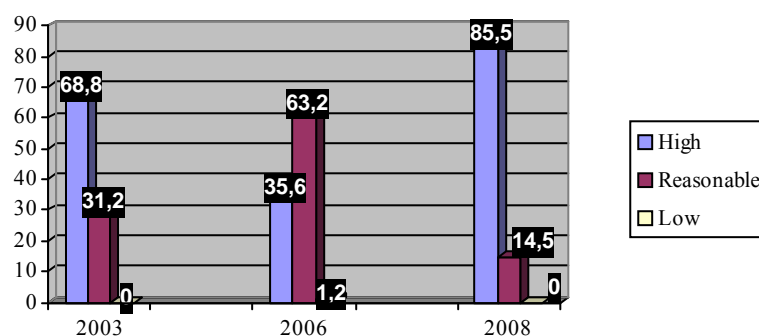
Conclusions of the Analysis of Research Works

The comparison of the results of three research works, completed in 2003 (before the EU accession) and in 2006 (after the EU accession) respectively, and in 2008 (economic recession), reveals the following trends:

- Obvious increase of respondents older than 30 years has been recorded. It depends on the need of older people to adapt to the changed economic situation after the EU accession. Many young people emigrate.
- The overwhelming majority of respondents are employed. The majority of respondents are employed in the sectors of construction and real property.
    - These are the main advantages of distance learning:
    - Convenient form of studies;
    - New method of studies;
    - An opportunity to get acquainted with new information technologies;
    - Opportunity to get a better job in the future;
    - High quality professional training.
- The economic conditions have changed in Lithuania in the period between the research works. The tuition fees of studies haven't changed during the same period. The new opinion of students changed compared to their previous opinion in 2003. They are satisfied with the current tuition fee of distance learning studies.

To sum up the research results, the distance studies offered by the Department of Construction Economics and Property Management of the Civil Engineering Faculty are developing rapidly and are viewed by the students positively.

CONCLUSION

The education system in Lithuania is changing and special emphasis paid on new technologies installation and adaptation in all educational levels. The Lithuanian Virtual University allows providing eLearning courses and programmes in all Lithuania.

The eLearning Masters studies at VGTU became very popular and in a high quality and viewed very positively by students. These studies have full accreditation by EU commission.

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CHAPTER-20

eLEARNING IN LITHUANIA-II

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ABSTRACT

The chapter is aimed to examine the emergence and growth of e-learning, i.e., the application of information and communication technology (ICT) in formal education (i.e., primary, secondary and vocational education) in Lithuania.

The chapter concentrates primarily on ICT policy and practice (incl. content and services, teacher training for ICT, and participation in international R&D projects), research findings and case studies of e-learning in Lithuanian primary, secondary and vocational education system.

COUNTRY

Lithuania is located on the eastern shore of the Baltic Sea. In 1989, the National Geographic Institute of France identified the geographical centre of Europe 24 km northwest of Vilnius. Its area is 65.300 sq. km. Its ethnic composition is as follows: 84% Lithuanian, 6.1% Polish, 4.9% Russian, 1.1% Belarusian, and 3.9% other. The religion in Lithuania is predominantly Roman Catholic. Other confessions include Russian Orthodox, Evangelical Lutherans, Evangelical Reformers, Old Believers, Jews, Sunni Muslims and Karaims. The national currency is Litas (Lt) = 100 cents (ct). The current exchange rate: 3.4528 Lt =1 EUR.

EDUCATION SYSTEM

The parliament defines the basic principles, structure, and objectives of education in Lithuania, while the Ministry of Education and Science with its institutions devise and implement education policy. The Ministry of Education and Science plays an important role in the educational system. For example, it defines the curriculum, which is used throughout the country. It also determines teacher's salaries, requirements for teachers' qualification, priorities for qualification development, and the assignment of educational staff. For example, after the changes in curriculum, special courses are ordered to be developed and conducted for teachers. The administration and financing of some national-level schools is the direct responsibility of the Ministry as well. However, the administration and financing of other general and vocational education schools is the responsibility of the local municipalities.

Pre-primary Education
Pre-primary Education in Lithuania is intended for children aged 1 to 6 and is optional. There are plans to make the last year before the primary education as a compulsory one. At present it mainly consists of public and some private kindergartens and, after drop in attendance from 1991 to 1999, it has been increasing since 1999, with 64 per cent of the five year olds and 78 per cent of six year olds attending in 2006.

Primary and Lower Secondary (Basic) Education
Primary school consists of Grades 1 to 4. Lower Secondary school that is called "Basic" consists of Grades 5 to 10. Education is compulsory for all students up to the age of 16. The "Basic" education, therefore, is also often seen as a compulsory one. Parents are allowed to choose whether their children begin Grade 1 at age 6 or 7. Although theoretically the suggested age for starting the primary education is six, there is an increasing tendency of the parents to wait until their child is seven years old before letting him or her to school. Enrolment in the primary school is 98% of the total age-group. Primary and Basic schools follow a national curriculum that is the same all over Lithuania. The schools and teachers, however, are expected to adapt it to their own particular needs. The curriculum at the primary level includes Mother Tongue (mainly Lithuanian, but in some schools also Russian, Polish, Belorussian), mathematics, foreign languages, world discovery that includes both science and history aspects, music, art, physical training, technologies, and moral education (either religion or ethics).

The curriculum at basic level also includes Mother Tongue (mainly Lithuanian, but in some schools also Russian, Polish, Belorussian), mathematics, foreign languages, history, geography, sciences, civil education, music, art, physical training, informatics, technologies, and moral education (either religion or ethics). In addition to that, the language minorities' schools also teach Lithuanian as a state language.

Till the 2006-2007 school year informatics was taught only in Grades 9-10, but now it is taught at Grades 5-6, after which it is integrated into other subject areas.

Upper Secondary Education
The upper secondary school consists of Grades 11 and 12. In parallel with these there are Gymnasiums. Education in gymnasiums lasts for 4 years and corresponds to Grades 9 to 12 of the secondary school. Gymnasiums offer general education at a more advanced level than that of ordinary secondary schools. From the year 2000, the system of "profiles" was introduced in the upper secondary schools all over Lithuania. This meant that any upper-grades student was free to choose one of four "profiles" for his or her studies: humanities, mathematics and science, technology, or art. The curriculum then was arranged in the following pattern: 50% - the main body of the curriculum that is the same for all students; 25% - compulsory curriculum for the certain profile; 15% - curriculum that is related to the certain profile (may vary from school to school), 10%-curriculum that is freely chosen by students depending on the availability of courses in their school. Since the 2006-2007 school years the concept of "profiles" was revised to the one of "individualized learning", and students seized to be attached to a certain profile, making their choices much wider: 60 % of the lessons are the same for everybody, and 40% is a choice of each student, however, dependent on the forming of groups for particular subjects.

The main body of the curriculum now consists of the following subjects: moral education (either religion or ethics); Lithuanian language (as Mother Tongue or State language), language of instruction (for non-Lithuanian schools); foreign language; mathematics; one chosen social sciences subject (history or geography) or integrated social science course; one chosen natural sciences subject (biology, physics, chemistry) or integrated science course; one chosen art subject (art, music, drama, choreography, modern communicative arts) or technologies, or integrated art and technologies

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course; physical training (general physical training or certain sport). During the two years student has to study not less than 9 and not more than 13 different subjects. The subjects at a secondary education can be studied at a basic or higher level.

Types of schools
In 1991 the Education Law authorized the creation of alternative, privately owned educational institutions. However, the number of private schools is still only minimal (about 1.7 %), a good portion of which are primary schools (out of primary schools, 7 % are private).

Reforms and Changes
After the significant changes in the political and economical system in Lithuania, the changes in educational system were also inevitable. There were big changes in structure, content, and teaching methods in Lithuanian schools. More use of active teaching methods, more freedom for schools and teachers to creatively look into the curriculum and educational materials, by adopting them to the needs of students. The curriculum is reviewed every 4-6 years, in order to adapt it to the changing needs of society.

ICT POLICY AND PRACTICE

The Centre for Information Technologies in Education (CITE) under the Ministry of Education and Science (MoE) is organisation in charge of coordination of the formulation of national policy and the implementation of all governmental programmes and projects for ICT introduction into general education and vocational education and training (retrieved on 23.11.2009 http://www.ipc.lt/english.htm,). The ICT programmes on state level are commonly aimed at the purchase of new hardware and software, teacher training in the area of ICT, establishment of national educational networks and services, and development of educational software and content. The Centre also coordinates ICT-related international projects, monitors the ICT implementation in education and takes care of ICT projects for disabled children. The number of the local educational bodies (at municipality level) has their own policy documents and programmes for ICT introduction into general education schools. The actual contribution of different municipalities to ICT implementation in schools varies: some municipalities allocate a lot of funds to ICT, whereas others hardly assign any resources. In general, the state and municipalities' activities have a considerable influence on ICT integration. In-service training centres in the counties play a significant role

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in promoting ICT literacy for teachers. Municipalities allow funds for buying new equipment and usually take full responsibility for ICT maintenance and cover expenses of Internet services. A school board and a principal decide on the usage of ICT at school.

General education schools usually have their own ICT implementation strategies on school level. The main state programme on ICT implementation in education is an annual strategic programme 'Education for Information Society' ('e-School') funded by Lithuanian budget and implemented by CITE since 2001. The annual budget of the 'e-School' programme is about 4.4 MEuro. The 'e-School' programme is based on the National Strategy for the Implementation of ICT in Lithuanian Education. Since 2004 the largest ITC in education projects in Lithuania are funded by European structural funds. Centralized coordination of state-wide ICT in education projects is achieved by monitoring of implementation of the national programmes and standards as well as by participation of CITE officials and experts in national-scale projects' Steering Committees and teams, as well as by coordination of ICT-related international projects.

Policy Strategies and Programmes
The newest Strategy and Programme for the Introduction of ICT into Lithuanian General and Vocational Education for 2008–2012 (URL: http://www.itc.smm.lt) has been approved by the Minister of Education and Science in December 2007, and they are currently under implementation by CITE. The vision of this Strategy is to create qualitative new and flexible students' and teachers' learning environments which would provide them personalized (customized) learning possibilities in electronic space and stimulate creation and implementation of modern ICT based teaching and learning methods. There are four objectives emphasized in this Strategy:

- To create digital learning content and to develop modern teaching and learning services.
- To form digital teaching and learning infrastructure, to improve schools provision with hardware and software, and increase access to ICT.
- To educate schools communities' competencies, to effectively apply ICT for education, to improve teaching and learning quality, and to develop digital teaching and learning culture.
- To apply ICT in educational process organization and schools management.

Software: Content and Services

Learning Content: There is still a big lack of supply of quality educational software and content in Lithuanian language. The development of ICT-based educational software and content (i.e., learning objects–LOs) is one of the targeted areas of the national policy for the ICT implementation. Each year CITE announces open tenders for the purchase of educational software and content for general and vocational education (including content designed for special needs students).

The software and content, which is fully completed and localised, can be offered for the competition. These tenders are the part of the governmental 'E-School' programme. All educational software and content is systemised and stored into several repositories on the web-servers at CITE. The other activities for the development of educational content are mainly based on small-scale competitions for content developers (teachers). Content sharing within Lithuania and with other countries is organised with the help of the centralised LO Metadata (LOM) standard compliant learning objects metadata repository (URL: http://lom.emokykla.lt/public, retrieved on 23.11.2009). Several important developments were carried out by CITE experts during the last years:

- more than 2000 Lithuanian LOs were described according to European Schoolnet's (EUN, URL: http://www.eun.org/ , retrieved on 23.11.2009) LOM application profile by specially trained LOs indexers;
- the centralised national LOM repository has been created;
- LOM repository has been connected to European Learning Resource Exchange (LRE) system for schools (URL: http://lreforschools.eun.org/LRE-Portal/Index.iface, retrieved on 23.11.2009), and enriched by additional services (Dagiene and Kurilovas, 2008; Kurilovas and Kubilinskiene, 2008).

Education portal (http://portalas.emokykla.lt, retrieved on 23.11.2009) has also been developed in CITE. Its main services are:

- news from all educational websites and institutions;
- educational newsletters and other central publications on-line, incl. International portals (e.g., EUN);
- legal documents for the teachers;
- LOs repositories;

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- large scale projects under implementation;
- teachers professional qualification development issues;
- collaborative environments;
- projects-based collaborative groups, weblogs and subjects-based forums; (9) consulting services for teachers and schools incl. on-line consulting on curriculum, assessment, planning, management, exams, etc.;
- questions and answers;
- links to educational institutions, education management institutions, teachers associations, educational information systems, etc.

Virtual Learning Environments (VLEs): Scientific research on evaluation of the most popular open source VLEs was performed in Lithuania in 2005 (URL: http://www.emokykla.lt/lt.php/tyrimai/194, retrieved on 23.11.2009) by the Institute of Mathematics and Informatics (IMI). Several scientific methods and frameworks were used as the basic tools for this research. As the result, Moodle VLE was evaluated the best VLE suitable to use on the module level, therefore it was proposed as the most suitable VLE for wide implementation in Lithuanian general and vocational education institutions, as well as for teacher in-service training system. Its fundamental advantages in comparison with the other open source systems are:

- clear social constructivist philosophy and design;
- modular, extensible architecture;
- wide and lively developer and user community (Kurilovas, 2005).

VLEs most suitable for usage on module level were chosen for comprehensive implementation in Lithuania, therefore de facto decentralised way of VLEs implementation was chosen in Lithuania to strengthen the schools as e-Learning communities. In summer 2006 Moodle version 1.6.3 was fully localised by IMI, and at the moment it is downloadable from CITE server (URL: http://vma.emokykla.lt) for installation in schools. A Tutor VLE was enriched by several functions and localised while implementing Education Development Programme in 2005, and at the moment is also downloadable from CITE server.

Teacher Training for ICT
The Requirements for Teachers Computer Literacy Programs (URL: http://www.itc.smm.lt/21z/duomenys/dokumentai/files/standartas_isak.pdf, retrieved on 23.11.2009) have been approved in March 2007 and have

changed the previous Teachers Computer Literacy Standard (2001). According to the new document, these requirements are for:

- teacher pre-service and in-service study programmes of all levels, an
- teachers' certification requirements to achieve higher qualification category.

In practice, teacher training Universities and Colleges are independent self-governing institutions. Consequently, it is up to a university or college to decide on the level of ICT integration into the study programmes. In-service teacher training institutions are traditionally provided with funding for the teachers' ICT training courses that accord with Requirements for Teachers Computer Literacy Programs (Technological and Pedagogical parts). Two forms of ICT-related training are funded by the state the budget during the national 'e-School' programme and widely apply training (workshops) in computer labs as well as distance learning. Other forms of training, such as workshops for teachers of different subjects, seminars, conferences, etc., are organised almost permanently at various levels of the education system: national teachers in-service training institutions, regional teachers in-service training centres and at schools. Various teachers' associations and other professional organizations set up collaborative networks, provide informal training and support for enthusiast teachers as well.

EDUCATIONAL RESEARCH

Several research projects on ICT implementation in education have been implemented in Lithuania in September-November 2009. These research projects have been commissioned by CITE and implemented by the Informatics Methodology Department of IMI. All research reports are available only in Lithuanian (retrieved on 23.11.2009 http://www.emokykla.lt/lt.php/tyrimai/194). These research projects are as follows:

The Analysis of ICT Implementation
In Education in Different Countries
The impact of ICT on education is examined in the research. There was analysed, structured and summarized different European countries' (Great Britain, Northern countries–Finland, Denmark, Sweden and Norway, the Netherlands, and Hungary) experience in ICT implementation in teaching and learning during last few years. There were achieved results and explored

changes opportunities trends. Analysis is based on representative international and national research data. The main attention is paid to;

- estimate modern experience on ICT practice in school,
- to discover electronic learning content and services strategic development trends, as well as
- to examine teachers' ICT competency problems.

Interdisciplinary approach is typical for the research: informatics, informatics engineering, technological and educational sciences knowledge is associated. The research results could be useful for these areas scientists, postgraduates and doctoral students, as well as education policy makers (Dagiene and Kurilovas, 2008).

The Analysis of Existing Computer Teaching Aids
The research is aimed to analyze digital learning resources (LOs) used in Lithuanian education, to estimate the essential factors and reasons crucial for the effectiveness and efficiency of their usage in Lithuanian schools, to analyze the schools' demand for digital learning resources, and to formulate the general proposals and recommendations for the further centralized schools' provision with digital learning resources. The research is based on the information and data accumulated while performing the representative survey on digital learning resources booked by CITE. The conclusions and recommendations of this research are proposed to implement while planning the development of digital learning resources and services, the schools' provision with digital learning resources, their localization and dissemination.

Teachers Training on ICT Application in Education
The research is aimed to analyze the existing study programmes on the teachers ICT competencies in Lithuanian Universities and Colleges, the future teachers' self-evaluation of their educational ICT competencies, to compare these results with the requirements of the course on the teachers' educational ICT literacy based on the existing Lithuanian requirements for the teachers' educational ICT literacy programmes. The research is based on the data of the representative survey booked by CITE. The conclusions and recommendations of this research are proposed to implement while planning and implementing all levels' studies and teachers' in-service training programmes as well as the teachers' certification.

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The following recommendations have been formulated by the researchers in the report.

Teacher Training Programme:
The researchers recommend the higher schools
- To introduce additional modules on ICT application in education into the study programmes or to expand the existing modules to no less than 4 credits.
- To pay much more attention to the improvement of quality of the used learning objects, to their conformance with the study programs, and to the implementation of their user-friendly system (repository) for LOs search on the internet, comment and assessment.

The Researchers Recommend the Creators of ICT
application in eEucation Study Programmes
- To prepare programmes mainly based on the use of e-learning systems and their components (LOs, repositories, and VLEs) in the teaching and learning process.
- To introduce additional modules on Semantic Web technologies (weblogs, wikis, e-portfolios) as well as on the search of LOs and structured digital learning activities in the repositories.

Teaching and Learning Methodologies and Assessment
- The researchers recommend the creators of ICT application in education study programmes to clearly schedule teaching and learning methods suitable to be used in the study programmes. It is recommended to mainly use the visual multimedia-based methods vs word-based methods; practice-based methods vs theoretical methods; active learning methods vs passive learning methods; student-oriented methods vs programme-oriented methods; and creative methods vs reproductive methods.
- The researchers recommend the higher schools to use more practical assignments, credits and especially creative assignment assessment methods in ICT application in the education competency assessment.

Educational ICT Competencies of Teachers
The researchers recommend the higher schools to organise ICT application in education programmes so that the future teachers after coming to schools would be able to:
- estimate ICT application shortages and problems, learn how to avoid these problems and to teach the colleagues on these topics;
- manage the class work using Web 2.0 technologies;

- help the colleagues to apply ICT in teaching the special needs students.

The Researchers Also Recommend Paying More
Attention To The Following Teachers' ICT Competencies
- to creatively individualize their subject's teaching and learning content;
- to purposefully use ICT tools in the teaching and learning process;
- to plan the use of ICT;
- to organize the technologic resources management in the teaching and learning process (Kurilovas and Dagiene, 2009).

Participation in International R&D Projects
Since 2004 CITE is actively participating in a number of large-scale international R&D projects coordinated mainly by EUN:

- **CALIBRATE.** EU FP6 IST CALIBRATE (Calibrating eLearning in Schools) project aims to support the collaborative use and exchange of LOs in schools. It brings together 8 Ministries of Education (MoE) and involves 17 partners in all. More information available: http://calibrate.eun.org
- **EdReNe.** EU eContent*plus* programme's EdReNe (Educational Repositories Network) project is a thematic network bringing together members from web based repositories of LOs with content owners and other stakeholders within education. The members share, develop and document strategies, experiences, practices, solutions, advice, procedures etc. on the organisation, structuring and functionality of repositories. The overall goal is to improve the provision of and access to LOs. More information available: http://edrene.org
- **P2V.** EU eLearning programme's P2V (Peer to Peer Networking for Valorisation) project applies the methodologies in large-scale contexts, including a larger network of schools, MoE and inspectorates, to identify good practice, tools and results in the eLearning programme related to three key areas of ICT in schools: digital resources, media literacy and new learning environments. It also further develops and refines an analytical framework to guide decision-makers at all levels for the effective use of ICT and e-learning in school environments. More information available: http://p2v.eun.org
- **eTWINNING.** eTwinning action is part of the European Commission's Lifelong Learning Programme. eTwinning is a

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framework for schools to collaborate on the Internet with partner schools in other European countries. It promotes school collaboration in Europe through the use of ICT by providing support, tools and services to make it easy for schools to form short or long term partnerships in any subject area. In eTwinning teachers (and pupils) are increasingly authoring their own LOs, adapting and localising those of others and joining new social networks and content-related communities. More information available: http://www.etwinning.net

- **ASPECT.** EU eContent*plus* programme's ASPECT (Adopting Standards and Specifications for Educational Content) project is the best practice network for educational content. For the first time, experts from all international standardisation bodies and consortia active in e-learning (CEN/ISSS, IEEE, ISO, IMS, ADL) work together in order to improve the adoption of learning technology standards and specifications. Most stakeholders will benefit from agreed profiles and established practices as projects like ASPECT help combine existing specifications into complete solutions that address the needs of the school sector in terms of LOs discovery, exchange and reuse. More information available: http://aspect-project.org/

- **INSPIRE.** INSPIRE (Innovative Science Pedagogy in Research and Education) is a two-year project run under the European Commission's Lifelong Learning Programme within the context of the Lisbon agenda. INSPIRE is coordinated by EUN. INSPIRE has set up a limited validation observatory where 60 schools in Europe use, test, and analyse new didactical tools in the field of Math, Science and Technology (MST). On the INSPIRE website the pilot schools are able to choose from 60 LOs to be applied in their science lessons. During the project, schools regularly provide reports of students' and teachers' feedback on the new teaching methods. More information available: http://inspire.eun.org/index.php/Main_Page

CASE STUDIES

CALIBRATE Project
Building a Learning Resource Exchange for Schools
The vision for a European LRE for schools has emerged directly out of EUN's work with its supporting Ministries in a number of EU-funded R&D projects. The active participation of a large number of MoE in these projects

seems to indicate that EUN work related to interoperability and content exchange is of strategic importance. The essential point for MoE is that the LRE represents a framework that supports semantic and technical interoperability of content repositories and adds value to national content strategies by providing:

- Federated search from within national portals.
- Access to high quality content from other MoE and international partners.
- An open architecture that MoE can implement locally with support from the EUN.
- Open source tools (e.g., for collaborative authoring, social tagging and curriculum mapping).
- Opportunities for MoE to monitor/apply new interoperability standards and specifications.

The LRE vision also does not assume that all LOs from national repositories will "travel well" and can be used in different national contexts. But, there appears to be a growing appreciation by MoEs that some LOs developed in one country have the potential to be reused elsewhere.

Validation of LRE Service in Lithuania: Two CALIBRATE project tools validation days has been held in Lithuania in October and November, 2007. Totally 41 teachers participated from 21 schools. The following subjects' teachers have participated mostly: Mathematics-14 teachers, Information Technologies–11, and Physics–6. One of the validated tools was CALIBRATE portal. Portal's usability and different LOs search strategies implementation level have been evaluated mostly. The main results of CALIBRATE portal validation are following:

- 85% of teachers can (re-)use LOs, and 80 % can create LOs by themselves with no or little help.
- 97% of teachers prefer (i.e., find it useful and very useful) full conformity with the query, 82% would take into account other teachers ranks, 81% prefer LOs sorting adequate to the search method, 42% would take into account LOs popularity, 68% prefer LOs sorted accordingly with their profile, and 52% would take into account similar users opinion (tagging).
- The majority of teachers prefer to reuse "small" learning assets, and they intend to reuse the majority of learning assets in another way

and in another learning context than it have been primarily designed by their authors.

- Most of the teachers prefer to have the mechanism of advance search of ultimately reusable resources.
- 77 % of teachers were satisfied or very satisfied with LOs they found in LRE portal.
- 100% of teachers could find the LOs in LRE portal later again
- 95% of teachers would use LRE very soon or perhaps, only 5 % do not know.

LRE validation in Lithuania has shown that the teachers prefer LOs from national repositories which have the potential to "travel well" and can be used in different national contexts.

These reusable LOs preferred by the teachers are mainly "small" decontextualised learning assets. Therefore in order to maximise LOs reusability in Europe LRE should consist mainly of decontextualised learning assets. There are two main conditions for LOs reusability elsewhere:

- LOs have to fit different countries' national curricula.
- Different countries' LOM application profiles have to be oriented towards quick and convenient search of reusable LOs (Kurilovas, 2009).

Approaches concerning application profiles and curricula mapping (incl. controlled vocabularies) are the main while creating any metadata guidelines or strategies.

Indeed, LRE at the moment contains about 140.000 high quality LOs, and the main problem is to provide more quick and convenient search possibilities of the suitable LOs in the repositories.

LRE validation in Lithuania has shown that the majority of teachers prefer to have the mechanism of advance search of metadata: 1.7–General. Structure; 1.8–General. Aggregation Level; 5.2–Educational. Learning Resource Type; and 7.1– elation. Kind (Kurilovas, 2009)
Therefore it is extremely important to identify LOs metadata standard's elements suitable to describe LOs reusability level, and to develop software for such kind of advances search in the repositories. The following LOM standard elements are extremely important to fill in while creating Los

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Figure 2. Key selection criteria of the Learning Objects used by teachers

1. LOs took into account the knowledge and expertise of teachers to work with ICT
2. LOs took into account the knowledge and expertise of pupils
3. The LOs concerns a topic that is part of the normal MST curriculum
4. The LOs clearly combines MST with ICT technology
5. It is based on an inquiry-based approach
6. It is based on a hands-on science approach
7. It develops a creative learning environment
8. The use of ICT is presented as an example of good practice
9. A clear description of how to use the LOs is available
10. A clear description was available on how to introduce the LOs in the curriculum or extra-curricular (fieldwork) activities.
11. Different aggregation level
12. Number of participants of the experiment
13. It has been used before in similar circumstances by other experienced teachers
14. The description is backed up by action-research reports or case studies
15. The LOs results from cooperation between schools, universities or research labs

INSPIRE Project

Figure 3.
Impact of MST lessons/activities on pupils after the INSPIRE tests

1. Stimulated debate with my fellow pupil about scientific issues (and societal issues such as ecology, related to them).
2. Made it easier for me to understand and learn mathematics, sciences and technology.
3. Made it easier to understand the use of ICT in general.
4. Made it possible, for me, to integrate better and to remember what I was learning.
5. Stimulated my interest and motivation for mathematics, science or technology.
6. Improved the relations and the cooperation between the pupils in the classroom.
7. Made it easier for me to link mathematics, science and technology more closely to my everyday life.
8. Made it easier to study by myself and at my own pace and speed.
9. Made it easier for me to understand and the work of scientists and researchers.
10. Helped me evaluate critically the use of data and scientific methods.
11. Develop my ability to use scientific methods.
12. Helped me clarify the choice of my profession for later life.

The authors while being INSPIRE coordinators in Lithuania have performed the questionnaires-based survey of the teachers of Biology, Chemistry and Physics in 10 general and vocational education schools from different regions of Lithuania. 31 science teachers (10-Biology, 11- Chemistry, and 10 – Physics) from these schools have filled in the proposed questionnaires. 36 LOs (12 for each science subject) from LRE have been proposed to the teachers to evaluate during the experiment in real pedagogical contexts in their schools. Some results of this survey are presented further.

Figure 2 shows that the major criteria which is for LOs selection by the science teachers has been "It took into account the knowledge and expertise

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of teachers to work with ICT" (298 points) and "It took into account the knowledge and expertise of pupils to work with ICT" (277 points). On the other hand, only the minority of teachers have needed a clear description on how to introduce the LO in learning activities. In other words, science teachers prefer 'personalized' and 'decontextualized' LOs suitable for flexible LOs introduction in different pedagogical contexts.

The pupils' survey has been also performed during the project. 95 boys and 88 girls have filled in the questionnaires in Lithuania. Some results are presented in Figure 3.

Figure 3 shows that LOs implementation had a different positive impact ranged from "Made it easier to study by myself and at my own pace and speed" (200), "Made it easier for me to link MST more closely to my everyday life" (201) and "Improved the relations and the cooperation between the pupils in the classroom" (202) to "Stimulated debate with my fellow pupils about scientific issues" (404 points).

Tables 1 and 2 present the results of the authors' questionnaire aimed to analyse the learners' pre-requisites, enhanced competences (both general and subject), learning and assessment methods and digital environment (VLE) used during the experiment, as well as the teachers' conclusion of LOs usability in future.

Table 1.
General information

Names	Values	Biology	Chemistry	Physics	Total
Learner profile information	High knowledge/ skills level	0	0	1	1
	Average knowledge/ skills level	9	9	8	26
	Low knowledge/ skills level	0	1	0	1
	Gifted	0	0	1	1
	Motivated	3	5	4	12

	Needs personalization	1	1	1	3
Learning aims / General competences	Communication in mother tongue	8	7	7	22
	Communication in foreign language	6	6	7	19
	Competence in MST	4	3	5	1
	Digital competence	6	5	7	18
	Learning to learn	5	2	3	10
	Social competencies	3	3	0	6
	Enterprising and Creativity	7	4	7	18
	Personal and Cultural understanding	4	2	0	6
Subject competences	Agreeably with the curriculum	5	4	3	12
	Do not agree fit the curriculum	0	0	0	0
Digital environment used in the experiment	Moodle	5	3	4	12
	LeMill	0	0	2	2
	Other	0	0	0	0
	Not used	4	6	4	14
Conclusion on LOs usability	To localise and use	4	4	5	13
	To use without localisation	6	7	7	20
	Not to use	0	0	0	0

Table 2.
Learning and assessment methods used during the experiment

	Word-based methods	4	3	0	7
By information	Visual-based methods	9	10	9	18

source					
	Theoretical methods	4	3	0	7
By theory and practice ratio	Practice-based methods	9	10	8	27
By teacher and students activity relationship	Active learning methods	1	0	1	2
	Passive learning methods	8	7	7	22
By authoritarianism and humanity relationships	Programme-oriented methods	5	5	7	17
	Student-oriented methods	8	9	5	22
	Authoritarian methods	2	1	1	4
	Humane methods	3	3	4	10
By the students activity creativity level	Reproductive methods	3	4	5	12
	Creative methods	7	4	4	15
By the students reasoning operations relationships with the logical forms and shapes	Analysis	6	8	3	17
	Synthesis	7	5	4	16
	Abstraction and generalisation	4	4	4	12
	Deduction and induction	3	3	1	7
	Analogy	4	3	3	10
	Hypothesis	6	1	2	9
	Experiment	4	4	2	10
Assessment methods	Test	5	5	4	14
	Credit	0	2	0	2
	Practical assignment	8	7	8	23
	Creative assignment	4	2	4	10
	Self-assessment	6	1	5	12
	E-Portfolio	0	0	1	1
	Project work	1	1	1	3

Tables 1 and 2 show that all general competences were addressed by the proposed LOs, and different pedagogically sound proactive learning and assessment methods have been used during the experiment. From the teachers' point of view, VLE Moodle is the most suitable digital environment to implement these learning and assessment methods while working with personalized and decontextualised LOs. In the respondents' opinion, the majority of LOs are suitable to use without localization, and the others require localization before implementation in school practice.

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Prof. Dr. Habil Valentina DAGIENE is the Head of the Department of Informatics Methodology in the IMI, as well as the Professor in Vilnius University. She takes care of ICT teaching in basic and secondary schools. She is the vice chair of the Technical Committee of IFIP for Education (TC3) the member of the Group for Informatics in Secondary Education (WG 3.1). She has published over 100 scientific papers (incl. ISI Web of Science), the monograph and more than 50 books in the field of Informatics and ICT in secondary education. Her research activity is concentrated on programming methodology, teaching methods of informatics and information technology, technology-enhanced learning (learning content, activities, services, interoperability and standards, quality evaluation, learning process optimization), software localization. She together with DIM have been organizing Olympiads in Informatics, International Contest on Informatics and Computer Literacy for students "Bebras" (Beaver), running the Young Programmer's School by Correspondence for more than 25 years. She together with DIM have organised the International

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