THE INFLUENCE OF LEARNING STRATEGIES ON PROBLEM-SOLVING PERFORMANCE: ANALYSES IN EUROPEAN AND ASIAN CONTEXTS

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Keywords: problem solving; learning strategies; comparison study

Problem solving is considered one of the most important cognitive skills for successful learning. Some studies have pointed out that students' learning strategies influence their adoption of exploration strategies during the problem-solving process (Molnár et al., 2017) and have the power to impact their problem-solving performance (Csapó & Molnár, 2017). The purpose of this study is twofold: (1) to monitor the influence of parents' educational level on students' learning strategies in European and Asian contexts and (2) to detect and compare the predictive power of students' learning strategies on their problem-solving performance in two different cultures. The sample for this study comprised 12-year-old students from China (N=187) and Hungary (N=835). Problem solving was measured using a set of nine tasks developed in accordance with the MicroDYN approach. Three learning strategies (elaboration, memorization, and control strategies) were distinguished and measured using a self-report questionnaire adapted from the PISA 2000 assessment. The tests were reliable (Cronbach's alpha: CN: .90, HU: .84). Structural equation modeling was used to analyze the predictive power of students' characteristics and background factors as regards their problem-solving achievement in both groups. The fit indices were acceptable for both the Chinese (χ^2=222.34, df=111, p<.01, CFI=.93, TLI=.93, RMSEA=.08, SRMR=.08) and Hungarian (χ^2=244.01, df=110, p<.01, CFI=.96, TLI=.95, RMSEA=.04, SRMR=.04) samples. Parents' level of education significantly predicted the use of memorization strategies in both Chinese and Hungarian students. However, the effect was negative for Chinese students (β=-.224, p<.01) and positive for Hungarian students (β=.134, p<.05). That is, Chinese students with well-educated parents tended to use more effective learning strategies, but this was not the case with Hungarian students. The Hungarian students, even those with well-educated parents, used the memorization strategy more often. Chinese students who often study by memorizing proved to be less successful problem solvers (β=-.531, p<.01), while the opposite effect was observed in Hungary (β=.213, p<.01). Students who tend to use elaboration (β=.450, p<.01) or control (β=.320, p<.01) strategies for learning proved to be better problem solvers in China. However, the use of these two learning strategies had no significant effect on problem-solving performance in the Hungarian group. The three learning strategies involved in the study had significantly different impacts on students' problem-solving achievement between groups. Based on this finding, it is proposed that the Chinese and Hungarian students used different exploration strategies during the problem-solving assessment process and that the different exploration strategies were impacted differently by the three learning strategies.

This study was funded by OTKA K115497.