

Advantages of the Web-Based Training for the Increasing Quality of Preparation and Self-Preparation of Students from the Specialty “Food Technology”

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Abstract

The report represents the results of implementation e-learning based lessons and quizzes in the education of students in Technical College of Yambol, Bulgaria. The e-learning is a way to use networking technologies that allow to access the training materials at any possible time, permit interacting with the training environment in convenient for the user time, that lead to improving self motivation and the effectiveness of acquiring knowledge's. The area of e-learning study in Technical College of Yambol included courses in Informatics, Programming languages, Information technology, Common and General Chemistry, Biochemistry, Microbiology, Ecology. The results of our investigation show that the performance of e-learning system is the reason for improving the effectiveness of the education, as well as improving the motivation among students and teachers have been registered.

Keywords: *e-learning, effectiveness of the education, motivation*

1. Introduction

The education and possibility of acquiring different competences must be available, not only in the range of the compulsory education, but also after the beginning of an active social life, if possible, without taking too much time from the professional, social and personal activities. These educational tendencies, in particular for University education, are imposed, because of the need of active involvement of the educational institutions in the development of the European educational and scientific space; the demographic characteristics of the students; the expanding globalization and stronger competition in the area of educational services, especially with the introducing of the electronic and distant learning. The implementation of Bologna strategy the EU's efforts should be directed to unification in 2010 to educational programs in all EU member states (short training courses, BA, MA, MD ect.). That means to develop and coordinate flexible, modernized curricula in all areas, which to correspond to the requirements of the labour market, and quality assurance systems (Furtunova, 2009). This demands the integration of classic and modern educational models and establishment of new ones that can give opportunity not only of acquiring knowledge and skills in a modern environment, but also to develop intellect and social skills to the students, alter the accent of the education,

applying interactive methods, modification the roles of teachers and students. Simultaneously it is necessary the education to be hold during a convenient for the student's time, place, way and rate.

In the management of the university education changes, regarding the integration of information and communication technologies (IT), is necessary the Boards of the educational facilities to make their choice on the market section of education services, they want to place their offers on and for the options for suitable and modern pedagogical technologies. For the realization of the educational policy of the university is of big importance the understanding, the adoption and exploitation of the ideas of the pedagogical stuff. Still, the modern educational technologies are only partially implemented, most of the time from particular lecturers or disciplines, not like a consistent policy and specific measures for realization (Pehlivanova and Ducheveva, 2008).

2. Materials and Methods

The concept of the E-learning in Technical College –Yambol, is based on the idea of using elements of electronic leaning (*e-learning*) and the relevant technologies. We accept the idea, that *e-learning* is a type of learning, which preparation, implementation and management requires using modern information and communication technologies, including Internet.

The screenshot displays a Moodle course interface for Microbiology. The main content area is divided into four topics, each with a title, a description, and a list of resources. The left sidebar contains navigation menus for activities, forums, administration, and courses.

Topic Number	Topic Title	Description	Resources
1	Тема №1	Предмет на микробиологията. Типове организация на микроорганизмите - основни групи микроорганизми. Разпространение и значение на микроорганизмите.	Тема №1 Тест №1 Предмет и задачи на микробиологията. Създаване и развитие на микробиологията като наука.
2	Тема №2	Микроорганизмите в биотехнологичната промишленост.	Тема №2 Тест №2 Микроорганизмите в биотехнологичната промишленост.
3	Тема №3	Прокариоти. Форма и големина на бактериите. Строеж на бактеријната клетка. Рикетсии, хламидии и микоплазми. Размножаване. Разпространение и значение.	Тема №3 Тест №3 Прокариоти. Форма и големина на бактериите. Строеж на бактеријната клетка. Рикетсии, хламидии и микоплазми. Размножаване. Разпространение и значение.
4	Тема №4	Строеж на бактеријната клетка – капсула и стена.	Тема №4

Figure 1. The Topic format of organizing, compulsory subject Microbiology, the lessons and test are organized by topics (or units), regardless of how long they will take


It is an attribute of the global information society - born by the necessity of the modern student for more flexible and open education and becomes possible thanks to the progress of the education, information and communication technologies. The goal of the project activities is not only to enrich the traditional systems and approaches for learning, but also to develop and integrate new pedagogical technologies in an interactive environment.

During the theoretical validation of the development and integration of e-learning system in the college, we accept that the web – based learning concept is inseverable part of the Information Society concept, which technologic platform is based on digital multimedia and global communications. Education, during which www is used as a virtual environment, for introduction of the subjects and realization of the learning process.


Based on traditions and cultural mission, in the Technical College -Yambol, are placed the foundations of the e-learning. We could say that, the model, on which the learning is based, has five main components (external environment and conditions; policy; integration; practice; experience and effects) is suitable for our work. In the College activity, e-learning is base on MOODLE. As a result of our work the foundations of a technical and informational data for future distant learning took placed: virtual library with materials - lectures and exercises on some of the subjects; tests; glossaries with the terminology for the different subjects.

The ecology as a science


OK

 The non-living or physical factors e.g. temperature, amount of water, amount of oxygen, light ect., are called:


abiotic factors
 biotic factors
 edaphic factors
 climatic factors

 Which factors belong to the biotic factors?

symbiosis
 mutualism
 pH of soil
 mineral salts
 competition

 Meteors and rock fragments burn up in the:

stratosphere
 mesosphere
 troposphere
 lithosphere
 biosphere

 Abiotic ecological factors include:

the chemical and physical properties of the environment;
 the interaction of the organisms in a certain habitat;
 the water, temperature, wind, atmosphere composition, soil;
 the light, oxygen dissolved in the water, the relief of the area;

Figure 2. Sample list of questions in quiz module, compulsory subject Ecology, developed in the Virtual Learning Environment eDuTK

The e-learning materials are base for raising the quality of learning; it forms a permanent interest in the students towards the studied subjects. The study materials in the self-training modules are developed and approbated (Figure 1). Tests and glossaries are also created in the college system of e-learning for the following subjects: General and Inorganic Chemistry, Biochemistry, Microbiology and Ecology.

There are three different formats for the class (course) – Weekly, Topic, and Social (Nedeva, 2005). The weekly format organizes the class into weeks, with assignments, discussion boards, tests, etc, all residing in a week-by-week block. The Social format is built around a forum (bulletin board), which is good for announcements and discussions. The Topic format organizes everything by topics (or units), regardless of how long they take (Figure 1.). Our courses are in topic format. They are used for e-learning by our students, who use the resources of their home PCs by logging into <http://tk.uni-sz.bg/e-learning/>.

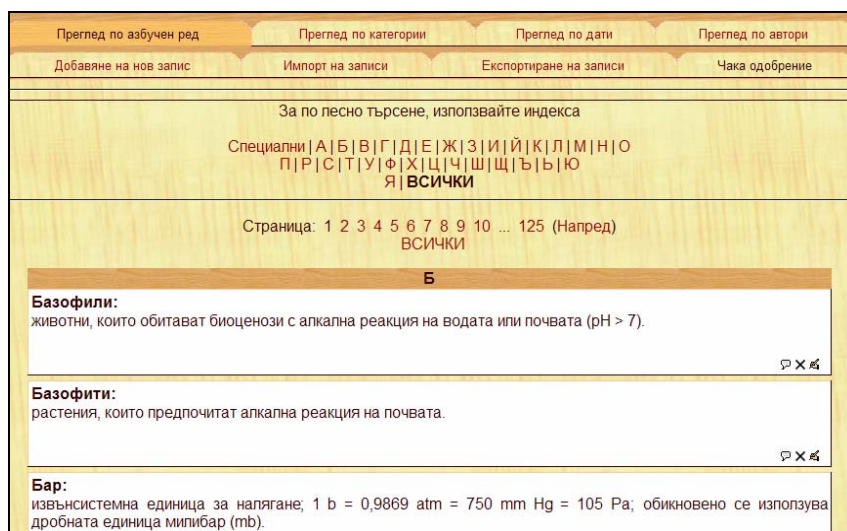


Figure 3. The Glossary, compulsory subject Ecology, developed in the Virtual Learning Environment eDuTK

Quiz module allows the teacher to design and set quiz tests (Figure 2). Each question has a category. When you create a new question, it is stored in the category you select. To create a new question, you must select the type of question you want from the pull-down menu. You have the option of adding, which includes: Multiple choice questions; True/False questions; A short answer question; A numerical question; Matching question; Description question; Random set; Random short answer; A special embedded question (Cloze). These questions are kept in a categorized database, and can be re-used within courses and even between courses. Quiz module includes grading facilities (Nedeva, 2005).

The Glossary offers the opportunity to create and maintain a list of definitions and terms that are specific to the content of the given area of study. The Glossary can be

separately for each lesson or thematic to the all area of the study subject. The students can be searched or browsed in many different formats (Figure.3). It is possible to automatically create links to these entries throughout the course.

Our considerations to choose the MOODLE are based on:

- First, this is Modular Object-Oriented Dynamic e- Learning Environment.
- Second, it includes large community of programmers and users;
- Licensed under GPL;
- Translated into 60 languages (incl. – Bulgarian).

Its build up by 9 modules, which could be extended and enlarged; compatible with large number of browsers; it has integrated HTML editor; secure and safe; gives options for interface setting. Our opinion is that the main advantage, from pedagogical point of view, is that it is based on implementing the theory of the social construction, the discussing problems and individual adaptation in the process of learning.

3. Research and Results

The main ideas of the theory of e-learning in the College are based on the following principles:

- Student's knowledge is built up more actively by interaction and communication with the surrounding environment and became significant, when it is used in a wide social context;
- The acquiring of new knowledge must be effective and students to be not only subject of training but able to interact and take experience;
- During the process of e-learning in the given environment, the students are affiliating in a small group, with its own characteristics and culture, with common values and in the process of join activity they become part of that group (Pehlivanova and Ducheveva, 2008).
- There are conditions created for effective communication, feed back, individualization and creativity.

The feed back of e-learning is taken and developed into two main aspects:

- Feed back “student – lecturer” as an ability of the student to contact his teacher for different issues, which came out in the process of learning.
- Feed back “education effectiveness” - ability of the student to evaluate the level of results, the gaps in the introduction of the study material, the effectiveness of the learning.

According to the analysis of the data, this type of feed back gives a chance to the lecturer to correct the gaps and to adapt the content, according to the specifics of the targeted group, the current state of the scientific field and the labour market requirements. In order to evaluate the qualities and the effectiveness of incorporated e-learning, the inquiry research with the participation of 61 students has been made (Figure 4). The students were from the specialties “Automatics, informational and controlling technique” (37 students) and “Food technology” (24 students); from the 1st and 2nd year during 2006 year (Pehlivanova and Ducheveva, 2008).

They were divided into three age groups:

- first group – 19 years old (23 people);
- second group 20-21 years old (26 people) and
- third group – 22-26 years old (12 people).

From the participants of the inquiry 53 of 61 were first year students and 8 students from the second year of study; 35 with male sex and 26 female. In order to improve e-learning and carry out monitoring, in 2009 has been conducted a new survey questionnaire with 64 students (51 women and 13 - men) from the specialty «Food Technology», the first, second and third course: "General and Inorganic Chemistry", "Biochemistry", "Microbiology" and "Ecology".

The data from the survey for the qualities of the e-learning shows, that 67% of the inquired students prefer combined learning. This means that they accept the e-learning not as a new model, but as an opportunity for improving and to overcome of the shortcomings of the traditional forms of learning. The fact that 24,5% of the students, most of them from the third age group, with more social experience and partly occupied, prefer the e-learning, confirms the standpoint about the meaning of the new educational technologies for increasing the equal social possibilities for education and qualification during the entire life.

The aim of the investigation was:

1. to evaluate how the electronic courses influence on the effectiveness of student's self-preparation and are they improve the quality of obtained knowledge's;
2. to estimate whether educational content meets the requirements for accessibility, usefulness, applicability of the proposed information and whether it is appropriate and understandable for the students;
3. to discover the connections between student's skills in the field of information technologies and e-training in the specific subjects;
4. to analyze the opinion of students about the importance of e-learning form of education and their preferences to the way of acquiring new knowledge's as well as their self-motivation for learning through electronic tests.
5. the level of student's motivation is done by indirect indicators like interest, usefulness and necessity of e-learning and their perception for difficulty.

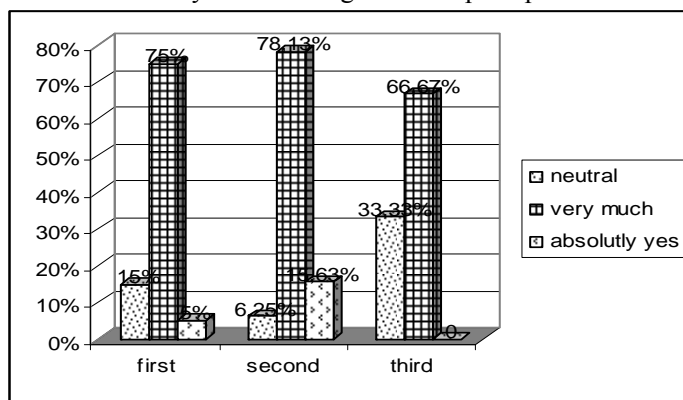


Figure 4. The effectiveness of the developed electronic material for improving the quality of self-preparation

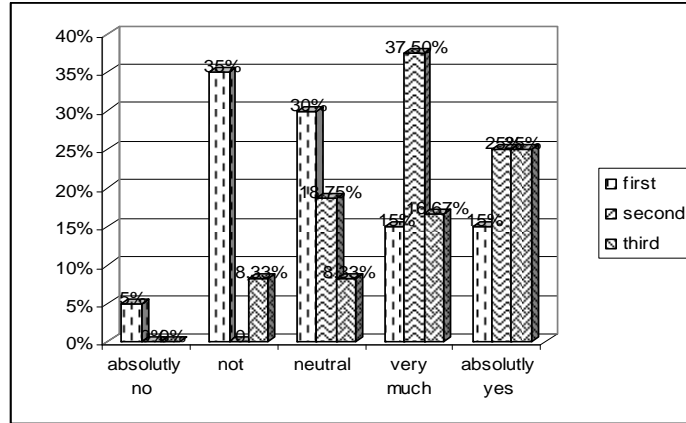


Figure 5. Preferences of the students for e-learning.

The diagram from the investigation shows that during these years students change their opinions and preferences about the e-learning (Figure 5). Most of the investigated students (60, 94%) have very good skills with computer technologies that support their prosperity in other educational courses and self-preparation in a virtual environment. Only 9% haven't the necessary skills to work with computers.

About half of students evaluated the electronic form of training as a very interesting and useful (Figure 6). This fact is confirmed by the results for the practical relevance of content and form of training. This is an indirect indicator that speaks to increased motivation for learning. Only 37% of students find that teaching content is easy for assimilation.

The development of content in different disciplines is characterized by modules, multiple and varied use, interactivity, flexibility about learning strategies and take into account of student's individual skills, time and place of usage and opportunity for development.

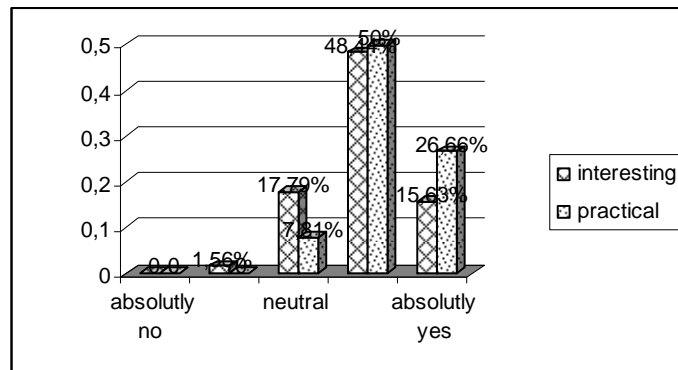


Figure 6. Assessment of interest and usefulness of e-learning

The advantages of assessing the preparation of students by electronic tests are that:

- they are automated;
- individualized;
- with repeated use;
- easy processing of results;
- opportunity for self-evaluation;
- data retention and production of portfolio performance of students.

According to the database 17 % of the students under investigation access as very well the possibilities to use the electronic tests; 34 % - responded as absolute. That means that half of the inquired students appreciated the advantages, objectiveness and impartiality of evaluating their knowledge's by electronic tests.

4. Conclusion

The analysis of the results and the database of our investigation enable us to make the following conclusions:

- there are increase interest and preferences of the students from specialty "Food Technology" to the introduction e-learning in the main compulsory disciplines;
- practicalness, usefulness and interesting way of presentation the content are the main reasons for the increasing the motivation and the interest of the students;
- increasing the preferences to the educational materials, published on the web-page, has been mentioned, as well as the rising the level of self-preparation of the students;
- students reported that electronic tests overcome a large part of the effects of subjectivism in the evaluation of their knowledge's;
- the development of educational information in accordance to the pedagogical criteria and indicators for quality, facilitating the adoption by students and increased their activity.

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