

Progress Monitoring Briefs Series

Brief #3: Common Progress Monitoring Graph Omissions: Making Instructional Decisions

Progress monitoring assessment is one of the four essential components of Response to Intervention (RTI), as defined by the National Center on Response to Intervention (NCRTI). Progress monitoring data allow teachers to evaluate the academic performance of students over time, quantify rates of improvement or responsiveness to instruction, and evaluate instructional effectiveness (NCRTI, 2010). To make these instructional decisions, it is essential to use a trend line on a student's graph and have concrete decision rules. It is also important to show instructional changes on the student's graph to provide a full picture of the student's progress and the strategies used to improve outcomes.

This brief focuses on the common omission of trend lines and instructional changes in progress monitoring graphs and provides information on two decision rules that can be used to inform instructional decisions based on progress monitoring data. It addresses progress monitoring using curriculum-based measurement (CBM) and uses recommendations from *RTI Implementer Series Module 2: Progress Monitoring – Training Manual* (NCRTI, 2012).

Additional references and resources are listed at the end of this brief.

What Is the Importance of a Trend Line?

Using a trend line in a graph provides a visual illustration of a student's actual and estimated performance. Comparing a student's goal line with the trend line can help teachers make data-based decisions about a student's progress.

For example, Evan is a third grader. The progress monitoring graph in Figure 1 includes Evan's scores, a goal, and a goal line, but no trend line. This graph illustrates Evan's progress toward his goal, data point by data point. Without a trend line, there is no representation of the overall trend of the progress he is making and future trajectory given current instruction. With the addition of a trend line, school staff will be able to answer the question: Does the trend line show that the student is likely to reach the set goal?

FIGURE 1. GRAPH WITH A GOAL AND GOAL LINE BUT NO TREND LINE



How Do You Draw a Trend Line?

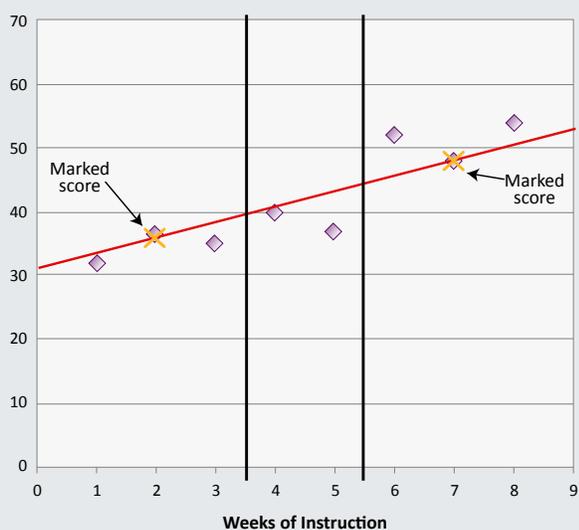
A reliable trend line can be drawn after seven or eight weeks of data have been collected and graphed. Although most software programs will include a trend line option, you can also use the Tukey Method to draw a trend line by hand. For more information about how to draw a trend line by hand, see *NCRTI Implementer Series Module 2: Progress Monitoring – Training Manual* (NCRTI, 2012).

The graph in Figure 2 shows eight graphed CBM scores. To draw a trend line using the Tukey method, first separate the scores into three somewhat equal groups using vertical lines. For example, in Figure 2, group one has three data points, group two has two data points, and group three has three data points.

Next, working with only the first and third sections, find the median data point and the middle week of instruction for each. In Figure 2, the scores in the first group are 32, 36, and 35, with a median score of 35; the middle week is Week 2. Mark an X at the spot where 35 (on the vertical axis) and Week 2 (on the horizontal axis) intersect. Use the same process for the third group, with scores of 52, 48, and 54; mark an X at the intersection of Week 7 and 52. Draw a line to connect the Xs to create the trend line, as shown in Figure 2.

FIGURE 2. THE TUKEY METHOD

Words Read Correctly per Minute



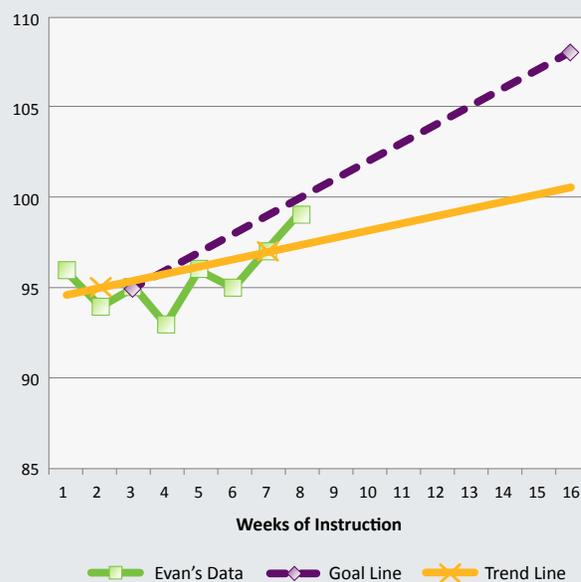
Interpreting Goal and Trend Lines

With both a goal line and trend line in a graph, school staff can compare desired performance (the goal line) and actual and estimated performance (the trend line), and will be better prepared to make decisions about a student's response to the instruction. Figure 3 shows Evan's graph with both a goal line and a trend line. As you can see, the addition of the trend line allows for comparison between desired performance (the goal line) and actual performance (the trend line) over time. Based on this comparison, Evan's teacher and other staff members can make a decision about the effectiveness of his instruction and determine whether changes are needed to help Evan reach his goal.

Figure 3, with both a goal line and a trend line, more clearly illustrates that Evan may not reach his goal. The two methods listed below can help teachers to make decisions about whether an instructional change is necessary for Evan.

FIGURE 3. GRAPH WITH STUDENT SCORES, A GOAL LINE, AND A TREND LINE

Words Read Correctly per Minute



Evaluating Student Progress

With the goal line and the trend line in place, practitioners can evaluate a student's progress using either the Four-Point Method or Trend Line Analysis to decide whether instructional programs or goals should be revised (NCRTI, 2012).

Four Point Method:

If three weeks of instruction have occurred and at least six data points have been collected, decisions can be made by examining the four most recent data points and following these steps:

- If a student's four most recent and consecutive CBM scores are above the goal line, increase the goal.
- If a student's four most recent and consecutive CBM scores are below the goal line, make an instructional change.
- If the four data points hover around the goal line, no change is needed. Continue to collect data to ensure that adequate progress continues.

Trend Line Analysis:

If four weeks of instruction have occurred and at least eight data points have been collected, the trend line can be compared to the goal line using the following steps:

1. If a student's trend line is steeper than the goal line, increase the goal. The instructional program is effective.
2. If a student's trend line is flatter than the goal line, the student is making insufficient progress. Revise the instructional program.
3. If a student's trend line and the goal line are the same, no changes are needed. However, continue to collect data to ensure adequate progress continues.

Based on the information on Evan's graph (Figure 3), the staff at Evan's school could see that his trend line was

not keeping pace with his goal line and an instructional change was needed to ensure that Evan would reach his goal. Because Evan was making some progress with the intervention, the school staff did not want to begin a new intervention. Rather, they decided to increase the intensity of the intervention by increasing the number of intervention sessions per week. What to change is an important consideration, and it does not always require a complete change of instruction. If the student is responding to the instruction, increasing the amount of time either by length of session or number of sessions are both good options.

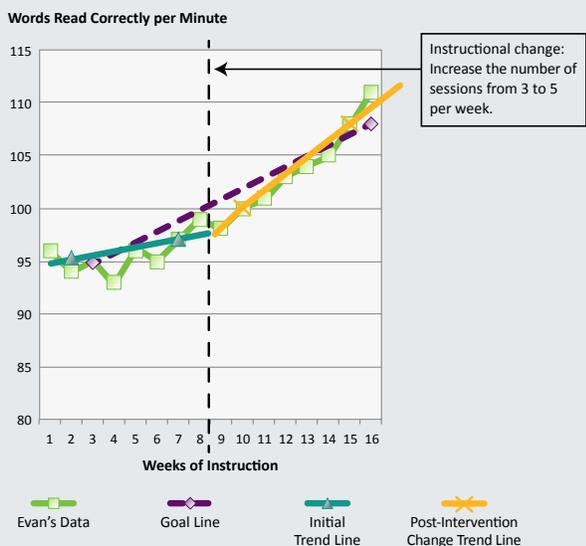
How to Document an Instructional Change

Figure 4 shows the point at which Evan's teachers decided to make a change in his instructional program. A change in a student's instruction or an adjustment in a student's performance goal is marked on the graph by inserting a dotted vertical line at the relevant week of instruction (see Figure 4). (This is often referred to as a phase change line.) Notes should be added to indicate the nature of the instructional change (e.g., a new intervention, longer sessions, and/or more sessions) or an increase in the goal. These notes should be as specific as possible so that a school staff member looking at a student's chart will have a precise understanding of the results of the decisions made. Unclear or ambiguous record keeping makes it difficult for teachers to know what the specific change entailed and to determine whether the instructional change has had an effect.

The graph in Figure 4, with the addition of a second trend line, shows that Evan appears to be responding positively to this instructional change—his rate of improvement has increased since the change occurred. You can see that the nature of the instructional change has been explained in the box to the right of the graph. This makes the graph useful not only to Evan's teacher, but to other staff members who work with him, as well as his parents.



FIGURE 4. GRAPH WITH STUDENT SCORES, A TREND LINE, A GOAL LINE, AND A DECISION POINT



To be of greatest value, a progress monitoring graph should present a clear story of a student’s progress. The graph should indicate the weeks of instruction involved, needed progress as shown by the goal line, actual and projected progress as indicated by the

trend line, the point at which an evaluation of progress resulted in an instructional change, and the nature of that change. After an instructional change has been made, an additional trend line should be added to illustrate student progress following that change.

Checking the Student Accuracy Rate

This brief described the important roles of the goal line and trend line. It is also important to check the student’s accuracy rate for each week. If a student is increasing in words read correctly per minute but is also making more errors (incorrectly reading words), the student is not actually improving. Students should be increasing the number of words read correctly per minute, with the accuracy rate remaining at 95 percent or above.

For example, Evan’s fluency rate was 105 correct words per minute at Week 14. Did this represent actual improvement? Yes, because at Week 14, he read 108 words in a minute and 105 of them were correct. This was an accuracy rate of 97 percent. Evan remains an accurate reader as his fluency rate increases.

References

National Center on Response to Intervention. (2012). *RTI Implementer Series: Module 2: Progress Monitoring – Training Manual*. Washington, DC: U.S. Department of Education, Office of Special Education Programs, National Center on Response to Intervention.

National Center on Response to Intervention. (2010). *Essential components of RTI—A closer look at Response to Intervention*. Washington, DC: U.S. Department of Education, Office of Special Education Programs, National Center on Response to Intervention. Retrieved from http://www.rti4success.org/pdf/rtiessentialcomponents_042710.pdf



Additional Resources

Fuchs, L. S., & Oxaal, I. (n.d.). *Progress monitoring: What, why, how, when, where*. Washington, DC: U.S. Department of Education, Office of Special Education Programs. Retrieved from <http://www.rti4success.org/pdf/progressmonitoringwhatwhyhowwhenwhere.pdf>

These PowerPoint slides explain CBM, contrast it with mastery measurement, and show how CBM can be applied to instructional planning, individualized education program development, and learning disability identification.

National Center on Student Progress Monitoring. (n.d.). *Student progress monitoring* [website]. Retrieved from <http://www.studentprogress.org/>

Although the National Center on Student Progress Monitoring project has concluded its five-year contract with the U.S. Department of Education, Office of Special Education Programs, this website continues to be maintained and offers many valuable resources related to progress monitoring.



About the National Center on Response to Intervention

Through funding from the U.S. Department of Education's Office of Special Education Programs, the American Institutes for Research and researchers from Vanderbilt University and the University of Kansas have established the National Center on Response to Intervention. The Center provides technical assistance to states and districts and builds the capacity of states to assist districts in implementing proven response to intervention frameworks.



National Center on Response to Intervention
<http://www.rti4success.org>

National Center on Response to Intervention

1000 Thomas Jefferson Street, NW

Washington, DC 20007

Phone: 877-784-4255

Fax: 202-403-6844

Web: <http://www.rti4success.org>

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