THEORETICAL AND PRACTICAL ASPECTS OF COMPUTER COURSE "INFORMATION TECHNOLOGY" FOR BLENDED LEARNING OF FUTURE ECONOMISTS

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Abstract: This article contains the analyzed conception of blended learning and peculiarity of blended learning process in higher school. There is an example of computerized learning system in higher school on basis of Moodle; main aims of the Information technology course in economical type of schools have been studied. Some difficulties which students are faced with while taking the course, as well as reasons of low educational level in computer science are mentioned. Driving forces for educational activities of students have been investigated; distinguished descriptions of methodical learning systems in using the information communicative technologies have been made; it is examined the structure of computer course for future economists and its use in learning process on the basis of Moodle 2.5 based on the principles of blended learning has been examined.

Keywords: blended learning, model of blended learning process, system e-learning in higher school, computerized learning course, Moodle

INTRODUCTION

Information technology science today plays an exceptional role in future specialist training in the field of mathematics, computer and informative technology, production, economics and management. It is also very important for formation of definite informative standards, intellectual development as well as scientific conception of the world, in comprehension of applied trend of information technology.

Information technology science and communicational technology today are inalienable parts of human culture. They are the keys for knowledge of the surrounding world with the use of computers and informational technologies; they are important components of personality development.

Therefore every person has their rights for high quality informative education and it's obligatory for every society to give the opportunity to get it.

With the civilization development the role of computer science and its methods is constantly increasing. The interrelation of computer science into other sciences is getting more significant. Informational technologies today are the powerful instrument in difficult problems solutions, which appear in different spheres of human (commercial) activities. The gradual process of computerization of science and production will continue. In connection with it, there appear major alterations in qualifying requirements of future specialists in any sphere, especially in production, economics, finance and management.

Therefore problem investigations, which appear nowadays in computer training of future economists education in higher schools and finding their solution is an urgent social goal.

One way for increasing quality level in computer science training for future economists today is the use of innovative educational technologies, particularly a blended learning.

In this article are examined theoretical and practical aspects of applying blended learning approach in future economic specialists training on the example of the authorized computer course *Information Technology*, accomplished in computerized learning system in higher school on the basis of CLMS Moodle 2.5, that gives the opportunity to increase the efficiency of learning process and provides better quality of specialists professional training and forms their IT-competence.

1. BLENDED LEARNING AS AN INNOVATIVE EDUCATIONAL TECHNOLOGY IN HIGHER SCHOOL EDUCATION

The fast development of information technologies makes changes in almost all spheres of human activities, and education takes one of the first places among them to introduce innovations on the basis of information communicative technologies.

The notion of online training is attached fast in students' minds today. The internet becomes largely an educational space, which provides modern students with better opportunities of getting to informational database and of teamwork. New educational approaches like distant-learning, electronic learning, mobile-learning, online learning and blended learning develop fast (see examples Adams 2008, Blended_learning, E-learning, M-learning, Online Nation). But specialists suggest exactly blended learning is one of the most perspective innovation trend in higher school.

In the research work (Tryus 2012) the concept of blended learning process is analyzed in details. Therefore we give here only basic principles, of which the use of the blended learning approach in authors professional activity consists.

Blended learning is aimed first of all at learning and professional requirements of every participant of the learning process. While in traditional learning system a general knowledge level is expected from all present students in class. A lesson has got an only usual scheme, individual qualifications are mostly not taken into account the blended learning system provides everyone the opportunity to choose the rate of mastering as well as priorities in learning themselves. Blended learning is useful for those students, who in case of different circumstances cannot be present at the lectures in their higher school (because of health problems, family circumstances, occasionally employment or permanent work, especially for senior, graduate students) and for those, whose profession demands durable business trips and missions, that means durable absence from the town, where the higher school is.

In the principles of blended learning the learning process includes job-retraining and qualification raising of specialists and studying to get a post-graduate degree. So graduates, who have got a bachelor's degree, can get a master's degree in the field they work, without discontinuing work. Learning programs like these are widely used in German and British universities. In several European countries universities offer some modules which are taught simultaneously in traditional way for present in class students and for distant ones so they won't feel left alone. Blended learning gives opportunities to students to go on learning at universities in European countries.

In contemporary educational literature sources you may find different explanations to the concept of blended learning (Collis 2001, Musiyovska 2013, Heinze 2013, Koval 2008).

According to one of them, *„blended learning is a purposive process of getting knowledge, experience and skills. It is learning of methods for education and personality development, obtaining of creative abilities by complex and systematic application of the traditional and innovative pedagogical technologies and informative-communicative learning technologies to complement one another with the aim to get the better quality of education"* (Tryus 2012). We will use it in the context of our study.

2. PECULIARITIES IN ORGANIZATION OF BLENDED LEARNING IN HIGHER SCHOOL EDUCATIONAL PROCESS

As it is mentioned above, the tendency in organization of the educational process in higher school develops toward blended learning process, which combines traditional as well as computerized methods, forms and means in its organization.

As a rule, blended learning consists of following stages (Tryus 2012):

- individual students' work on the theoretical material using distant, electronic and mobile technologies;

- learning practical skills in form of traditional class lessons using innovative pedagogical technologies;

- discussing difficulties on the internet in online or off-line mode using distant, electronic and mobile technologies;

- monitoring and executing control as well as scoring students' educational achievements using computerized test programs, especially doing a computer test;

- execution of final test in discipline (examination test) and presentation of student's qualification project in traditional full-time form.

Blended learning model is a type of using informational educational resources in traditional learning with applying of the elements of asynchronous and simultaneous distant and mobile learning. Blended learning in higher school is recommended as a part of traditional learning in class lessons. The aim of blended learning is to combine the advantages of traditional and distant learning and to reduce their defects.

The main problem in introduction of blended learning in higher school is the low rate of self-management and self-control of learning students. If they are too low, the learning material won't be learned well enough and will influence the education quality. Therefore purposive work on the development of student's self-educated skills and getting knowledge, making them communicative and cooperative in teamwork are not less important aims in learning process and forming their informative and communicative competences.

For realization of blended learning process technology in higher school computerized learning systems are mostly used. One of the most widespread systems of this type is Moodle (Modular Object Oriented Distance Learning Environment) (Website learning management system Moodle, Smirnova-Trybulska 2007).

Here we observe an example of electronic learning in higher school, in which one of the authors participated.

3. SYSTEM E-LEARNING FOR HIGHER SCHOOL ON THE BASIS OF MOODLE

Cherkasy State Technological University has created an e-learning system on the basis of Moodle 1.9. It is intended for learning process support of full-time, distant and external students, for management of their individual work and for monitoring and executing control and assessment of students' educational achievements in automated mode.

System e-learning of Cherkasy State Technological University is made accessible to all students and teacher staff and administration of the higher school according to the

rights of access to the information resources and its subsystems (E-Learning System CSTU).

For blended learning's successful software support, monitoring and assessment in System e-learning of Cherkassy State Technological University is created its full elements structure. It includes course structure, course scheduling, course curriculum, initial control, course modules, accounting-graphic and projects database, final test and general knowledge assessment tasks. Each module has its organization structure of the course.

Learning process organization in system e-learning is connected with individual task completion, examination, computerized questionnaire, discussions on Internet forums and chat.

On the basis of system e-learning is made an electronic assessment register, that includes necessary information about the course.

The qualification project (Tryus 2012) describes in details the system e-learning in higher school on the basis of Moodle 1.9 and its peculiarities in use for all types of education in learning process management.

4. LEARNING PROBLEMS AND SOME WAYS OF THEIR SOLUTIONS FOR FUTURE ECONOMISTS

There are some learning aspects of information technology study for economists in higher school of Ukraine.

The research analyze proved, that the main aims of information technology study in higher educational institutions today are:

- − formation of students personality, development of their intellectual ability, analytic and synthetic thinking and intuition;

- − learning of computer scientific hardware, which is necessary for learning professional disciplines, development skills for cognizant perception of learning material from different information sources for appropriate profession;

- − learning methods, necessary for process analysis and modeling phenomena, which appear in social, economical, technical, production and information schemes; searching for optimal decisions to gain better production efficiency, and choosing the best way of implementation of these decisions, processing and analyzing the results of these calculating experiments;

- − to form a satisfactory qualification level of graduate students for future professional occupation, further self-education skills in information technology science, research work with an application of up-to-date achievements in information technology;

- to form components of information culture, which are connected with the future professional occupation in the informative society.

The research of information technology training for economists in some higher schools in Chernivtsi and Cherkasy proved, that students' learning achievements and information culture level do not correspond with the needs of the modern information society. All this can make a negative influence on the students' qualification quality and qualification skills.

As the result research, students say, that the significant reasons are the low level of information technology training at school (75,41% and 44,78% correspondingly), inability and unwillingness of students to learn individually (54,10% and 38,81% correspondingly).

Among the ways of their solution, which exist in higher school and in information technology training today, the key position is the intensification of learning-perceptional activity of students while doing information technology training course on the basis of wide use of pedagogical and information-communicative technologies (see, example, Tryus 2005).

The purposeful work of information technology teachers in forming and development of cognitive activity of their students leads to increasing their competence and thinking development. Significant didactic potentialities for increasing of quality of learning-perceptional activity of their students are connected with the use of modern informative-communicative technologies.

The increase of students' educational level in information technology course, intensification of their learning and perceptional activity, the answer to other mentioned problems in learning can be provided by introduction of a methodical system in information technology with the wide use of innovative pedagogical and informative-communicative technologies. This methodical system became *computer guided methodical training system* „that will provide the purposeful process of obtaining knowledge, skills and methods in learning and perceptional activity of students, development of their creative abilities on the basis of information technology in use" (Tryus 2005).

The authors do a scientific research of completion computer guided methodical training system for information technology training for economic and finance students. (Yatsko 2012, 2011).

On the basis of this research authors have created a computer guided learning system in information technology training for future economists and called it *Information technology* training course, that is implemented into learning process in Bukovyna State University of Finance and Economics.

5. COURSE SPECIFICATION OF DISCIPLINE *INFORMATION TECHNOLOGY* FOR ECONOMIST STUDENTS

The aim of *Information technology* course for economist students is to gain theoretical knowledge and study the principles of modern and perspective software systems and networks, knowledge of system and applied software, as well as professionally peculiar purposeful software to meet the requirements of economic activity (Yatsko 2011).

Learning tasks of *Information technology* course are gaining theoretical knowledge in information technology and computer science, technological providing of computer systems and networks, algorithmization and programming, modeling of economic processes, automatic management systems and economic data processing. In addition to all students have to form their skills in practical application of their knowledge of information communicative technologies in professional purposeful tasks in economics and finance.

One of the leading tasks in organization of learning discipline is combination of its theoretical and practical aspects. Hereby the practical aspect is connected with gaining of practical skills in work with the prepared software for common and special use, as well as ability of mastering simple programs with the use of one of high level programming languages.

The training course is divided into three learning modules (Yatsko 2011).

The first module is „*Theoretical basis of economic information technology and computer technics*”. It considers the history of computer, computer science and information technology, basic concepts of information systems and their qualification. The module also includes the peculiarities of application of technology systems in economics, the role of communicative technologies in rising of competitiveness of enterprises. Students study the role of computer technology in economics, the perspective of use of applied data processing systems in economics for solving business cases. The basic concepts of information modeling of information environment, their historical stages of development are introduced. The module includes information about structural elements of business information systems, hardware and software support, word processing programs, presentation creating systems, spreadsheets, computer networks and their use in economics. The notions of concepts of e-commerce, e-business, methods of Internet trading and Internet marketing, transactions on the Internet and Internet-banking are revealed.

The second module is "*The information technologies for solving economic tasks*". It considers methods of information security, databases, their control systems and functionality, methods of data selection by request, use of forms in making user's interface, basic web design and object-oriented programming.

The third module is „*Perspectives of development in information technology and computer systems*”. It considers the possible ways of improvement in computer and communication technics, perspective technologies in data storage and transmission,

use of calculation in small business. Students study the methods of evolution modeling in economics, the use of obscure models and methods of making decisions in information-analytical control systems. The module covers modern mathematical systems in data processing, artificial intelligence systems, expert systems and their use in economics and business. It deals with a role of mathematical logic application, with the use of logical models in expert systems, with monitoring strategies and solving collisions. Students get acquainted with perspectives of use of Internet in commerce and business, modern information systems in economics and of use of artificial neuronal networks in commerce.

6. ELECTRONIC TRAINING COURSE *INFORMATION TECHNOLOGY* FOR FUTURE ECONOMISTS

For study of the discipline *Information technology* based on blended learning principles approach, represented in authors' work (Tryus 2012), on the basis of Moodle 2.5 there was completed a training course *Information technology* (The system of e-learning department of computer science BSFEU) (Figure 1, 2).

Figure 1. The main window of electronic learning system of computer science department of BSFEU

The Moodle 2.5 provides LMS (Learning Management System), CMS (Content Management System) and VLE (Virtual Learning Environment). Therefore it can be

useful in all stages of scheduling and realization of the learning process and meets all the requirements of this type of systems (Virtual Learning Environment).

Detailed information about Moodle 2.5 and its functionalities you can find on the website of this system using the link (Moodle 2.5.1 release notes, New features Moodle 2.5.1).

Electronic training course *Information technology* has the following structure:

1. General course characteristics:
    − a course news;
    − goals and tasks of the course;
    − a study program;
    − a course structure;
    − a schedule of the course;
    − types of control and criteria of assessment of students' learning activity during the course;
    − a list of printing works and informational resources of the course;
    − a list of useful software of the course;
    − a glossary of the course.

2. Entrance control of the course:
    − questions and tasks for the entrance control;
    − a list of disciplines with a necessary learning material;
    − an entrance test

3. Theoretical learning material of the training course (contains abstracts from lectures and presentations).

4. Materials for practical training:
    − program catalogue;
    − methodical guidance to practical classes

5. Individual students' work:
    − methodical guidance for learning theoretical material for individual work;
    − tasks for individual work;

6. Current, topical and attendance control:
    − lecture attendance control;
    − practical classes attendance control;
    − current control;
    − individual and practical task reports;

- module control;
- module tests;
- topics for essays and abstracts;
- creating and presentation of students' projects;

7.   Module control:
- questions and typical tasks for control;
- module test;
- module test results;

8.   Semester course control:
- questions and typical tasks for semester test;
- semester examination test results in the discipline;
- summing up form of *Information technology* course;
- summing up questionnaire of *Information technology* course;

9.   Knowledge storage control:
- questions and typical tasks for knowledge storage control;
- test of knowledge storage control;
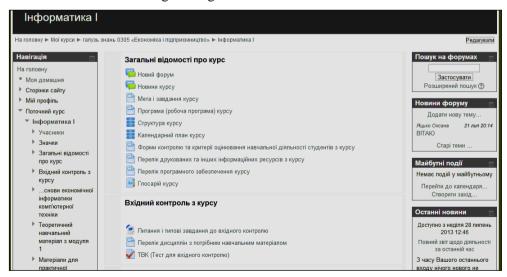- results of knowledge storage control.

Figure 2. Main page of electronic training course *Information technology*

To create the electronic *Information technology* course on the basis of Moodle 2.5 were used the following types of:

- activities: database, glossary, task, test, lesson, forum;

    –   resources: book; inscription, folder, page, link.

For successful learning of theoretical and practical material students must do some tasks. Namely for learning theoretical material we use such type of activity of Moodle 2.5 as a lesson. After students have finished listening to the lecturer, have watched multimedia (MMVF) or presentation they have to revise the lecture material on the PC from the *Information technology* electronic course once again (Figure 3). Computer training program contains on each page a fragment of theoretical material of a lecture and students should complete the test (Figure 4) to move on the next page.
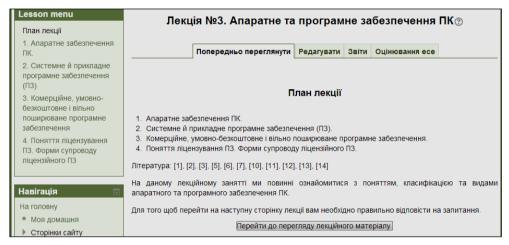

Figure 3. Start page of an electronic lecture

Figure 4. Fragment of an electronic lecture

Before students start working at practical tasks, a teacher prepares an oral test and a computerized test in the system Moodle 2.5 to activate students' gained knowledge. Students send all the results and reports to electronic learning systems database. All types of students' learning activities in electronic learning system *Information technology* can be checked and students get marks for each type of activity and final mark at the end of the module, which will be stored in electronic register. This gives students a possibility to observe their educational achievements and encourages them to make progress.

CONCLUSION

To sum up all the possible ways to overcome negative tendencies in educational information technology training for future economists and perspectives of its development the following conclusion is made:

1. We should introduce corresponding learning programs of information technology course at school and in higher school, update the information technology training course at higher school, fill it content up with information about modern achievements in computer science, innovative informative and communicative technologies, especially in economics, and improve the level of basic theoretical support in computer science.

2. Purposeful way of learning process improvement is creation and adoption in higher school computer based methodical training systems in information technology course on the basis of innovative pedagogical and informative communicational technologies. (technology web-2.0, technology of electronic, distant and mobile learning, social networks).

3. Every higher educational institution has to create an educational-scientific informative environment, which will provide the successful use of information communicative technology according to the blended learning model in traditional and distant lessons, especially lectures, practical classes, laboratory classes, tests, research work management and individual work of full-time and external students.

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