

Improving Working Memory in School Children through Chess Training

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Abstract : Working memory refers to a cognitive processing space where information is received, managed, transformed, and briefly stored. It is an operational process of transforming information for the execution of cognitive tasks in different and new ways. Many class room activities require children to remember information and mentally manipulate it. While the impact of chess training on intelligence and academic performance has been unequivocally established, its impact on working memory needs to be studied. This study, funded by the Cognitive Science Research Initiative, Department of Science & Technology, Government of India, analyzed the effect of one-year chess training on the working memory of children. A pretest-posttest with control group design was used, with 52 children in the experimental group and 50 children in the control group. The sample was selected from children studying in school (grades 3 to 9), which included both the genders. The experimental group underwent weekly chess training for one year, while the control group was involved in extracurricular activities. Working memory was measured by two subtests of WISC-IV INDIA. The Digit Span Subtest involves recalling a list of numbers of increasing length presented orally in forward and in reverse order, and the Letter-Number Sequencing Subtest involves rearranging jumbled alphabets and numbers presented orally following a given rule. Both tasks require the child to receive and briefly store information, manipulate it, and present it in a changed format. The Children were trained using Winning Moves curriculum, audio-visual learning method, hands-on-chess training and recording the games using score sheets, analyze their mistakes, thereby increasing their Meta-Analytical abilities. They were also trained in Opening theory, Checkmating techniques, End-game theory and Tactical principles. Pre equivalence of means was established. Analysis revealed that the experimental group had significant gains in working memory compared to the control group. The present study clearly establishes a link between chess training and working memory. The transfer of chess training to the improvement of working memory could be attributed to the fact that while playing chess, children evaluate positions, visualize new positions in their mind, analyze the pros and cons of each move, and choose moves based on the information stored in their mind. If working-memory's capacity could be expanded or made to function more efficiently, it could result in the improvement of executive functions as well as the scholastic performance of the child.

Keywords : chess training, cognitive development, executive functions, school children, working memory

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