14-18-YEAR-OLD STUDENTS' ADAPTIVE STRATEGIES

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The models developed for adaptive strategy use (*Siegler* & *Lemaire*, 1985; *Siegler*, 2000) can be used for investigating the development of pupils' mathematical thinking. Many scientists argue that pupils' adaptive strategy use should be improved at a very early age (*Gravemeier*, 1994; *Selter*, 1998; *Bransford*, 2001; *Baroody*, 2003). Mental multiplication and division strategy categories are by *Heirdsfield*, *Cooper*, *Mulligan*, *Mulligan* and *Calvin* (1999): Counting, Basic fact, Right to left separated, left to right separated depending on local value and Wholistic strategy.

The purpose of this study is to monitor how successful Hungarian students are in solving one-digit and two-digit multiplication problems and whether their effectiveness actually depends on adaptive strategy use.

The survey included two groups of students (23 students aged 14-15 and 92 students from upper secondary school). A set of tasks was compiled for the purpose of this investigation. We also used a mathematical achievement test, a background factors questionnaire and the questionnaire developed by Kelecsényi and *Csíkos* (2013), called Mathematical Beliefs. The results show that there are differences in the strategy use of talented children and those of average students (*Thomas*, 2002). We came to the conclusion that one-digit number multiplication tasks are solved by basic fact strategy (*Lemaire* & *Siegler*, 1995). With tasks involving two-digit numbers, students use either left to right or right to left strategies depending on local value. However, gifted students use holistic strategies just like adults. It seems that the strategy 'I imagine it were written in my mind' – as *Csíkos* called the strategy – is rather frequently observable among students (*Csíkos*, 2013; *Vígh-Kiss*, *Csíkos* & *Steklács*, 2013). The use of other different strategies was also observed. The usefulness of improving pupils' adaptive calculation and multiplicative skills for everyday life and real-life situations will be discussed. Furthermore, adaptiveness as an approach comprising also metacognitive components of mathematical thinking may have relevant transfer effects from one domain to others.