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The role of spatial training in improving spatial and calculus performance in engineering students.

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Summary: Freshman engineering students who took a mental rotation (MR) test as a pretest at freshman orientation and as a posttest at the end of the first semester (675 students; 542 males, 133 females) were divided into intervention and comparison groups based on a pass/fail MR pretest cutoff score. Those who failed the test were all assigned to a spatial intervention consisting of a 1-credit course meeting weekly over the semester; those who passed were assigned to the comparison group. The present study used a regression discontinuity (RD) analysis to determine the effectiveness of the intervention. A treatment effect was found for posttest MR performance as there was a discontinuity or jump in the regression intercepts at the cutoff score of the pretest variable, with the intervention group performing at higher levels than would be expected if there had been no intervention. Using the same RD analysis, the intervention also showed transfer effects, improving calculus performance of the students in the intervention condition.

Classification: C35 C45 D35 G25 C65 I25 I65

Keywords: spatial training; gender; engineering; spatial skills; calculus performance

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