Linking MAP to State Tests: Proficiency Cut Score Estimation Procedures

Overview

NWEA conducts regular linking studies to examine the correspondence between the Measures of Academic Progress (MAP™) and state standardized tests used to measure student achievement. Each 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. These 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 may use different tests for measuring student achievement, linking studies are usually necessary for each state.

Equipercentile 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.

NWEA currently uses an alignment study technique called an "Equipercentile Method" to estimate state cut scores, a method commonly used for equating scores from tests that use differing scales (Ryan and Brockmann, 2009). This method requires a sample of students for which both MAP test scores and state test performance are available, and although methodologically simple, produces cut score estimates and state test pass/fail predictions that are essentially equivalent to those generated by more complex statistical methods (Cronin, et al., 2007). Brief descriptions of the steps used under the equipercentile method follow:

Methods

1. **Obtaining a data sample**
   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. State testing data are collected from NWEA partners. Individual scale score and performance level outcomes for each individual student are harvested.
   c. National Center for Education Statistics (NCES) school identifiers and school-assigned student identifiers are used to link state test scores and MAP™ scores to the appropriate individuals.

2. **Cut Score Estimation.** The following procedures are used to estimate proficiency-level cut scores from 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").
   b. These same percentage points are used to determine the equivalent cut scores on the MAP assessment for that sample of students. 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^{th} and 65^{th} 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

Roughly 2-3 new or updated studies can be completed every three months. Quarterly review meetings are scheduled during which PRR district managers consult with research staff to establish priorities for the coming quarter. Requests for additional/new state test linking studies should be directed to PRR district managers so that they can be prioritized during those quarterly meetings.

When updates or changes occur to state tests or state test proficiency cut scores, a new MAP/State test linking study must be completed. Such updates cannot be attempted, however, until after the state test has been administered at least once under the new testing conditions. For example, if a state announces a change to its state cut scores, to take effect for the Spring 2011 administration of the state test, NWEA could not attempt an update until after the Spring 2011 state test data were published. This means that states administering spring tests generally will not have alignment study results until sometime during the following fall or winter. *New* and/or updated state test linking studies can be completed no earlier than the first quarter that NWEA researchers obtain sufficient sample size of test records to complete the study.

References

Ryan, J., & Brockmann, F. (2009). A practitioner's introduction to equating with primers on classical test theory and item response theory. CCSSO: Washington, DC.

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.