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Abstract

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Embodying cognition in the classroom: A new approach to foster physical activity and learning

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Motivating children to engage in adequate levels of physical activity is an important public health priority. Regular physical activity not only has benefits for children's health, but also provides important educational gains. Numerous studies have reported a positive effect of physical activity on cognitive functioning in general, and in particular on tasks that require effective executive functioning (e.g., attention, inhibitory control, and working memory). Neuroscientific research has shown that physical activity fosters learning and cognition through improved blood flow, oxygenation, and neural connectivity of the brain. Moreover, behavioral and developmental research has shown that involvement in specific types of physical activity – such as team sports – improves students' concentration, compliance with rules, cooperative behavior, and social and intellectual skills.

Prior research in this field has largely focused on the impact of school-based physical activity interventions targeting changes to curricula, school recess and class breaks, on increasing physical activity during the school day. In this theoretical review, we discuss an innovative approach based on the theoretical framework of embodied cognition, which advocates that body movements, such as gestures, and cognitive processes are inextricably bound. For example, when combined with speech, gesturing can reduce working memory load and improve learning.

Although most studies have examined the physical activity aspect in isolation from the learning tasks, some studies have attempted to integrate physical activity into the learning task, for example in literacy and numeracy. However, the motivation for this integration has largely been to make physical activity less isolated from the learning activities, thereby saving valuable curriculum time (a key aspect in an overcrowded curriculum). In addition, these studies were primarily interested in effects on overall physical activity and cognitive functioning. We argue that in addition to the general positive effects on physical and cognitive functioning, an embodied cognition approach to integrate physical and cognitive activities will also result in specific positive effects on the cognitive tasks that are integrated with the physical tasks. This theoretical review examines advanced theories on the relationship between physical activity, fitness, and cognitive performance, and describes a general framework for intervention programs that use an embodied cognition perspective to integrate educational and physical activities for preschool children. Theoretical and neuroscientific evidence will be presented, followed by a summary of existing physical activity programs. Finally, suggestions for implementing a new intervention program will be further discussed.