

Chapter 3: Method

This chapter describes the research methodology used to investigate the joint effects of a semestered block schedule and the IMP curriculum on student mathematics learning at Suburban High School. First, the chapter provides a general description of the school community, including the students and teachers at the school. Then, the chapter describes the traditional curriculum and schedule that had previously been used at Suburban High School, and the IMP curriculum/semestered block schedule that were adopted. Then, the chapter describes data collection and statistical methodology for each of three approaches used to compare mathematics learning of students using the traditional schedule and curriculum to that of students using the block schedule and IMP curriculum:

1. analysis of an Algebra Achievement Test completed by students at the end of Grade 11,
2. analysis of student enrollment in mathematics courses as reported by student transcripts, and
3. analysis of student participation in and exam grades for Advanced Placement (AP) mathematics classes as reported on yearly School Profiles published by Suburban High School.

The chapter ends with a short description of qualitative data collected to help describe unique aspects of how the IMP curriculum and semestered block schedule were implemented at Suburban High School.

Participating Students

Participants in this study's analysis of algebra achievement include students at Suburban High School who were enrolled in the eleventh grade during the spring of 1997 (Traditional cohort), the spring of 2000 (First Reform cohort), or the spring of 2001 (Second Reform cohort). Participants in this study's transcript analysis include those who participated in the analysis of algebra achievement, plus students who used a traditional schedule and curriculum throughout high school, and graduated in the spring of 1996 or the spring of 1997. The analysis of Advanced Placement (AP) participation used information from additional years, analyzing transcripts of students who participated in other parts of the study, plus those of all other students who graduated between the spring of 1995 and the spring of 2001.

Suburban High School is the only high school in a small, relatively affluent school district in the Eastern United States. A number of colleges are located nearby, and the local population tends to be well educated. Traditionally, more than 75% of students at Suburban High School attend 4-year colleges after graduating from high school; counting both 2- and 4-year colleges, about 90% of Suburban High School students go on to college immediately after high school graduation.

The school generally enrolls between 900 and 1000 students each year, distributed as 200+ per grade, in Grades 9 through 12. Most students at Suburban High School have graduated from the district's only public middle school, which shares a campus with the high school.

In 1997, the Department of Education in the state where Suburban High School is located rated the school as being in the top quintile (20%) statewide in socio-economic status. In 2000 and 2001, the school was rated in the second-from-top quintile.

Since the 1991-92 school year, when students in the Traditional cohort were in sixth grade, students at the feeder middle school have used the *Visual Mathematics* curriculum (Foreman & Bennett, 1991). *Visual Mathematics* is an innovative curriculum designed to reflect the reforms characterized in the NCTM *Standards*. Published by a small non-profit company, *Visual Mathematics* is currently used only in a handful of districts across the United States. Because of their unusual middle school experience, students in both the Traditional cohort and students in the First Reform and Second Reform cohorts entered high school with a unique prior mathematics experience that may influence their readiness for solving the kind of problems emphasized by *Standards*-based curricula.