

Applying Precision Teaching to Academic Assessment

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■ Words like *retardation*, *learning disability*, *dyslexia*, and *handicapped* all receive a great deal of attention and are of justified concern to parents and educators. Although many attempts have been made to define these terms, there is still much work to be done. If the diagnosis or assessment of a student experiencing particular learning difficulties is to be of any use to the classroom teacher, it should provide specific details about the child's academic and social behaviors which the teacher can use to plan appropriate instruction.

Precision teachers, having learned that a child can have difficulty in one area and yet perform well in other areas, look for the components of a child's performance. You can demonstrate this to yourself. Take your preferred hand and time yourself for 1 minute in the task of writing the letters of the alphabet in order. Switch to your nonpreferred hand, and again write the letters of the alphabet for 1 minute. Unless you have had previous practice with your nonpreferred hand, it is likely that you will have written fewer letters with your nonpreferred hand and that they will be less legible than those written by your preferred hand. This demonstrates a *letter writing deficit* with your nonpreferred hand. Not all problems can be assessed as simply as in this example. However, assessment is where we begin. The task then is to find an assessment approach which also provides information on how to change the learning situation in a way that will insure the most effective and beneficial change for the student.

In analyzing the student's learning situation, precision teachers consider its instructional as well as its motivational components (Kunzelmann, Cohen, Hulten, Martin, & Mingo, 1970); look at the possibilities; and select those events which will serve to change the student's problem behaviors.

In the project shared, precision teaching was used to evaluate a student's difficulty with basic addition facts, work out a change in the teaching plan to improve addition skills, and evaluate the student's performance to determine the effect of the change.

□ Lester was an 8 year old boy enrolled in the primary classroom at the Experimental Education Unit, Child Development and Mental Retardation Center, University of Washington. He was referred to the Unit from a regular first grade because of learning difficulties and some discipline problems, such as fighting and stealing. His former teacher described him as achieving the lowest score in the class on a published math test. Some school personnel suggested that Lester "should not be performing at such a low level." On the other hand, it was suggested that he was "retarded" and had a "learning deficit." Lester had also been described as "dyslexic" because he made some letters backwards, or as "severely emotionally disturbed" because he occasionally stole lunches.

Description of the Student

Planning Lester's Project

The labels which had been applied to Lester did not accurately describe his problems, nor did they provide the teacher with a solution to them.

The teacher needed a starting point. She knew from his records that Lester, whatever the reasons, had shown little progress. When Lester first entered the Unit, he was doing almost no academic work. The teacher's goal, therefore, was to help him develop his academic skills and increase his understanding of and accuracy in basic primary work. Lester's class consisted of 13 other children from 6 to 9 years in age. They had been referred with the same variety of diagnostic labels as Lester.

- To determine Lester's ability to deal with basic addition facts, the teacher prepared an extensive breakdown of number facts with sums from 0 to 9. She prepared 36 worksheets dealing with the following types of addition problems:
1. Problems in which the bottom number was gradually increased from 0 to 9.
 2. Problems in which the bottom number was always 1 and the sums of the 2 numbers were ordered into increasing sequences, decreasing sequences, or random sequences.

The initial recording phase. The teacher gathered 1 minute samples of Lester's work on each of the 36 worksheets. Lester started an automatic timer which buzzed after 1 minute. Then he raised his hand, and the teacher corrected his work and directed him to go on to the next 1 minute sample. He worked for approximately 1 hour each morning for a week. The purpose was to give the teacher a precise breakdown of Lester's basic addition skills.

At the end of this initial recording period, Lester's performance indicated that he did know basic zero combinations. He could add one plus zero, two plus zero, three plus zero, etc. However, when he came to other combinations, such as one plus two, he made many errors.

Initiating a change in the teaching plan. Based on this information, the teacher was confronted with a decision. What should she do about Lester's poor math performance? As mentioned earlier, if a teacher has a description of both the instructional and motivational aspects of the instructional situation, she has the opportunity to change either component and study the effects of this change.

If the teacher's only information about Lester's math performance had been his high error frequency and low correct frequency during the initial recording phase, she would have designed an instructional change, i.e., a modification in the lesson plan utilizing audiovisual devices, different workbook sequences, flashcards, or other instructional materials.

However, the teacher had other information about Lester's math ability which caused her to question how effective an instructional change would be. She had

observed during lunch periods that Lester, who loved to eat, frequently used basic math facts correctly in orally calculating how many servings of a favorite food he had received and how many more servings he might have. In checking with Lester's previous teacher, she learned that he had been exposed to basic addition and subtraction facts and had been experiencing "some success." Information on Lester's performance in other subjects also indicated that motivational procedures had proven extremely successful in changing his performance. Based on these considerations, the teacher decided to try a motivational change rather than an instructional change.

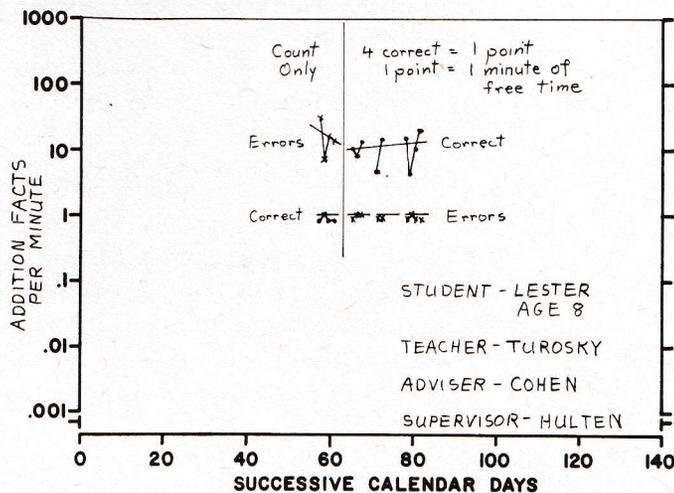
For the next 9 days, Lester received 1 point for every 4 problems he did correctly. Each point earned him 1 minute of free time. Lester chose to use his free time for art activities, playing with Hot Wheels, and other interesting classroom activities. This was the only change made in the teaching plan. The timing sequence was kept the same, as well as the plan for correcting Lester's work.

Measuring Lester's performance to determine the effect of the change. During all of the work sessions following the initiation of the planned change, the teacher recorded the frequencies of Lester's correct and incorrect responses to addition problems to determine if she had made the right teaching change.

□ Figure 1 shows Lester's performance on simple addition problems presented in random order. During the 4 days that Lester's teacher only counted, he completed around 14 problems per minute. However, almost all were incorrect. The straight vertical line shows when the teacher began giving 1 point for every 4 correct problems. The first day after the change was introduced, Lester did 10 problems correctly with no errors. During the next 8 days he continued to improve. He made 1 or no errors. Lester's performance had completely reversed itself.

Results

Figure 1 Lester reversed his performance completely in basic addition facts after he could earn points for each correct answer.



Discussion of Lester's Arithmetic Performance

The teacher checked Lester's performance on other addition worksheets which grew progressively more difficult. The same pattern occurred. During the inventory pretests, Lester had many errors and showed no correct answers. The picture reversed itself each time the point system was used, and Lester consistently was able to correctly answer between 10 and 25 problems.

□ The data described demonstrate how a teaching procedure can change a student's behavior dramatically. In this case when the teacher chose to give Lester points for each correct answer, he reversed his performance completely in basic addition facts. It was suggested earlier that many definitions of types of exceptionalities are vague and do not lead to specific teaching plans. In the project shared, rather than worry about the implications of Lester's diagnosis, his teacher worked out a plan to help his math problem. The plan was put into effect, and the recording of Lester's correct and error frequency in math performance showed that it worked. It should not be implied that the use of bonus points will work with all subjects or that it would work with Lester in other areas. But after Lester's success in basic addition facts, the teacher applied the analysis and measurement components of precision teaching to other curriculum areas.

Other Changes in Lester's Performance

□ It was mentioned earlier that Lester had some social behavior problems which also concerned his former public school teacher. Before Lester entered the Experimental Education Unit, he averaged almost four talkouts without permission every 10 minutes during certain parts of the day. A specific plan was utilized to remediate this problem. Within about 2 weeks, Lester's talkouts almost completely disappeared, and he would raise his hand for permission to talk.

The problems of fighting and stealing were found to occur very infrequently when an actual count of these behaviors was made. However, when the behaviors did occur, the teacher was able to successfully eliminate both problems through the application of specific plans for changing these behaviors.

Conclusion

□ This project suggests that if a teacher wants to individualize instruction for exceptional children, a system must be followed which allows the teacher to determine the child's actual performance and the exact effect of any teaching change on the child's performance. Precision teaching provides such a system. Charting assists the teacher in planning individual instruction and evaluating its effectiveness.

References

Kunzelmann, H. K., Cohen, M. A., Hulten, W. J., Martin, G. L., & Mingo, A. R. *Precision teaching: An initial training sequence*. Seattle: Special Child Publications, 1970.