Training University Students on the Balance Scale Problem

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Abstract: The cognitive development relating to solving balance scale problems has been studied in great detail, though effective training methods have not. In this study, students enrolled in a university-level introductory physics course were trained with examples from one of four conditions: when only one quantity (either weight or lever arm length) was different on each side of the balance, or when both weight and length were different, but the correct response corresponded to the side with either the greater length or greater weight. We found that when training involved the variation of only one quantity, participants were able to transfer learning to other configurations of weight and lever arm length. However, when training involved the variation of both quantities, participants were only able to answer correctly questions similar to those with which they were trained. These participants were unable to transfer learning to other configurations.