

Understanding working memory as a facilitator of math learning: Offloading as a potential strategy

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Abstract

High working memory capacity (WMC) is linked with stronger mathematical abilities; however, underlying mechanisms remain unclear. One theory suggests that problem solvers may offload information from their working memory in order to reduce cognitive load to solve problems more effectively. We investigated whether the use of offloading improved problem-solving skills. Ninety-three undergraduate students were administered a pre-test and WMC tasks. Participants were then split into two conditions, offloading or no-offloading, and were administered a post-test. ANOVA results indicated that while both groups improved, the offloading group showed greater improvement. Participants with lower WMC performed better when offloading, but there was no significant interaction between WMC and condition. Additionally, pre-test moderated the effect of offloading, suggesting students might benefit from offloading with greater prior knowledge. These findings have theoretical implications for mechanisms underlying the relationship between working memory and mathematics, and how to support students in classrooms.