

INFLUENCE OF THE PROCEDURAL (PROCESS) AND CONCEPTUAL (GESTALT) WORD PROBLEM ASSIGNMENT ON THE CHOICE OF THE SOLVING STRATEGY⁵

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Our work was inspired by Hejn_ et al., (1990) about the passage between process and gestalt learning mathematics. The idea for the grasping phase of word problem solving was further elaborated by J. Novotná, (1997, 1999, 2000). See e.g. (Kratochvílová, 1995)

In the described experiment we focused on the influence of the procedural/conceptual assignment of one word problem dealing with division into unequal parts. Most of these problems have a conceptual nature. The task to construct their procedural variant is often difficult. For our experiment we choose the following two word problems:

Problem A (conceptual variant): Marie et Pavla have both the same number of beads. The beads are red and blue. Marie has 20 blue beads and by 10 red beads more than Pavla, Pavla has the same number of read and blue beads. How many blue and how many red beads does Marie have? How many blue and how many red beads does Pavla have?

Problem B (procedural variant): Both Ota and Petr had some money but Ota had 10 CZK more than Petr. Petr managed to double the amount of money he had and Ota added 20 CZK more to his original amount. They now found that both of them had the same amount. How many crowns did each of them have at the beginning?

The problems were solved by two groups of students: the experimental group (n = 30), aged 12-14, before being taught school algebra, and the control group (n = 32), aged 15-16, with the experience of school algebra. Students' solutions were analyzed using these variables: the choice of the order of problems with procedural/conceptual assignment; the solving strategy used by the solver; the discovery that both problems have the same mathematical model; the influence of the level of the solver's maturity and/or his/her mathematical development level. The results of our experiment will be presented.

References

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