E-LEARNING USE FOR ENVIRONMENTAL EDUCATION IN SME's

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ABSTRACT

In our paper we discuss the possibility of using e-learning for environmental education in SME's with the introduction of environmental management systems (EMSs) . We comment on the advantages and disadvantages of e-learning for environmental education and we mention our results for environmental education and self-education within interdisciplinary environmentally oriented e-learning courses.

Key words: e-learning, interdisciplinary environmental education, moodle, self-learning, learning organization. small and medium enterprise SME, Environmental Management System (EMS):

INTRODUCTION

Environmental management system (EMS) refers to the management of an organisation's environmental programs in a comprehensive, systematic, planned and documented manner. It includes the organisational structure, planning and resources for developing, implementing and maintaining policy for environmental protection.

In small and medium enterprises (further SMEs) a whole range of environmental management tools is being implemented, e.g. environmental audits, environmental management systems, environmental evaluation and product labelling, ecobalance, ecological product profile and the like. These tools came into existence predominantly as a result of the voluntary, internal initiatives of organisations.
Entrepreneurship success also in regions located further from traditional educational centers is directly linked to systematic, efficient and interdisciplinary self-learning. Traditional education model based on classical methods of oneway communication is not sufficient anymore. It is vital to focus on interactive, creative methods and techniques based on activation of the learner, concentrated on models of learning with prevailing two-way communication, not on other models of education.

E-LEARNING

E-learning is one of the techniques suitable for distant education as it is very flexible and enables continual improvements, updating and upgrading of the learning material, adaptations to different knowledge levels of course participants, utilizing materials from the internet and other information and communication technologies.

Educational texts are organized as a knowledge search system, based on scientific sources in literature and from the internet. When using a textbook on CD, the learner linked to internet can use references and citations in the text in an interactive way, and look for the source publication to get detailed

information about the issue that he/she is deeply interested in, and also compare that knowledge with other sources.

Moodle is a software package for creating educational courses and electronic courses on the internet. It is a project in continuous development, designed on the basis of a social positive approach to education. Moodle operates as Open Source software (under public license). That means it is protected by copyright but it gives quite a high degree of freedom to the users.

Moodle is an acronym for Modular Object-oriented Dynamic Learning Environment. It has links with the English expression "mood" - cheer, temper, frame of mind.

Moodle software installation in the framework of the Leonardo daVinci project REDILEM took place in September and October 2004. Subsequently we started to create and input the courses into the system: the texts, shortened texts, test questions, questions for discussion and task themes for course members. As the work is extensive,we started to experiment with the software during the period of inputting the texts so we could test the software and the predominantly innovative approaches to environmental education.

The concrete results with a specific course and a specific teacher provide a real opportunity to objectively evaluate the process of e-learning education, with the aim of constant improvement and development. We tried to involve the highest possible number of course members in the educational process, including bachelor and master degree students in the following study programs:

Product Management, Environmental Management, Product Strategies, Marketing, European Union and Common Market, Technical Barriers to Trade, and also in subjects focused on technical and natural Sciences, as well as for employees of SMEs in the regions taking part in lifelong education.

As several courses were translated into English, this cooperation does not have to be limited to the territory of the Slovak and Czech Republics, but can extend to the broader European and international environment as registered participants from Kuwait, Sudan, Saudi Arabia, Irak and Iran demonstrate.

The goals were successfully fulfilled mainly in the second series of courses with the following program. The students were present in the lectures and practices in IT lab. In the first part, the lecture was given by the teacher with the support of a power point the presentation for a duration of 20 minutes. Next, the students familiarised themselves with test questions and discussion themes, which were prepared for each student individually, with guidance to the source on internet that should be discussed. Students worked out their contributions to the discussion and answered test questions. At the beginning of the next lecture every student addressed his/her contribution to the discussion from the previous lecture, with reference to the recommended source. Consequently other students discussed the contribution too. The discussion was facilitated by the teacher, and the students had the opportunity to reach a much broader overview of the given theme. Students were recommended to analyze the sources in foreign languages too: papers in English or German .

Students were forced to use their language skills and keep them active and also get to know foreign opinions on a given theme.

We find it very enriching to connect works elaborated by course participants from enterprises of different sizes, from different educational institutions and Universities, from different professions, different regions and states, and help to improve mutual communication, communication of results and also economic and technical cooperation.

EVALUATION OF BENEFITS AND PROBLEMS IN E-LEARNING BY EXTERNAL STUDENTS

Even if it is clear that e-learning provides benefits to nearly all groups of learners, most benefits can be seen in distant learning, company, and Lifelong learning mainly in external education. During the last two years we have implemented e-learning programmes in SMEs, and with students of on internal and external courses totalling more than ten thousand people.

In the evaluation of the educational system, we systematically evaluate the opinions of students, and e-learning courses participants. As an example, we present below the results of 60 external students studying in the winter semester of 1st grade in 2005.
The characteristics of the respondents are presented in Table 1.
Respondents were 20-30 years old, full time employees, without managerial experience. Through further education they expect to improve their knowledge, skills and competencies for their jobs. They have limited financial and time possibilities. The majority of respondents use a computer and they have it one also at home. Approximately half of the respondents have an internet connection at home.

Table . 1 Characteristics of external students, reasons why they study and possibilities to of using e-learning

Part a.		
Characteristics of students	Number of students	Percentage (%)
1.Sex		
Male	54	94,7
Female	3	5,2
2.Age		
under 20 years	10	18,2
between 20-30 years	38	69,0
between 30-40 years	7	12,8
Above 40 years		
3.Completed education		
Basic	0	0
Secondary	53	94,6
Bachelor degree	1	1,8
Master degree	2	3,6
PhD	0	0
4.Actual job		
Student	6	11,3
full time job	42	79,2
part time job	4	7,6
Unemployed	1	1,9
5.Working position. I work as		
Freelancer	3	6,1
Employee	46	93,9

Enterpreneur	0	0
6. Experience from previous job		
No experience from previous job	11	20
I worked as an employee	35	63,6
I worked in my own enterprise	2	3,6
I worked in a different post	7	12,8
Part b.		
Characterics of reasons why they study		
7.You study with the aim to		
Improve your position at work	16	28,6
Improve your vocational education	29	51,8
Improve your social prestige	2	3,6
Improve opportunities in the search of the new job	9	16
8.What do you expect from the course ?		
New knowledge and skills	30	52,6
Certificate about new qualification	3	5,2
Participate in life long education	5	8,7
Testing new approach to education	6	10,5
9.How much time can you devote to your study ?		
One hour per day	38	66,6
Four hours per day	14	24,6
Eight hours per day	1	1,8
One hour per week	4	7
10.What do you miss most in your futher education ?		
Literature	3	8,1
Plan of education	4	10,8
Money	10	27
Web page of the course	3	8,1
Traveling, accommodation	1	2,7
Other	16	43,2
Part C		
Possibilities to of using e-learning		
11.I use computer		
Rarely	3	5,2
Often	42	73,6
Not very often	12	21
12. Can you use computer at home?		
Yes	45	78,9
No	12	21
13.if yes,do you have internet connection at home ?		
Yes	30	54,5
No	25	45,6
14.if no,do you have internet connection somewhere else ?		

Yes	42	85,7
No	7	14,3
15.If yes how far is that place from your home ?		
It is in our house	10	20,8
Less than 100 m	1	2,1
Less than 1 km	15	31.2
More than 1 km	22	45,8

On the basis of the experience from previously completed e-learning courses we consider for major benefits of e-learning education:- greater involvement of student in the education process; the possibility of studying at home; lower costs; greater time flexibility; the possibility of feedback in quizzes; and a lower lever of stress in tests than in conventional forms of studies We see the disadvantages and problems of e-learning education mainly in the the cost of the internet, the availability of the internet, the availability and cost of computers, developing new habits such as learning from the screen, missing the personal presence of the teacher, and the slow speed of internet connections.

Students were asked which benefits and problems from the ones given they consider to be most important. The highest percentage of students considered the most important benefit to be the possibility of studying at anytime and the possibility to of getting personalised feedback from the quizzes.
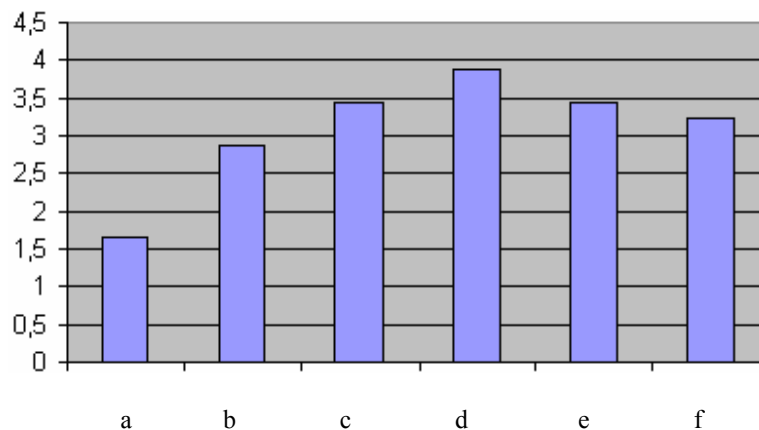

Fig.1 Order of importance of E-learning problems.

a.   availability of internet,
b.   availability and price of computer,
c.   forming new habits such as learning from the screen,
d.   missing personal presence of the teacher,

    e.   low speed of internet connection.
    f.   the price for the internet,

The major problems considered by the majority of students were the low speed of the internet connection, and the availability and price of quality computers. As we wanted to update the results after the course terminated, we asked the respondents to sort the benefits and problems of e-learning according to their importance.

The benefits were sorted as follows: allows study anytime, lower stress during tests, higher involvement of student in education process, personal feedback from the quizzes, less costly for the student.

The disadvantages and problems were sorted as follows: the biggest disadvantage was missing the personal presence of the teacher, the low speed of the internet and, need to change the learning habits to study from the screen. All the problems are now becoming resolved. More and more institutions and households are becoming connected to the internet, and the speed is improving as well.
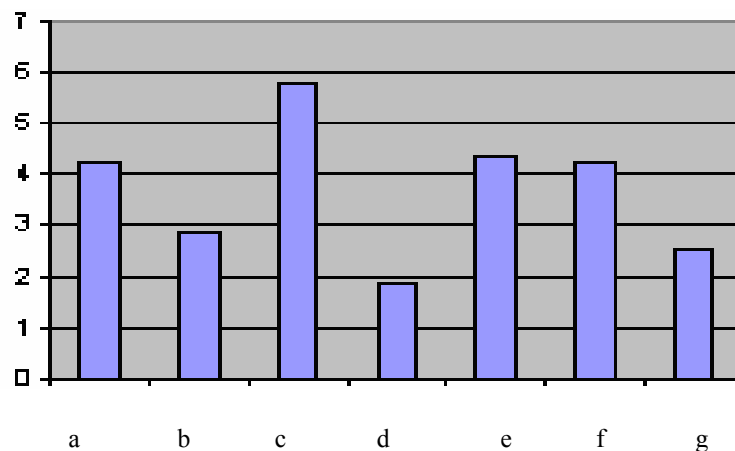

Fig.2 Order of importance of E-learning benefits.

    a.   greater involvement of student into education process,
    b.   possibility of studying at home,
    c.   lower costs,
    d.   greater time flexibility,
    e.   possibility of feedback in quizzes
    f.   lower lever of stress in tests than in conventional form of studies
    g.   study in the home environment

CONCLUSION

The authors in the paper present their practical experience gained in testing e-learning courses developed with Moodle software in the framework of the Leonardo daVinci REDILEM project. The

major focus was given to an evaluation of the advantages and disadvantages of e-learning from the perspective of teachers and learners who were teaching and learning using this up-to-date method.

After completion of the Leonardo daVinci REDILEM project we continue to organize and further develop e-learning courses for different target groups, mainly focused ~~to~~ on students and distant students of the STU Bratislava, the EU Bratislava and the SEVS in Skalica, in both Slovak and English. The Leonardo daVinci REDILEM project was followed by the European Social Funds project "Support and implementation of new educational forms in the Faculty of Economy at the University of Economics in Michalovce ". The major goal in the framework of the project using experience in e-learning gained through the REDILEM project is to design, work out and put into practice efficient systems for distance learning for students of the Faculty of Economy at the University of Economics in Michalovce in the Zemplin region.

The most recent application of e-learning that we took part in is the course for employees of financial institutions in the area of renewable energies and energy efficient technologies for the evaluation of relevant projects in the framework of the LEONARDO daVinci FIP TREET project, and implementation of e-learning education in SEVS Skalica in the bachelor and master programs in the areas of international relations, environment, regional development and environmental management.

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