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The Role of E-Learning in the Knowledge Management System of Higher Education Institutions

PhD Thesis

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Table of Contents

1. Introduction.....	2
1.1 Relevance	2
2. Background And Objectives	3
2.1.1 Objectives	3
2.1.2 Hipoheses.....	Hiba! A könyvjelző nem létezik.
2.2 Literature Review	6
2.3 Data Sources.....	6
2.4 Evaluation Methodologies Of Research Results.....	7
2.4.1 Data File Generated By Linking Ilias And Neptune Data Sets.	7
2.4.2 Questionnaire	8
3. Results.....	9
3.1 Justification Of Hypotheses	9
4. New And Original Scholarly Achievements	13
5. Conclusion And Suggestions	14
6. Publications In The Area Of The Phd Research	16

1. INTRODUCTION

1.1 Relevance

Electronically supported learning is gaining ground in our daily lives, as the use of computers is becoming an important tool for lifelong learning. The integration of information and communication technologies (ICT) in education affects a wide variety of educational systems and the participants of education as well. Most of the studies, however, does not give a clear answer to the impact of these novel techniques on the learner and the learning process.

According to figures from the Central Statistical Office students studying in higher education institutions in the school year 2012/2013 was 338,467. 233,678 conduct their studies on a full-time basis, while 104,789 study on distance or correspondence courses, so the total number is about. one-third. It also shows that a significant proportion of those students chose distance learning. Those students involved in distance learning have special needs due to different living conditions.

Customized knowledge management solutions and services play an increasing part both in the business and the academic sector. Higher education institutions also present several other challenges. The declining number of students and the rising cost of training encourage institutions to seek more attractive features in order to draw attention to themselves, to attract and keep students in the institution. Knowledge management tools can be the method of attraction and may prevent the dropout of students. In this process teachers play a key role in new functions as mentors and tutors. The tutor as a "master" introduces students to these novel knowledge acquisition methods. Technical and IT solutions, like e-learning management systems (LMS), have an essential function, while digital competence development and use also play a key part.

After the literature review I have examined knowledge management related processes , tools, and strategies taking place within higher education institutions. In my thesis I also looked for the answer to what utilization opportunities may arise in the higher education institutions, which are using knowledge management tools. My goal was to introduce the transforming role of higher education institutions in order to meet the needs of the new age and to analyze whether there is an interaction between universities, colleges and business players. I would also like to introduce knowledge management processes and tools to facilitate the ability to adapt the institutions to the changed circumstances of students needs.

During the processing of the literature mapping the results of similar studies caused significant difficulties. The studies were generally based on surveys, furthermore in many cases it was not even specified whether the sample is representative or not.

I had the opportunity to follow the development of the LMS ILIAS (Integriertes Lern - , Informations- und Arbeitskooperations System, Integrated Education, Information and Collaboration System) as I have participated in almost all of the international conferences from the third ILIAS conference in 2004 to 2010, where user institutions presented the most important results. However, detailed empirical studies, if any , were dealing with other areas not the effects of ILIAS on student test results. The ILIAS community in Hungary is active,

and many publications, including doctoral dissertations were published about the application of ILIAS in different reference institutions and communities, nevertheless there was not any research among the list of publications that empirically have examined the impact of online education on exam results or the difference between full time and distance learning students.

I started my research just in the right moment for this issue to be addressed. At my workplace I had access to students' data sets entering and staying active in ILIAS, the time spent within and the data of students' exam results queried from the Neptune system. Since students used two different codes when entering the systems,, the two databases were linked with certain IT tools. The idea came up to draw conclusions from a comparison of the students' online activity within the semester and exam results .

To my best knowledge, such an empirical study on linking two data sets have not yet been conducted. The results are presented below. Furthermore, I would also like to note that - in my opinion - the results of my research can be used to tailor solutions to knowledge management services, so that they get more and more ground both in business and in the academic sector. Higher education institutions are also more fraught with challenge. The declining student enrollment, the increasing costs of training encourages the institutions to offer more attractive services to call attention to themselves, thus to attract and retain students for the institution. Knowledge management solutions may be one of these tools.

2. BACKGROUND AND OBJECTIVES

2.1.1 Objectives

Based on scientific objectives by means of a complex statistical analysis the main goal of the research was to explore, whether there are significant differences in study habits , methods and motivation among the full time and distance learning students.

My research has been conducted in a specific higher education institution, Dennis Gabor College. I regard the survey and its results as a case study. Based on the results of this study and the findings of other higher education institutions I have drawn general conclusions as an answer to my research question.

I have done complex econometric analysis on the basis of primary data for the specific structure and format available. My goal was:

- to convert and organize the data
- to create new derived data.
- to select the appropriate statistical methods for the systematic analysis of the data for
- to examine whether there is a connection between the form of education (full-time and distance learning), the students' online learning activities and number of credits earned at the end of semester

As a result, I will draw conclusions, which:

- On the one hand: answer the fundamental question of whether the use of e-learning framework influenced the study results of the students.
- On the other hand: I propose suggestions to promote the more effective participation of students in higher education institutions supported by ICT tools educational

process, taking into account the specific needs and circumstances of students in distance learning, which vary from full-time students' needs.

- Third, draws attention to the opportunities and increased importance of non-academic use of frameworks used in teaching.

Thus I intend to:

1. Explore and evaluate the differences outlined above between full time and distance learning students, with particular reference to the use of e-learning tools.
2. Evaluate the results of distance learning students using e-learning tools, rate economical and additional impacts of e-learning.
3. Evaluation of Knowledge Management tools used in higher education institutions.

In my research is not my intention to examine either primary and secondary school education and digital learning materials. My research focuses on adult education and adult training. I examine the didactic principles and andragogical methods used in adult education in this regard.

I define student groups on the basis of their specific circumstances and learning habits based on national and international literature. I also give an overview to which extent can the system provide a solution to different student needs,.

In my analysis is not my intention to deal with the use of e-learning and knowledge management outside higher education institutions , such as companies either, since - although there are similarities between the behavior and function of these organizations - the academic institution plays a unique multi-functional role in the transfer of knowledge .

I also delimit my analysis of lifelong learning, because it would lead to the direction of investigating higher education graduates' opportunities in the labor market. This topic is a natural extension of my research, but would unnecessarily extend the scope of the paper.

2.1.2 Hypotheses

Based on the literature review, and my professional experience gained predominantly in the field of e-learning I set the following research hypotheses:

1. Table: Hypotheses and Research Methods

Hypothesis	Research method
H1. There is a significant difference between full time and distance learning students in learning and Internet access habits. By study habits I imply curriculum access methods and time and place of access.	Case Study. Questionnaire. Crosstab analysis.
H2. The use of learning management systems (Learning Management System, LMS) may improve the learning outcomes of students. The	Case Study. Exam results statistics compared with time spent in the LMS.

positive effect is not system-specific.	Analysis of variance. Correlation.
H3. The use of learning management systems is changing traditional learning habits. Non-traditional forms of learning facilitates adaptation to different situations. Students acquire teaching material at a suitable time and methods different from traditional ones, which facilitate the success of participation in the training process.	Case Study. Questionnaire. Crosstab analysis.
H4. E-learning, as a knowledge management tool in higher education, support students, making the learning process more effective. By using online tools, students in higher education can keep in touch with each other and with their teachers and administrators, thus facilitating more successful administration, and knowledge transfer.	Case Study. Questionnaire. Analysis of variance. Correlation.

Source: Own composition

My doctoral thesis is divided into three major sections.

- The first part presents national and international literature on knowledge management, e-learning, and higher education institutions, focusing on those areas that are not properly discussed concerning my research question.
- In the second part materials and methods are presented by temporal delimitation of the processed data. I describe origins and structure of the data used in my analysis for the case studies and the statistical methods for processing of these data.
- In the third part I present the results of my research. Finally, I examine my hypotheses.

INTRODUCTION AND METHODOLOGY

2.2 Literature Review

The analysis of the related national and international scientific literature and its critical evaluation focused on these priority areas:

- The definition of e-learning, narrowing the definition
- Understanding of the concept of knowledge management systems, their use in higher education
- Introducing the development of higher education institutions, the concept of third-generation university
- the difference between Connection with participating in the definition didactic aspects of distance learning students in the form of training and living habits of

Particular attention was paid to the place occupied by Hungary in the European Union in terms of e-learning skills and literacy. I have reviewed international and Hungarian scientific studies and their results relevant to my research topics.

Sources described above helped to formulate my own research objectives, and examine areas where there is a hiatus in the literature sources and try to look for answers to these questions.

2.3 Data Sources

The survey was conducted during the 2011-12 academic year. The study occurred in a special moment because vast changes took place in higher education in 2013 with the introduction of public education law. The survey recorded this last moment.

I have used two set of data for the research:

1. The quantitative survey data sets consist of the students' logged time spent in the ILIAS Learning Management System (LMS), and credits earned during the semester recorded in the Neptun Administrative Study System. These data sets were analyzed to discuss the effects of the LMS use on the students' study results.
2. A questionnaire has also been distributed among students who were active ILIAS users. Their survey responses provided data to gain information on their living conditions and study habits related to the distance learning system.

The two data files had to be converted for statistical processing.

To carry out my research a primary data set was used. I have used data of the academic year 2011-2012, of the ILIAS LMS use and students' exam results. The target group was all Dennis Gabor College students using ILIAS: undergraduate, higher education degree, postgraduate, and students who started college before the Bologna system. I examined the exam results of 1,695 students.

The student sample is representative as this is the base population. Students only have access to learning materials through ILIAS only as printed textbooks are not available. In addition to taking notes in class therefore logging in to ILIAS is the only opportunity to prepare for the

exam, so it is the students' best interest to use the system. Thus, the sample distribution is most likely the same as the probability distribution of the variable being tested.

This question does not arise in Neptun, the learning administration system, as all student information can be found Neptun. Each student is assigned credits at the beginning of the semester, and some of these completed by the end of the exam period.

To examine the relationship between academic success and the use of the ILIAS distance education system, I have used the following data: the time spent in the Learning Management System, and the students' academic performance obtained from Neptun.

To analyze the interaction between the two variables, the ILIAS and Neptun records had to be connected. This was performed with the help of an auxiliary file, which included students' codes from both systems.

Therefore in the final SPSS data file I have set one of the codes (only to identify the rest of the data), time spent in the distance learning system in minutes, the number of credits the students were assigned to, and the actual number of credits obtained, the ratio calculated from these data, and the students' form of study (full time or distance learning).

I had to dismiss cases (students), when it was not possible to match the two codes (ILIAS and Neptun). I also dismissed students not obtaining or assigned to any credits. Thus, descriptive statistical indicators - average etc. - differed from the indicators of the overall student population. This did not cause a problem in the research, because I have intended to explore correlations and differences of two forms of learning - distance and full time learning, so distortion has not been caused by the survey .

The test results were analyzed using the percentage of credits assigned and completed. The reason for this is that this statistic had been used for college semester results statistics, thus the methodology and the results were given. The best result for the student was, if they obtained 100% of the credits they had been assigned to, so I chose the ratio of credit to measure student success.

2.4 Evaluation Methodologies of Research Results

2.4.1 Data file generated by linking ILIAS and Neptun data sets.

When selecting evaluation methods, I had to take into account the temporal and additional limitations of the research.

Panel (data) analysis would theoretically have been adequate to analyze student results in measuring efficiency by the use of the LMS, but the circumstances did not give an opportunity to do so. In case of panel analysis the recurrent observation of the same students is performed. The test is suitable in a pedagogical study to track the effectiveness of a teaching method. ILIAS LMS system was introduced in 2005 and has been fully applied by 2008. During the period my research has been conducted all the college students have already used the ILIAS system, so it was not possible to separate a specified period of time or student group that studied either by traditional teaching methods or online educational tools.

Thus I chose two available data sets: ILIAS system usage data, and the students' exam results. Technically, I had the opportunity to receive students' exam results, who used ILIAS, and join the two sets of data on the level of individuals.

Since the two sets of data to be examined – time spent in the distance education system in minutes and the rate of credits completed – are high measurement level metric variables, correlation analysis was used to examine the connection between them. The differences between the two forms of training were analyzed by analysis of variance and correlation calculated separately for the two forms of training.

2.4.2 Questionnaire

A promotion of the questionnaire was conducted via the Neptun education administration system. I drew attention to the possibility of filling in the questionnaire through targeted e-mails to students in May 2012. E-mails were sent to all active (who entered the system during the investigation period) BSc and Higher Education Degree students signed up to college courses. 1,690 students results have been examined.

Also, I have placed the questionnaire and a brief description on the main surface of the ILIAS desktop. Thus, those students also learned about the possibility, who did not receive an e-mail notification. The ratio of filling in the questionnaire was approximately 11%. A total of 177 persons opinion was analyzed further.

The questionnaire itself was an ILIAS application. I was able to access statistical data as an administrator and results import in a suitable format (PDF, Excel).

3. RESULTS

3.1 Justification of Hypotheses

H1. There is a significant difference between full time and distance learning students in learning and Internet access habits. By study habits I imply curriculum access methods and time and place of access.

Summarizing the results of the study I declare the following statements:

- There is significant correlation between the form of study and age group. The 18-22 age group studies mostly in full time programs, while the age group older than 30 studies in distance learning.
- Full time students typically have no children opposed to distance learning students
- There is also a connection between the form of training and work habits. Almost all distance learning students work. More than 50% of full-time students work besides their studies.
- Full-time students use the distance learning system in the main school building in a prominently higher proportion, than distance learning students. This result is reversed in case of the workplace.
- Twice as many distance learning students enter the system at night between than full time students.

The second table summarizes the results:

2. Table: Differences between full time distance learning students

	Full time	Distance Learning
Age	18-22	30+
Work	50%	94%
Place of study	college	workplace
Time of study	during the day	at nigh
Child	no	yes

Source: Own research

I conclude, therefore, that the typical full-time students belongs to the age group 18-22 years old, has no children, uses the distance learning system especially during the day in the main school building, and is likely to work part-time in general parallel with her studies.

Distance learning students are typically over the age of 30, likely to have children, work full time, use ILIAS at night and at work.

Thus, I accept the first hypothesis. Different student groups study according to their needs and circumstances. Their learning and knowledge-seeking habits vary.

H2. The use of learning management systems (Learning Management System, LMS) may improve the learning outcomes of students. The positive effect is not system-specific.

According to the hypotheses relationship was compared between the two forms of learning. The difference between the two groups may be characterized by the different extent of the distance learning system's effect on student performance. According to the results in case of full-time students the correlation is much higher than in case of distance learning students, see Table 3. Both results were significant, $p = 0.00$.

3. Table: Correlation of time spent in ILIAS and credit performance of full time and distance learning students

		Credit performance
Full time		
Time spent in ILIAS	corr. coefficient	,491**
	Sig.	,000
Distance learning		
Time spent in ILIAS	corr. coefficient	,304**
	Sig	,000

Source: Own research

In case of full time students the correlation coefficient is 61% higher. If coefficients of determination are calculated, the results are 0.24 and 0.09. Thus calculations show that the use of ILIAS has two and a half times greater impact on academic performance in case of full time students.

Based on the results of analysis of variance and correlation tests I make the following statements:

- Time spent in ILIAS definitely improves the ratio of completed credits.
- The use of ILIAS has two and a half times greater impact on academic performance in case of full time students, than in case of distance education students.

Thus I consider the second hypothesis justified, since ILIAS use improved each student group's performance, but in a higher extent in case of full time students. In my opinion, the fact, that the more than half of the respondents work beside their studies in some for or another, explains this result. Access to online learning materials for full-time students is of great importance

H3. The use of learning management systems is changing traditional learning habits. Non-traditional forms of learning facilitates adaptation to different situations. Students acquire teaching material at a suitable time and methods different from traditional ones, which facilitate the success of participation in the training process. E-learning, as a knowledge management tool in higher education, support students, making the learning process more effective.

By using online tools, students in higher education can keep in touch with each other and with their teachers and administrators, thus facilitating more successful administration, and knowledge transfer.

There is a significant (statistically proven) difference mainly between the location of using ILIAS: in case of the answers "I use ILIAS on campus, on classroom / library computers", "I use ILIAS on campus on my own laptop" and "At my workplace". $P = 0.000$, so this result essentially ruled out, that the distortion of the sample induced (or substantially influenced) the differences.

When justifying the third hypothesis I refer to these results already mentioned during the justification of H1:

- Full-time students use the distance learning system in the main school building in a prominently higher proportion, than distance learning students. This result is reversed in case of the workplace.
- Twice as many distance learning students enter the system at night between than full time students.

I would like to highlight the results of the gradual spread of mobile devices (27%). This value was negligible during a similar survey years ago, but over the years with the proliferation of mobile devices (smartphones, tablets) this form of learning has grown by leaps and bounds.

The third hypothesis therefore is regarded as justified, as non-traditional forms of learning (home, work, mobile device, per night) has been clearly shown gaining ground, especially among distance learning students.

H4. E-learning, as a knowledge management tool in higher education, support students, making the learning process more effective.

By using online tools, students in higher education can keep in touch with each other and with their teachers and administrators, thus facilitating more successful administration, and knowledge transfer.

ILIAS is used for educational administration by one-third of the respondents (on a low - medium level). Whereas a higher proportion of distance learning students (39%) turn to online resources than full time students (31%), because they have fewer opportunities for personal contact.

These life situations (see above) almost determine students to have different experiences and strategies related to IT use. However there is no significant difference between the two groups concerning overall satisfaction with ILIAS.

Communication with teachers and administrators less significant than study activities, however, since the ILIAS system is primarily designed for self-study, this result is natural. However, since administrative activities is still around 30% of the online activity of respondents this is considered significant. Thus, the fourth hypothesis is justified.

4. NEW AND ORIGINAL SCHOLARLY ACHIEVEMENTS

Based on research results I came to the following conclusions:

1. Variance analysis proved that there is a significant difference between full time and distance learning students ($p = 0.000$). Correlation calculation proved that time spent in ILIAS significantly improves the ratio of credits completed by the students. The coefficient of determination in case of fulltime students is 0.24, while at distance education students is 0.09. Thus, in case of full time students using ILIAS has two and a half times greater impact on learning performance than in case of distance learning students.
2. I demonstrated by applying correlation analysis, that online education has a positive impact on the academic achievements of students compared to traditional education, in accordance with similar studies,. The correlation coefficient is 0.376, which is of medium strength. Students using online resources for knowledge acquisition purposes have improved their academic performance, thus higher e-learning literacy contributes to the successful acquisition of knowledge. Sample of students tested in the case study is considered representative, in view of the higher education institution examined.
3. Based on the questionnaire statistical methods prove that 67% of distance learning students work besides their studies. 55% of full time students work in some form or another besides their full time studies. Thus there is a great overlap between full time students, and students working parallel with their studies. Using cross-table analysis I proved that 55% of full time students work in some form or other. The student sample in this case is not representative, since filling in the questionnaire was optional. Nevertheless, it may logically be assumed that the results may be applied to a larger range of data.
4. Full time and distance learning student groups study according to their needs and life situations, thus their study and knowledge acquisition habits also differ. Non-traditional forms of learning (at home, in the workplace, on a mobile device, during the night) clearly gain ground, especially among students of distance learning students. The cross-table analysis showed a significant difference in several cases. These empirical results have confirmed the allegations, which are listed in the literature of e-learning as the most important advantages of online education: non-traditional forms of education compared to traditional methods facilitate learning besides family and work.
5. Questionnaire answers confirmed that students make use of online tools to liaise with teachers and administrators in addition to the traditional personal forms. This issue concerned a specific area, where - according to best of my knowledge - no investigation has been made, so the research, although the sample is not considered representative in this case, may serve as the basis for further investigation.

5. CONCLUSION AND SUGGESTIONS

As a result of my research, I conclude that the use of digital tools in education is inevitable, there was a breakthrough in the user point of view. Students already possess the tools and attitude, which enables the exploitation of available content in the online environment.

Hence the value creation of knowledge management for the participants of the process can be summarized as follows:

- Traditionally the transfer of knowledge takes place with the teacher's assistance in person, or by books and notes. However, due to the expansion of online media, a LMS (Learning Management System) can be an up-to-date solution to manage knowledge transmission. The introduction of this service is recommended in an ascending system, gradually covering the entire organization. The goal is that the system would be exploited by all teachers, students, administrators on an institutional level within the daily practice of education.
- By introducing e-learning systems students have the opportunity to measure themselves and acquire knowledge in a new medium, through active involvement, not only passively absorbing knowledge. Learning in virtual groups, developing joint projects prepare students for team work, which they will use in their future workplace. The opportunities of Web 2.0, wikis, forums promote teamwork and sharing of experiences.
- Full-time students also commit themselves to work in various forms. This contradicts the fact that theoretically they should fully concentrate on their studies and should be present in the educational process. Instructors need to find the opportunities in this situation that help full time students to cope with the learning process. Digital teaching materials facilitate this process.
- The use of e-learning and educational administration systems significantly help the transfer of knowledge in the case of students, teachers and employees. Although higher education institutions and for-profit companies differ in many respects from each other in terms of knowledge management, they would like to achieve the same goal. However, similar situations occur in both types of institutions, for example the quitting or retirement of employees. In these cases, it is essential that the employee's knowledge will not be lost for the organization. The retention, codification and transfer of knowledge is achieved by using the same tools. In this process, e-learning and blended learning appears not as a "panacea", but as an opportunity that facilitates effectiveness.
- A key feature of third-generation universities is their relationship with market actors. It is essential that higher education institutions and the corporate sector work more closely, enhancing each other's effectiveness. Universities and colleges should continuously monitor and probe labor market and business needs, and to educate such knowledge workers with marketable skills, who fulfill the gaps in the labor market, thus contributing to long-term economic development.

For further research and practical applications of the area I make the following recommendations:

- To further examine the change of study habits a time-series panel study is necessary. The research should be carried out in an institution where digital learning materials and teaching aids are still to be applied on an institutional level. My present position in the Budapest College of Communication and Business is ideal for this purpose, as the introduction of e-learning tools is being applied. The subject of the research is the study of a group of students before and after the use of learning management tools. With the comparison of the results new information will be gained concerning the use of digital learning materials and the effectiveness of e-learning tools.

These tasks are extremely comprehensive, they require significant time and financial resources. The topic however is very interesting, it is definitely suitable for research. Research have been conducted on similar topics by the Knowledge Management Working Committee of the Hungarian Academy of Sciences. It would be advisable to unite the previously accumulated knowledge of professionals in this subject and involve researchers in a long-winded, hoop-style study, using grant resources.

In the coming years knowledge-based economy will become the engine of economic development. During this process, higher education institutions will function as knowledge centers, to identify, develop, publish, and deliver knowledge, thus take part in regional development.

6. PUBLICATIONS IN THE AREA OF THE PHD RESEARCH

Publications In Scientific Journals

In English

1. **A. Petákné Balogh** (2013).: E- learning Skill and Use in EU Countries; A Statistical Analysis, *Vezetéstudomány*, XLIV (2), 2013. Corvinus Egyetem, 113-127 p. ISSN 0133-0179
2. E. Noszkay – **A. Balogh**: Knowledge Management - a New Role of Universities, *International Journal of Management Cases*. 14 (2) 2012. Access Press UK, 131-137 p. ISSN 1741-6264
3. **A. Petákné Balogh**, K. V. Siakas, S. Koinig, D. Ekert, D. Coakley, R. Colomo-Palacios, V. Kostoglou. (2013): Social Media Networker. A new profile for a new market. *Electronic Business and Marketing*, Szerk: Tokuro Matsuo, Ricardo Colomo-Palacios. *Series of Studies in Computational Intelligence*. 484, 2013. Springer Verlag, 137-146 p. ISSN 1860-949X

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In Hungarian

4. **Balogh A.** (2011): Tudásmenedzsment és a felsőoktatási intézmény, mint vállalat. *Gazdaság és társadalom*. III. évf. 1. szám, 2011. Nyugat-magyarországi Egyetem, 113-127 p, ISSN 0865-7823

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2. **A. Balogh** – E. Noszkay (2009): Correspondence System of Lifelong Learning, Knowledge Management and E- learning in Everyday Higher Education Practice, The Enterprise Information Systems International Conference on Research and Practical Issues of EIS (CONFENIS), Győr, 2009. 1-9 p. CD-ROM CONFENIS konferenciakiadvány. [CD:\CONFENIS-English\IT Professionalism, Education\Noszkay, E. – Balogh, A.: Correspondence System of Lifelong Learning, Knowledge Management and E-learning in Everyday Higher Education Practice]
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2. **Petákné Balogh A.** (2011): Az EU-országok infokommunikációs fejlettségének statisztikai vizsgálata. 8. Országos Gazdaságinformatikai Konferencia, Győr, NJSZT-GIKOF, absztraktok. 2011. 61. p.
 3. **Balogh A.** – Komáromi L. (2008): Innovatív minőségi folyamatok az eLearningben, a tutorálás, mentorálás módszertana és gyakorlata a Gábor Dénes Főiskolán, Informatika a felsőoktatásban konferencia, Debrecen, 2008., 1-9 p. ISBN 978 963 473 129 0, <http://www.agr.unideb.hu/if2008/kiadvany/papers/G64.pdf>

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2. **Balogh A.** (2011): Az intézményi tudásmenedzsment támogatása e- learning eszközök segítségével. In: Tudásból várat..., Tudásmenedzsment elméleti és módszertani megközelítésben. A Magyar Tudományos Akadémia Vezetés-és Szervezéstudományi Bizottság Tudásmenedzsment Albizottságának II. számú gyűjteményes kötete, 2009 – 2011, szerkesztette: Noszkay Erzsébet, N&B Kiadó, Budapest, 9-15. p. ISBN: 978-963-08-1265-8

In English

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