

## ABSTRACT

Title of dissertation: THE JOINT IMPACT OF BLOCK SCHEDULING AND  
A STANDARDS-BASED CURRICULUM ON HIGH  
SCHOOL ALGEBRA ACHIEVEMENT AND  
MATHEMATICS COURSE TAKING

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This study investigated mathematics learning at a suburban United States high school that simultaneously adopted a semestered (4 x 4) block schedule and the Interactive Mathematics Program (IMP), a curriculum designed to implement the National Council of Teachers of Mathematics (NCTM) *Standards*. Previous research has often found that at sites where a block schedule was adopted without changes to mathematics curriculum and instruction, mathematics achievement has declined. In contrast, when a semestered block schedule and the IMP curriculum were implemented jointly, with extra time allocated to planning and staff development, the two innovations were followed by improvements in student mathematics achievement.

At the end of Grade 11, compared to an earlier cohort of students who had used a traditional schedule and curriculum, students using the block schedule and IMP were better able to formulate algebraic models, interpret graphs and tables, solve algebra

problems presented in context, and work in pairs to solve an extended, open-ended, applied algebra problem. Students who had used a traditional schedule and curriculum were better able to perform symbolic procedures presented in standard format.

Over 4 years of high school, students using the block schedule and IMP on average spent 67 more hours enrolled in mathematics courses than had earlier groups of students who used a traditional schedule and curriculum. Of students using the block schedule and IMP, 58% completed four core courses from the IMP curriculum and went on to enroll in at least one additional advanced mathematics class. In contrast, only 48% of students using a traditional curriculum and schedule completed three core courses (algebra 1, geometry, and algebra 2) and went on to enroll in at least one additional advanced mathematics class.

Under the semestered block schedule about 15% of the student body enrolled in a newly offered Advanced Placement (AP) statistics course, and half of those enrolled completed the AP statistics exam for college credit. AP Calculus enrollment remained about constant after the school adopted the block schedule and IMP, but a larger percentage of AP Calculus students completed the more demanding BC course, and Advanced Placement exam grades improved.

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ACHIEVEMENT AND MATHEMATICS COURSE TAKING

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