

# **EFFICIENCY OF USING "NETWORK BOOMERANG" TECHNOLOGY FOR LECTURES ON "INFORMATION TECHNOLOGY IN EDUCATION" FOR STUDENTS OF HIGHER EDUCATION IN THE CONDITION OF INFORMATIZATION OF EDUCATION**

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## **ABSTRACT**

The article discusses ways of increasing students' engagement, motivation and participation in higher education using "Network Boomerang" technology, as an example of pre-service IT teacher training.

**Keywords:** Education reforms, innovative teaching, active learning, network boomerang, e-learning, computer-assisted learning, smart technology.

## **INTRODUCTION**

The state pays a great attention to the development of education in the Republic of Uzbekistan, including the modernization of vocational education on the basis of modern requirements. In this regard, President of the Republic of Uzbekistan Sh.M.Mirziyoev said, "The solution of one more problem is very important: it is the professional level of teachers and professors and their specialist knowledge. It is important to create an environment that will actively promote the process of education, spiritual enlightenment issues and the formation of its true values."

The innovative activity of pedagogues is the main factor in the reform of the education system. One of the most important aspects of modern education is the achievement of the innovative character of the pedagogical activity. The more innovation there is in the pedagogical activity, the better understanding of the teacher's own experiment can be achieved. In it, the teacher participates widely in creating, applying and improving innovation as the subject and organizer of the innovation activity. They seek to analyze the content in science and the essence of changes in knowledge and traditions.

For the innovative activity of teachers to be efficient, it is crucial that e-learning resources be created and used in the educational process, thus forming an e-learning environment, since the age we live in is the age of an informed society.

## **Materials and methods**

The innovative activity of teachers is reflected in the formation of and filling with the content of educational technologies and methods in the digital information educational environment and the proper organization of the distance learning process.

The implementation of "The network boomerang" technology in teaching ITE module via a digital information environment can help significantly improve the effectiveness of teaching.

"The network boomerang" technology focuses on deep learning, creative understanding and mastery of the presented learning material. It is designed to explore topics that are of different content and nature (problematic, controversial, meaningful), including those in verbal and written forms. When using this technology, each workshop participant will have different assignments, becoming, in turn, a student or tutor, thus collecting the required points to successfully complete the module being taught.

This technology allows developing critical thinking and logic, developing written and verbal communicative skills, bringing ideas and arguments. Using various textbooks and other literature, students will be able to express themselves freely, while the teacher can evaluate all students during one course.

When implementing "The network boomerang" technology in an e-learning environment, first a special folder should be created in the computer, with only one file (course name, index, html), which serves as an access point to the course content. The remaining files in folders are as follows:

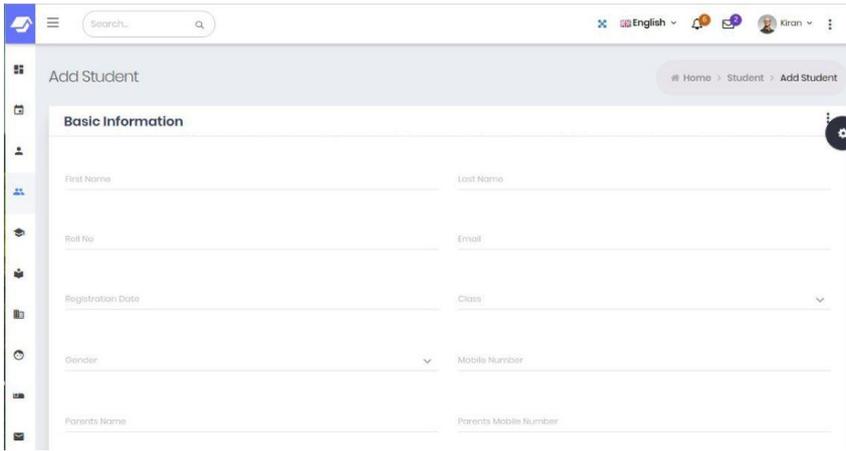
IMG - graphics, pictures, animations and others;

CHARTER - lectures, laboratory works and their content;

TEST - tests, control tasks, exercises;

FILE - handouts related to "The network boomerang" method.

At the first stage, students are enrolled after a special folder is created.



The screenshot shows a web application interface for adding a student. The page is titled "Add Student" and has a breadcrumb trail: "# Home > Student > Add Student". The form is titled "Basic Information" and contains the following fields:

First Name	Last Name
Roll No	Email
Registration Date	Class
Gender	Mobile Number
Parents Name	Parents Mobile Number

Each student has access to the digital resources, and studying these resources both individually and in groups, they answer questions and participate in discussions, while the teachers can evaluate them based on their participation..

At the second stage, students will be explained the following guidelines / recommendations:

- ✓ Studying the assignments carefully;
- ✓ Completing the task (remembering);
- ✓ Allowing up to 10-15 minutes' of preparation time, depending on the volume of the text,

The teacher should monitor each student through a local network or the online monitoring system.

**Table 1.1. A suggested planning of a lesson using “The network boomerang” method**

Stages of the lesson and timing	Type of activity	
	The teacher	The student
Organizational part 5 min	Greetings and marking attendance	Greetings.
Introduction 5 min	1. Presenting the material to be learned 2. Explaining the purpose and tasks of the teacher	1. Writing an outline of the material. 2. Listen.
The main part 55 min	1. Explaining the new topic, using presentations. 2. Assigning a task to be done in computers using "The network boomerang" method.	1. Listening, making notes. 2. Performing the assignment on the computer.
The closing part 15 min.	1. Summarizing the task and evaluating students. 2. Assigning homework.	1. Listening. 2. Write down the homework.

Students will be evaluated using a marking scheme, depending on how well the assignment is fulfilled. The teacher will introduce students to the evaluation criteria and procedures, for example, the answers to the questions can be evaluated using the following criteria:

- 3 points - if the full answer is provided;
- 2 points – if additions are made;
- 1 point – if the answer is incomplete;
- 0 point - if not answered. - 0 points.

If a 5-point grading system is used, the criteria can be adjusted as follows:

- 5 marks for full answer, 4 for an addition, 3 for a response close to the correct answer, 2 for non-answer, and 1 for non-participation.

The following tasks are assigned when using “The network boomerang” method in teaching ITE module.

Learning materials

For each of the group members:

- 1.1. What is the distance learning system?
- 1.2. What is the purpose of distance education?
- 1.3. Distance learning methods and the content of distance learning.

At the end of the training, the teacher evaluates students' performance, expresses their opinion and addresses them with the following questions:

- ✓ What did you learn from today's lesson?
  - ✓ What did you learn?
  - ✓ What has been new to you?
- What else would you like to know?

Once each student has scores (grades), the training session will be completed.

## RESULTS AND DISCUSSION

A special program has been developed to conduct the experimental studies. In the program defined the purpose, tasks, stages, and test areas of the experimental work. In the selection of experimental field the suitability of pedagogical conditions, material and technical and information support and experimental sites were studied.

The experimental work was carried out in three stages:

**Table 1.2. Stages of experimental work on preparation of students of the direction of professional education for innovative activity in the conditions of informatization of education**

№	Stages	Time	Main tasks
1	Organizational preparation stage (highlighting experience)	2016-2017 y	1. Definition of experimental sites. 2. Determining the number of recipients. 3. Formation of experience and control groups. 4. Organization of experimental work. 5. Development of experimental program
2	Stage of organization of experimental work (forming experience)	2017-2018 y	1. Development of methodology for preparation for innovative activities. 2. Implementation of large-scale experimental works. 3. Preliminary examination of the effectiveness of the developed methodology. 4. Enrichment of methodology of preparation for innovative activity according to the results of expertise.
3	Final Stage (Final Experience)	2018-2019 y	1. Re-examination of the effectiveness of the developed methodology. 2. Summarizing and analyzing the results of experimental works. 3. Analyzing obtained results with the use of MS Excel software and the mathematical-statistical method

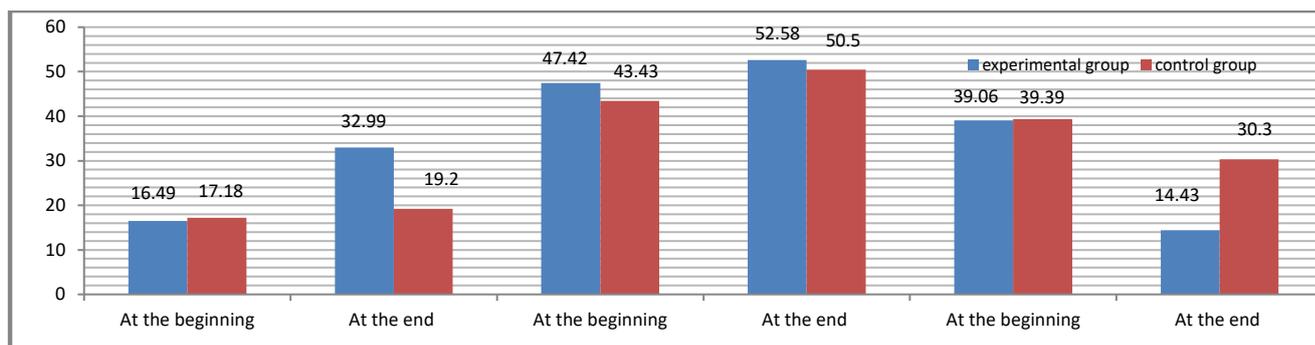
In preparing students for innovative activities in experimental - testing and control groups conducted preliminary assessment of students' knowledge using both theoretical and practical tests. The students of 2-3 courses (TUIT 650-17 and 651-17), Karshi branch of TUIT 11-17 and 12-17 groups, and students of Ferghana branch TUIT 620-17 and 621-17) of the higher educational institutions of the direction of "5350400 - Professional education in the field of information and communication technologies" participated in the experimental work.

The final assessment was carried out after the introduction of innovation methodology into general and professional subjects. Training in experimental groups was conducted using innovative methods of preparing for innovative activity based on the methodology we have proposed.

The results of the experimental groups were systematically analyzed and the results compared and concluded with each other. As described above, we summarize the results of the experimental groups in the following tables, diagrams, and methodological statistics.

**Table 1.3. The results of the experimental study in higher education institutions**

Students' level of learning	In the experimental group n=97		In the control group m=99	
	At the beginning of experiment	At the end of experiment	At the beginning of experiment	At the end of experiment
Top	16 (16,49%)	32 (32,99%)	17 (17,18%)	19 (19,2%)
Average	46 (47,42%)	51 (52,58%)	43 (43,43%)	50 (50,5%)
Low	35 (36,09%)	14 (14,43%)	39 (39,39%)	30 (30,3%)



The overall results of experimental studies in higher education institutions are as follows:

- In control groups 17.18% of students showed the highest level in the first stage, 19.2% of students achieved the highest level in the final stage, and 16.49% of students in the pilot groups showed the highest level while 32.99% of students at the final stage reached a high level;

- The average number of students in control groups was 43.43% at the initial stage, and at the end of the year it was 50.5% in the experimental groups it was 47.42%, at the end of the experiment reached to 52.58%.

- The number of low-level students dropped from 39.39% in the control groups to 30.3%, and in the experimental groups from 36.09% to 14.43%.

Processing of the general results of our research using the mathematical - statistical method revealed an efficiency index of 1.4. This was base to say that the achieved efficiency is statistically correct.

## CONCLUSION

In conclusion, the organization of the lesson through the technology of "The network boomerang" helps ensure that the students have regular mental activity in the classroom, quickly absorbing and delivering new knowledge, developing logical thinking, teaching their knowledge to another student. The technology allows for continuous improvement of knowledge during the course and the effective use of the new learning materials.

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