

## Analysis of Combined Learning in Discipline 'Introduction to Communications and Computer Technologies'

Lachezar Yordanov

**Abstract:** This report analyzes the necessity of introducing e-Learning training in the educational process in universities. It also covers the benefits of this type of learning for students and businesses. The main features of traditional and combined learning in universities are described. The results of introduction of e-Learning system as a supporting tool to until now used traditional method of learning in the discipline 'Introduction to Communications and Computer Technologies' are reflected.

**Key words:** Introduction to Communications and Computer Technologies, traditional learning, e-Learning, combined learning, practical learning, motivation of the students.

### INTRODUCTION

In the last ten years online learning is used as form of distance learning in most high educational institutions, enriching the existing traditional methods for educational process. At the moment it still concomitants the traditional method of learning of students. The idea of combined learning objectives transforming the learning environment in a place, where knowledge is available to students in any way, at any time and any place. The universities are the institutions that should provide support and motivate students to participate in a new type of learning process corresponding to the dynamics of life and the economy needs.

The effective training requires more specific understanding of the needs of learners, learning content, target groups and organizational conditions and environment. For perfection, better and more complete mastery of the course content, to promote self-development and self-learning was made meaningful analysis [1, 2, 3]. The expansion of traditional learning with different aspects of online learning facilitates the students and allows targeted groups for self-refinement of the time for learning outside the classroom.

The new electronic forms of training are becoming more popular not only among young people who are motivated to work in Internet space, but among working people for improving of qualification and perfection of their skills. On the basis of modern information and communication technologies and the Internet is realized a complex strategy for the implementation of modern electronic forms of education at the University with constantly updating content such as:

- offering modern electronic forms of communication and learning;
- opportunity for learning at any time and place;
- offering interactive and attractive multimedia solutions;
- opportunity for self-assessment and others.

The inclusion of electronic forms of training in the discipline 'Introduction to Communications and Computer Technologies' contributes to increasing access to educational material and the ability to learn anytime and anywhere.

E-Learning and individualization are effect of application of computer technology, the mobile techniques and technologies and Internet in the educational process and occur in all stages of modern education. The student self-determines when, where and how much time to devote to school work.

### EXPOSITION

In the present report is submitted research of methods of learning and formation of roles for groups of students in the study of the discipline 'Introduction to Communications and Computer Technologies'. The discipline is studied in the first semester from students in 'Computer System and Technologies' and 'Telecommunications' at University of Ruse "Angel Kanchev".

## MODELING ROLES OF TRADITIONAL LEARNING METHOD

In traditional method of learning the course material is taught to students in the classroom in form of lectures and practical exercises. The theoretical material is presented during lectures using interactive multimedia presentations and visual aids. During the practical sessions students solve practical tasks described in manuals and checked by teacher.

Control questions for self-check knowledge are published at the end of the manuals and lectures. Some of the questions are examined during the lecture or exercise at the audience.

The materials on paper are provided in lecture hall and in library.

## MODELING ROLES OF LEARNING IN COMBINED METHOD

Combined learning is conducted using the traditional method of learning extended by e-Learning system.

For e-Learning training of the discipline 'Introduction to Communications and Computer Technologies' and purposes of study are used the following platforms for distance learning *e-Learning Shell* and *e-Learning Shell II* (fig. 1 and fig. 2) [4, 5]. For expanding the possibilities of e-learning the materials posted at the platforms *e-Learning Shell* and *e-Learning Shell II*, lecture and practical material with additional photo material is available electronically. This allows students to learn even without internet connection. They only need to have a computer or e-book to read the materials.

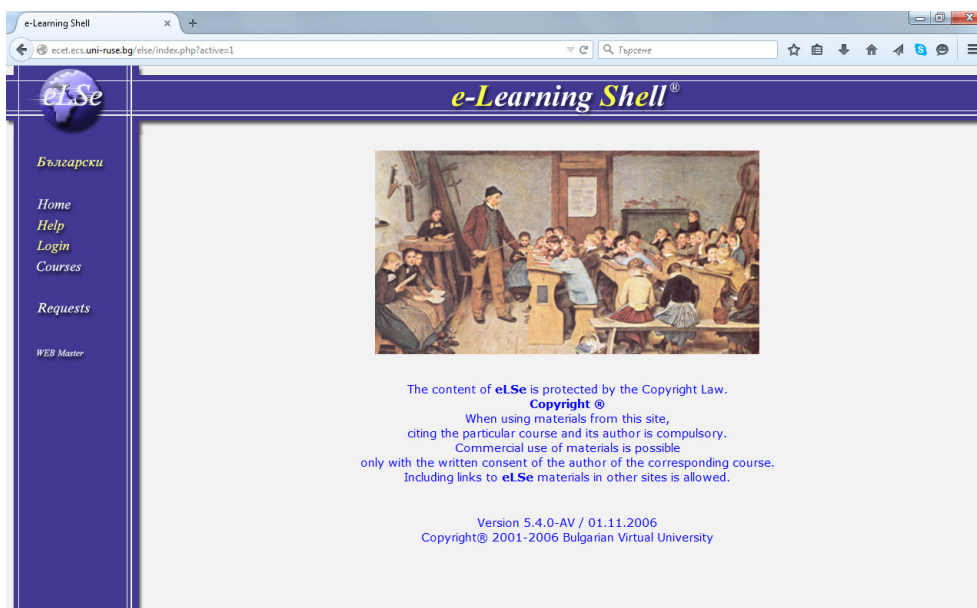


Fig. 1. Home screen of platform for distance learning *e-Learning Shell*

For independent solving of the practical tasks is necessary computer loaded with an operating system (OS) Windows and MS Office. The results of solving the relevant task are applied as pictures.

When working with the electronic version of the documents without presence of internet connection is not possible for online self-checking of knowledge. It can only be done by answering the questions at the end of the lecture or exercise. Solving the tests can be realized online only at the platforms of *e-Learning Shell* and *e-Learning Shell II* in presence of internet connection.

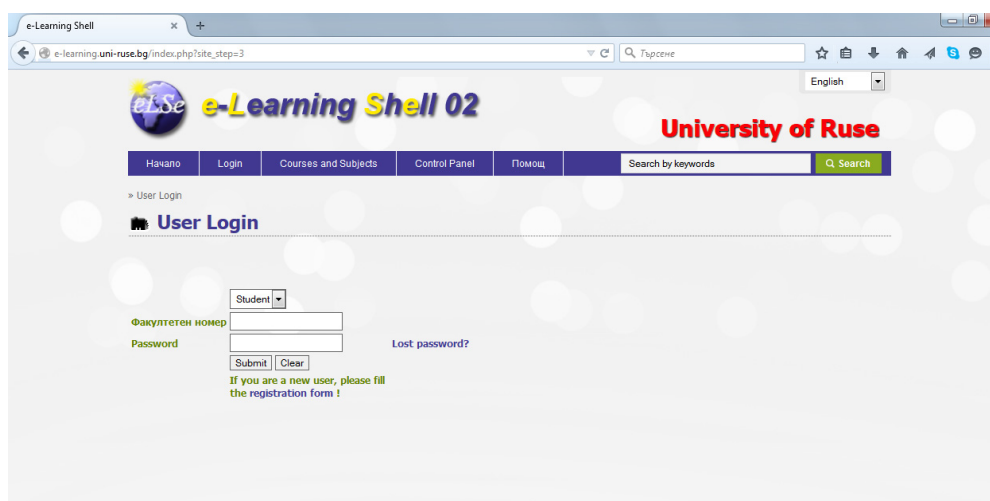


Fig. 2. Registration screen of platform for distance learning *e-Learning Shell II*

Final testing of all students is done through testing and solving individual practical task in the classroom for a specific time. Checking their answers and level of solving the problem is evaluated by the teacher. Points are awarded to each element of the answer and six-point scale grades are awarded according to the sum of points. In 40% of maximum points is three; 80% – six and two other grades 4 and 5 are equally distributed in the range of points between grades three and six, i.e.  $40\%/3=+13.33\%$  is a step in the evaluation, at 53.33% – four and 66.66% – five. Solving test and practical task are evaluated individually.

### MODELING ROLES OF PRACTICAL TRAINING

During the practical exercises students solve practical tasks described in manuals. After solving the task teacher checks the solution, provides guidelines for made errors and after they are corrected teacher allows student to continue with next task. If they need help in solving tasks, students turn to the teacher.

### FORMATION OF TARGET GROUPS

Target Group A. Students are studying discipline 'Introduction to Communications and Computer Technologies' only by traditional method – in the classroom.

Target Group B. Students are studying discipline 'Introduction to Communications and Computer Technologies' by combined method – through traditional training extended by e-Learning system. Student's learning material is provided electronically and access to distance learning platform during the first practical trainings in the discipline 'Introduction to Communications and Computer Technologies'. It recommended self-study before the relevant lecture and exercise.

Trained students before October 2013 have been working only with the platform *e-Learning Shell*. Trained students from the target group B during the school year 2013-2014 is given the opportunity to work in both platforms *e-Learning Shell* and *e-Learning Shell II*.

Recruitment of actors in the target groups is made with a questionnaire survey of students until filling the target group.

### LEARNING OUTCOMES OF TARGET GROUPS

Students started their education in the years 2011-2012; 2012-2013 and 2013-2014 are selected for the research. For each of the target groups A and B are selected five students. In the period 2012-2014 are also included students from part-time learning.

Learning outcomes of students for the relevant year and target group are represented in figure 3 students from full-time training and figure 4 – part-time training.

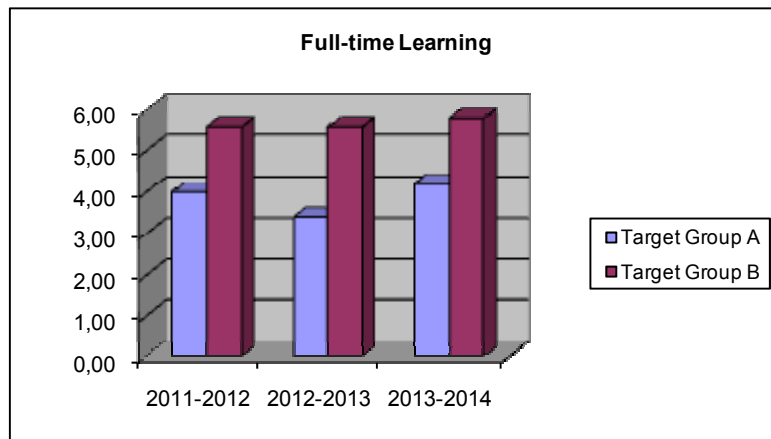


Fig. 3. Average result of students in full-time education in the discipline 'Introduction to Communications and Computer Technologies'

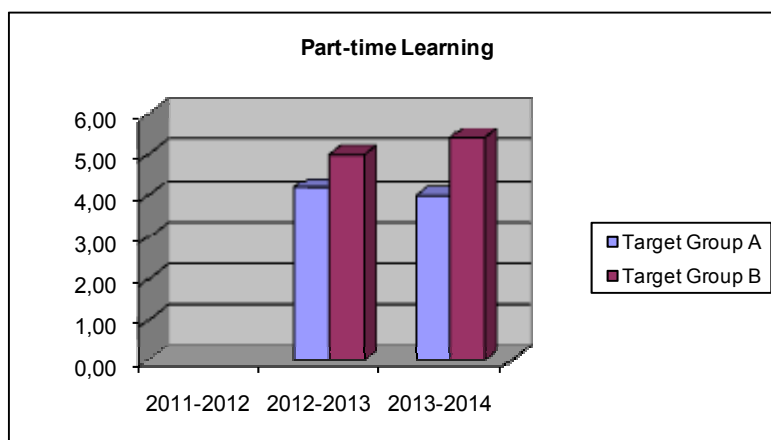


Fig. 4. Average result of students in part-time education in the discipline 'Introduction to Communications and Computer Technologies'

For the period of the research success of students in the traditional form of training target group A (average grade 3.98) is lower than that of combined learning target group B (average grade 5.43). The main reason for this is little time for learning separated from group A and low motivation of students for self-expression and enhancing knowledge. Higher motivation of students from target group B produces relevant results.

## CONCLUSION

The report presents results of the introduction of roles in training by the traditional method and by combined learning – traditional training extended with e-Learning system. The information in electronic format contains: theory, the possibility of self-checking, repeating the theoretical material of wrong answers and verification of knowledge by making tests in the discipline 'Introduction to Communications and Computer Technologies'. A comparative analysis of target groups A and B, trained by the traditional method and by combined learning is performed.

Visibly better results are obtained with combined training, which motivates students for more actively participation in the learning process, gives confidence in the knowledge and stimulates them for self-expression. I recommend to students to use combined method of learning the discipline 'Introduction to Communications and Computer Technologies' to achieve better results.

In the next publication I will analyze the results of all students in the discipline 'Introduction to Communications and Computer Technologies' trained with combined method.

---

**REFERENCES**

[1]. Iliev, V., Development of e-Learning in Chemical Technology and Metallurgy University of Sofia, The Fourth National Conference with International Participation on e-Learning in Higher Education, Academic Publishing House "Tsenov" Svishtov, 2012, pages 136-139.

[2]. Peytcheva-Forsyth, R., For Quality of e-Learning, The Fourth National Conference with International Participation on e-Learning in Higher Education, Academic Publishing House "Tsenov" Svishtov, 2012, pages 32-48.

[3]. Zaharieva, G., Evaluate the Effectiveness of Training in Distance Learning – Following the Example of Master Program 'International Business and Management' in D. A. Tsenov Academy of Economics, The Fourth National Conference with International Participation on e-Learning in Higher Education, Academic Publishing House "Tsenov" Svishtov, 2012, pages 156-162.

[4]. <http://ecet.ecs.uni-ruse.bg/else/>

[5]. <http://e-learning.uni-ruse.bg/>

**ABOUT THE AUTHOR**

Assistant Lachezar Lazarov Yordanov, PhD, Department of Computing, University of Ruse, 8 Studentska Str., Ruse 7017, Bulgaria, Phone: +359 82 888 859  
e-mail: [liordanov@ecs.uni-ruse.bg](mailto:liordanov@ecs.uni-ruse.bg)

**The paper has been reviewed.**