Establishing a Relationship Between Diagnostic Assessment and Intervention Tools to Predict Statewide Assessment Scores: Mathematics

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Abstract

Illinois has adopted a mandate that requires all public schools to use a response to intervention model. This model has prompted schools to adopt individually tailored intervention programs. One such program is the SuccessMaker™ Mathematics computer program. Although many of these programs are being adopted by schools, the relationship between outcomes from these programs and the Illinois Standards Achievement Test (ISAT) mathematics content area is unknown. Therefore, the purposes of this study were to a) calculate the correlations between SuccessMaker™ Mathematics and ISAT, and b) to develop benchmarks for a local school based on this correlation. Outcome variables from the SuccessMaker™ Mathematics computer program were collected from three student cohorts across kindergarten, first grade, and second grade, and correlated with the students’ 3rd grade ISAT scores in the math content area. Based on the predicted relationship between the SuccessMaker™ scores and ISAT scores, a cut score was derived to identify students who are at risk for not meeting ISAT standards in mathematics.

Background

• All school districts in Illinois are required to implement a Response to Intervention (RTI) model no later than January 2010. (Illinois Education Association, 2008)
• Federal legislation (i.e. NCLB) calls for increased accountability as well as increased use of data and scientifically based practices. (Shinn, 2008)
• Within an RTI framework, curriculum based measurements (CBM) have been established as a method for identifying students at-risk for not making satisfactory progress. (Marstone, 1998)
• Curriculum based measurements (CBM) are standardized, short duration measures based on the content of students current instructional curriculum. Sensitive to instructional gains, CBMs can be used repeatedly throughout the school year to monitor the students’ progress relative to expected benchmarks.
• Local norms based on CBMs can be used to establish benchmarks reflecting expected levels of students’ performance.
• Studies have demonstrated that CBMs in (reading/ math) can be used to predict student performance on statewide, high-stakes tests. (Shaprio, 2004)
• Identifying students at-risk has been conducted in many ways. A percentile-based cut score based on local or national norms is often used to identify students not making sufficient progress, without consideration of high-stakes testing outcomes. This method is problematic, in that it can over identify or under identify students at risk for not meeting state standards.
• An alternate method is to use a correlation derived cut score between the high-stakes test and the CBM. (Spence & Cates, 2004)
• In addition to multiple methods of identifying students at-risk, other methods of benchmarking student performance such as commercial instructional programs like SuccessMaker™, are suggested as alternatives to CBM benchmarking. (www.pearsonschool.com). However, no empirical evidence to the authors’ knowledge has been collected that demonstrates SuccessMaker™ can adequately predict high-stakes testing.

Purposes

There are two purposes to this study:

• Purpose 1: Determine the actual magnitude of the correlation between SuccessMaker™ and the ISAT.
• Purpose 2: Determine the extent to which a percentile rank and correlation derived cut score result in differential identification of students at-risk for not meeting state standards.

Participants

Participants included current 4th, 5th, and 6th grade student cohorts from an elementary school located near Bloomington-Normal, Illinois. SuccessMaker™ data from the students’ kindergarten, first grade, and second grade were collected, as well as their 3rd grade ISAT scores.

Methods

• For each academic quarter, students’ Current Course Levels (CCL) on the SuccessMaker™ computer program were correlated with their scores on the math content area of the Illinois Standards Achievement Test (ISAT) taken in the 3rd grade.
• For each academic quarter, a scatter plot was created depicting students’ CCL and corresponding predicted ISAT score
• Based on the 2008 ISAT standards, a cut score was established for each quarter to identify students who might be at-risk for not meeting or exceeding expectations

Results

• Correlations between SuccessMaker™ Mathematics current course levels (CCL) and ISAT mathematics scores ranged from .53 to .62.
• The graphs display correlation derived cut scores and percentile-based cut scores.
• The percentile-based cut scores consistently identified more students as at-risk than did the correlation derived cut scores.

Discussion

• The purposes of this study were to determine the actual magnitude of the correlation between SuccessMaker™ and the ISAT, as well as determine the extent to which a percentile rank and correlation derived cut score result in differential identification of students at-risk for not meeting state standards.
• Results indicate that correlations range from .53 to .62.
• Currently, correlations between CBMs in math and ISAT scores are around .70.
• Correlation derived cut scores consistently identified fewer students as at-risk than their percentile-based cut scores.
• Results suggest that by using correlation derived cut scores outcomes from diagnostic assessment and intervention tools can be used effectively to develop local benchmarks and identify students who are at risk for not meeting ISAT standards.
• Future research should evaluate criteria and decision rules for determining the optimal placement of correlation derived cut scores.