

Grade 3 CBM CUT SCORES to ISAT
Cross - Validation (10/2007)

The use of expectations or benchmarks for DIBELS and Curriculum-Based Measurement to determine whether students have mastered basic skills has become common practice in many school districts around the country and in the state of Illinois. This paper reports the results of an analysis of the relation between CBM and DIBELS data and the Illinois Standards Achievement test results for more than two thousand students from cohorts of third grade students between the 2003-04 and 2006-07 school years, for all or some schools in six different districts. Because Grade 3 is the first year in which students are assessed with large scale state tests in Illinois an extensive examination of data revealed a high degree of stability of previously reported Cut scores for the ISAT. When scores from 2361 to 2541 repeated measurements of students assessed with either DIBELS or AIMSWEB probes were combined across school years probabilities (hence cut scores) for proficiency (i.e., meeting standards) did not change substantially.

Purpose. Previous reports substantiated the use of CBM cut-scores for determination of the proficiency status of students using the state mandated test (i.e., Illinois Standards Achievement Test –ISAT) as an indication of proficiency. Since the original determination of cut scores, the ISAT has been rewritten and rescaled to meet the changing needs of the Illinois State Board of Education in relation to the No Child Left Behind Act. The purpose of this investigation was to establish the consistency of cut-scores predictive value from the old to new ISAT. Specifically, the question for this investigation was, “Do the cut-scores still function in identifying proficiency status of students?”

Method. Because the ISAT has been re-scaled, all scores from the Illinois Standards Achievement Test for students in participating districts were coded as meeting or not meeting standards. A logistic regression was run for each participating district with more than 100 students for each time period and predicted probabilities were visually compared to determine if there were substantial differences. Because differences in probabilities seemed to be more a function of sample size than covariation, all scores were combined in a three omnibus logistic regressions ignoring the source of the independent variable (i.e., DIBELS or Aimsweb probes) and the source of the dependent variable (i.e., proficiency status on either the old or new ISAT). In this way cut scores would be maximally generalizable, large N and variability of source material). Finally bivariate correlations by district and by year were computed using the actual scale scores and CBM scores to examine the consistency of the linear relationship between CBM and ISAT.

Grade 3 CBM CUT SCORES to ISAT
Cross - Validation (10/2007)

Results. In Table 1 , the predictive probability of meeting standards on ISAT are presented based on the analysis of Fall, Winter and Spring R-CBM and DIBELS Scores . The number of student scores used the prediction varied from fall, winter to spring, and by district, but more than 2000 scores were combined for each analysis. A probability of .5 indicates the cut between equal likelihood of meeting and not meeting standards. This .5 probability is default cut score determined by logistic regression.

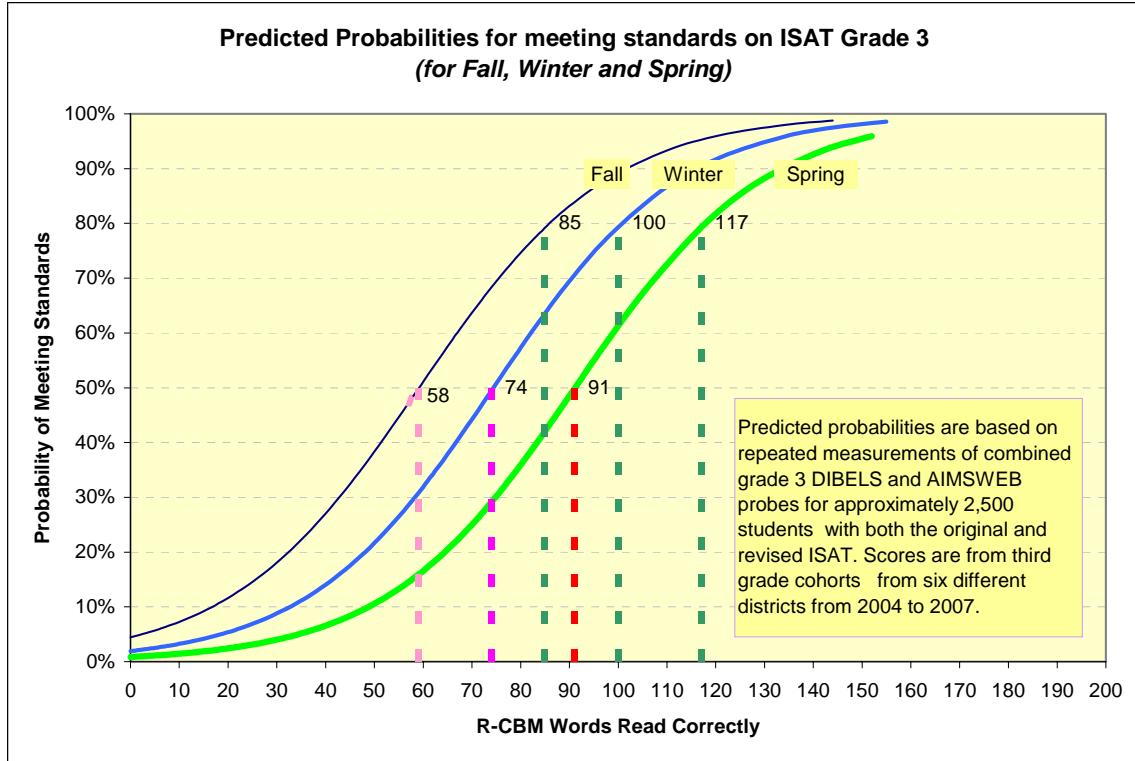
Table 1. Probability of Meeting standards on ISAT based on Grade 3 administration of CBM and DIBELS (combined N approximately 3000 students)

Probability of Meeting Standards on ISAT	Curriculum - Based Measurement		
	Fall	Winter	Spring
10	16	32	48
20	32	48	64
30	42	58	74
40	51	66	83
50 *	58	74	91
60	66	82	98
70	75	90	107
80 **	85	100	117
90	101	116	133
100	233	240	274
<i>N</i>	<i>2361</i>	<i>2531</i>	<i>2541</i>

Note. Decimal removed from probabilities. * 50% probability corresponds to Below Basic Cut score. Approximately 30% of students with scores less than this point meet standards. **80% probability corresponds to proficient Cut score. Approximately 90% of students with scores above this point meet standards.

These probabilities are displayed graphically in Figure 1 below. The tree “S” shaped curves demonstrate the regularity of increasing probabilities. For example, in the Spring of grade 3 CBM scores below 91 are considered an indication that students are *unlikely* to have sufficient mastery of basic skills to be successful without substantial intervention. This same score in the Fall would have been considered to be an indication of proficiency (i.e., a student who entered third grade with a CBM score of 91 would *likely* have mastered sufficient skill to be ready for typical instruction in the third grade curriculum without substantial intervention). These scores are not guarantees, rather they represent probabilities, or general indications of proficiency and the likelihood of the necessity of intervention.

Grade 3 CBM CUT SCORES to ISAT
 Cross - Validation (10/2007)



The concurrent and predictive validity coefficients for CBM/DIBELS and ISAT are presented in Table 2. These coefficients range from .64 to .75 with a median coefficient of .69. This means that between 41 and 56% of the variance in ISAT test scores can be predicted from a single administration of CBM or DIBELS (i.e., typically the median score of three probes), which takes less than 4 minutes to administer per child.

Table 2. Criterion – Related Validity for CBM (and DIBELS) with ISAT

Time	Year	District	Source	r	N
FA2	2004	1	AW	.67	524
FA2	2005	2	AW	.67	21
FA2	2005	4	AW	.64	87
FA2	2005	1	AW	.66	437
FA2	2006	3	DB	.70	181
FA2	2007	5	AW	.68	1111
<hr/>					
WINTER	2004	1	AW	.65	538
WINTER	2005	2	AW	.70	22
WINTER	2005	4	AW	.66	94
WINTER	2005	1	AW	.7	446
WINTER	2006	3	DB	.75	202
WINTER	2006	6	AW	.75	106
WINTER	2007	5	AW	.72	1123
<hr/>					
SPRING	2004	1	AW	.67	539

Grade 3 CBM CUT SCORES to ISAT
Cross - Validation (10/2007)

SPRING	2005	2	AW	.67	23
SPRING	2005	4	AW	.68	95
SPRING	2005	1	AW	.69	445
SPRING	2006	3	DB	.71	200
SPRING	2006	6	AW	.74	107
SPRING	2007	5	AW	.72	1132

Note. AW =Aimswweb probes. DB = DIBELS Probes.

Discussion. The Cut scores to ISAT previously reported on measuredEffects.com are remarkably robust. Not only do the cut scores function well with both the new and old ISAT, but also regardless of the source of the CBM probes (i.e., DIBELS and AIMSWEB probes). The data presented in this report indicate that the use of these cut scores for the purpose of curriculum evaluation is warranted. That is, if more than 20 to 30% of students in a district obtain CBM scores categorized as “Below Basic,” it is likely that modifications in the general education curriculum are warranted.

At the same time it is important to note, these are probabilities not certainties. Approximately 30% of students with probabilities of less than .50 do meet standards. A frequently asked question is, *Why would the 50% probability predict 30% and not 50%?* The answer to this question is that students with scores substantially below the cut are substantially less likely to meet standards. The 30% marker has to do with the correlation between the independent and dependent measures (i.e., CBM and ISAT). That is, as scores approach the cut score, the probability of meeting standards increases to 50%. Thus, the designation of Below Basic is an estimation, and a student with a CBM score of 16 is far less likely to meet standards than a student with a CBM score of 57, even though in the fall of third grade both are generically designated as “Below Basic.”

Limitations. In this report I have attempted to clarify the nature of the relations between CBM and ISAT. Although the sample included in this report is far more robust than previous samples, questions still remain regarding the fidelity with which data have been collected and reported.