PRINCIPLES OF THE USE OF ICT IN THE FORMATION OF MATHEMATICAL COMPETENCIES OF PRIMARY SCHOOL PUPILS

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ABSTRACT

This article presents the suggestions and recommendations on the use of ICT in the formation of mathematical competencies of primary school pupils.

Keywords: Elementary school, mathematics, ICT, competence, modeling.

INTRODUCTION

On the basis of the analysis, it was possible to distinguish the following methodological requirements for the organization of mathematical activities aimed at the formation of mathematical competencies in primary school pupils through information and communication technologies (ICT): 1) The priority of independent mathematical activities of school pupils; 2) Taking into account the individual and age characteristics of pupils as well as the current and potential levels of development of their mathematical abilities; 3) To achieve a certain level of professional skills of pupils in solving basic problems and mastering basic theoretical materials; 4) To create conditions for the development of various components of mathematical skills; 5) To create conditions for the formation of positive motivation and constant interest in mathematical activities in pupils through ICT.

One of the most important components of mathematical competence is the flexibility of thought processes. An effective tool for developing this component is to address issues in teaching in a number of ways and to use issues routinely and purposefully to select the best rationale among them.

Materials and Methods

The formation of mathematical competencies in primary school pupils is reflected in the ability to quickly understand the material from mathematics, creativity, the ability to generalize and the reversibility of thought processes [1].

Most of the theoretical issues in the textbooks are characterized by their non-standard nature, the diversity of ideas for solving and many of which can be solved in several ways. They are appropriate to the level of knowledge of the pupil or learners and do not require additional new knowledge to solve them.

The introduction of ICT in primary education allows for more effective organization of the activities of pupils and the teaching staff. In this regard, there is a process of integration in the pedagogical system of using ICT. The formation of mathematical competencies of pupils through the use of information resources in primary education is carried out in the following information environment:

1. Reading and writing numbers, understanding their notation in the form of the sum of room additions; mastering the technique of counting by ICT (counting in reverse and reverse order, counting in pairs and decimals, saying the number before and after the number);

2. Know the results of tabular cases of addition, subtraction, multiplication and division on the basis of ICT, be able to perform verbal calculations within 100 in uncomplicated cases; Understand the meaning of the terms "sum", "subtraction", "multiplication" and "division" and be able to use them in reading numerical expressions; Understand and apply the terms "half", "one-third", "one-fourth", write fractions using fractions, show 1/2, 1/3 in the model of circles and other geometric figures, the percentage and proportion of numbers in solving practical problems find the number.

3. Understanding the meaning of the relations "... more", "... less", "... more than", "... less than", "all", "left", "equal" through ICT and be able to solve simple problems based on them; solve practical problems using the relationships between quantities (product price, quantity and value, path, speed and time in linear motion);

4. Recognize geometric shapes through ICT: cross-section, triangle, rectangle (including right rectangles and squares), pentagons and circles on slides; recognize and find the surrounding geometric shapes; measure the length of the cut, make a cut of a given length, be able to visually measure the length of the cut; be able to make straight rectangles, squares, triangles and circles using a ruler and compass;

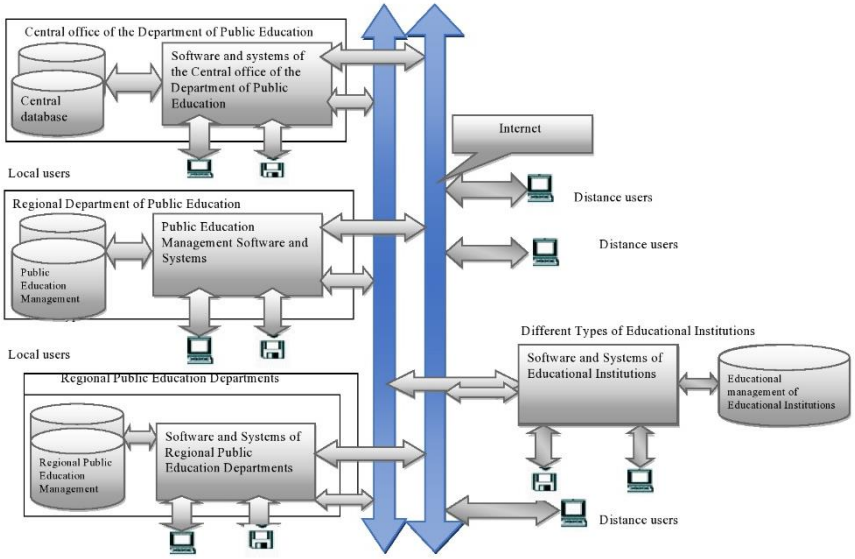
5. Calculate the perimeter of a polygon, the face of a right rectangle, and the face of figures made up of square units; to know the units of length (mm, cm, dm, m, km) and surface (cm, kv, dm, kv, m, kv), the basic ratios between them, to apply them in place.

We know that the electronic information management system for monitoring the quality of teaching in the general secondary education system has not been developed. “Webmaktab.uzedu.uz” developed by the Center for Development of Multimedia General Education Programs under the Ministry of Public Education; Webbogcha.uzedu.uz and E-SCHOOL information systems is databases. In these systems, there is no possibility to correlate the quality of teaching, the achievements of pupils with the factors that affect the quality of education.

All these databases in general secondary education, especially in primary education, are scattered and not connected to a single information system. The key indicators in the public education system are taken in paper form in October each year, and changes made until the same period next year are not reflected in key indicators.

The solution to the existing problems will be found through the development and implementation of an electronic information management system for monitoring the general secondary education system in a comprehensive manner (see Figure 1).

Figure 1: Information system in general secondary education



RESULTS AND DISCUSSIONS

Training in the information system is the material and technical base of educational institutions in the field of our interest; quantitative indicators of methodical maintenance; information about pupils: at what age they went to school, attended preschool, parental education, the availability of conditions for home schooling and independent study, the results of surveys on professional interests, the availability of textbooks; additional classes and clubs organized at the school; level of provision of educational and methodical literature; provided with information and communication technologies.

It is known that the origin of the word “information” (from the Latin informatio - explanation, presentation, concept, informare - formation, thinking). Despite the proliferation of mass media, the concept of information remains one of the most debated issues in science, and the term can have different meanings in different areas of human activity.

Different models are used in the implementation of ICT in primary education.
A model is some traditional (drawing, diagram, template, etc.) template that is usually presented in its original or abstract (mental or symbolic) form and contains the basic features of the modeled object. According to M.V Yadrovskaya's monograph "Models and modeling in pedagogy" modeling is the reproduction and study of a part of reality (object, event, process, situation) or its management based on the authority of the object, using events or similarities in the educational process making process [2].

A.M Novikov studies modeling as an active process and argues that "models in pedagogical systems as a system are arranged in different hierarchical order" [3]. The author cites the lesson model as an example and evaluates it as a template designed as a script.

Summarizing all the ideas, it was concluded that modeling in pedagogy is one of the main categories in the theory and practice of cognition. Modeling in pedagogy is a set of integral and interconnected methods for creating, researching a model of a pedagogical object, logical operations (observation, analysis, synthesis, hypothesis formation, formalization, idealization, abstraction, comparison, finding similarities by analogy, generalization, categorization,

systematization) , drawing conclusions) and practical activities of design (experimentation, interpretation, verification).

ICT modeling of educational material in primary school refers to the process of preparation of information by the educator for the educational process through ICT.

In the research work of L.M. Friedman on "Concentration and modeling in training", he studies modeling as a method of cognitive processes. The author emphasizes the important role of modeling in the learning activities of pupils and recognizes the importance of mental operations (analysis, synthesis, comparison) in the design [4].

In the learning environment, vector and cluster modeling are available, which serve to explore similarities and differences in the process, object, or event being studied.

In his research, A. Uvarov said that it is used in the organization and management of information services of educational institutions on the basis of cluster models. According to the scientist, clustering is organized on the basis of the following components: the use of various forms of education on the basis of information and communication technologies; the introduction of digital educational resources in educational institutions; the provision of software, adequate media; ICT-based education management; development; and the use of ICT services in the educational process [5].

V.A Yasvin's textbook "Educational environment: from modeling to projecting" explores the possibility of models in the study of the educational environment. In practice, the scientist writes, a model is a natural or social object or an artificial construction or a definite system of events [6]. Based on this view of the scientist, we understand that modeling is the acquisition of an analogue or new knowledge about a system through a natural or social object or an artificial construction of a phenomenon or a definite system of phenomena. For this reason, it is possible to provide consumers with information on the compliance of mathematical competencies acquired by pupils in primary education with state standards and the successful operation of the educational institution, as well as the activities of each pedagogical team in ensuring the quality of educational services. However, artificially created models presented to primary school pupils in mathematics lessons can be represented in the form of models, various geometric figures, schemes, drawings and depicting them as well.

CONCLUSION

In conclusion, the introduction of information and communication technologies in primary education allows for more effective organization of the activities of pupils and the teaching staff, which is accompanied by an effective integration into the pedagogical system using computer, information and communication technologies.

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