Estimation Improvement through Strategy Comparison

Summary: Estimation is a key math skill but one that can be very difficult for students to master. A group of researchers report in *Teaching Children Mathematics* about an effective new method for teaching estimation through the use of side-by-side comparison of different estimation strategies.

Practical Applications

The core feature of the author's proposed approach is to have students consider two strategies for solving an estimation problem side by side. So, for instance, students may have one page which shows two fictional students' approaches to tackling the same estimation problem of 14 x 29: Student A "explains" that she rounded the first number and then multiplied, while Student B "explains" that he rounded both numbers before multiplying. The student is then prompted to consider the value of each fictional students' strategies and to try utilizing each strategy to form an opinion about which one is more effective in a given situation.

The authors go on to make several suggestions for how teachers can effectively implement this comparison method:

- Teachers should choose problems purposefully – they should be problems which exemplify important concepts or challenges in estimation, and they should be solvable through different strategies
- Teachers should be careful when designing instructional materials by making sure they have written records of the different strategies and steps students are to compare, building in "explicit opportunities to identify similarities and differences in strategies," and creating questions that prompt students to reflect on the effectiveness and efficiency of different strategies
- Ensure that students have the necessary background skill knowledge to be able to make comparisons
- Build in time for class discussions that can highlight conclusions about different strategies.

Conclusion and Citation

The researchers found that students taught with the comparison method had significantly higher ability to flexibly use different estimation strategies and that these students also retained the content far better than their peers who only studied one question and one strategy at a time. Estimation is a difficult skill because there are so many different choices for students to make; arming them with a toolbox of strategies and ways to consider which is appropriate when makes estimation far more manageable.

Star, J., Kenyon, M., Joiner, R. & Rittle-Johnson, B. "Comparison Helps Students Learn to be Better Estimators." *Teaching Children Mathematics*, 16.9 (2010), pp. 557-563. http://tinyurl.com/22sfz8h (subscription only)