Evaluating Student Performance Using a Trend Line Analysis: The Tukey Method

The IRIS Center

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Narrator: Evaluating Student Performance Using a Trend Line Analysis: The Tukey Method. Educators can use trend line analysis to evaluate student performance and make data-based instructional decisions. When using this method, the educator compares the student's goal line and trend line. The goal line is the straight dotted line representing a student's expected rate of improvement needed to meet a predetermined goal. It may be denoted by a capital G. The trend line is the straight solid line representing the general direction of the student's scores. It may be denoted by a capital T.

Before conducting a trend line analysis, the educator should collect at least eight data points. For example, educators can collect data once per week across eight weeks of instruction or twice per week across four weeks of instruction. Once these data are collected, the educator can easily and quickly create a trend line using the Tukey method. Let's look at an example.

An educator collected data once per week for eight weeks and graphed the following scores: 9, 12, 14, 11, 15, 14, 12, and 15. The educator then used the following steps to create a trend line.

Step 1: Divide scores into three relatively equal groups. If the scores cannot be divided equally, divide them into approximate thirds. In our example we have eight scores, so we divided them into approximate thirds. We do this by drawing two vertical lines—denoted in pink—that place three scores in the first group, two in the second group, and three in the third group.

Step 2: Find the intersection of the midrate and middate for the first group of scores. The midrate or median score is the score that falls in the middle when scores are arranged from lowest to highest. The middate is the middle week of instruction. Place an X at the intersection of the midrate and middate. In our example, the first group contains three scores across the first three weeks of instruction. The scores are already arranged from lowest to highest, so we can easily identify the midrate and the middate. Now we place an X at the intersection of the midrate (12) and the middate (Week 2).

Step 3: Find the intersection of the midrate and middate for the third group of scores. In our example, the third group consists of three scores across the final three weeks of instruction. Once we arrange these scores from lowest to highest, we can easily identify the midrate and middate. Now we place an X at the intersection of the midrate (14) and the middate (Week 7).

Step 4: Draw the trend line. Draw a line beginning at the X in the first group and continuing through the X in the third group. In our example, we draw a line from the first point to the second point to create the trend line. We then label it with a capital T. After using the Tukey method to graph a trend line, you can use a trend line analysis to evaluate student

performance. If the trend line is steeper than the goal line, the student's performance is exceeding expectation and a more ambitious goal is needed. If the trend line is flatter than the goal line, the student is not making adequate progress. As such, the educator should implement a different instructional approach and monitor the student's progress to determine if the approach is effective. Finally, if the trend line is around the goal line, the student is on target to meet the goal. No changes to instruction are necessary at this time, and the educator should continue collecting data. Looking back at our example, we see that the student's trend line is flatter than the goal line. The educator will implement a different instructional approach and monitor the student's progress to determine if this approach is effective.