Supplementing problem solving with erroneous examples does not improve learning from an online fraction tutor

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Abstract

It is established that examples are beneficial for learning, but are certain types of examples more helpful than others? Erroneous examples include errors that students are asked to correct, something that can be helpful in addressing misconceptions. One domain that is vulnerable to misconceptions is fraction arithmetic. In the present study, undergraduate students solved fraction problems using a tutoring system we designed. Some participants worked with the Erroneous-Example tutor, which supplemented problems with erroneous examples, while other participants worked with a traditional Problem-Solving tutor that did not include erroneous examples. To evaluate the impact of tutor type on learning and self-efficacy, we analyzed difference scores from pre-test to post-test. While overall participants significantly improved their fraction knowledge and self-efficacy, there was no significant difference between the two groups. Bayesian analyses provided evidence for the null model, i.e., that erroneous examples were not more beneficial than traditional problem solving.