



Many problems in education are the direct result of using ineffective or less effective instructional techniques when more effective ones are readily available. The studies detailed below describe variations of a strategy proven to be very effective for increasing academic achievement with a modest investment of time and resources.

## Description

Student learning is the result of many factors, but one of the most significant in producing learning is “**opportunities to respond**.”<sup>1</sup> Similar to academic engaged time or active learning, opportunities to respond are the ways curriculum and instruction interact to evoke student responses. **As student academic responses increase, learning increases.** Thus, teaching strategies that result in active responding are generally more effective than ones that permit students to simply sit and listen. Strategies that promote fluency (many responses per unit of time) are also extremely efficient and effective.<sup>2,3</sup>

“Instructional methods such as peer tutoring, individualized instruction, programmed instruction, seat work, small reading groups, free reading, calling for frequent individual and group response, homework, and home tutoring, offer the ability to accelerate the occurrence of academic behavior and subsequent achievement gain. Similarly, ecological improvements that allow the teacher: (a) to monitor student responding, rather than engage in exposition; and (b) to limit the time students spend in transition, waiting, and looking for materials, will maximize achievement gains.”<sup>1</sup>

**Precision Teaching** is an example of an extremely efficient method of instructional assessment and curricular restructuring. It consists of (a) **performance standards for both accuracy and fluency**, (b) **daily evaluation of performance relative to the standards**, (c) **modification of instruction according to a systematic analysis of performance**, and (d) **large increases in opportunities to perform critical academic or other basic skills**. In some classroom applications, Precision Teaching has been made to be even more potent by combining it with other effective and efficient methods such as direct instruction, classwide peer tutoring, and computer-aided instructional decision-making.<sup>2,4</sup>

## Evidence

Over a 4-year period (from 1974 to 1977) students and teachers in the Sacajawea Elementary School (in Great Falls, MT) engaged in 20 to 30 minutes per day of Precision Teaching, using curriculum and instruction that were otherwise similar to what was practiced elsewhere in the school district.

- Students **advanced an average of 19<sup>th</sup> to 40<sup>th</sup> percentile points** (depending on the subtest) on the Iowa Test of Basic Skills higher than comparable students elsewhere in the school district.<sup>4</sup>
- By the end of the four-year study, **fourth-grade students who used Precision Teaching scored on average above the 90<sup>th</sup> percentile** while the district's average scores were near the 65<sup>th</sup> percentile.

“These results were confirmed by the Joint Dissemination Review Panel of the U.S. Office of Education...The improvements themselves are dramatic; but when cost/benefit is considered, they are staggering, since the time allocated to Precision Teaching was relatively small and the materials used ...were quite inexpensive. **Improvements of two or more grade levels per year of instruction are common in Precision Teaching classrooms.**”<sup>2,4</sup>

A year-long study of fourth-grade students from the Valley Dale School in Azusa, California, revealed additional support for these methods. Thirty-two students from one of the four fourth-grade classrooms in the school experienced classroom instruction that consisted of Precision Teaching; peer management of short, daily practice sessions; and computer-aided decision-making. Specifically, the approach included (a) **instructional decision-making based upon a graphic analysis of daily performance assessments**; (b) **1-minute curriculum-based assessments in each of three subject areas each day**; and (c) **class-wide peer tutoring consisting largely of focused practice exercises indicated by the graphic analysis**. The procedures required fewer than 30 minutes each day for the performance assessments, analysis and decision-making, and focused practice, and required only modest teacher supervision.<sup>6</sup>

Participating students represented the lowest performing of the four fourth-grade classrooms in the school at the beginning of the study with only four of 32 students functioning at grade level.

- At the close of the study, only three of the 32 students did not score at or above grade levels in reading, spelling, and mathematics.
- Improvement on standardized achievement tests for all students revealed **average growth of 18 percentile points across all subtests**.<sup>2,5</sup>

## Application

Eliza is a fourth-grade student at the Valley Dale School. For a few minutes during her various academic periods each day, Eliza works with a classmate on exercises in reading, mathematics, and spelling. For the first few minutes, she reads aloud, answers arithmetic problems, and spells words dictated to her as her peer tutor times her work. After each exercise, the two students look at Eliza's work, correct it, count the number of correct and incorrect responses, and record and graph the scores. Based upon an analysis of the graphed information, they arrange materials for practice. Academic skills are then practiced together in an effort to develop better fluency and accuracy for each skill. A few minutes later, Eliza and her classmate exchange roles (i.e., Eliza now becomes the tutor and her classmate the learner).

## Endnotes

1. Greenwood, C.R., Delquadri, J.C., & Hall, R.V. (1984). Opportunity to respond and student academic performance. In W.L. Heward, T.E. Heron, D.S. Hill, & J. Trap-Porter (Eds.) *Focus on behavior analysis in education*. Columbus, OH: Merrill.
2. West, R.P., Young, K.R., & Spooner, F. (1990). Precision Teaching: An introduction. *Teaching Exceptional Children*, 22(3), 4-9.
3. West, R.P. (2003). Utah's public education in 2050: It's hard to make predictions especially about the future. In M.K. Winder (Ed.) *UTAH 2050: The Beehive State in Fifty Years*, Salt Lake City, UT: Eborn.
4. West, R.P., & Young, K.R. (1992). Precision Teaching. In R.P. West & L.A. Hamerlynck (Eds.) *Designs for Excellence in Education: The Legacy of B.F. Skinner*. Longmont, CO: Sopris West.
5. Binder, C., & Watkins, C.L. (1990). Precision Teaching and direct instruction: Measurably superior instructional technology in schools. *Performance Improvement Quarterly*, 3(4), 74-96.
6. de Ayora, P. (1988). *A peer-mediated application of a computer-based instructional decision-making program for improving academic performance*. Unpublished doctoral dissertation. Logan: Utah State University.