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ABSTRACT

- Title: TO GROW IN MATHEMATICS
A study of pupils with different developments in mathematical achievement
- Language: Swedish
- Keywords: Children, mathematics, development in mathematical achievement, strategies of problem solving, types of errors

The main purpose of this study is to analyse how pupils, differing in achievement levels in mathematics, solve mathematical problems. What strategies are used when they solve a problem correctly and what types of errors are involved when they solve a problem incorrectly?

Groups of pupils, who have shown different developments in mathematical achievement from grades 3 to 6 have been studied.

The pupils' solutions have been classified as correct, incorrect or not answered. The strategies of the solutions are analysed and if the solution is wrong the error is classified in one of two categories, grave error or simple error. Grave errors are, for example, when the pupils use incorrect rules of arithmetic, "borrow a ten" incorrectly or use 1 hour = 100 minutes. Simple errors are errors in the calculations and slips.

The pupils very seldom used mental arithmetic. However, they did so more often in grade 3 than in grade 6. When they solved a problem they frequently used a standard model. When the pupils solved problems correctly they used the same strategies irrespective of their total results. However, when they made errors they used a number of different strategies.

When the pupils who reached good results in both grades made a mistake, it was almost always a simple error. The pupils who had poor results in both grades made a great number of grave errors. The grave errors continued in grade 6. This group of pupils left the problems unanswered to a greater extent than the pupils in the other groups. One group of pupils have vastly improved their results to grade 6. In grade 3, however, they made grave errors to almost the same extent as the group with poor results in both grades. In grade 6 this group made mostly simple errors. One group of pupils performed poorly up until grade 6. This group made a larger number of grave errors in grade 6 than in grade 3.

When we become aware of the strategies the pupils use to solve a problem incorrectly we can, once again, establish the fact that their previous knowledge and skills are very different and, consequently, it is most essential that the teaching be more individualised.

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