METHODS FOR DEVELOPING PROBLEM ANALYSIS SKILLS IN PRIMARY SCHOOL MATHEMATICS

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Annotation: *This article examines methods for developing problem analysis skills in primary school mathematics. The study focuses on pupils' difficulties in interpreting word problems and identifying mathematical relationships between quantities. Instructional approaches based on identifying known and unknown values, representing situations with diagrams, and justifying the choice of operations are described. The results indicate that systematic analytical practice improves mathematical reasoning, accuracy of solutions, and independence in problem solving.*

Keywords: *primary mathematics, word problems, problem analysis skills, mathematical reasoning, problem-solving strategies, primary school pupils, teaching methods*

Problem analysis in primary mathematics refers to the ability of pupils to understand the meaning and structure of a word problem before performing calculations. Many learners attempt to solve tasks by immediately searching for numbers and applying operations without interpreting the relationships described in the text. This leads to situations where calculations are correct but the final answer is incorrect because the mathematical situation was misunderstood. Therefore, the first stage of problem solving should always involve comprehension rather than computation.

At the beginning of instruction, pupils need to identify known and unknown quantities. Recognizing what information is given and what must be found clarifies the purpose of the task and directs attention to relationships between values. When this step is omitted, learners often rely on isolated keywords such as "more," "left," or "altogether," which may not reflect the real operation required. Systematic analysis helps pupils focus on meaning instead of individual words.

An essential element of analysis is establishing relationships between quantities. Pupils determine whether values are combined, compared, or separated and may represent the situation using diagrams, tables, or short symbolic records. Visual representation reduces cognitive load and allows learners to observe connections more

clearly. As a result, they begin to reason about the situation rather than guess an operation.

Gradually pupils learn to justify the choice of operation. Instead of providing only a numerical answer, they explain why addition, subtraction, multiplication, or division is appropriate. This justification develops mathematical reasoning and prevents mechanical problem solving. Regular practice in analysis improves accuracy, independence, and confidence in solving word problems, transforming them into tools for developing logical thinking rather than sources of confusion.

Effective development of problem analysis skills requires structured instructional progression. At the initial stage, pupils should learn to read a problem slowly and restate it in their own words. Paraphrasing helps them separate essential information from secondary details and prevents superficial interpretation. When learners can explain the situation verbally, they begin to understand the relationships between quantities rather than focusing only on numbers.

The next step involves organizing information. Pupils may list known quantities, unknown quantities, and conditions of the problem. Short records, tables, or simple schemes help learners visualize how values interact. For example, comparison problems can be represented by bar models showing greater and smaller quantities. Such representations reduce memory load and make the mathematical structure explicit.

An important skill is recognizing problem types. Pupils gradually distinguish between joining, separating, comparison, equal grouping, and sharing situations. Instead of memorizing operations, they identify the situation category and select an appropriate strategy. This classification supports flexible thinking and allows learners to adapt knowledge to new tasks.

Teachers should encourage prediction before calculation. Pupils estimate whether the answer should be larger or smaller than the given numbers and explain their reasoning. Estimation activates logical thinking and helps detect mistakes after computation. If a calculated result contradicts the expected magnitude, learners learn to review their reasoning process.

Verification is another necessary component of analysis. After obtaining a result, pupils check whether it satisfies the conditions of the problem. They may substitute the answer back into the situation or solve the problem using an alternative method. This step forms a habit of mathematical reflection and strengthens independence in learning.

Collaborative discussion further supports analytical development. When pupils explain their reasoning to classmates, they clarify their own thinking and encounter alternative strategies. Comparing different solution paths demonstrates that correctness depends on logical consistency rather than memorized procedures. Through repeated discussion, learners gain confidence in expressing mathematical arguments.

As analytical skills strengthen, pupils become less dependent on teacher guidance. They construct solution plans independently, justify chosen operations, and evaluate the

plausibility of answers. Consequently, word problems shift from routine exercises to opportunities for reasoning and communication. The ability to analyze problems therefore contributes not only to arithmetic accuracy but also to the broader development of logical and critical thinking in primary mathematics education.

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