

Effects of Explicit and Implicit Motor Instruction Methods in Pupils with Special Needs: The Relationship with Verbal and Visuospatial Working Memory

Marjan Kok, Vrije Universiteit; Elmar Kal, Brunel University; John van der Kamp, Vrije Universiteit

Physical Education (PE) teachers need to apply learning methods that suit the individual constraints of their pupils and will benefit motor learning experiences. This is particularly challenging in special education, in which all pupils have special and diverse educational needs. This study examined the effects of type of instruction and feedback on motor learning and perceived competence of pupils with special educational needs practicing a balancing task in a PE-setting. The main aim was to test if and how pupils' verbal and visuospatial working memory capacities (WMC) were related to changes in motor performance and perceived competence due to practice, and whether these relations were affected by type of instruction and feedback. A cohort of 82 special education pupils aged 9–13 years practiced balancing on a slackline in two sessions (week 2 and 3) during PE-classes. A PE-teacher provided them with either explicit (internal focus) or implicit instructions and feedback (a combination of analogies and external focus) on movement execution. Balancing performance and perceived competence were measured at pretest (week 1) and posttest (week 4). Furthermore, we measured verbal and visuospatial WMC. The pupils significantly increased their balancing performance and perceived competence from pre- to posttest, with no differences between groups. The relation between verbal WMC and learning outcomes was significantly mediated by instruction type. Verbal WMC significantly predicted improvements in perceived competence in the explicit instruction group and improvements in balancing outcome in both instruction groups. Yet, whereas verbal WMC was positively associated with improvements in balancing outcome in the explicit instruction group, a negative relationship was present in the implicit instruction group. This implies that PE-teachers may need to align their instructions with the verbal WMC of their pupils, by providing analogies and external focus instruction in pupils with low verbal WMC and internal focus instructions in pupils with high verbal WMC. Funding source: The Netherlands Initiative for Education Research.