

## RESULTS OF THREE RESEARCH WORKS ON E-LEARNING WITH A SPECIAL EMPHASIS ON THE CHANGE OF ECONOMIC CONDITIONS

Silva Rimkuvienė<sup>1</sup>, Natalija Lepkova<sup>2</sup>, Mindaugas Krutinis<sup>3</sup>

*Vilnius Gediminas Technical University, Sauletekio ave. 11, LT-10223 Vilnius, Lithuania*  
E-mail: <sup>1</sup>[Silva.Rimkuvienė@vgtu.lt](mailto:Silva.Rimkuvienė@vgtu.lt), <sup>2</sup>[Natalija.Lepkova@vgtu.lt](mailto:Natalija.Lepkova@vgtu.lt), <sup>3</sup>[Mindaugas.Krutinis@vgtu.lt](mailto:Mindaugas.Krutinis@vgtu.lt)

**Abstract.** This paper compares the results of three research works carried out by the authors. The paper focuses on the change of economic conditions after Lithuania's accession to the EU and economical recession. The first research was carried out in 2003–before the EU accession. The research was based on a questionnaire. The second research was completed in 2006 – after the EU accession. The third research was completed in 2009 – the economic recession was occurred. The results of three research works were compared on the basis of general indices of the economic level. The main purpose of the comparison was to show the differences of students' opinion and the development of e-learning in the Civil Engineering Faculty of Vilnius Gediminas Technical University (Lithuania).

**Keywords:** E-learning, economic conditions, comparison, questionnaire.

### 1. Introduction

Due to fast advances in internet communication technology, the past decade has seen an increasing number of online education programs and software applications developed at every level of business life as well as in academia. Leading technology companies such as IBM and HP utilize online tools not only to facilitate communication among their employees, but also to train them in various respects of their work life (Yucelen, Kuzulugil, 2008). Parallel to the world, there is a growing interest in online education in Lithuania, as well.

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 centres were established in Kaunas University of Technology and Vilnius University, as well as three student support centres 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).

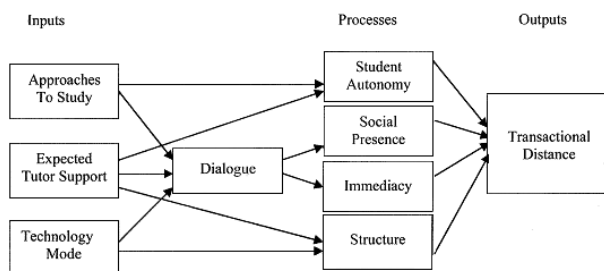
Currently, Lithuania uses the Academic and Research Network LITNET, which opens a door to the state-of-the-art world of IT and information repositories. It is the source of the newest information; a tool used by scientists, students and schoolchildren in their work and studies; as well as an important 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 computerisation 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) and the Lithuanian Academic Libraries Network (LABT) (Rutkauskiene et al, 2003, 2005).

Creation and development of the portal “Lithuanian Virtual University (LVU)” ([http:// www.lvu.lt/app](http://www.lvu.lt/app)) is part of the programme of the Ministry of 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 (Lithuanian Virtual University, 2009).

The presence of such technical media (print, audio, video, computer-based) is a distinguishing feature of distance education. Students study these materials, generally alone, at times and in places of their own choosing. There are arrangements to test their knowledge, skills and attitudes through assignments that are sent to a tutor for marking, or marked by computer (Rumble, 1997). The technology mediated transactional distance model is shown in Fig 1 (Wheeler, Reid, 2005).



**Fig 1.** The technology mediated transactional distance model (Wheeler, Reid, 2005)

Changing conditions caused by economic, social and technological factors force higher education institutions to maximize their investments in instructional technology equipment, facilities and training in order to provide new learning experiences for students.

## 2. E-learning at the Department of Construction Economics and Property Management of Vilnius Gediminas Technical University (Lithuania)

In order to show the e-learning courses at VGTU, before it is necessary to analyse the whole e-learning courses, existing in Lithuania. Distance Learning Pro-

grammes and Courses, Proposed By Universities and Colleges in Lithuania are shown in Table 1.

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: Real Estate Management and Internet Technologies and Real Estate Business. Since 2000 students can enroll in Construction Management e-learning course selecting Construction Economics and Management as a major subject (Rimkuvienė, Lepkova, 2004).

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 paper 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 141 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 Fig 2.

## 3. Main socio-economic indicators of Lithuania

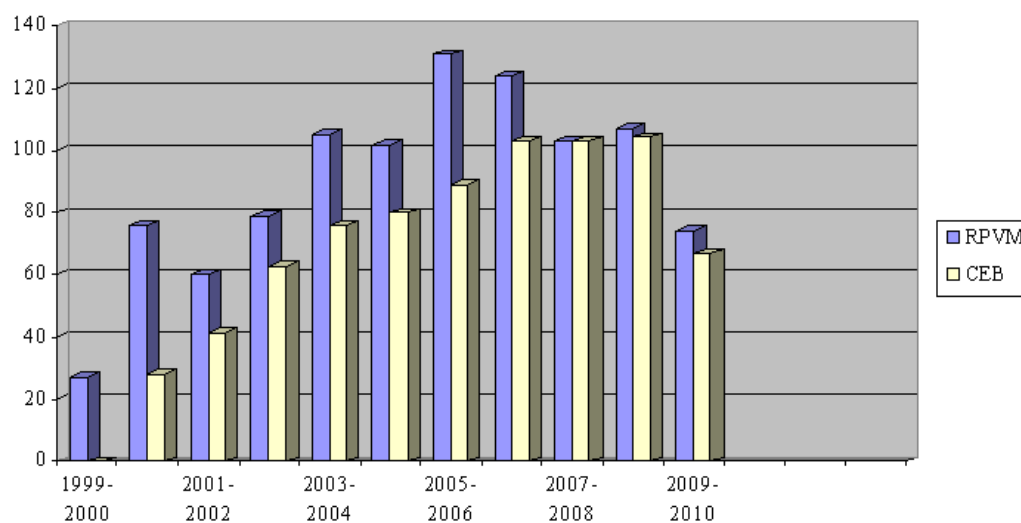
Table 2 shows the main economic and social indicators of Lithuania.

As illustrated in Table 2, the average number of population has been decreased in recent years. The main reason is high level of emigration, especially after the EU accession in 2004 and economical recession in 2009.

The current rate of inflation is very high, and it prevented Lithuania from joining the euro area in 2006.

**Table 1.** Distance learning programmes and courses, proposed by universities and colleges in Lithuania (all information from various courses collected by authors)

Education institution	Programmes	Courses	Name of programmes or course	Applied virtual learning environment
Lithuanian Virtual University	–	50	Applied statistics and etc. See more: <a href="http://www.lvu.lt/app?service=external/index&amp;sp=2683&amp;sp=2222">http://www.lvu.lt/app?service=external/index&amp;sp=2683&amp;sp=2222</a>	WebCT, Moodle
Kaunas University of Technology	2 (Master) 1 (special studies)	12	Information Technologies (3 specializations) Distance learning Information technologies Pedagogy Courses: Distance learning and etc. See more: <a href="http://emtc.ktu.lt/cms/emtc/app?service=external/index&amp;sp=1985&amp;sp=1965">http://emtc.ktu.lt/cms/emtc/app?service=external/index&amp;sp=1985&amp;sp=1965</a>	WebCT, Moodle, Black Board Vista CE6
Vilnius Gediminas Technical University	4 (Master) 3 (equalizing studies/courses)	21	Construction Economics and management Real Estate Valuation and management (3 specializations) Business management (3 specializations) Business Processes Management Technologies Business and Management Administration (3 specializations)  Courses: ANM infrastructure and etc. See more: <a href="http://irma.vtu.lt/lspace/central.nsf">http://irma.vtu.lt/lspace/central.nsf</a>	IBM Workplace Collaboration Services Learning Space
Mykolas Romeris University	2 (bachelor)		Law and Management Social Work	Moodle
Siauliai University	1 (bachelor)	-	Education	Moodle, Learning Space
Vilnius Law and Business College	5 (bachelor)	-	Business management Finance Accounting Tourism and Hotel Management Law	WebCity



**Fig 2.** Variation in the number of students in e-learning programs

#### 4. Analysis of three research works based on questionnaire 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 et al, 2004; Lepkova et al, 2006).

The second research have been fulfilled in 2006 year, after accession to the EU. 86 respondents took part in a questioning.

The third research been fulfilled in 2009, 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 questionnaire-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 (Web-site of e-learning of Vilnius Gediminas Technical University).

In present paper 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.

Comparison of Distribution of respondents by age is shown in Fig 3. The age of respondents ranged between 21 and 55 years.

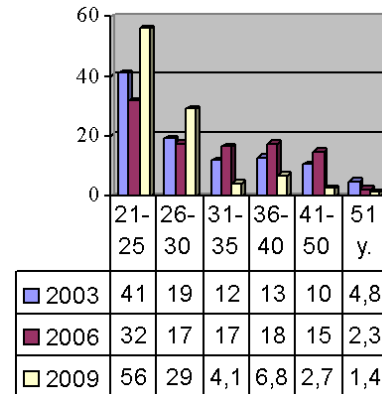
As illustrated by Fig 3, the students enrolled in the distance-learning course are people of different age groups (6 groups in total).

Fig 4 shows the distribution of respondents by type of employment.

Fig 4 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.

The distribution of respondents by motives of studies is shown in Fig 5. As illustrated by Fig 5, 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.



**Fig 3.** Distribution of respondents: comparison by age groups, %

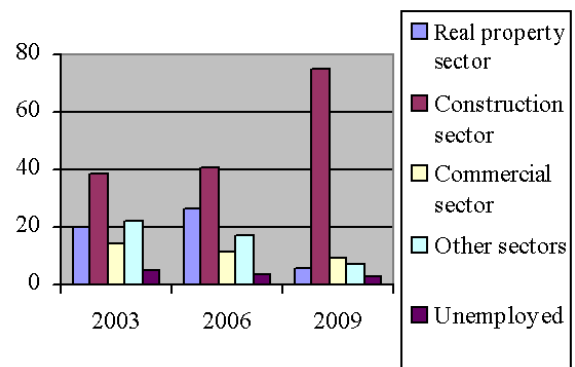
We have reached the part dealing with very important economic problems.

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 Fig 6.

Fig 6 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.

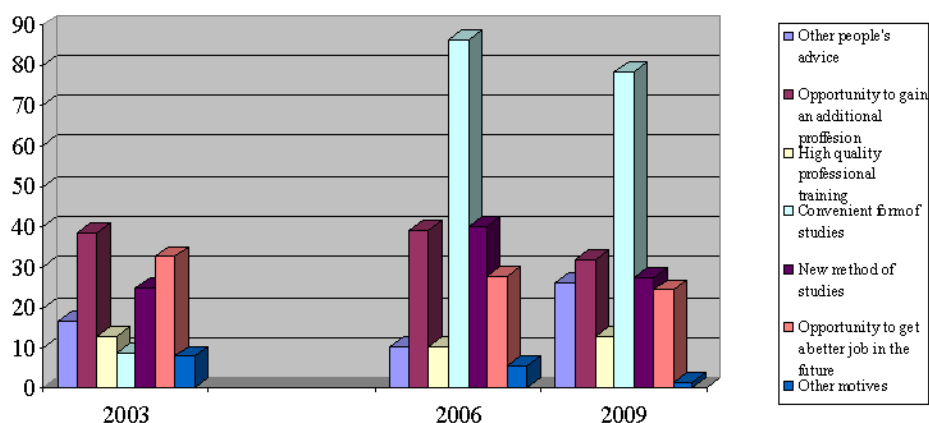
Fig 7 compares respondents' opinion about the level of tuition fees.



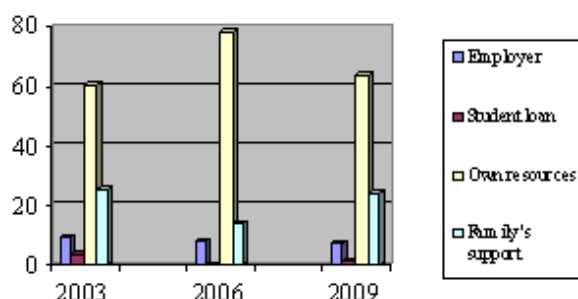
**Fig 4.** The distribution of respondents by type of employment, %

**Table 2.** The main indicators of economic and social development (annual) in Lithuania (Statistics Lithuania, 2008, 2009)

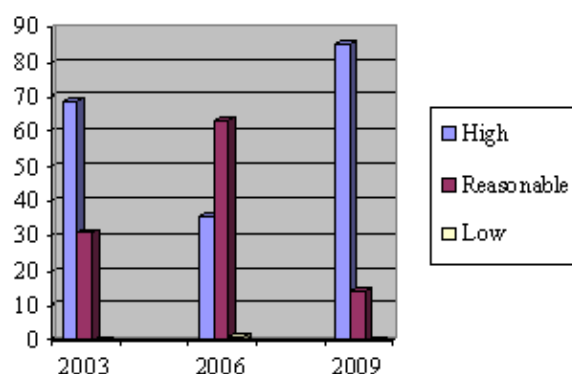
Indicators	2003	2004	2005	2006	2007	2008	2009
Annual average population, thousands	3,454.2	3,435.6	3,414.3	3,394.1	3,366.2	3,354.7	3,331.2
Unemployment rate, by labour force survey data, %	12.4	11.4	8.3	5.9	4.3	5.9	13.8
Inflation (December compared to December of previous year), %	-1.3	2.9	3.0	4.5	7.3	10.9	12.4
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	2,142.2
Gross domestic product at current prices, LTL million	56,804	62,587	71,200	81,973.6	77,939	60,265	No data



**Fig 5.** Distribution of respondents: comparison by motives of studies, %



**Fig 6.** Distribution of respondents: comparison by the source of financing, %



**Fig 7.** The comparison of respondents' opinion about the level of tuition fees, %

## Conclusions

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 2009 (economic recession), reveals the following trends:

a) 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.

b) The overwhelming majority of respondents are employed. The majority of respondents are employed in the sectors of construction and real property.

c) 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.

d) 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. Most of students identified that the current tuition fee of distance learning studies is high. As the result of eco-

nomical recession and difficult economical situation in Lithuania the number of students in 2009 has been decreased.

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