Student Trends in Schools Encouraged to take the SBAC Interims

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The Smarter Balanced Assessment Consortium (SBAC) has been an assessment partner of the Montana Office of Public Instruction since 2015. The first year of assessments was a trial run of the Summative end of year assessment given in Grades 3-8. As a complement to the Summative assessment, SBAC has a battery of assessments meant to help students preform standards-based grade level work and prepare for the Summative assessment. The SBAC Interim assessment consist of two different grade level regimens. The Interim Assessment Block (IAB) measure approximately 8 grade level assessments of student performance per content areas (math and ELA). Designed to be administered during one class period, they can be taken individually, or mixed with the specific regimen of the IABs at a specific grade level. The Interim Comprehensive Assessment (ICA) is meant to mirror the Summative assessment and contains four different components for both math and ELA. Traditionally in Montana, most schools have chosen to take the IABs. In fact, only 2883 student took the Math ICA in the 2019 – 2020 SY.

What both exams have in common is that there are scale scores (the basic unit of assessment measurement) and proficiency levels. The Interims have their own metric for proficiency level that is different from what is provided with the Summative. The Interims proficiency level is 1 to 3 with 1 representing Below Standard, 2 representing At/Near Standard, and 3 representing Above Standard. Typically, most students who take the Interim assessments in Montana score At/Near Standard on both the ELA and math assessments. To focus this analysis on the greatest number of students, this analysis only considers IAB students.

The Statewide Longitudinal Data System (SLDS) program has analyzed Interim data during the last four administrations of the Interim assessment. In 2016 – 2017 14 districts administered the assessment. Analysis focused on correlation of student performance based on school and demographic subgroups. The 2017-2018 analysis focused on the different types of IABs and compared the Interim scale score to the Summative scale score to see which IAB was the most effective in producing gains on the Summative assessment. The 2018-2019 analysis looked to individual student performance on the IAB and compared it with the Summative scale score. In general, students that took the ELA IAB scored higher on the Summative whereas there were no significant differences among the math test takers. The analysis also looked to the performance of IAB test takers on the Summative assessment and compared results with the rest of the grades 3-8 students in the state. For each grade level, IAB test takers outperformed their peers who did not take an interim assessment on the Summative in both math and ELA.

For the 2019-2020 dataset, we looked to matched pairs of ELA and Math test takers. A matched pair represents a student that took the same test at different grade levels over a period of two years. It is a particularly robust analysis since it is the same students that is compared across years. The measure of comparison is whether the student meets grade level standards. In this second report, we look in this document at groups of schools and how they compared to the rest of the schools in the state who took

the assessment. These groups include Comprehensive schools, Targeted schools, and MCLP/MCLSDP schools (schools that received a Title 1 Literacy grant).

Context

Schools meriting additional support from the OPI are classified as either comprehensive or targeted schools. This classification is the result of an analysis of student test scores, graduation rates, dropout rates, and attendance among other factors. There are 27 Comprehensive schools that teach at least one of the Interim grade levels. Of those, 12 participated in the required assessments. One explanation for the relative low turnout of comprehensive schools is that testing ended early with the onset of the COVID-19 pandemic in March.

Among the participating schools, 53.83% of students took the assessments. Those that did had a high number of assessments per student. In ELA, 1173 students took 3705 assessments. The average participating comprehensive student took 3.16 ELA assessments. In Math, 1038 students took 8433 assessments. The average participating student took 8.13 math assessments. Another thing to note about the test administration in participating schools 1280 students took either a math or ELA assessment, indicating that many students took assessments in both content areas.

When taking this into account, 1101 Comprehensive students took the math and/or ELA assessments. For the MCLP/MCLSDP schools, 6316 students took the math and/or ELA assessments. For Targeted Support schools, 1433 students participated. Thus, 7305 students who took an SBAC IAB Interim were in schools in which it was required to administer the assessment. Since some schools participate in one or more of the programs, the total number of participants counts each student as unique.

Student Count	
Comprehensive Schools (FY19)	1101
MCLP / MCLSDP	6316
Targeted Schools (FY19)	1433
Total Population Required Schools (FY 20)	7305

The population of these required schools consists of 4497 (61.56%) students qualifying for free or reduced lunch. For comprehensive schools, the rate is 100%. For Title 1 Literacy grant schools, 63.05% of students qualify for free and reduced lunch. For targeted schools, the percentage is similar (64.62%).

	Total Required Schools		Comprehensive Schools		MCLP / MCLSDP		Targeted Schools	
	Freq	**Percent**	**Freq**	**Percent**	**Freq**	**Percent**	**Freq**	**Percent**
Free and Reduced	4497	61.56	1101	100.00	3982	63.05	926	64.62
Not Participating	2808	38.44	0	0.00	2334	36.95	507	35.38
Total	7305	100.00	1101	100.00	6316	100.00	1433	100.00

Similar percentages of Title 1 Literacy grant schools (29.54%) and targeted schools (28.12%) are American Indian. The number for comprehensive schools is 94.73% of the students that took the assessment were American Indian. Similar percentages of White students in MCLP/MCLSDP (60.83%) and targeted schools (60.78%)

	Total Required Schools		Comprehensive Schools		MCLP / MCLSDP		Targeted Schools	
	Freq	**Percent**	**Freq**	**Percent**	**Freq**	**Percent**	**Freq**	**Percent**
Hispanic	314	4.30	15	1.36	279	4.42	54	3.77
American Indian or Alaskan Native	2086	28.56	1043	94.73	1866	29.54	403	28.12
Asian	45	0.62	1	0.09	37	0.59	11	0.77
Black or African American	41	0.56			38	0.60	6	0.42
Native Hawaiian or Other Pacific Islander	13	0.18			13	0.21	*	*
White	4505	61.67	30	2.72	3842	60.83	871	60.78
Multi-Racial	301	4.12	12	1.09	241	3.82	85	5.93
Total	7305	100.00	1101	100.00	6316	100.00	1433	100.00

Similar percentages of students with disabilities took the assessment across comprehensive schools (11.53%), Title 1 Literacy grant schools (12.63%) and targeted schools (10.26%).

	Total Required Population		Comprehensive Schools		MCLP / MCLSDP		Targeted Schools	
	Freq	**Percent**	**Freq**	**Percent**	**Freq**	**Percent**	**Freq**	**Percent**
Special ED Students	900	12.32	127	11.53	798	12.63	147	10.26
Not Special ED Students	6405	87.68	974	88.47	5518	87.37	1286	89.74
Total	7305	100.00	1101	100.00	6316	100.00	1433	100.00

Findings

Analysis was conducted on four levels. The first level addresses all students that who schools were required to participate in the SBAC Interims. The comprehensive schools were compared against students in all other schools (including some other required schools). The same is true for the MCLP/MCLSDP schools and the targeted schools. This produces four analysis each for Math and ELA.

The One-way Analysis of Variance (ANOVA) was used to measure any differences between means. The one-way ANOVA with two fixed factors is identical to a T-test when it compares two means. The ANOVA is designed to consider more than two variables. An opportunity with an ANOVA is that the researcher

can calculate an effect size (partial Eta squared). The F statistic is similar to the T statistic. It represents the ratio of the variance calculated among means to the variance within the samples. Effect sizes measure the strength of the relationship between two variables. The partial Eta square is the ratio of variance explained by the dependent variable, in this case scale scores, when controlling for other predictors. A small partial Eta squared is 0.01, a medium outcome is 0.06, and a large outcome is 0.14.

When taken all students that took the ELA assessment from these three groups of required students and compare them to rest of the test takers, the mean difference in scale scores is 35.4. This difference is a significant difference and does represent a small effect. Stated another way among all students in required schools, test scores were significantly less.

	Mean	Std. Deviation	N	F	Sig.	Partial Eta Squared
Required Schools	2453.57	133.12	14594	580.826	0.000	0.017
Remainder	2488.97	132.00	18380			
Total ELA IAB	2473.30	133.66	32974			

For Math, the mean difference is 55.85 scale score points. The finding is significant and is representative of a moderate effect.

	Mean	Std. Deviation	N	F	Sig.	Partial Eta Squared
Required Schools	2444.74	114.46	16762.00	2151.617	0.000	0.054
Remainder	2500.59	117.09	20748.00			
Total Math IAB	2475.63	119.20	37510.00			

For comprehensive schools, the mean difference with the rest of the test taking population is 108.76 points. The finding is significant at the $p < .0001$ level and the effect is large. One can say that test scores are significantly lower in comprehensive schools, however with a moderate degree of certainty.

	Mean	Std. Deviation	N	F	Sig.	Partial Eta Squared
Comprehensive Schools	2373.18	127.93	2616	840.181	0.000	0.048
Remainder	2481.94	130.59	30358			
Total ELA IAB	2473.30	133.66	32974			

The same is true with math. The mean difference between comprehensive schools and the rest of the test taking (math) population is 96.04. This difference is significant at the .001 level and represents a large effect.

	Mean	Std. Deviation	N	F	Sig.	Partial Eta Squared
Comprehensive Schools	2398.21	99.54	7272.00	4235.624	0.000	0.101
Remainder	2494.25	115.99	30238.00			
Total Math IAB	2475.63	119.20	37510.00			

With MCLP/MCLSDP schools the difference was less pronounced. The mean difference is 28.51, meaning that students in the remainder of schools on average scored 28.51 points higher. This is significant at the p<.001 level and represents a low effect.

	Mean	Std. Deviation	N	F	Sig.	Partial Eta Squared
MCLP / MCLSDP	2455.53	134.30	12424	356.091	0.000	0.011
Remainder	2484.04	132.11	20550			
Total ELA IAB	2473.30	133.66	32974			

In Title 1 Literacy grant schools, the mean difference in math is 56.76. Although the difference is significant at the p < .001 level, the effect is moderate.

	Mean	Std. Deviation	N	F	Sig.	Partial Eta Squared
MCLP / MCLSDP	2440.35	113.09	14195.00	1056.596	0.000	0.053
Remainder	2497.11	117.70	23315.00			
Total Math IAB	2475.63	119.20	37510.00			

Among targeted schools, the mean difference (ELA) with the rest of the testing population was 15.12 points. The difference is significant at the p<.001 level. The effect size is small, meaning that while one may say that the difference is significantly lower, but will only a low degree of certainty.

	Mean	Std. Deviation	N	F	Sig.	Partial Eta Squared
Targeted Schools	2459.61	121.52	3114.00	36.096	0.000	0.001
Remainder	2474.73	134.78	29860.00			
Total ELA IAB	2473.30	133.66	32974.00			

In math, targeted schools preformed higher. The mean difference was 13.75 and favored the targeted schools. The difference is significant, but the effect is low.

	Mean	Std. Deviation	N	F	Sig.	Partial Eta Squared
Targeted Schools	2488.24	109.15	3118.00	38.086	0.000	0.001
Remainder	2474.49	120.00	34392.00			
Total Math IAB	2475.63	119.20	37510.00			

Summary

Given that many of these schools are low performing, one would expect that the differences would have larger effect sizes. While only one mean difference favored the target groups, the remainder of the differences were largely low to moderate. The large effect sizes were seen with the comprehensive schools. It was also in these schools that the matched pairs underperformed in 2020 in comparison to their 2019 scores in the Below Proficient category.

It is advised to do a matched pairs analysis with the targeted and MCLP/MCLSDP schools to determine if continued exposure to the same assessment causes scores to increase. It is only one the basis of whether this or a similar analysis shows results can the benefit to the schools be accurately measured.