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E-learning in Management – Focus on Hungary, Serbia and Slovakia

ABSTRACT

The interpretation, according to the authors, of “e-learning” is defined as follows: (1) in the wider sense: a process of training, transferring knowledge or studying which is aided by digital equipment (storage, retrieval, display, forwarding and feedback of content and study-aides); (2) more specifically: an open form and framework of training, accessible through a private or public network, which enables the efficient organization of the

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training process for the user (young or adult), as well as the appropriate communication and feedback between the tutor and trainee, regardless of time or distance. First of all in this new study we review the basic theoretical foundations of e-learning, and in the second section we will highlight the major conclusions of an empirical study carried out in Hungary, Serbia and Slovakia.

Keywords: e-learning, continuing education, life-long learning, adult learning, benchmarking

1. Background

Due to the ubiquity of the Internet, e-learning is becoming a more and more important tool in education. 'E-learning is an approach to facilitate and enhance learning through, and based on, both computer and communications technology. [...] may be used to suit distance learning through the use of Wide Area Networks, and may also be considered to be a form of flexible learning where just-in-time learning is possible' (E-Europe, 2006). Others describe e-learning as simply pedagogy empowered by digital technology (European Commission, 2000). Nowadays, e-learning is defined as the acquisition of knowledge and skills using electronic technologies such as computer-and Internet-based courseware and Local and Wide Area Networks. (Fatma, 2013)

Internet technologies have altered the technological and economic landscapes so radically that it is now possible to make quantum leaps in the use of technology for learning. There are, however, still dangers. If we focus too much on the technology itself and not enough on how well it is used, we will continue to fall short, but, if we neglect the power of the Internet, we will never 'get off the ground'. In the end, successful Internet-enabled learning, or 'e-learning', depends on building a strategy which optimizes the technology within an organizational culture which is ready and willing to use it (Rosenberg, 2001).

E-learning is fast becoming a part of undergraduate courses, as an adjunct to traditional learning activities (Brown et al., 2007) for students and professionals. This combined approach might be more attractive to adult learners due to their assumed higher levels of motivation and capability for self-directed learning (Teeley, 2007). Specific post-graduate level courses (Brandys et al., 2006) and interprofessional online collaboration for professionals in learning and practice are also evident. (Varga-Atkins, Cooper, 2005; Bury et al., 2006) E-learning systems have become important

tools in the process of continuing education, especially in Europe, the United States, Australia and Canada.

However, the route to the effective use of e-learning is not straightforward. High setup costs and time commitments to maintain quality are issues arising in this respect. (Bronlund, 2011) The lack of quality assurance standardisation has also been noted. (Higgins, Thorne, 1998; Konstan et al., 1997) In order to establish a foundation for quality assurance standardisation, e-learning must fulfil specific requirements for conveying knowledge and skills and be accepted by its users. (Nesterowicz, 2014a)

Educators report the advantages of e-learning including the improved open access to education, time and place flexibility. There are also limitations such as high dropout rates, the lack of management oversight, and also the lack of attendee support and inadequate interaction between the tutors and users. (Nesterowicz, 2014b)

As noted by Carswell and Venkatesh (2002), much of the research into e-learning has examined the outcome differences between online and traditional classes or offered the experiences of teachers or users. Knowledge increase and acceptance are key issues if e-courses are to be successful tools.

E-learning is a convenient way of learning which can be employed at any time and anywhere. E-learning helps to reduce costs for the participants (travel, accommodation) and also for the providers (renting premises, printing materials). On the other hand, there are advantages of campus-based learning over e-learning, such as direct interpersonal relations, live contact with the tutor, a clear and precise time and place for the teaching session, a more transparent way to verify knowledge and the development of interpersonal skills. Therefore, e-courses need to be validated and standardized in the same way as those of conventional courses, to ensure the level of the information provided. It is not only the content of e-courses which requires review by specialists, but also the way in which they are designed and provided to attendees. (Nesterowicz, 2014a).

E-learning courses should be validated with regard to their facilitation of knowledge creation. We argue that, for this, the pre- and post-test method is relevant. In addition, we encourage the use of questionnaires on the acceptance of e-courses to request feedback from users and to check the level of satisfaction. Furthermore, users should have the opportunity to communicate with a tutor and other users.

The phenomenon of e-learning is very dynamic and it is difficult to predict its exact place and shape in the lifelong learning process in the near future. Undoubtedly, e-learning will be more relevant in the future than it is today and it will play a larger role in Higher Education and the business sector. (Nesterowicz, 2014a)

E-learning significantly enhances the educational opportunities for students and employees. However, this potential requires a certain level of institutional readiness

in human and infrastructural resources. One of the major tasks for universities and companies is to find optimal methods to incorporate e-learning into their educational process. (Frehywot et al., 2013)

Exhibit 0. Pros and Cons of E-learning Systems

Advantages	Disadvantages
<ul style="list-style-type: none"> • Cost reduction • Time and space flexibility • Multimedia forms • High interactivity 	<ul style="list-style-type: none"> • Lack of direct interpersonal relations • No exact definite time and place of training • Difficulties with the verification of knowledge

Source: Authors' own research.

2. Methodology – Benchmarking

The first step in relation to methodology is to define the scope of our research, as well as to state the aims and restrictions. We analyze the use of e-learning by the business sector in Hungary, Serbia and Slovakia. Our quantitative research is based on benchmarking methods.

Benchmarking means comparing examples of 'best practice'. There are many ways to benchmark, and we have opted for the functional form. Benchmarking has been variously described as expensive, effective, interesting, lustrous, immersive, frustrating, challenging and difficult, but it is not industrial espionage, free travel, stealing, just new fashion, cheap, easy. (Evans, 1977) "The object of functional benchmarking is to highlight the best practice of a company recognized as being a leader in a specific area." (Harmes-Liedtke, 2007, p. 5) – and the specific area of benchmarking in this study is e-learning. Again for the purposes of this study we have narrowed our focus geographically to three Central European countries, and here we asked companies to complete a questionnaire. For such a survey it is important that the countries examined are comparable, and enterprises in the Visegrad Group are comparable since they have a similarly developed environment. In addition, a structured survey of this type is an acceptable technique in the business sector (Bennett, 1986; Jankovics, 1991).

Our quantitative research focuses on examination and control, whilst the qualitative concentrates on understanding; hence hypotheses are formulated in quantitative research. (Pervez, Kjell, 2011) The subsequent sections are comprised of a review of the literature, our hypotheses, questionnaire, data gathering samples and a statistical analysis.

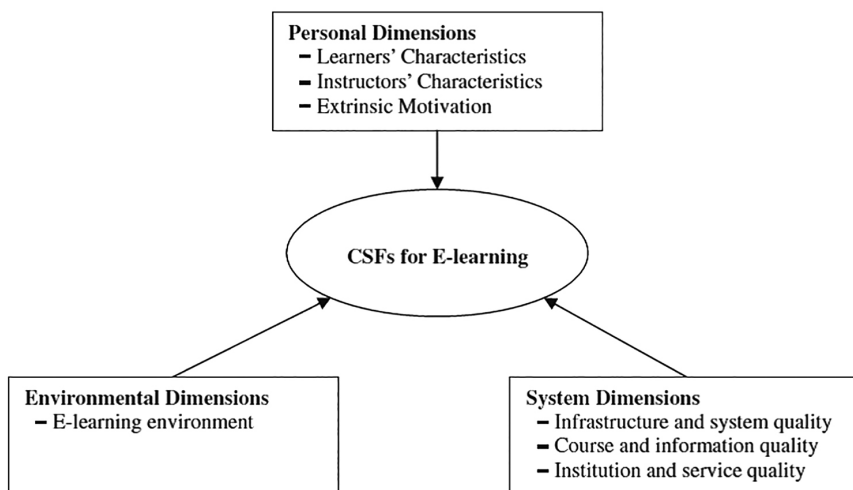
The quantitative research is extended by an analysis of the qualitative research employed. The purpose of qualitative research is to gather and understand information. Its role is especially important due to the earlier lack of information. This means that the qualitative research is exploratory and flexible. We also use control variables which entails a person, group, event, etc. in statistics which is used as a constant and unchanging standard of comparison in scientific experimentation. Basic methodology is employed with the assistance of Google and Microsoft

3. Literature Review

E-learning is an innovative approach to transfer information for educational purposes. Its purpose is to strengthen the knowledge, skills and other capabilities of users. (Siritongthaworn et al., 2006, p. 139). The essence of e-learning lies in the multiple appearance and mix of methods such as videos, e-books, forums, wikis and so on. The literature on e-learning is broad and so we have narrowed our focus to examining the critical success (the most influenced) factors of e-learning. The successful implementation of e-learning depends on many factors and these are also reviewed in this study.

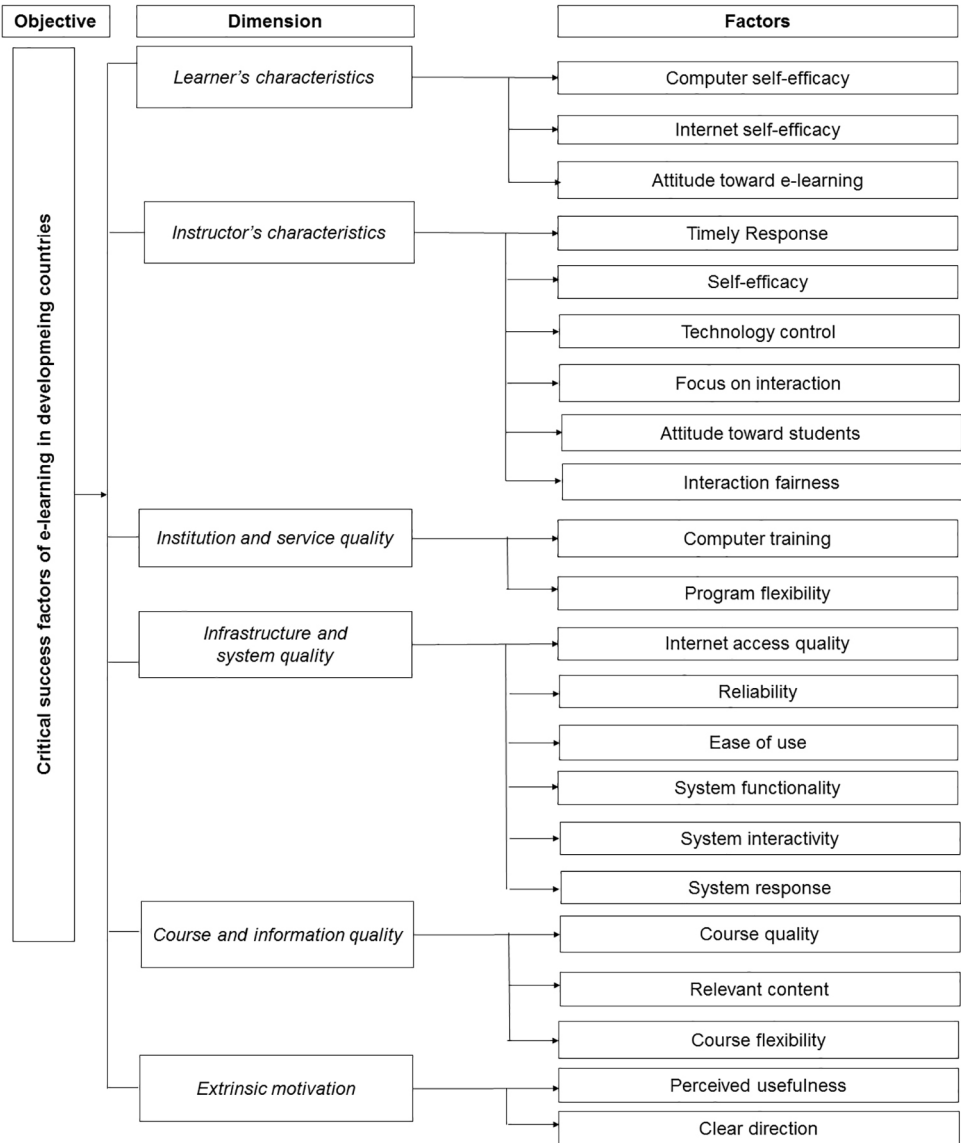
The next figure (Figure 1) shows the critical success factors of e-learning – three dimensions, namely personal, environmental and system.

Figure 1. E-learning's Critical Success Factors (CSF)



Source: Bhuasiri et al. (2012, p. 846).

Figure 2. Hierarchical Model for E-learning Critical Success Factors in Developing Countries



Source: Bhuasiri et al. (2012, p. 851).

The next model includes more factors (see Figure 2). Compared to the earlier model, the learner and instruction dimensions are the same, the course dimension is extended with information quality, the extrinsic motivation is a new dimension

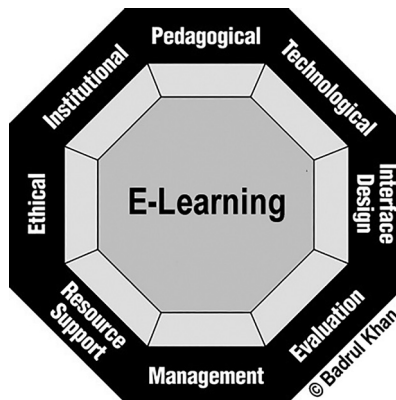
although related to the earlier design dimension. The second e-learning model contains a new dimension, the institution and service quality which was a subcategory in the first model.

If e-learning is analysed as a technology, then technology acceptance models can be relevant. The use of ICT devices plays a highlighted role because they are used during learning.

4. E-Learning Framework

The design, development, implementation and evaluation of open, flexible and distributed learning systems requires thoughtful analysis and investigation of how to use the attributes and resources of the Internet and digital technologies in conjunction with instructional design principles and issues important to various dimensions of online learning environments (Khan, 2001). These factors can encompass various online learning issues, including: pedagogical, technological, interface design, evaluation, management, resource support, ethical and institutional. Various factors discussed in the Badrul Khan's Eight-Dimensional e-Learning Framework can provide guidance in the design, development, delivery and evaluation of flexible, open and distance learning environments (Fig. 3).

Figure 3. Badrul Khan's Eight-Dimensional e-Learning Framework



Source: Khan (2001).

The E-Learning framework has the potential to provide guidance in (Khan, 2001):

- 1) planning and designing e-learning materials,
- 2) organising resources for the e-learning environment,

- 3) designing distributed learning systems, corporate universities, virtual universities and cyberschools,
- 4) designing LMS, LCMS and comprehensive authoring systems (e.g. Omni),
- 5) evaluating e-learning courses and programmes,
- 6) evaluating e-learning authoring tools/systems, LMS and LCMS,
- 7) designing and evaluating blended learning environments.

5. Hypotheses

When selecting dependent and independent variables for our research model to investigate the e-learning practices of different institutions, including profit and non-profit organizations, we relied on the specific internal contextual elements of such organizations with due regard to the statements made in the literature reviewed. Our main aim was to describe and explain the e-learning practices found in different organizations in Hungary in the light of these influencing factors. To investigate and explain the e-learning characteristics at different organizations we focused on specific influencing factors, which comprised of perceived usefulness, relevant content and course quality. These factors provide a context for a discussion consistent with the recent findings, highlighting the critical nature of these variables. Identifying the correlations among the variables of the research model allowed us to establish and prove the following hypotheses:

H1: The character of an enterprise (e.g., the business sector or owner) influences the perception of its usefulness, and so enterprises belonging to the same sector are perceived similarly in terms of usefulness.

H2: There is a correlation between perceived usefulness and course quality and content.

H3: There is a significant correlation between the learning content and target group of learners (employees).

Perceived usefulness was defined by Fred Davis as the degree to which a person believes that using a particular system would enhance his or her job performance (Davis, 1989). Perceived usefulness (a sub-category of extrinsic motivation) can be measured for the purpose of e-learning use (No. 4.3 in the questionnaire). Course quality can be evaluated by applied e-learning methods (No. 4.7 in the questionnaire). Learning content means the actual subject of the teaching programme (No. 4.12 in the questionnaire).

6. Sample and Data Gathering

For the purpose of our survey the same questionnaire was used in all cases. It was originally developed by our research team (Cranet, 2006; 2011) and most questions asked respondents to provide information on the characteristics relevant in 2012 and 2013.

In the research we covered the following areas:

- *Characteristics of the responding organisations*: the most important organizational and economic features (main area of operation of the company (sector), size of the organization (based on revenue and number of employees).
- *Key indicators of the use of e-learning*: if the respondent organization employed e-learning, we asked the reasons why, together with the major features (size of investment, framework etc.), the specific subjects for which the programme was used, where did the responsibility lie for developing and maintaining the framework and content through the data of the particular e-learning system. To cover those cases where e-learning was not employed, we also included a question asking the reasons why not.
- *Most important reasons why e-learning is not used in the responding organizations examined*: Respondents delivered different statements based on their agreement or disagreement. In the current questionnaire each statement was rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree).
- *The future of e-learning*: the most significant changes from a respondent's point of view are likely to occur in the next 12 to 24 months.

The answers were partly collected during interviews, but rather more via web survey. The statements in this paper are based on the use of descriptive statistical models (frequency, distribution, average) and a detailed stochastically cross-tab and correlation analysis supported by SPSS software. Several case examples collected during the personal interviews – while ensuring anonymity – were also added to our analysis. A small part of the web-survey was made via a Web interface. Ultimately we received valuable information from 153 responses from 3 countries (Hungary, Serbia and Slovakia).

Our examination is basically a descriptive work at an international level. In order to make statistical analysis easier, the same questionnaire was used in all countries translated from English into the native language. Altogether 270 companies responded to the questions from these 3 Central European countries. In total, 158 questionnaires from Hungary, 58 from Serbia and 54 from Slovakia were returned.

7. Sample Characteristics

Sector: Satisfying social needs is addressed in three large-scale sectors (private, public and business). Seventy-one percent of the respondents came from the business sector, 24% from the public and 5% from the private sectors respectively.

Table 1. Sectors of the Responding Organisations (%)

Sector	Distribution	Hungary	Serbia	Slovakia
Private	5.5	7.4	7.0	1.9
Public	23.6	14.8	43.9	11.1
Business	70.9	77.8	49.1	87.0
Total	100.0	100.0	100.0	100.0

Source: Authors' own research.

The business sector can also be divided into the following parts: micro, small, medium-sized enterprises and large-scale companies. Public administration is a special type of service and involves catering for public needs and with a public responsibility – if, that is, it has non-profit status. If, however, it is profit-oriented, it can be termed a public service. Within the public sector the role of two narrow areas are dominant – the state and local government – therefore they are especially important and both may have non-profit and profit-oriented organizations.

Size: nearly one third of the enterprises analysed in our study are either enterprises which employ fewer than 9 employees or a large-scale company; approximately one fifth is comprised of small-scale enterprises and one sixth of medium-sized enterprises.

Table 2. Size of the Responding Organisations (%)

Size/category	Distribution	Hungary	Serbia	Slovakia
Micro enterprise	30.5	55.8	42.9	0.0
Small enterprise	18.6	4.7	17.9	31.9
Medium-sized enterprise	14.4	7.0	10.7	23.4
Large-scale company	36.4	32.6	28.6	44.7
Total	100.0	100.0	100.0	100.0

Source: Authors' own research.

Slovakian micro enterprises were not included in the sample.

Industry: nearly one quarter of the companies in the sample are engaged in processing, approximately one fifth are active in finance and insurance while one sixth are involved in trade. The remaining 40% perform other activities.

Table 3. Economic Activities of the Responding Organisations (%)

Industries	Distribution	Hungary	Serbia	Slovakia
(C) Processing	24.8	20.8	25.0	28.8
(K) Finance, Insurance	20.3	3.8	6.3	1.9
(G) Trade & Vehicle Repair	16.3	0.0	4.2	0.0
(S) Industry & other services	13.7	9.4	22.9	17.3
(J) Information & Communication	10.5	1.9	6.3	1.9
(D) Electricity, Gas, Steam, Air-Con	3.9	1.9	0.0	0.0
(H) Transport, Storage	3.3	7.5	14.6	9.6
(Q) Human Healthcare, Social Services	3.3	32.1	14.6	13.5
(F) Construction	1.3	1.9	0.0	0.0
(O) Public Administration, Defence, Law & Order	1.3	0.0	0.0	3.8
(I) Accommodation, Catering	0.7	1.9	2.1	5.8
(N) Administrative and Support Activities	0.7	18.9	4.2	17.3
Total	100.0	100.0	100.0	100.0

Source: Authors' own research.

Owners: Two-thirds of the responding enterprises were owned domestically and one quarter were foreign-owned. Domestic companies in the Slovakian sample were underrepresented in comparison with the whole sample whilst the foreign-owned were overrepresented.

Table 4. Ownership of the Responding Organizations (%)

Owners	Distribution	Hungary	Serbia	Slovakia
Domestic	67.9	72.2	78.9	51.9
Foreign	27.3	25.9	12.3	44.4
Other	4.8	1.9	8.8	3.7
Total	100.0	100.0	100.0	100.0

Source: Authors' own research.

8. Use of E-learning

The cross table analysis is a widely spread analytical method which examines the relationship between two or more variables. With the performance of the analysis we sought the answer to the question of whether the use of e-learning was connected with the sphere, the size categories, the branches of the national economy and the ownership structure. The Pearson χ^2 statistics are the most frequently used statistics in connection with the cross table which measures the statistical significance of the correlation between two variables. The strength of the connection is measured by the variable phi. The value of the coefficient which examines the strength of the connection moves between 0 and 1, zero means lack of connection, while 1 indicates a strong connection. On the basis of the cross-tabulation analysis a significant correlation can be noted between the *sectors* and usage of e-learning.

Table 5. Cross-tabulation Analysis of the Responding Organizations

	χ^2	Phi	Sig.
Sector	252.551	0.967	0.000
Size	37.024	0.370	0.044
Industry	239.78	0.942	0.000
Ownership	253.995	0.970	0.000

Source: Authors' own research.

It is the public and state sectors which use e-learning systems to the greatest extent; this accounts for approximately half of the respondents. The 'other' sector also uses it frequently, although little more than 10% of the private business sector do so.

Table 6. Usage of E-learning by Sector (%)

	Uses
Private	11.1
Public or State	48.7
Other	43.6

Source: Authors' own research.

Based on the *size* it can be concluded that almost 70% of large companies, more than one third of the micro enterprises and one fifth of small and medium-sized enterprises use e-learning systems.

Table 7. Use of E-learning by Company Size (%)

	Users
Micro enterprise	36.1
Small enterprise	22.7
Medium-sized enterprise	17.6
Large-scale company	69.2

Source: Authors' own research.

The questionnaire was filled in by enterprises in *12 industries* but only 5 of these had a sufficiently large sample size (more than 15 questionnaires):

- (C) Processing,
- (G) Trade, Vehicle Repair,
- (J) Information & Communication,
- (K) Finance & Insurance,
- (S) Industry & Other Services.

Table 8. Sample Size Analysis

	Proper Sample Size					Improper Sample Size						
	C	G	J	K	S	D	F	H	I	N	O	Q
Uses (%)	42	36	69	61	33	33	50	20	0	0	100	60
Sample size	38	25	16	31	21	6	2	5	1	1	2	5

Source: Authors' own research.

More than two-thirds of information and communication enterprises with a proper sample size and 60% of companies active in finance and insurance were ranked as the greatest e-learning users. But also one third of trade and other service companies use these information systems.

9. Analysis of the Factors that Influence the E-learning System Usage

The following part summarizes some characteristics of the e-learning system on the basis of the cross tabulation analyses.

Size, industry and ownership do influence the use of e-learning systems, as we found correlations from all the points examined by means of the cross tabulation analysis.

Table 9. Cross-tabulation Analysis of Size, Industry and Ownership

	Size			Industry			Ownership		
	χ^2	Phi	Sig.	χ^2	Phi	Sig.	χ^2	Phi	Sig.
Cost-efficient	56.781	0.458	0.000	51.086	0.435	0.000	45.901	0.412	0.000
More effective education form	19.803	0.271	0.001	63.976	0.487	0.000	39.429	0.382	0.000
Better use of time	37.191	0.371	0.000	47.849	0.421	0.000	34.295	0.356	0.000
Employee need & training opportunities	27.541	0.319	0.000	59.956	0.471	0.000	23.940	0.298	0.000
Easier admin. and registration	39.111	0.381	0.000	52.099	0.439	0.000	32.499	0.347	0.000
Diverse content	41.144	0.390	0.000	29.768	0.332	0.003	26.411	0.313	0.000
Other	37.024	0.370	0.044	67.201	0.499	0.638	12.168	0.212	0.838

Source: Authors' own research.

The Impact of Size

Cost-efficiency is the strongest reason for using e-learning. (Note: In this case the χ^2 trial shows the greatest correlation at a 5 percent significance ($\chi^2 = 56,781$, Phi = 0.458)).

It can be concluded from the cross tabulation analysis that more than half of the large-scale companies and nearly one fifth of medium-sized enterprises regard **cost-efficiency** as the most important point in using the e-learning system. Fewer than one fifth of micro and small enterprises see this instrument rather as an **efficient form of education**.

Table 10. E-learning Usage by Size (%)

	Micro enterprise	Small enterprise	Medium-size enterprise	Large-scale company
Cost-Efficient	14	9	18	5
More Effective Education Form	17	18	18	37
Better Use of Time	17	18	12	44
Employee Needs and Training Opportunity	11	4	0	35
Eases Admin. and Registration	11	4	0	37
Diverse content	14	9	6	30

Source: Authors' own research.

Forty-four percent of large-scale enterprises thought that e-learning signifies better use of time, whilst more than one third thought that it made administration easier and that it is needed by the employees.

The Impact of Industry

In the case of different industries, the χ^2 trial showed significant correlation between the reasons for using e-learning. Based on the cross tabulation analysis we can confirm that industries use the system for different reasons.

More than half of those in *information communication* (J) explain e-learning usage as an **effective form of education**. Nearly half say that it is cost efficient and that there is a need for it from the employees' side. One third of enterprises in *trade* (K) also regard e-learning as an **effective form of education** – on the one hand, by making **better use of time** and, on the other hand, by also being **cost-efficient**.

Table 11. E-learning Usage by Business Sector (%)

	Proper Sample Size					Improper Sample Size						
	C	G	J	K	S	D	F	H	I	N	O	Q
Cost-Efficient	32	20	44	32	14	33	0	0	0	0	0	20
More Effective Education form	24	16	56	42	19	33	0	0	0	0	50	20
Better Use of Time	24	20	37	35	14	17	0	20	0	0	50	60
Employee needs and training opportunities	13	12	44	23	14	33	50	0	0	0	100	40
Ease Admin. and Registration	13	20	37	16	14	17	0	0	0	0	100	40
Diverse Content	10	16	31	16	9	0	0	20	0	0	0	20
Sample Size	38	25	16	31	21	6	2	5	1	1	2	5

Source: Authors' own research.

One third of the processing companies (C) mentioned **cost-efficiency** and one quarter regarded its **effective form of education** and **better use of time** as e-learning's advantages.

The impact of ownership.

More than one third of foreign companies see e-learning systems as good examples of **cost-efficiency** and **easier administration** – and they also see it as a more **effective form of education**.

- **H1: The character of an enterprise (e.g., the business sector or owner) influences the perception of its usefulness, and so enterprises belonging to the same sector are perceived similarly in terms of usefulness.**

Primarily, let us examine the average period of e-learning by business sector, size, industry and ownership. Can they be regarded as equal or similar?

Table 12. E-learning Usage by Ownership (%)

	Other	Domestic	Foreign
Cost-efficient	12	18	42
More Effective Education	12	22	38
Better Use of Time	25	21	33
Employee needs & Training Opportunities	25	18	22
Eases Administration and Registration	12	12	31
Diverse Content	0	10	24

Source: Authors' own research.

For the analysis the variance analysis was used. The variance analysis serves the comparison of the expected values of two or more multitudes, and essentially examines whether there is a difference between the averages of two or more groups. Therefore the question is, how the individual sectors, size categories, branches of national economy and ownership structures affect the average use of e-learning. If these averages are significantly different, it means that the independent variable has a remarkable effect on the dependent one.

In the case of *sectors*, where the averages are compared, we can see that there is no significant difference between the use by the private (5.00 years), public or state-owned (5.75 years) and other (5.36) sectors. Deviation is also similar (3.423; 2.840 and 3.241 years respectively) as the Levene test used for showing similar deviation does not show significance (0.629). The significance level of probability in the F-trial is 0.911, and so the null hypothesis can be accepted. E-learning averages do not significantly differ and so the different sectors have similar impacts on average.

A similar assertion can be made as far as *size* is concerned, where we examined whether the micro-, small – and medium-sized enterprises – as well as large-scale companies – have been using e-learning for a different period of time. On the basis of descriptive statistical examination, we can conclude that, on average, micro (5.00 years), small (4.00 years) and medium-sized companies (5.60 years) and also large-scale companies (5.47 years) have actually been using e-learning systems in a different way. The condition of deviation homogeneity is not met (not significant (0.394)) according to the Levene test; nor is the F-trial significant (0.904) – which means that the single size categories have been using e-learning systems for similar periods of time.

In the case of *industries*, the situation is the same since, on average, it is (G) Trade & vehicle repair (6.44 years) which has been using it for the longest period, whilst (S) other services have been using e-learning for the shortest time (4.33 years). Deviation is also similar (1.966–4.613 years) as the Levene test does not show a significant level (0.062). Further, the result of the F-trial is also not significant (0.893).

Finally, when examining *ownership*, neither the Levene-test (0.344) nor the F-trial (0.245) show a significant correlation, and the values of the averages (national = 5.18 years; foreign = 6.08 years) are similar.

On the basis of cross tabulation analysis, we have not found a correlation between the target groups of e-learning (intellectual, physical, both) and *sectors* ($\chi^2 = 3.648$; Sig. = 0.456), *size* ($\chi^2 = 9.789$; Sig. = 0.280), *industries* ($\chi^2 = 21.220$; Sig. = 0.384) and *ownership* ($\chi^2 = 5.519$; Sig. = 0.238).

If we examine the possible **developers** of e-learning (internal developers, external national enterprises or external foreign enterprises), there is a significant correlation between *sectors* and internal developers ($\chi^2 = 5.997$; Phi = 0.191, Sig. = 0.050), *size* and external foreign enterprises ($\chi^2 = 9.923$; Phi = 0.290, Sig. = 0.019), *ownership* and external foreign enterprises ($\chi^2 = 29.001$; Phi = 0.419, Sig. = 0.000). Internal developers are mostly employed by the public or state *sector* (41.0%). Approximately a quarter (23.1%) of the private sector employ internal developers.

More than a quarter of the large-scale enterprises (27.9%), one-tenth of micro and medium-sized enterprises (11.1% and 11.8%, respectively) employ external experts for e-learning.

One third of foreign enterprises employ foreign developers from outside, but international developers work for only some 4% of domestic companies.

In the case of using free or pay e-learning framework systems there is no significant correlation between the different sectors ($\chi^2 = 8.732$; Sig. = 0.189) and *ownership* ($\chi^2 = 11.550$; Sig. = 0.073). In the case of different sizes, correlations of medium strength (Phi = 0.456; Sig. = 0.004) can be detected at different sizes. Approximately 30% of large-scale companies, two-thirds of micro enterprises, three-quarters of small-scale enterprises and five-sixths of medium-sized enterprises do not use e-learning systems. Nearly half of the large-scale companies, a quarter of micro-enterprises and a tenth of small- and medium-sized enterprises involved in the examination use free e-learning software. Fewer than one fifth of large-scale companies and a twentieth of micro enterprises use pay systems.

Based on the cross tabulation analysis, a significant correlation can be seen between *ownership* and external foreign companies which **provide** e-learning ($\chi^2 = 6.515$, Phi = 0.199, Sig. = 0.038). Regarding the strength of correlation, Cramer V and the contingency coefficient can be applied based on the size of the table, which approximately shows a similar result of weak significance (0.199). The greatest number of foreign companies interviewed (16% of the respondents) used foreign enterprises, whilst this proportion is hardly 4.5% in the case of domestic companies.

A similarly significant correlation can be found between *sectors* and the internal organizational units dedicated to **developing** e-learning ($\chi^2 = 7.155$, Phi = 0.208,

Sig. = 0.028). Cramer V also shows a result of weak significance here (0.208). Thirteen percent of the responding public or state organizations use the services of an internal organizational unit in order to improve e-learning content. This proportion does not reach 3% in the case of the private sector.

When examining the sectors as far as e-learning **content** is concerned, a significant correlation can only be detected in improving language skills ($\chi^2 = 10.492$, Phi = 0.252, Sig. = 0.005.) Based on Cramer V the correlation is of medium strength, whilst it is 11% for the private sector.

If we analyze *size*, 7 of the 9 examined areas showed significant correlations. These are the following.

- Retraining,
- Information Technology (e.g. Office Programme Packages),
- Qualification Examinations, Labour Regulations, Compulsory In-house Training,
- Fire Protection and Labour Safety,
- Improving Language Skills,
- On-the-job Training for Vocational Jobs,
- Professional Software Support,
- New Equipment and Tools.

Table 13. Correlations Between E-learning Content and Size

	χ^2	Phi	Sig.
On-the-job training for vocational jobs	12.967	0.331	0.005
Retraining	12.291	0.323	0.006
New Equipment and Tools	17.637	0.387	0.001
Improving Language Skills	10.847	0.303	0.013
Professional Software Support	6.099	0.227	0.107
Information Technology (e.g. Office Programme Packages)	4.815	0.202	0.186
Fire Protection and Labour Safety	14.534	0.351	0.002
Qualification Exams, Labour Regulations, Compulsory In-house Training	21.527	0.427	0.000
Other	9.901	0.290	0.826

Source: Authors' own research.

Regarding content, in all cases it is the large-scale companies that use e-learning systems to the greatest extent. In nearly half of these, e-learning supports qualification examinations (48.8%) and on-the-job training for vocational jobs (46.5%). The e-learning support for qualification examinations can be seen in only a tenth of SMEs (11.1% of micro-enterprises, 9.1% of small enterprises, 11.8% of medium-sized

enterprises), and on-the job training for vocational jobs is provided in only a sixth of the enterprises (16.9% of micro-enterprises, 13.6% of small enterprises, 17.6% of medium-sized enterprises).

E-learning support for familiarisation with the new tools and equipment is typical of more than a third of large-scale companies (41.9%), one sixth of medium-sized enterprises (17.6%) and one seventh of micro enterprises (13.9%). Surprisingly, none of the responding medium-sized enterprises used e-learning for retraining, although nearly one tenth of micro enterprises (8.3%), nearly one fifth of small enterprises (18.2%) and one third of large-scale companies (32.6%) declared that they used it. One third of large-scale companies (30.2%) and one seventh of micro enterprises said that they used e-learning for computer-assisted fire protection and labour safety purposes. Only one quarter of large-scale enterprises (23.3%) and one twentieth of micro enterprises (5.6%) used e-learning to improve language skills.

Table 14. Frequency of Significant E-learning Content Usage by Company Size (%)

	Micro-enterprise	Small enterprise	Medium-sized enterprise	Large-scale company
On-the-job Training for vocational jobs	16.9	13.6	17.6	46.5
Retraining	8.3	18.2	0.0	32.6
New Equipment and Tools	13.9	0.0	17.6	41.9
Improving Language Skills	5.6	0.0	5.9	23.3
Fire Protection and Labour Safety	13.9	0.0	0.0	30.2
Qualification Exams, Labour Regulations, Compulsory In-house Training	11.1	9.1	11.8	48.8

Source: Authors' own research.

There is no correlation between e-learning content (Improving language skills, Professional Software Support, Information Technology, Fire Protection and Labour Safety) and *ownership*.

Table 15. Correlations Between E-learning Content and Ownership

	χ^2	Phi	Sig.
On-the-job training of vocational jobs	7.066	0.207	0.029
Retraining	7.720	0.216	0.021
New equipment and tools	10.449	0.252	0.005
Improving language skills	1.136	0.083	0.567
Professional software supportng	3.674	0.149	0.159

	χ^2	Phi	Sig.
Information Technology (e.g. office programme packages)	2.491	0.123	0.288
Fire Protection and Labour Safety	2.300	0.118	0.317
Qualification Exam, Labour Regulations, Compulsory In-house Training	8.048	0.221	0.018
Other	10.403	0.251	0.845

Source: Authors' own research.

Based on the cross tabulation analysis there is a significant correlation between *ownership* and the following e-learning contents:

- on-the-job training of vocational jobs,
- retraining,
- new equipment and tools,
- qualification examinations, labour regulations, compulsory in-house training.

If we also examine the format in accordance with the content, we can find significant correlation. In our primary research we asked about the following formats:

- Text,
- Presentation,
- Multimedia / Video, traditional format,
- Standard, SCORM content,
- Interactive, communicating with the student.

A significant correlation exists between the four examined e-learning formats and company size. Regarding strength, this is medium in multimedia (0.395) and interactive (0.341) formats, whilst weak in the two other cases.

Table 16. Correlations Between E-learning Format and Size

	χ^2	Phi	Sig.
Text	8.860	0.274	0.031
Presentation	9.360	0.282	0.025
Multimedia / video, traditional format	18.428	0.395	0.000
Standard SCORM content	6.608	0.237	0.086
Interactive, communicating with the student	13.736	0.341	0.003

Source: Authors' own research.

Frequency was the strongest in large-scale companies, followed by micro and small enterprises; finally medium-sized enterprises followed when we examined all size categories and formats.

Approximately half of the large-scale companies (48.8%), one quarter of micro enterprises (25.0%), more than one fifth of small enterprises (22.7%) and more than one sixth of medium-sized enterprises (17.6%) also use text formats in their e-learning systems. This was the case in 41.9% of large-scale companies, one fifth of micro enterprises (22.2%) nearly one-seventh of small enterprises (13.6%) and one-eighth of medium-sized enterprises (11.8%). The use of multimedia, video and interactive materials was most typical of large-scale companies (46.5% and 37.2%, respectively). The multimedia format (16.7%) was more frequently used by micro enterprises than interactive materials (11.1%). Multimedia and interactive e-learning materials were both popular with small (9.1%) and medium-sized enterprises (5.9%).

Table 17. Frequency of Significant E-learning Format Usage by Company Size (%)

	Micro Enterprise	Small Enterprise	Medium-sized Enterprise	Large-scale Enterprise
Text	25.0	22.7	17.6	48.8
Presentation	22.2	13.6	11.8	41.9
Multimedia/video, traditional format	16.7	9.1	5.9	46.5
Interactive, communicating with the student	11.1	9.1	5.9	37.2

Source: Authors' own research.

If we examine *ownership*, we can conclude that there is no significant correlation between the format of e-learning materials (text, multimedia and standard) and ownership on the one hand, but, on the other, a weak correlation does exist between presentation (0.199) and using the interactive format.

Table 18. Correlations Between the E-learning Format and Ownership

	χ^2	Phi	Sig.
Text	3.149	0.138	0.207
Presentation	6.548	0.199	0.038
Multimedia / video, traditional format	3.878	0.153	0.144
Standard SCORM content	1.171	0.084	0.557
Interactive, communicating with the student	7.286	0.210	0.026

Source: Authors' own research.

If we examine **the use/non-use of e-learning systems**, it is clear that it is in significant correlation with the sectors ($\chi^2 = 21.053$, Phi = 0.354, Sig. = 0.050). The proportion of those avoiding answering this question is surprisingly high: nearly half of those in the public/state sector (48.7%), and one third of the organizations in the

private sector (34.2%) omitted this question. This system has been used by 37.6% of the private sector and 46.2% of the public or state sector. According to one-eighth of the private sector (12.8%) it has not been used due to lack of need, whilst another 6.0% said there was no intellectual and financial capital for that purpose.

Table 19. Frequency of a Significant E-learning Format Usage/non-usage by Sector (%)

	Other	Public or State	Private
Not applicable	11.1	48.7	34.2
Within 1–2 years	11.1	0.0	3.4
Within 1 year	11.1	0.0	1.7
Long term	11.1	0.0	4.3
E-learning is currently used	55.6	46.2	37.6
No training planned	0.0	5.1	12.8
No intellectual/financial capital for that purpose	0.0	0.0	6.0

Source: Authors' own research.

The use/non-use of e-learning systems correlates with the *size of the enterprise* ($\chi^2 = 33.406$, $\Phi = 0.532$, $\text{Sig.} = 0.015$). E-learning methods are used by more than half of the large-scale companies (51.2%), more than one third of medium-sized enterprises (35.3%) and 27% of micro and small enterprises. This question was not answered by 41.7% of micro enterprises and more than one third of small enterprises (36.4%) and large-scale companies (37.2%).

Table 20. Frequency of Significant E-learning Format Use/non-use by Size (%)

	Micro Enterprise	Small Enterprise	Medium-sized Enterprise	Large-scale Company
Not applicable	41.7	36.4	11.8	37.2
Within 1–2 years	0.0	0.0	5.9	7.0
Within 1 year	2.8	0.0	5.9	0.0
Long term	2.8	9.1	5.9	2.3
E-learning is used currently	27.8	27.3	35.3	51.2
No training planned	11.1	27.3	23.5	2.3
No intellectual/financial capital for that purpose	13.9	0.0	11.8	0.0

Source: Authors' own research.

One quarter of small (27.3%) and medium-sized enterprises (23.5%) and more than one-tenth of micro enterprises (11.8%) think that they have no need to use it for

retraining, although in the case of large-scale companies, the proportion is not significant (2.3%). Among non-users the proportion of those lacking intellectual and financial capital for this purpose is significant in micro (13.9%) and medium-sized companies (11.8%). A tenth of small enterprises (9.1%) and 6% of medium-sized enterprises currently not using e-learning methods are planning to use it in the long term. Regarding medium-sized enterprises, 5.9% – 5.9%, respectively, plan to use e-learning within 1 or 1–2 years.

H2: There is a correlation between perceived usefulness and course quality and its content.

E-learning systems are used for the following reasons:

- cost-efficiency,
- more effective form of education,
- better use of time,
- employees' needs and training opportunities,
- easier administration and registration,
- diverse content.

In most cases e-learning is regarded as a more effective form of education, but it is also seen as cost efficient and a better use of time.

Table 21. Possible Reasons for E-learning Use in the Sample

	Yes	No/No Answer	Total
Cost efficiency	40	230	270
More effective form of education	43	227	270
Better use of time	41	229	270
Employees' needs and opportunities for training	32	238	270
Eases admin and registration	29	241	270

Source: Authors' own research.

When we examine whether there was a correlation between the sums spent on the framework for e-learning and the reasons for its use, we found no such correlation. The table below illustrates the fact that 80% of the respondents spend no more than 500.000 HUF on any framework.

Table 22. Correlations Between Possible Reasons for E-learning Use and Expenditure on the Framework

N=49	No. of Indications	Do not spend on it (%)	<500.000 HUF (%)	500.001–1.000.000 HUF (%)	1.000.001–3.000.000 HUF (%)	3.000.001–5.000.000 HUF (%)	5.000.001–10.000.000 HUF (%)	>10.000.001 HUF (%)
Cost efficiency	27	40,7	44,4	3,7	3,7	3,7	0.0	3,7
More effective education form	29	44,8	41,4	6,9	,0	3,4	0.0	3,4
Better use of time	27	44,4	33,3	7,4	7,4	3,7	0.0	3,7
Employee needs & training opportunities	23	60,9	21,7	8,7	4,3	,0	0.0	4,3
Eases admin & registration	18	50,0	33,3	5,6	5,6	,0	0.0	5,6
Diverse content	16	43,8	37,5	12,5	,0	,0	0.0	6,3

Source: Authors' own research.

When we examined whether there was a correlation existing between e-learning usage and e-learning content, the answer was positive (except for one example) – i.e. the value of significance is lower than the usual 0.05 level of decision-making and the null hypothesis is kept, and so there is a correlation between the single variables in the columns and those in the rows.

Table 23. Correlations Between the Possible Reasons for E-learning Usage and E-learning Content

χ^2 : Phi: Sig.	On-the-job Training for Vocational Jobs	Retrain Ing	New Equipmnt & Tools-	Improve Language Skills	Professional Software Support	Informatics (e.g. office programme packages)	Fire Protection and Labour Safety	Qualification Exams, Labour Regulations, Compulsory in-house Training
Cost-efficient	20.198: 0.274: 0.000	61.753: 0.455: 0.000	91.580: 0.582: 0.000	37.030: 0.370: 0.000	79.340: 0.542: 0.000	35.783: 0.346: 0.000	61.997: 0.479 0.000	73.545 0.522 0.000
More effective education form	7.501: 0.167: 0.006	55.797: 0.470: 0.000	64.896: 0.490: 0.000	64.699: 0.490: 0.000	33.065: 0.350: 0.000	32.241: 0.346: 0.000	24.630 0.302 0.000	66.149 0.495 0.000
Better use of time	3.869: 0.120: 0.045	59.670: 0.470: 0.000	52.629: 0.441: 0.000	35.635: 0.363: 0.000	67.294: 0.499: 0.000	43.238: 0.400 0.000	33.683 0.353 0.000	79.718 0.543 0.000

χ^2 : Phi: Sig.	On-the-job Training for Vocational Jobs	Retrain Ing	New Equipment & Tools-	Improve Language Skills	Professional Software Support	Informatics (e.g. office programme packages)	Fire Protection and Labour Safety	Qualification Exams, Labour Regulations, Compulsory in-house Training
Employee needs, training opportunities	5.498: 0.143: 0.019	71.716: 0.515: 0.000	74.892: 0.527: 0.000	96.408: 0.594: 0.000	61.338: 0.477: 0.000	48.512: 0.424: 0.000	58.402 0.465 0.000	78.957 0.541 0.000
Eases admin & registration	2.470: 0.096: 0.116	31.789: 0.343: 0.000	54.259: 0.448: 0.000	48.921: 0.426 0.000	33.610: 0.353: 0.000	24.960: 0.304: 0.000	34.726 0.359 0.000	69.439 0.507 0.000
Diverse Content	5.950: 0.147: 0.016	28.556: 0.325: 0.000	55.827: 0.455: 0.000	37.347: 0.372 0.000	86.122: 0.565: 0.000	17.863: 0.257: 0.000	20.809 0.278 0.000	22.411 0.288 0.000

Source: Authors’ own research.

On the basis of the Phi χ^2 based association indicator used in the 2×2 table there is a significant correlation of medium strength between:

- cost efficiency and using new equipment and tools (0.582),
- cost efficiency and professional software support work (0.542),
- employees’ needs for e-learning training and retraining (0.515),
- employees’ needs for e-learning training and using new equipment and tools (0.527),
- employees’ needs for e-learning training and improving language skills (0.594),
- employees’ needs for e-learning training and qualification examinations (0.541),
- easier admin. and registration by means of e-learning and qualification exams (0.507),
- diverse e-learning content and professional software support work (0.565).

H3: There is a significant correlation between the learning content and target group of learners (employees).

By means of cross-tabulation analysis, we examined whether there was a correlation between e-learning content and annual expenditure. According to χ^2 null hypothesis, there is no correlation between the two variables in terms of annual maximum expenditure and content. The value of χ^2 fluctuated between 4.2 and 7.9 in all cases and their significance level was always higher than 0.05 – and so the null hypothesis was accepted.

Table 24. Correlations Between the E-learning Content and Maintainence of the the Framework System

χ^2 : Phi: Sig.	χ^2	Phi	Sig.
On-the-job training	5.507	0.335	0.357
Retraining	7.909	0.402	0.161
New equipment, tools	4.830	0.314	0.437
Improving language skills	4.476	0.302	0.483
Professional software support	4.379	0.299	0.496
Information Technology (e.g. office programme packages)	6.967	0.377	0.223
Fire Protection and Labour Safety	7.082	0.380	0.215
Qualification exams, labour regulations, compulsory in-house training	4.271	0.295	0.511

Source: Authors' own research.

By using the cross-tabulation analysis again, we examined whether there was a correlation existing between the e-learning content and format. The table below illustrates that there was a significant correlation between these two e-learning factors.

On the basis of Phi, the correlation is stronger than medium between:

- text format and retraining (0.598) as well as fire protection and labour safety content (0.534),
- presentation and retraining (0.524) and e-learning content based on improving language skills (0.524),
- multimedia format and retraining (0.506) plus using new equipment (0.573) plus improving language skills (0.613) and e-learning material supporting professional activity (0.601),
- interactive format and using new equipment (0.501) as well as content supporting professional activity (0.525).

Table 25. Correlations Between the E-learning Content and Format

χ^2 : Phi: Sig.	Text	Presentation	Multimedia	Standard, SCORM Format Content	Interactive
On-the-job training	16.061	26.054	6.000	5.405	6.031
	0.479	0.311	0.149	0.141	0.149
	0.000	0.000	0.014	0.020	0.014
Retraining	62.074	74.258	69.051	12.300	36.152
	0.598	0.524	0.506	0.213	0.366
	0.000	0.000	0.000	0.000	0.000
New equipment, tools	46.093	64.896	88.604	31.678	67.801
	0.413	0.490	0.573	0.343	0.501
	0.000	0.000	0.000	0.000	0.000

χ^2 : Phi: Sig.	Text	Presentation	Multimedia	Standard, SCORM Format Content	Interactive
Improving language skills	59.701 0.470 0.000	74.258 0.524 0.000	101.3 0.613 0.000	19.838 0.271 0.000	53.726 0.446 0.000
Professional software support	41.543 0.392 0.000	39.636 0.383 0.000	97.455 0.601 0.000	46.178 0.414 0.000	74.505 0.525 0.000
Information Technology (e.g. Word office programme packages)	64.986 0.491 0.000	40.486 0.387 0.000	52.907 0.443 0.000	33.454 0.352 0.000	40.009 0.385 0.000
Fire protection, labour safety	76.849 0.534 0.000	24.630 0.302 0.000	60.004 0.471 0.000	39.055 0.380 0.000	40.250 0.386 0.000
Qualification exam, labour regulations, compulsory in-house training	62.074 0.479 0.000	58.340 0.465 0.000	60.004 0.471 0.000	44.735 0.407 0.000	82.495 0.553 0.000

Source: Authors' own research.

Conclusions

The average period of using e-learning is similar per sector, size and ownership. If we take the developers of e-learning into consideration, the public and private sector prefer internal developers while large-scale companies and foreign enterprises are in favour of external developers, outsiders. In the case of e-learning, foreign enterprises have their system operators from abroad.

Table 26. Hypotheses Analysis

Hypothesis	Explanation	2012–2013		
		(Yes/No)		
		True	Partially True	Not True
H1	The character of an enterprise (e.g., the business sector or owner) influences the perception of its usefulness, and so enterprises belonging to the same sector are perceived similarly in terms of usefulness.	Yes		
H2	There is a correlation between the perceived usefulness and course quality and content.	Yes		
H3	There is a significant correlation between the learning content and the target group of learners (employees).	Yes		

Source: Authors' own research.

Taking e-learning **content** into account, the public or state sector uses e-learning systems for language training to a greater extent than the private sector. Large-scale companies use this modern tool of information technology in several areas more frequently than small and medium-sized enterprises. As far as foreign enterprises are concerned, we can conclude that they prefer using e-learning systems in several fields to a greater extent than domestic organizations do.

The analysis which provides the basis of this paper, however, is somewhat limited from several points of view – which is why we are striving to involve more respondents in our future research. We plan to conduct this in other countries within Eastern Europe.

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