Multisensory Approach to Thinking Strategies

Why Is This Strategy Useful?

Research has shown that there are three distinctive learning styles: auditory, visual, and tactile. Each student has his or her own unique learning preference style or way of processing and retaining information and elementary school children learn best in a tactile/kinesthetic style. When students can manipulate and experience conceptual information through activities students are more readily able to learn. A multisensory approach to thinking strategies is the process of appealing to the visual, auditory, and tactile/kinesthetic senses to engage students’ cognitive processes from a number of senses. Used as a strategy to teach addition to students in need of remediation in mathematics, it has proven to be an effective strategy for elementary students.

Description of Strategy

A multisensory approach to thinking strategies aimed at improving remedial students’ skills in basic addition. Students are given a number of ways to approach arithmetic problems. Teachers are provided with three half-day workshops on the rationale for and use of the strategy. The duration of the lessons is approximately 11 weeks for two 20-minute sessions per week. A Multisensory Basic Fact Program (MBFP) kit is developed to support this strategy. The following are the basic components of the MBFP kit for teaching addition.

(a) **TACTILE.** Pupils are encouraged to count on from the greater addend whenever 1, 2, or 3 are added.

(b) **VISUAL.** Different picture is introduced for each double. Similar pictures are used for related near doubles. (e.g., For 6 + 8, for example, two extra eggs would be pictured with a carton containing a dozen eggs).

(c) **VISUAL.** Another type of picture is used for near 10s.

(d) **VISUAL & AUDITORY.** Referring to the familiar traffic light colors, teachers explain to pupils that green means “start working here.” Green coding can then be used to mark the greater addend in facts like 3 + 6 = - to visually cue pupils to the starting place for counting-on. Oral prompts are highly emphasized in the teachers’ notes for the MBFP kit: "Start BIG and count on." "5 + 5 is the fingers’ fact. 5 + 5 = 10." The option to involve pupils kinesthetically when introducing a strategy is important in the MBFP. Students can, for example, tap out the +2 or the + 3 count-on pattern. Or they can trace with a finger a path around two weeks of a classroom calendar before writing the matching 7 + 7 = 14 fact.

(e) **REINFORCEMENT.** During exercises pupils are asked to circle and then do just the count-ons on a page or, after completing an exercise, to go back and circle all near doubles. Discrimination exercises like these are designed to reinforce the appropriateness of using a particular strategy.
Research Evidence

At least one quasi-experimental single group designed study supports this strategy. Remedial mathematics students from second- through sixth-grades participated in small pull-out groups (one to ten students per group) for remedial mathematics sessions focused on basic addition skills. Students took pre- and post-tests to assess their basic addition skills. Additionally a teacher survey was administered to gauge teachers’ perceptions of students’ interest in the activities. Results show that teachers felt students were more engaged in the learning process and that they could easily learn and use the skills. Findings also indicate that students in all grades (except second-grade) made performance gains and all grades (including second-grade) retained or improved upon these gains over time.

Sample Studies Supporting this Strategy


The effectiveness of the Multisensory Basic Fact Program to teach addition facts to 115 remedial groups in grades two through six in Australian schools was studied. Performance increased between pre- and posttests and was maintained on the retention test.

Additional Resources

Sample Activity

Source: NC Learns http://www.learnnc.org/lp/pages/783

Graphic representations

Organizing numbers and representations of numbers graphically can help children move quickly and flexibly with counting and computation. A ten frame (shown at right), found in a variety of text and resource books, helps children work easily with 10, a "nice number." Briefly show children a ten frame with, for example, 6 counters in the spaces, and then ask them how many counters there are and how many spaces without counters there are. By repeating this activity frequently with other numbers of counters from 1 to 10, children become adept at recognizing pairs of numbers that partition 10 and at using 5 and 10 as benchmarks.