



IMP STUDENTS SCORE HIGHER THAN THEIR PEERS ON SAT-9

CAN THIS BE MATHEMATICALLY CORRECT?

by SYLVIA TURNER

In the fall of 1989 the mathematics department at Lincoln High School began searching for a different approach to mathematics. The traditional approach of the past had not provided a pathway to mathematics for enough of our students. With the attrition rate high in our courses and frustration rising among some of our teachers, the quest began.

We applied, and were accepted, to become a pilot school for the Interactive Mathematics Program. The impact on our department and school has proven to be beyond our hopes and expectations. The number of students enrolled in a 4th year of mathematics for the fall of 1999 is five times greater than it was just four years ago. In the past we would commonly encounter students in our courses that liked our class but hated math. It is now typical to have students that love mathematics and want to pursue it in college.

We have had the time and support to get this curriculum up and running with a strong cohort of fully trained IMP teachers. It is now time to take a close look at the statistics.

The California State Board of Education is pressuring schools to raise their expectations of students. They are holding us, as teachers and administrators, accountable for the performance of our classes on the Stanford Test of Academic Skills (SAT-9). The augmented portion of this test addresses the additional standards mandated by the California State Board of Education. Therefore, we have chosen to use these tests as one of our measures. The results follow.

A matched pair study of our 8th grade verses 9th grade SAT-9 scores looked closely at the effectiveness of our different programs. The 8th and 9th grade scores for each individual were compared and the difference computed. The average of these differences for all 9th grade IMP students was then compared to the average difference for all Non-IMP students.

Improvement of students placed in our 9th grade course options were analyzed first within their individual groups (Concepts, pre-Algebra, Algebra 1, Algebra 1 Honors). These group averages were then compiled as a Non-IMP group and compared to the average improvement observed

9th Grade Students	Average Raw Score on SAT-9
IMP Students	36.06
Algebra 1/Geometry Students	26.50

A test of significance shows that this difference is significant at the less than 1% level.

in IMP. Some of our below grade level courses (Concepts, Pre-Algebra) showed a higher average improvement than our Algebra courses so those numbers were included in the IMP/Non-IMP comparisons. The average percentile rank improvement noted for 9th grade IMP students was 17.58 and for all Non-IMP students it was 10.88. This is strong evidence that improvement on SAT9 is greater for students that choose the IMP option for their mathematics program at Lincoln High School.

The next question we asked was whether the IMP student average

on the 9th grade SAT-9 was significantly higher than the Non-IMP student average. Since all students in IMP during their 9th grade year are at grade level or higher, they were compared to 9th grade students in Algebra 1 or higher.

We also wanted to know what happens as the years progress. As the students experience the two math programs at our school, do some become better thinkers, better scientists, better writers? These are all questions the department has wondered about, and while the IMP teachers have had a sense that the IMP students were developing skills not tested

on the mathematics assessments, we have not had the opportunity to look at the data until now.

The SAT-9 and STAR (the 11th grade augmented test based on the California mathematics content standards) results for the 1998-99 junior class at Lincoln High School were analyzed next. No one was dropped from the averages for any of the tests. This is due to the comparable mix of students.

Each of the tests show significance at less than 1% and they confirm our hypotheses. We were especially pleased with the results on the STAR test. The Lincoln High School Junior class was ranked in the top 10% for their STAR mathematics results on the Mathematically Correct website. Lincoln High School's outstanding ranking on the skill-driven test owes much to the IMP students' success.

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Students	IMP (n = 125)	Non-IMP (n = 373)
% on grade level	51.4%	45.6%
% honors	18.2%	22.8%
% below grade level	30.4%	31.6%

SAT 9 Test	IMP Students	Non-IMP Students
SAT Math	28.87	22.12
SAT Reading	65.65	55.56
SAT Language	34.30	29.00
SAT Language Expressions	17.75	14.96
SAT Science	22.20	18.63
SAT Social Science	22.96	19.08
STAR	22.72	18.11

The results on all of the SAT-9 tests and STAR.