

DEVELOPMENT OF CRITICAL THINKING OF PRIMARY SCHOOL PUPILS AT MATHEMATICS LESSONS

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Subject of the study: The priority direction of reforming the primary education system in Ukraine is to prepare pupils for life, through developing their ability to think critically, work in a team, solve problems, search independently, analyze information. Therefore, the issue is relevant.

Objectives: The aim of our research is to develop the technology for the development of critical thinking in the process of teaching mathematics in primary school, to implement it in the process of teaching mathematics in primary school and to analyze the obtained experimental data.

Methods used: The concept of critical thinking is explored in the works of J. Anderson, K. Bakhanov, J. Braus, M. Wexler, D. Wood, R. Johnson, S. Zair-Beck, G. Ennis, D. Kluster, V. Mees, A. Pometun, N. Pospelov, R. Sternberg, L. Terletskaia, S. Terno, A. Pylo, D. Halpern, and others. Critical thinking is determined by J. Braus and D. Wood as rational reflexive thinking, focused on deciding what to make and take for granted (Braus, J. & Wood, D., 1994). The technology of development of pupils' critical thinking is being introduced in many countries of the world (M. Weinstein, A. Crawford, M. Lipman, S. Matthews, D. Macinster, V. Saul, C. Temple and others), including Ukraine (K. Bakhanov, T. Voropai, S. Myroshnyk, A. Pometun, L. Terletska, S. Terno, O. Tiahlo, and others). Since critical thinking may be developed by solving problematic tasks, the work on which requires to take a responsible attitude to decision making (S. Terno), the technology for developing critical thinking is based on the theory of problem-based learning, and, in particular, on approaches to developing pupils' research skills. Meanwhile, the question arises, from what age can the technology of development of critical thinking be applied in the educational process, taking into account the data of Piaget, that the best conditions for the development of critical thinking are created up to 14-16 years old? What learning content, in particular mathematics, will promote the development of critical thinking of primary school pupils? Does the existing program in mathematics for 1 - 4 grades contain this content?

We have studied the possibilities of developing critical thinking of primary school pupils in mathematics lessons while mastering the numbering of numbers and arithmetic operations with numbers and subject tasks. A technology of the development of critical thinking of pupils during familiarization with the new cases and methods of computing, while studying, solving simple and complex tasks, including typical tasks (tasks containing a constant value and tasks for processes) has been developed. This technology provides for 1) solving the task of updating a known knowledge or method of action; 2) making changes to the content of the task; comparison of the obtained problem with the previously solved, the definition of the general and the different; 3) clarification of the possibility to apply a known method of action with the received task, if necessary, correcting it; 4) the study of a mathematical object by changing non-essential features, determination the effect of a particular change on the result; 5) reflection of one's own activity and discovery of new knowledge or way of action, formulation of an indicative basis for action; 6) the assignment of new knowledge or way of action by performing activities on new content ... A cyclical repetition of paragraph 2) is admissible.

Result summary: The presented technology is implemented in a line of textbooks and educational exercise books in mathematics for grades 1– 4 by S. Skvortsova and O. Onopriienko [2, 3]. The development of critical thinking of pupils occurs through a system of learning tasks, in which they immerse themselves in research and “discover” new knowledge and ways of acting, reflexively formulating the approximate basis of a new action. The obtained experimental data after the analysis of pupils' test works, the questioning of teachers, testifies to the effectiveness of the developed technology for the development the critical thinking of pupils.

Brief conclusion: Meanwhile, the presented general technology concerns only the stage of acquainting pupils with the new knowledge or way of action, but work on the development of critical thinking of pupils should not be limited by this stage only.

Literature

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