

## NWEA State Standards Alignment Study Methods

### Overview

NWEA conducts regular state alignment studies to examine the correspondence between the Measures of Academic Progress (MAP™) and state standardized tests used to measure student achievement. Each alignment study identifies the specific Rasch Unit (RIT) scale scores from MAP that correspond to the various proficiency levels for each subject (reading, mathematics, etc.) and for each student grade. Alignment studies also estimate the probability that a student with a specific RIT score would achieve a status of “proficient” or better on her/his state test. Because all states set their own standards for proficiency and may use different tests for measuring student achievement, alignment studies are usually necessary for each state.

### Distributional Method

In order to conduct alignment studies, it is necessary to study the performance of students who have completed both their state test and MAP. Examinations of data from students who have completed both tests allow NWEA to describe the relationships between the two tests. This makes it possible to predict how future students will likely perform on their state test, based upon their performance on MAP assessments.

Previous alignment studies have used statistical techniques known as linear regression, quadratic (second order) regression, and Rasch Status-on-Standard (SOS) modeling to predict state test performance based on MAP performance. While effective and accurate, these techniques require that both test scores, the MAP score and the state test score, must be known for each student in the study. In reality, it is often difficult to obtain both these pieces of information for students, which means that alignment studies using these techniques may take longer because the data collection process is more difficult.

NWEA currently uses an alignment study technique called the “Distributional Method” to estimate state cut scores. This method was developed by John Cronin, Branin Bowe, and Gage Kingsbury at NWEA. Like previous methods, the distributional method requires a sample of students for which both MAP test scores and state test performance are available. What is different about the distributional method is that it does not require researchers to know each student’s scores on both tests. So long as the MAP scores and the state test scores come from the same group, it is not necessary to match each state test score and MAP test score to a single individual. Such group level data is much easier to collect, permitting NWEA to conduct new state alignments with greater speed and efficiency. Furthermore, the distributional method has been found (Cronin, et al., 2007) to produce cut score estimates and state test pass/fail predictions that are essentially equivalent to those generated by previous statistical methods.

Brief descriptions of the steps used under the distributional method follow.

### Methods

1. **Obtaining a data sample.** The following procedures are used to obtain a sample of data in which nearly all students take both their respective state assessment and MAP.

- a. All valid student MAP test records for Northwest Evaluation Association clients in the target state for the appropriate term are collected and their results are aggregated by grade and subject area for each school.
  - b. Data are retrieved from the department of education web sites in the target state showing the number of students tested by grade and subject area in each school and the proportion of students tested who performed at each proficiency level.
  - c. National Center for Education Statistics (NCES) school identification information is used to link the results from the state test to the appropriate school in the NWEA database, thereby assuring that the MAP test data and the state test data come from the same schools within the state.
  - d. The data are filtered to find schools whose tested population on the NWEA assessment was between 95% and 105% of the population taking the respective state exam. If this method generates at least 700 students per grade, the sample size is considered sufficiently large. This additional filtering process increases the certainty that, within the sample, the same students are completing both the state tests and MAP.
2. **Cut Score Estimation.** The following procedures are used to estimate proficiency-level cut scores from group samples for which both state test and MAP test performance are known.
- a. For each grade level within a state sample, the proportion of students achieving each of the No Child Left Behind Act (NCLB)-reported proficiency performance levels on their state assessment is computed (example: for a state that uses three proficiency levels, those percentages for third grade math might be 20% “below proficient,” 45% “proficient,” 35% “advanced”). These percentages would mean that the cut scores for third grade math proficiency levels are at the 20<sup>th</sup> percentile for “proficient” and the 65<sup>th</sup> percentile for “advanced” within this state sample of third graders.
  - b. MAP data for students in the sample group of schools are aggregated by grade and subject area, and an equipercentile method is used to determine the score equivalent to the state’s proficient level on the RIT scale. In the previous third grade scenario, for example, the sample of third grade math RIT scores for that state would be rank ordered from lowest to highest. The RIT scores corresponding to the 20<sup>th</sup> and 65<sup>th</sup> percentiles are assigned as the cut scores for “proficient” and “advanced,” respectively.
  - c. This two-step process is repeated for all grades and for all test subject areas.

### Alignment Study Policy

Studies are completed on a quarterly basis. Because alignment studies generally use the publicly posted state assessment results, the state must have completed testing and posted the results before the study can be attempted. This means that states administering spring tests generally will not have alignment study results until sometime during the fall or winter. *New* state alignment studies will be completed in the first quarter that NWEA researchers obtain sufficient sample size of test records to complete the study. *Updated* state alignment studies will be completed in the first quarter following a change in the state test vendor or the state standards. The same sampling requirements apply.

Each quarter, research staff will review that data available for all states that do not currently have studies. If a state appears to have enough data to produce a valid study, staff will try to complete it. Studies with sufficient data will be reported.

### References

Cronin, J., Kingsbury, G.G., Dahlin, M., & Bowe, B. (2007, April). *Alternate methodologies for estimating state standards on a widely used computer adaptive test*. Paper presented at the American Educational Research Association, Chicago, IL.