Reciprocal Teaching – Math

Why Is This Strategy Useful?

Reciprocal teaching is an interactive strategy and a cooperative learning instructional method. This strategy is used mainly for literacy development to promote reading comprehension skills. It can be adapted for promoting students’ comprehension of mathematical word problems. Reciprocal teaching can benefit students of all ages and abilities. Evidence suggests that it can effectively be used with middle school (sixth-and seventh-grade) and high school students across general and special education.

Description of Strategy

Reciprocal teaching refers to an interactive instructional activity that takes place in the form of dialogue between teachers and students regarding segments of text. When implementing reciprocal teaching, the teacher and students take turns assuming the role of “teacher” in leading the dialogue. This dialogue is structured by the use of four strategies: summarizing, question generating, clarifying, and planning. For example, the teacher may ask students to clarify words or phrases in the math word problem, guide the group in generating questions to identify the key parts of the word problem, summarize the purpose of the word problem, and construct a plan with the solution steps.

Every member of the instructional group takes the role of “teacher” in leading dialogue. When the adult teacher is leading the dialogue, he or she provides instruction, and models how the four strategies can be used for math problem solving. Students assume the role of “teacher” with guided practice of the strategies. As the students become increasingly competent in their understanding of the problem solving process, the teacher should provide less support and become less involved in the dialogue.

Research Evidence

At least one quasi-experimental design study provides support for this strategy. Three 4th grade math classes were assigned to modeling or reciprocal teaching (referred to as socially-assisted) intervention conditions or to the comparison group. Within each classroom, students were randomly assigned to groups of four students. Each group included low-, moderate-, and high-achieving students. Although both intervention groups had better math problem solving proficiency following the intervention, the students in the reciprocal teaching group showed better understanding and use of world knowledge to organize text meaning and solve the math word problems.

Sample Studies Supporting this Strategy


A form of socially assisted group learning based on a modified version of reciprocal teaching for mathematics (Campione, Brown, & Connell, 1988) was evaluated in terms of its effectiveness in promoting fourth graders’ solution of complex 2-step word problems. The emphasis in this method is for an adult tutor to elicit solution suggestions from students and to explore the multiple solutions in seeking group agreement. The method focuses attention both on world
representations underlying numbers and on transfer of problem solution planning skills to children over time. The results were compared with those from a modeling-reinforcement tutoring control condition and a classroom activity control in a 10-week study of fourth graders' solution of 4 types of 2-step math word problems, constructed to avoid keywords. Individuals who received either type of training earned higher scores for all problem types than did controls on quizzes; children in the modified reciprocal teaching condition outscored those in the modeling condition on problems that required information to be added from outside the problem and on a quiz of mixed problem types. Subsequent analysis of solutions and videotaped math behaviors suggested that those in the socially assisted learning condition used labeled representations in problem solving more effectively and deduced implied information earlier and more often than those in the modeling condition.