

UDC 001.8

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## METHODS OF TEACHING THE DISCIPLINE «INFORMATION AND COMMUNICATION TECHNOLOGIES» IN PEDAGOGICAL EDUCATION

### *Abstract*

*The article discusses innovative methods used in teaching the discipline «Information and communication technologies» at a pedagogical university: game methods, project method, case study method, interactive methods.*

*The conditions of successful application of the considered methods, examples of their application are analyzed.*

***Key words:** pedagogical methods, innovative methods, game technologies, case study, design method.*

### **1 Introduction**

Modern pedagogical science combines traditional and innovative approaches in teaching and educating the younger generation.

Any teacher who plans the educational process is concerned about the question: How to organize the learning process in such way so that it is most effective and so that the future specialist meets the requirements of today?

### **2 Materials and methods**

One answer to this question is the use of active teaching methods. The word method (from the Greek methods – the path to something) means an approach to the phenomena being studied, a planned way of scientific knowledge and the establishment of truth. It can be said that in the most general sense, a method is a way to achieve a specific goal, a set of methods or operations for mastering reality. In pedagogical education, the method acts as an ordered way of working to achieve educational goals. At the same time, the methods of teaching activity of a teacher and the methods of teaching activity of students are in close interaction [1].

The features of innovative learning include: advancing work; anticipation of development; openness to the future, focus on the personality, its development; the obligatory presence of elements of creativity; partnership type of relationship – cooperation, co-creation, mutual assistance, etc.

The main components of the activity of teachers consider three groups of teaching methods:

1. Methods of organization and implementation of educational activities (verbal, visual, practical reproductive and problematic);
2. Methods of stimulation and motivation (cognitive games, analysis of life situations, creating situations of success);
3. Methods of control and self-control (oral and written control, laboratory and practical work, machine and machine-less control, frontal and differentiated, current and final.

The inclusion of active methods in the educational process activates the cognitive activity of students, enhances their interest and motivation, develops the ability to learn independently; provides the maximum possible connection between students and teachers. There are many teaching

methods in the educational process and the types of their classification, but innovative (active) teaching methods are a particularly important group.

Currently, the following active teaching methods are the most common:

- Interactive method;
- The project method is a form of organization of the educational process, focused on the creative self-realization of the student's personality, the development of his intellectual and physical capabilities, strong-willed qualities and creative abilities in the process of creating new products of practical importance;
- Brainstorming a specialized method of group work aimed at generating new ideas that stimulate the creative thinking of each participant;
- Game method;
- Role-playing games a method used to assimilate new knowledge, develop certain communication skills. A role-playing game involves the participation of at least «two players», each of whom is invited to conduct targeted communication with each other in accordance with a given role;
- Trainings are exercises in which, during the course of living or modeling specially defined situations, students have the opportunity to develop and consolidate the necessary knowledge and skills.
- Group discussions on a specific issue in relatively small groups (from 6 to 15 people);
- Learning using tutorials;
- Analysis of practical situations – a method of teaching decision-making skills, its purpose is to teach students to analyze information, identify key problems, generate alternative solutions, evaluate them, choose the best solution and formulate action programs.

Teaching methods should be applied to enhance learning motivation; to enhance the cognitive activity of students, develop teamwork skills, the formation and development of communication skills (communication skills with peers and teachers).

The quality of graduate training depends, first of all, on the level of professional competence of the teaching staff and the organization of its activities, on the teacher's ability to students' skills, and to maintain interest in educational and scientific activities [2].

As you know, the basis of innovative educational technologies used in the educational process should be a social order, professional interests of future specialists, and consideration of individual, personal characteristics of students.

Therefore, when training specialists in a higher pedagogical educational institution, the use of innovative forms and methods must be organically combined with an understanding of the goals and objectives of teaching and training future teachers. In this regard, the use of active learning methods is associated with the desire of teachers to enhance the cognitive activity of students. When teaching students, the discipline of Information and communication technologies, teachers of the department use non-traditional types of lectures, which can significantly revive the students' perception of the material. An example would be a problem lecture, which begins with a problem question, a paradox, an unfinished situation that arouses interest among students. The answer is formulated during the lecture. Throughout the lecture, the question posed encourages future teachers to creatively understand and solve the problem. The main task is to introduce the student into a problem situation, for the way out of which he lacks the available theoretical knowledge, and he is forced to actively generate new knowledge himself with the help of a teacher and with the participation of other students, based on the knowledge of someone else's or his professional experience and logic [3].

Thanks to such lectures, students get acquainted with different opinions on the issue under discussion, which contributes to the intensification of the learning process and the assimilation of program material. In other words, if in a traditional lecture, explanation, illustration, description, and examples are used primarily, then in the problematic lecture, a comprehensive analysis of phenomena, the scientific search for truth [3, 6].

Innovative teaching methods also include lectures, presentations, situational tasks, creative tasks, the project method, brainstorming, etc. They develop the student's ability to navigate in unusual conditions, critical situations, analyze emerging problems, the ability to predict the consequences of decisions, the ability to independently solve and select the most optimal way to solve the problem.

The innovative methods of teaching students are based on active methods that help to form a creative, innovative approach to understanding professional activities, develop independent thinking, the ability to make optimal decisions in a specific situation. Innovative teaching technologies, reflecting the essence of the future profession, form the professional qualities of future teachers, kinds of foundation for professional skills in conditions close to real ones. The use of various methods and techniques of active learning awakens students' interest in the educational and cognitive activity itself, which allows you to create an atmosphere of motivated, creative learning and at the same time solve a whole range of educational, educational, and developmental tasks.

Improving the effectiveness of student learning directly depends on the skillful selection and use of a variety of teaching methods that are most appropriate to the topic and situation, as well as on the activation of the entire educational process. The choice of teaching methods is primarily determined by the content of the educational material and the learning objectives that are applicable to different disciplines. Pedagogical experimental data of Kh.E. Meichner confirm the advantage of using active teaching methods in the educational process: trainees keep in memory 10% of what they read; 20% of what they hear; 30% of what they see; 50% of what they hear and see [3].

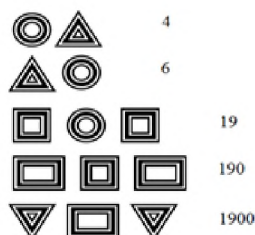
For the future teacher, the important thing is the need to master the skills of using gaming technologies that they will need in their professional activities. Students actually form a simulated game situation. The game usually gives situations with an open end, where students must make a decision, defend their point of view, for example, resolve a conflict, complete a certain situation or problem [4].

One of the most important tasks of the learning process is to increase interest in the subject. One of the effective ways to solve this issue is the use of gaming technology. After all, the game accompanies children from the first days of a conscious life. By «game technologies» in pedagogy we mean a fairly extensive group of methods and techniques for organizing the pedagogical process in the form of various pedagogical games. Unlike games, in general, the pedagogical game has an essential feature a clearly defined goal and the corresponding pedagogical result, which can be substantiated, highlighted in explicit or indirect form and are characterized by educational and cognitive orientation [5].

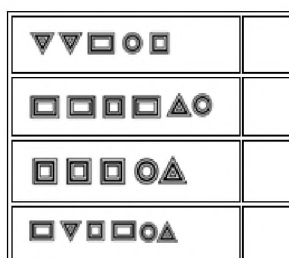
### 3, 4 Results and discussion

In the ICT course, gaming technologies or their elements (puzzles, crosswords, clusters, filling in correspondence tables, etc.) are most appropriate for fixing, organizing or repeating material (for example, when studying topics Information processes, Number systems, Computer architecture, Algorithmic, logical basis of the computer).

Task 1: In some non-positional number system the numbers look like different geometric figures. Below are some numbers recorded in this number system. (Picture 1). What numbers do the entries in the second table correspond to? (Picture 2).



Picture 1 – Table of preset numbers written using shapes



Picture 2 – Table for determining numbers written using figures

The advantages of gaming technology include:

- The game gives a break in everyday life with its monotony and orderliness.
- The game gives order. In any game there are always rules that must be respected.
- The game provides an opportunity to create and rally the team.
- The game allows you to organize the basic concept of the topic.
- The game takes away from the standard teacher-student relationship (question and answer),

which allows students to open up more.

One of the innovative methods of teaching disciplines in teacher education is the use of the case-study method. The problem of introducing the case-study method into the practice of higher vocational education is currently very relevant, due to two trends. The first follows from the general orientation of the development of education, its orientation not so much on obtaining specific knowledge, but rather on the formation of professional competence, skills and mental activity, the development of personality abilities, among which special attention is paid to the ability to learn, change the paradigm of thinking, and the ability to process huge arrays of information. The second follows from the development of requirements for the quality of a specialist, who must also have the ability to conduct optimal behavior in various situations, be systematic and efficient in times of crisis [6].

Case technology is a modern educational technology, which is based on the analysis of some problem situation, this is action learning. The essence of the case-method is that the assimilation of knowledge and the formation of skills is the result of active independent activity of students in resolving contradictions, as a result of which there is a creative mastery of knowledge, skills, abilities and the development of mental abilities. In the case-method, the formation of the problem and the ways of its solution take place on the basis of the case, which is both a technical task and a source of information for understanding the options for effective actions and requires reliance on the existing knowledge and skills of students.

The case method can be successfully applied when studying various topics from the course Information and communication technologies (for example, Text Editor, Internet Search Engines, Computer Configuration).

Task 2: The company received orders. Customers are asked to assemble computers and meet the amount that they are willing to pay. The task of students is to help customers in determining the configuration of a computer, i.e. select the components of the computer according to the requirements of customers. Terms of the order: on the one hand, the customer should not purchase an unnecessary thing, i.e. if the employee of the company believes that the customer himself has chosen some object that he really doesn't need, then the employee must prove this convincingly and convincingly; on the other hand, if a company employee believes that an item is needed, one must also intelligently and convincingly prove to the customer that he will need this item.

Students work in groups of 2-3 people, each group gets its own case, which includes: a list of computer components and their price, the necessary background information on individual devices and their compatibility, and the purpose of the computer that the customer wants to receive, the amount of the order. Groups are organized in such a way that two groups work on one computer configuration option.

Stage 1. Students work begins with an introduction to the reference literature, they independently analyze the contents of the case. As a result, each student should have a holistic impression of personal computer devices and their main technical characteristics. Acquaintance with the case ends with a discussion. The teacher assesses the degree of understanding of the situation, sums up the discussion and the students proceed directly to the choice of computer configuration.

Stage 2. The groups are divided into employees and customers. The employees present a computer configuration option for a given amount, explaining their choice and convincing the customer in choosing this particular configuration. The customer, if necessary, exposes its requirements. At the end of the presentation of the computer configuration, the customer announces

whether he is satisfied with the service of this company. Students working on other orders can also express their opinions on the configuration of the computer under discussion.

Stage 3. The teacher gives a general assessment to all participants and each individual; parses the entire course of the lesson, focusing on successful and unsuccessful decisions; assesses the general behavior of participants interest, mutual assistance, unconventional thinking, discipline, etc.

Thus, the case study method is aimed at achieving common learning goals: learning content and developing skills at the required level; personal development of the learner; development of analytical skills and teamwork; ability to listen and understand an alternative point of view; plan your actions and anticipate their consequences.

At the present stage, the most optimal form of ICT training is project training using the project method. The basis of the design form is creative activity. Signs of the design form of training are:

- the presence of the organizational stage of preparation for the project independent selection and development of a solution option, selection of software and hardware, selection of information sources;

- selection of a leader from among the participants in the project (organizer, coordinator), distribution of roles;

- the presence of a stage of self-examination and self-assessment (reflection on activity), protection of the result and assessment of the level of implementation;

- each group can engage in the development of a separate project or participate in the implementation of the collective.

E. Polat gives such a definition to the project method in the modern sense: «... the method», which implies «a certain set of educational and cognitive techniques that allow solving a particular problem as a result of independent actions of students with the obligatory presentation of these results».

The design method is always focused on the independent work of students. With it, students not only receive the sum of certain knowledge, but also learn to acquire this knowledge, use it to solve cognitive and practical problems [7].

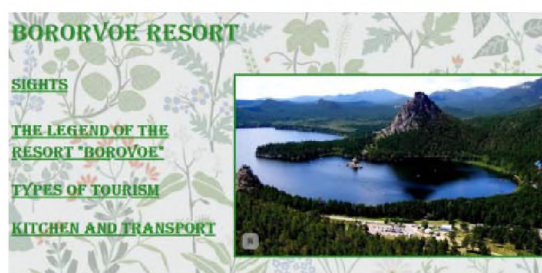
The use of design technology in combination with other teaching methods allows the formation of the following competencies:

- ✓ information – the ability to competently perform actions with information;
- ✓ communicative – the ability to enter into communication in order to be understood;
- ✓ social – the ability to act in society, taking into account the positions of other people;
- ✓ subject – the ability to apply the acquired knowledge in practice.

Results during the implementation of projects:

1. Formed and worked out
2. Skills in the collection, systematization, classification, analysis of information;
3. Ability to present information in an accessible, aesthetic way;
4. Ability to work independently, make choices, make decisions;
5. Expand and deepen knowledge in various subject areas;
6. The level of information culture is increasing, which includes working with various equipment (printer, scanner, microphone, etc.);
7. The student pretty thoroughly studies the computer program in which he creates the project;
8. The student has the opportunity to realize his creative ideas (Picture 3).





Picture 3 – The first web page of the project work on HTML

Interactive teaching methods for ICT include the use of blairenglish.com online services. The content contains the «Information Technology & Web Vocabulary Exercises» Menu section, which includes the following topics:

- ✓ English verbs of movement on computers exercise;
- ✓ Computer keyboard key name vocabulary exercise part 1;
- ✓ Vocabulary to describe computer problems exercise;
- ✓ Web page vocabulary exercise;
- ✓ Vocabulary for using computers at work exercise;
- ✓ Computer code sign & symbol names exercise part 1;
- ✓ Computer code sign & symbol names exercise part 2.

Here is an example of using this content. Exercise: Adding information to a database [8].

Read the following conversation between Peter and Juan about how to add the details from a CV/resume on to a database for candidates applying for job vacancies in their company.

From the context, try to guess the meaning of the words/phrases in bold. Then do the quiz at the end to check if you are right.

Juan: 'For the vacancy in our department we have to enter all the CV details for the candidates on to the database for candidates. Do you know how to do that?'

Peter: 'No, I've never done it before.'

Juan: 'No problem, I'll show you how to complete the form in the database with the details. First of all, you'll need to have both the database and a copy of the CV open on the screen. Now, in the database **click** on the button that says 'new entry' using the mouse. This takes you to a new screen where you can enter the details.'

Peter: 'Ok.'

Quiz:

Below is a definition/description of each of the words/phrases in bold from the above text. Now fill in the blanks with one of these words/phrases in bold. Only use one word/phrase once and write it as it is in the text. Click on the «Check Answers» button at the bottom of the quiz to check your answers.

When the answer is correct, two icons will appear next to the question. The first is an Additional Information Icon «Info». Click on this for extra information on the word/phrase and for a translation. The second is a Pronunciation Icon «Listen». Click on this to listen to the pronunciation of the word/phrase and to do a pronunciation speaking test.

1. When you press a key or a mouse button for more than 1 second, you \_\_\_\_\_.
2. To move your finger while still touching the glass on a touch screen tablet/phone, is \_\_\_\_\_.
3. To move through/down text boxes on an online form by the keyboard, you \_\_\_\_\_.
4. A more common way to say 'press' a button on a mouse, is \_\_\_\_\_.
5. When you select/click on an image or photo and then physically move it on the screen, you \_\_\_\_\_.
6. When you stop holding down a key or mouse button, you \_\_\_\_\_.
7. A different way to say 'click' or 'press' on a touch screen device (e.g. iPad), is \_\_\_\_\_.
8. A verb that means to move up or down a web page or document, is \_\_\_\_\_.

9. After moving/dragging a photo on the screen, to put or place it in its new position, you \_\_\_\_\_.

10. Another way to say 'enter' or 'write' words or numbers with a computer, is \_\_\_\_\_.

11. To copy some of the text from a document, you first have to \_\_\_\_\_.

12. To make the keys on a keyboard write letters, numbers etc..., you have to \_\_\_\_\_.

Tests are performed interactively, which is convenient when working with text on the use of this Internet service.

Also, for independent work of students used online courses are used on the open platform MOOC from leading teachers of KazNU named after Al-Farabi. In today's fast-paced world, one of the important criteria that defines a highly qualified specialist is the ability to quickly and efficiently work with huge amounts of information: make calculations, design drawings and electrical circuits for calculating risks, and exchange data with foreign colleagues. organize meetings online, etc. To solve the full range of tasks, it is necessary to actively use the methods of sharing electronic computing devices and specialized software products, in other words, information and communication technologies. On the course «Information and communication technologies» are will learn the basics of obtaining, processing and displaying information using modern computing devices. Get familiar with the operating principles and basic components of computers. As part of the course, you will gain the skills necessary when working with the main software applications that are actively used by specialists in all fields of science and business. The course will provide you with the necessary fundamental knowledge to further study violations in the computer world. The course structure is simple and convenient. The course consists of 15 lectures thematically integrated into modules. Each lecture contains a video, accompanied by a description in the form of a short line and materials for independent study with step-by-step instructions on how to use the topics [9].

The next interactive course for the study of information technology is the course «English for Programmers» at Intuit International Open University. This course is useful in that all topics cover materials on the study of information and communication technologies. The course contains on each topic a lecture material, a terminological dictionary, assignments for reading in English and also assignments for translating text into English. Each topic ends with an interactive test. In conclusion, the final interactive test is passed. The course contains more than 30 hours of lectures. The test material is presented accessible, understandable and easily perceived for its productive study by students. An example from the course is offered below:

- advantages of word processing over using a typewriter – преимущество текстового процессора перед использованием обычной печатной машинки;

- cut and paste the text – удаление, вставка текста;

- find and replace – находить данное *слово* или фразу и заменять одну группу знаков (букв) на другую группу;

- word wrap – завёртывание слова, завершение строки;

- print – отпечаток, копия;

- header, footer – заголовок, окончание страницы;

- customize – выполнять по индивидуальному заказу;

- layout – схема, план, расположение элементов;

- merge – объединять информацию;

- spell checker – *программа* проверки правописания;

- thesaurus – *тезаурус*, тематический словарь [10].

## 5 Conclusions

Information and communication technologies are one of the main factors in the formation of a new global economy and rapid changes in society.

Over the past ten years, new means of information and communication technologies have fundamentally changed the way people interact and communicate. ICTs have the potential to change the nature of education – both the models of the educational process and the roles of students and teachers in it are changing.

The main goals in education are to provide an increase in the quality of education due to the diversity of the content of the methods of organizing the educational process, supporting experiments and innovations, and disseminating information.

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*Material received by the editorial office: 17.02.2020*

**ЕРСУЛТАНОВА, З.С., ЦЫГАНОВА, А.Д., АЙТБЕНОВА, А.А.**

#### **ПЕДАГОГИКАЛЫҚ БІЛІМ БЕРУДЕ «АҚПАРАТТЫҚ-КОММУНИКАЦИЯЛЫҚ ТЕХНОЛОГИЯЛАР» ПӘНІН ОҚЫТУ ӘДІСТЕРІ**

*Мақалада педагогикалық университеттегі «Ақпараттық және коммуникациялық технологиялар» пәнін оқытуда қолданылатын инновациялық әдістер қарастырылған: ойын әдістері, жобалық әдіс, case study әдісі, интерактивті әдістер. Қарастырылған әдістерді сәтті қолдану шарттары, оларды қолдану мысалдары талданады.*

*Кілт сөздер: педагогикалық әдістер, инновациялық әдістер, ойын технологиялары, кейс-стади, жобалау әдісі.*

**ЕРСУЛТАНОВА, З.С., ЦЫГАНОВА, А.Д., АЙТБЕНОВА, А.А.**

#### **МЕТОДЫ ПРЕПОДАВАНИЯ ДИСЦИПЛИНЫ «ИНФОРМАЦИОННЫЕ И КОММУНИКАЦИОННЫЕ ТЕХНОЛОГИИ» В ПЕДАГОГИЧЕСКОМ ОБРАЗОВАНИИ**

*В статье рассматриваются инновационные методы, используемые в преподавании дисциплины «Информационные и коммуникационные технологии» в педагогическом ВУЗе: игровые методы, метод проектов, метод case study, интерактивные методы. Анализируются условия успешного применения рассматриваемых методов, примеры их применения.*

*Ключевые слова: педагогические методы, инновационные методы, игровые технологии, case study, проектный метод.*