INFORMATION AND COMMUNICATION TECHNOLOGIES AS THE MEANS OF INCREASING OF EDUCATION EFFICIENCY IN PRIMARY SCHOOL

INFORMAČNÉ A KOMUNIKAČNÉ TECHNOLÓGIE AKO PROSTRIEDOK ZVÝŠENIA EFEKTÍVNOSTI VZDELÁVANIA V PRIMÁRNEJ ŠKOLE

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Abstrakt

V súčasnosti je veľmi dôležité zavedenie informačných a komunikačných technológií do výchovno-vzdelávacieho procesu základnej školy Zaužívanie moderných pedagogických technológií podstatne mení vzdelávací proces, ktorý umožňuje riešiť mnohé problémy rozvojového, personálne orientovaného učenia, diferenciácie, humanizácie, formovania individuálnej vzdelávacej perspektívy žiakov.

Využívanie informačných a komunikačných technológií vo výchovno-vzdelávacom procese podporuje jeho efektívnosť, komplexný a harmonický rozvoj osobnosti žiaka, zverejňovanie ich talentu a významne ovplyvňuje obsah, formy, metódy a prostriedky vyučovania. Dobre zvolené počítačové programy zabezpečujú rozvoj tvorivých schopností, stimulujú kognitívnu aktivitu, emocionálnu sféru a intelektuálne pocity žiakov.

Kľúčové slová: informačné a komunikačné technológie, efektívnosť vzdelávania, základné vzdelávanie, počítačové programy.

Abstract

Today, the introduction of information and communication technologies into the educational process of elementary school becomes very important.

The introduction of modern pedagogical technologies has substantially changed the educational process, which allows solving many problems of developmental, person-oriented learning, differentiation, humanization, and the formation of an individual educational perspective for students.

The using of information and communication technologies in the educational process promotes its efficiency, the comprehensive and harmonious development of the student's personality, the disclosure of their talents, and significantly influences the content, forms, methods and means of teaching. Successfully selected computer programs provide development of creative abilities, stimulate cognitive activity, emotional sphere and intellectual feelings of schoolchildren

Key words: information and communication technologies, education efficiency, primary education, computer programmes.

The problem

Modern society is characterized by the global process of informatization, a rapid transition to a new stage of development – information society. In connection with this, among the main strategic goals of the development of the information environment in Ukraine, the provision of computer and information literacy of the population has been determined, first of all, through the creation of a system of education focused on the use of the latest information and communication technologies (ICTs) in the formation of a fully developed personality.

Analysis of recent research and publications

The coverage of the problems associated with the use of information and communication technologies in the elementary school education process is disclosed in the works of Ukrainian and Russian researchers M. Levshyn, F. Ryvkind, M. Goltsman, N. Makarova, V. Varchenko, L. Fukson; foreign researchers D. Clements, K. Hochman, T. Oppenheimer, S. Papierta and others.

The purpose of the article. One of the main tasks of primary school is the use of ICT in the process of studying most of the curriculum subjects within the school curriculum. Therefore, the purpose of this article is to carry out analysis of educational development programs and pedagogical software tools that should be used to improve the efficiency of teaching younger schoolchildren.

Research results

In order to create comfortable conditions in the classroom and to achieve high level of mastering of educational material, it is necessary to use the possibilities of information and communication technologies, namely: – creation and preparation of teaching materials (task variants, tables, memos, schemes, drawings, demo tables); – creation of presentations on a certain topic from the educational material; – use of ready-made software products; – use of Internet resources during the preparation and conduct of the lesson, extracurricular activities, self-education; – monitoring of tracking the results of education and upbringing.

For practical work of shoolchildren at the computer you can use a set of educational and developmental programs for 24 forms "Stairs to Computer science Plus" (33 computer programs), a package of programs – "Treasury of Knowledge" (3 boxes), " Computer Science. 1 year of study ", GCompris, etc. They contain a large number of different programs – from mouse simulators, programs for studying various educational subjects in the form of games, in the form of puzzles, tasks for the formation of computing skills, the development of logical thinking. For example, in the complex "Stairs to Computer Science Plus" on mathematics "Mathematical Cosmodrome" (2nd form); "Chickens" (forms 3 – 4); "Television" (forms 3 – 4).

As a rule, most programs are aimed at implementing not one, but several tasks. When working with the program "Disassembled drawings" not only spatial imagination is developed, but also the skills of working with the mouse are formed – the operation of dragging the object is being worked out; when working with the program "Mathematical Cosmodrome" in addition to the formation of oral counting skills (addition and subtraction) – the operation of selecting an object (button) using the mouse, etc.The "Stairs to Computer Science Plus" course is a complex of educational and developing game programs for junior schoolchildren. There are four content lines in its basis:

- formation of ideas about the possibilities and scope of the computer use, familiarization with safety techniques when working with a computer and in a computer class;
- the formation of elementary necessary skills with the mouse and keyboard;
- development of general abilities of the child: logical thinking, spatial imagination, attention, wit, visual and auditory memory, creativity;

- support of educational subjects: mathematics, Ukrainian and English, natural sciences, "I and Ukraine", basics of health, logic, fine arts, music;
- algorithmics: formation of ideas about algorithms, development of algorithmic thinking.

In the propaedeutic informatics course, taught under the program "Computer science" in elementary school, the developing direction of educational activities aimed at developing the creative abilities and logical thinking of schoolchildren is implemented.

This direction is traced in each lesson. For it, there is a separate component of the lesson and work with the textbook, in the section entitled "For Wise Boys and Girls." In addition, some texts in the textbook and programs in the educational complex introduce the basics of logic and are aimed at developing the spatial imagination of schoolchildren.

Elements of logic are introduced already in form 2 on the example of recognition of true and false statements. Processing of expressions takes place in exercises, the content of which may be as follows: " Think and finish statements. If the brother is older than the sister, then the sister ... ".

Continuation of acquaintance with the basics of logic is continued in form 4 and is carried out in parallel with the study of various types of algorithms (linear, cyclic, with branching). At this time, the concept of science "logic" and its founder – the ancient Greek philosopher Aristotle, are introduced, the construction of statement objections is processed, the structure of the logical sequence is determined. Anchoring exercises can contain the following tasks: "What animal is neither fish, nor bird?", "Which of the two statements in the above situation is true?".

The development of logical thinking is carried out in the course of solving logical problems, a large number of which is contained in the textbook. Tasks can be the following: "Of the three identical-looking coins, two weigh the same, and one is lighter than the others. How to find a light coin with one weighing?", "Winnie the Pooh, Rabbit and Piglet drew flags of different colors: blue, green, red The rabbit drew not red, Winnie the Pooh – not red and not blue. What color is the flag of each one? ”

Patterns are not only found in graphic objects. We offer tasks for finding patterns in numerical examples: "Help the gnomes to continue a series of numbers: 2, 3, 6, 7, 10, 11, _, _, _, _", "The mass of melon is equal to the mass of two apples or the mass of one apple and two plums. How many plums will balance a melon? ” Logical computational exercises may require grouping the numbers so that the amounts in the groups are the same.

Complexes of educational development programs can be used while studying many topics of different subjects, in the process of working on educational projects, at the lessons of repetition, generalization and systematization of educational material. Let's consider the example of several such computer programs.

GCompris from fr j'aicompris "I’ve understood! " This program is designed for schoolchildren aged three to eight, tasks of which will teach to work with the keyboard and mouse, read, calculate, draw, perform tasks on logic, spatial imagination, in an interesting form explains the fundamentals of natural sciences (mathematics, physics, geography) .

The GCompris kit includes several development programs. All are colorfully decorated and have musical and verbal accompaniment. The programs are distributed thematically and in terms of complexity. The simplest ones are marked with one star, two – are more complex , and the most difficult – with three stars. The educational development program consists of the following categories: computer learning: keyboard and mouse exercises (mouse manipulation, mouse clicks); research: colors, sounds, memory training; experiments: the study of physical phenomena; entertainment: a variety of entertaining games; mathematics: exercises on simple calculations (algebra exercises, game "Number-eater of unequal numbers", mathematical games for memory development, tasks for equilibrium on weight, exercises on finding the right combination of numbers and actions with them); geometry (drawing program, task to draw a given object, mirror image of the picture); counting of items (exercises for a cash count, count

of items, games in the search for a pair with recalculation, numbers on pairs of dice, Magic Hat, order of numbers, tasks for guessing, drawing by numbers);

- puzzles: tangram, Tower of Hanoi and others;
- reading: falling letters; train of letters; game in search of a number and its vocabulary record; reading the words that correspond to the picture; search for a missing letter;
- strategic games: chess, 4 in line, the game "Ovari" with Tuxon.
- Let's consider the subject connection of the educational and developing complex GCompris in computer science and mathematics at primary school.
- One of the main tasks of the lesson of mathematics is the formation of the initial ideas about the number, size, strong computational skills with natural numbers and zero, the primary skills of measuring and calculating values; visual and sensual ideas about geometric shapes, graphic skills.

As it has already been noted, there is the category "Mathematics", which contains multi-level math problems in the program package GCompris. Example:

- the game "Numer-eater of unequal numbers". The task of schoolchildren is to bring the Number-eater to all expressions that are not equal to the number indicated on the top of the screen. For example: the table with 36 examples for "+" is given in the range of 20 and you have to select those with values equal to 6. Next task: to select the expressions "≠" 6; (Subject: Adding and subtracting within 20 / 1form) Find the numbers that are divided (multiples) by 2; numbers multipliers for 4; choose a prime number. At 2 form math classes;
- mathematical games for memory development. The proposed tasks for finding pairs for cards in which there are the expression and answers to it ("+", "-" in the range of 10, 20, with a passing decimal, and "÷", "•" (tabular and extra-tabular cases) are indicated). math classes forms 2 and 3;
- task for equilibrium on the scales. In the given categories, the tasks of the following type are proposed: dragging weights for equilibrium on the scales. For example: given weights weighing 1, 2, 2, 5, 5, 10 kg and you need to pick up a combination of these to make up a total of 17; on the scales a ball is placed in weight of 3kg; we must move the weights (10, 2, 10, 5, 10) to two sides for equilibrium; weigh the pear using weights 2, 5, 2, 10, 5; task for determining mass of objects with dragging of weights in grams and kilograms. At lessons in mathematics both forms 1 and 3;
- exercises for finding the right combination of numbers and actions with them. The schoolchildren are asked to write the expressions and calculate them: the actions "+", "-" and the numbers 9 and 9 and the answer 18 are indicated; indicated actions "+", "-", "÷", "•" and numbers 5, 6 and 7 and answer 77; indicated actions "+", "-", "÷", "•" and numbers 3, 9, 4, 8, 10 and the answer 34.

In the category "Geometry" schoolchildren are offered to draw a given object (the picture from the right part to draw in the left part), draw a mirror image of the given drawing.

The task of counting items. Schoolchildren are offered exercises for monetary calculation (the practice of using money); games in search of a couple with a recount (turning a card to find a pair with the number and the picture corresponding to that number); numbers in pairs of cubes (counting the number of dots on the cubes before they fall to the ground).

These tasks can be performed at different stages of the mathematics lesson in primary school.

The capabilities of the computer as a visual guide of a qualitative level make it possible to significantly increase schoolchildren's interest in the material being studied. Pedagogical software tools are such means of teaching mathematics. Pedagogical program means a new didactic means intended for partial or complete automation of the learning process with the use of computer technology. At the present stage, various PPMs have been developed in accordance with the math program in primary school of general education institutions: "Mathematics 1

form", "Mathematics 2 form ", "Mathematics 3 form ", "Mathematics 4 form", PPM "Contour plus", which allows to ease work of a teacher and save time.

The multimedia textbooks of the "New School" series have been verified by the Ministry of Education and Science, Youth and Sports of Ukraine and officially recommended for use in the educational process. Each lesson in the PPM reveals a specific topic in accordance with the curriculum and contains means for its explanation: drawings, photographs, speech support; exemplary solution to tasks, tasks, questions, etc. The program "Mathematics, 1 form" also contains a reference on work with the PPM, methodological recommendations, a glossary (dictionary of terms and concepts), a personal index, the application "Writing numerals", for verification of knowledge control questions, tasks are provided etc.

In the process of development of PPMs, developers are increasingly improving ways to influence schoolchildren's perceptions. Since the introduction of computer technologies in the process of teaching mathematics is most often carried out through a computer-oriented lesson, then, along with the selection of "intelligent" computer programs, there is a problem of teacher's pedagogical skills, the ability to design and develop lessons on the basis of methodological and methodical provisions and requirements.

In this type of training, the teacher selects the lesson topic and launches it, and the software product explains the new material, calls the schoolchildren to the blackboard and summarizes the lesson. The teacher can only concentrate the attention of schoolchildren. In such PPM the role of the teacher fades into the background, that is, the student becomes the center of activity, who, proceeding from his/her individual abilities and interests, builds up the process of cognition. The teacher often acts as an assistant, consultant, encourages original finds, stimulates activity, initiative, independence.

In such PPM the lesson consists of a certain number of steps – structural elements containing a set of images, video clips of the text united on a certain basis (for example, the problem statement, its solution – studying the new material, demonstration, tasks for initial consolidation (can be used as an independent work of students) with subsequent screening, creative tasks);

The multimedia lesson of mathematics consists of the following stages: the subject of the lesson, introduction, study of the new material, initial consolidation, development of mathematical knowledge, summing up the lesson.Thus, the use of information technology in the educational process of primary school will not only modernize it, increase efficiency, motivate schoolchildren, but also differentiate the process taking into account the individual characteristics of each student. Teacher informatization allows to flexibly manage learning process and diversify ways to provide new information.

The creative association "MASKI" presents the animated "Abetka-Malyatko" from the cycle "Lessons from the Aunt Owl. Arithmetic-Malyatko" In the animated program, there are many wonderful children's poems and easy-to-remember memories, Aunt Owl introduces numbers to children, simple arithmetic actions and concepts, tells about each figure as a child deserves, that is interesting, it should surprise, and at the same time, be accessible – this was what the creators of the program sought.

It is also advisable to use educational and develoшшп games of the trade mark "Soroka Biloboka":

"Bee Zhou-Zhou. Enchanted Numbers" is an exciting game for children 3 – 8 years old. Together with the brave bee Zhou-jou, the child travels to Magic Forest and "removes charms" from the numbers. In such game, the child can easily get acquainted with numbers and figures. And also learn simple mathematical actions: addition, subtraction, multiplication and division;

"Petryk. Forest Adventures" is a computer educational game for children aged 3 – 7. Traveling with Petryk, a younger schoolchild in a gaming form will get acquainted with mathematics. The training takes place during the journey of Petryk, who needs to go through the forest to find a way home. At the same time he gets into different situations, where it is

necessary to apply mathematics. Educational computer game "Petryk. Forest adventures" will teach children to recognize colors and figures, to match dimensions, altitude, distance, to perform simple logical tasks and, of course, to count;

"Petryk. Grandma's holidays " is an exciting mathematical game for children aged 7 to 9. Petryk visits grandmother, where he has many interesting adventures. By helping Petryk fulfill the grandmother's task, the child will easily learn to add, subtract, multiply, divide, learn a multiplication table, and develop logical thinking. The child gets points for correctly performed tasks. And if the task is completed successfully and on time, then the bonus is also 50 points. The task can be repeated in any order, which allows you to consolidate the learned material;

"Snail. Mysterious Islands" is an exciting interactive game for children aged 8 – 11. Petryk travels across the sea with his grandfather and gets on mysterious islands. On the islands of the Rectangles, the Triangles and the Circles, he is acquainted with interesting inhabitants, assists them, applying knowledge in mathematics. Hence, the ways in which ICT can be used in maths depends on the creative nature of the teacher's professional activity, which will make the lesson interesting, accessible and useful.

Conclusions

Consequently, we can draw the following conclusions. The active and creative use of information and communication technologies in the educational process at the primary school lessons promotes its efficiency, the comprehensive and harmonious development of a schoolchild's personality, the disclosure of talents, and significantly affects the content, forms, methods and means of teaching. Well-chosen computer programs provide development of creative abilities, stimulate cognitive activity, emotional sphere and intellectual feelings of schoolchildren. At the same time, schoolchildren's ability to work, interest in their various activities increases, spatial imagination, memory, logical thinking improves, their worldview expands. Therefore, the computer has great opportunities for improving the educational process.

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