Classwide Peer Tutoring (CWPT) -- Algebra

Why Is This Strategy Useful?
Classwide Peer Tutoring in Algebra helps students learn and practice algebra problem-solving skills. After a lesson delivered by the teacher, students from the same classroom tutor each other. Students in mixed-ability pairs take turns in the roles of tutor and tutee. Researchers think the strategy is useful because it provides multiple opportunities for students to practice algebra problem-solving skills with frequent and immediate feedback. All students can benefit from this strategy, including those at risk and students with disabilities can benefit from this strategy. Research indicates this strategy may be most effective with 14 and 15 year old students.

Description of Strategy
The teacher trains students to use Classwide Peer Tutoring (CWPT) by explaining and modeling the procedures. Then the teacher divides students into pairs by pairing students of different abilities whose abilities did not differ too largely. The teacher first provides an algebra lesson to the whole class. After the lesson, students practice their algebra problem-solving skills with CWPT. Students use worksheets as prompts. The student in the tutor role uses an answer key to determine if the tutee’s answers are correct. After completing half of the worksheet, the students switch roles. Tutors record the tutee’s answers. The tutor models how to solve problems when the tutee answers them incorrectly. Tutors are provided with models of problem solving methods to help them provide assistance. The teacher monitors student performance and tutoring behavior by walking around the room during CWPT.

Research Evidence
At least one randomized controlled trial provides some evidence for Classwide Peer Tutoring in Algebra. In the study, 262 eighth grade students both at risk and not at risk for math failure were randomly assigned by class to treatment or control groups. The measures were a pretest, a posttest, and a maintenance test of basic algebra equation and word problem-solving ability. For 14 and 15 year old students, the performance of the treatment and control groups did not differ significantly at posttest even though the control group performed significantly better at pretest than the treatment group.

Sample Studies Supporting This Strategy

This study examined the effectiveness of using classwide peer tutoring (CWPT) in heterogeneous middle school math classrooms to teach students in beginning algebra problem-solving skills. The literature on CWPT demonstrates its effectiveness with basic academic skills, but little research addresses whether CWPT can be effective for teaching higher order thinking skills. This study compared the effectiveness of CWPT with traditional independent student practice. Additionally, the performance of students at risk of math failure (students whose grade in math was a D or an F and/or who scored a stanine of three or lower in the math section on a standardized assessment) was compared with the performance of students not at risk of math failure. An analysis of the data indicates that both CWPT and independent student practice were effective strategies for helping students to learn beginning algebra problem-solving skills. Neither strategy was significantly more effective than the other. Students at risk of math failure
demonstrated slightly greater performance gains than did students not at risk of math failure. Related findings indicate the CWPT was most effective with 14- and 15-year-old students. Implications for using CWPT for increasing students’ higher order thinking skills is discussed as well as its use in heterogeneous classrooms and with middle school students.

Additional Resources


Using Peer Tutoring for Math:
http://www.k8accesscenter.org/training_resources/mathpeertutoring.asp

Sample Activity

Source: http://www.lehigh.edu/projectreach/teachers/peer_tutoring/peer_tutoring_open.htm

Tutoring Steps
1. Students get into their tutoring dyads
2. Students place the stack of flashcards in the center of the placemat.
3. Teacher sets timer for half the total length of the tutoring session (i.e. 10 minutes of a 20 minute session).
4. The student first playing the role of tutor picks up the first card, shows it to the tutee, and asks tutee to respond:
   - Math facts: “What is the answer?”
5. Tutee responds
   - Math facts: (example): “5 times 4 equals 20.”
6. Feedback/Error Correction Procedure:
   If tutee response is correct:
   o Tutor places card on the smiley face on the place mat.
   o Tutor says “Yes! Two points.”
   o Tutor marks 2 points on the tutee’s point sheet
   o Tutor presents next card

   If tutee response is incorrect:
   o Tutor says the correct answer and repeats the prompt. For example, for a math fact problem after an incorrect response, the tutor would say: “5 times 4 equals 20. What answer?”
   o After tutee responds correctly, Tutor places card on the question mark portion of the placemat.
   o Tutor marks 1 point on the tutees point sheet.
   o Tutor presents next card.

7. When the stack of cards is finished, the tutor returns to the cards placed on the question mark of the place mat and asks the tutee to respond to the questions he/she got incorrect the first time, following the same procedure as above.
8. When the timer goes off, tutor and tutee switch roles.