

Chapter 20

Model of Forming Mathematical Notional–Terminological Apparatus in Elementary School Children

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ABSTRACT

Terminology is one of the constituents of the scientific knowledge system. Mastering terminology means to learn the extent and content of notions, and also to use these terms in work. The problems of terminology formation were studied by Bogoyavlensky, Galperin, Talyzina. In the studies of Vygodsky, the inner speech derives from conversational speech in a way of changing its function and consequently its structure. Though there has not been developed complete methodic conception of forming terminology apparatus in children, the chapter is intended to describe a model that forms mathematical terminology apparatus in the process of teaching. The main methods of studies were psychology literature analysis, educational process analysis (teaching mathematics), watching and testing elementary school children in Russia.

INTRODUCTION

Education mainly is characterized by increasing attention to learner, to one's self-development and self-knowledge. Therefore basic purpose of education may look like preparing children to life so that they could maximally realize their potentiality. In connection to this, there became important development functions in teaching a subject. It is not a simple mastering subject of "mathematics", but development of personality by means of mathematics. In conception of school mathematical education in Russia there are outlined basic purposes of education: teaching learners the ways of thinking and methods of cognition,

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forming quality of mathematical reasoning, mathematical thought abilities and skills. However there occurs formalism in mathematical knowledge of school children and its insufficient effectiveness; insufficient level of mathematical culture and mathematical reasoning that slow down development. Knowledge and skills have fragmentary character and represent a set of very weak interconnected, dogmatically learnt information and also poor skills in performing standard calculation algorithms, transformations, in solving typical tasks and so on. Such knowledge is actualized very hard by school children at lessons in mathematics. It is almost not needed in real life and forgotten very soon. Meanwhile learners don't have vision about mathematics as of unique science with its methods and its language. The importance of pointed out problems is intensified by growing significance of applying mathematics in various fields of science, economics and manufacturing.

Establishment of mathematical reasoning, as unity of logical operations, as ability to deductive discourse, to thinking in curtailed constructions, ability to sensible operating by sign systems of mathematical language, clearly depends on quality of mathematical terminology formation at elementary school.

The ideas about need of effective work on including mathematical terminology into speech of learners are written by many pedagogues, among them there are researches of D.N. Bogoyavlesky (2013), L.S. Vygodsky (1999), P.Y. Galperin (1985), A.N. Gvozdeva (2007), V.V. Davydov (2001), N.F. Talyzina, V.A. Svetlova and others.

L.S. Vygodsky (1999) states that on the base of forming higher mental functions there goes difficult process of reshaping outside world into inside one. He writes about decisive meaning of perception in speech development, and notes that children have to speak and think only through perception.

Base of research: "Kazan city general education school №81" with advanced teaching of certain subjects. There have been chosen 63 learners at the age of 6-8 years.

In this research there are set the following tasks: revealing specifics of terminology apparatus formation in elementary school children: defining system of mathematical terms (terminological apparatus) for 6-8 year old children, making model of mathematical terminological apparatus formation in elementary school children.

RESEARCH PROBLEM

In literature on teaching mathematics there are worked out general issues, systems of terms, and also some points about mastering terms. In several works there are shown stages of terminology formation. For example, terminology formation is considered as process of mastering educational material: 1) acquaintance with mathematical term (recognition, remembering); 2) introduction of term into passive dictionary of learners (understanding); 3) introduction of term into active dictionary of learners (usage).

School practice shows that teachers are not satisfied with the present methodic of terminology formation.

Understanding the importance of this problem and discontent by its solving makes teachers to seek new ways in terminology formation which sometimes appear to be more effective than traditional ones. However teachers solve as usual only partial aspects of the problem.

Taking into account realization conditions, there are all reasons to state that there has not been developed yet complete methodic model of forming mathematical notional-terminological apparatus for elementary school. Its absence entails appearing of many subjective recommendations, which sometimes contradict to each other, so this situation doesn't help in mathematical development of learners.

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