The Impact of Mandatory Remediation for High School Students

A Special Project to

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The Impact of Mandatory Remediation for High School Students

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ABSTRACT

This project determined the effectiveness of the district requirement that mandated that high school freshmen and sophomores scoring below the fiftieth percentile in reading and/or mathematics on the Measures of Academic Progress test take a remedial course for reading and/or mathematics in addition to courses in English and mathematics. The Measures of Academic Progress was used by the district as a predictor of likely success on the Washington Assessment of Student Learning.

The data showed that some growth was achieved by groups of students required to take additional reading and/or mathematics. However, the value of the growth was limited when compared to the impact the additional requirement had on addressing other issues related to student achievement.

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CHAPTER 1

Introduction

Background for the Project

A great debate has taken place on the best practices for improving student achievement on the Washington Assessment of Student Learning. In a school district, student achievement was measured using an assessment known as the Measures of Academic Progress. The Measures of Academic Progress was a computer-based assessment program aligned with Washington's Essential Academic Learning Requirements. The assessment tested student abilities in reading and mathematics and provided immediate data in a number of specific skills related to reading and mathematics.

Using data from the Measures of Academic Progress assessment, the school district made estimations of student likelihood for success on the Washington Assessment of Student Learning. Students deemed unlikely to pass the Washington Assessment of Student Learning because of low scores on the Measures of Academic Progress were assigned additional courses in reading and/or mathematics. The courses were commonly referred to as doubles classes, meaning that a student was required to double up on reading and/or mathematics if the district projected that passing the Washington Assessment of Student Learning was unlikely based on a student's score on the Measures of Academic Progress.

The rational for requiring doubles classes in reading and/or mathematics came from the school board as written in Board Policy R3110.1, which stated that individual student placement could be based on scores on individual student achievement tests. The

district's strategic plan put policy R3110.1 into action with section 2.4.2, a section identifying the need for catch-up growth. Students in middle school and elementary school typically improved seven to nine points each year on the Measures of Academic Progress in reading and mathematics when taking one reading and one mathematics class. The school board expected that students with low scores could and should improve 14 to 20 points if students took additional classes in reading and/or mathematics.

High school students scoring below the 50th percentile on the Measures of Academic Progress in reading and/or mathematics were required to take an additional class in either reading and/or mathematics. For the 2008 and 2009 school years, students below the 73rd percentile in mathematics were to be required to take an additional mathematics class.

What remained unclear was whether additional reading and/or mathematics actually increased student achievement on either the Measures of Academic Progress assessment or the Washington Assessment of Student Learning. No research was presented in support of the policy requiring students to take additional courses in reading and/or mathematics at the high school level.

Statement of the Problem

Data on student achievement was not prepared to support or refute the efficiency of requiring students to take additional reading and mathematics classes at the high school level. The question that needed to be answered was whether or not requiring additional reading and/or mathematics was successful in raising high school student scores on the Measures of Academic Progress.

Purpose of the Project

This project was created to evaluate the efficiency of requiring students performing below the 50th percentile in reading and/or mathematics on the Measures of Academic Progress to take additional classes in the reading and/or mathematics. This project looked at test results and the academic growth of students placed in additional classes.

Delimitations

The district was comprised of 15,087 students and was located in a population center of over 160,000 people. The population center was comprised of three cities in a region that was noted for a large government nuclear facility, massive agricultural activity, and for serving as the region's retail hub.

The district was a well-funded and well-supported educational entity. The district's two new high schools had been built with over 25 million dollars in tax payer funds. The third high school was an older facility that had been renovated in the year 1990 for under six million tax payer dollars.

All 236 teacher at all high schools in the district were highly qualified. In addition, over 65% of the district's high school level teachers had earned a master's degree.

Although the number of students required to take doubles classes changed with each school year, the district had over 200 high school students in doubles classes in reading and/or mathematics at any given time. Of the multiple high schools in the district, the high school with the highest free and reduced lunch count and the largest minority population had the most students taking doubles classes in reading and/or mathematics. Essentially, the poorest and most diverse high school student population had a significant portion of the school's students enrolled in doubles classes. While the district had a 26%

Hispanic student population, the high school with the most students taking doubles had a Hispanic population of 43%. While the district had a free and reduced lunch count at 27%, the high school with the most students taking doubles had a free and reduced lunch count of 63% (Office of Superintendent of Public Instruction, 2008).

The high numbers of doubles students in one of the district's high schools placed a burden on career-related and elective course offerings for freshmen and sophomores. Student schedules did not have room for students to take doubles in reading and mathematics and still have room for science, career related courses, or elective courses.

A comparison of data using the Measures of Academic Progress at the high school level was used to either support or refute the efficiency of requiring additional reading and mathematics courses. Student assessment results were compared between students required to take additional reading and mathematics and students that took only a single course in reading and mathematics.

Assumptions

Teachers and students expressed some concern over the perceived benefits of requiring students to take additional reading and/or mathematics classes based on student scores on the Measures of Academic Progress. In the absence of data to support the benefits of requiring additional reading and mathematics, students and teachers often responded to the requirement with negative opinions.

Hypothesis

Students required to take two reading and/or two mathematics classes each day would show significant growth on the Measures of Academic Progress.

Null Hypothesis

Students required to take two reading and/or two mathematics classes each day would not show significant growth on the Measures of Academic Progress.

Significance of the Project

This project supported or refuted the efficiency of requiring high school students to take additional reading and/or mathematics courses based on student scores on the Measures of Academic Progress. The number of courses high school students needed to graduate stayed the same and the doubles requirements greatly reduced the variety of courses high school students could take during the school day. If the practice of requiring students to take the doubles classes proved to be ineffective, then administrators and the school board would need to take a hard look at continuing the practice.

Procedure

This project was based on data collected from district high school students who took the Measures of Academic Progress assessment in both the fall and spring for the subjects of reading and mathematics. Test data was compared between students enrolled in additional reading and mathematics classes and students enrolled in only a single reading and mathematics class. Interviews with students and teachers about student progress were also taken.

Definition of Terms

block schedule. The term referred to a high school daily schedule in which students attended a class that met for a longer class period than a traditional class period but did not meet everyday. Class periods lasted on average of an hour and 20 minutes.

college-readiness. The term referred to the concept that high school graduates would be prepared to succeed as college students immediately after graduation.

doubles. The term doubles referred to the additional reading and/or mathematics class that were required of students in the school district.

traditional seven period day. The term referred to a high school daily student schedule in which a student attended the same seven class periods everyday of the semester. Class periods lasted on average of 45 minutes.

traditional six period day. The term referred to a high school daily student schedule in which a student attended the same six class periods everyday of the semester. Class periods lasted on average of 55 minutes.

Acronyms

MAP- Measures of Academic Progress

NCLB- No Child Left Behind

NWEA- Northwest Evaluation Association

WASL- Washington Assessment of Student Learning

Chapter 2

Review of Selected Literature

Introduction

Literature on best practices for improving high school student achievement on standardized tests in the state of Washington was reviewed for this project. The review of literature was intended to locate research that could support or refute the practice of requiring students that fell below the 50th percentile on the MAP test in reading and/or mathematics to take an additional course in reading and/or mathematics. National, state, and local research-based literature was reviewed. The reviewed works shared the common focus of improving student learning at the high school level.

The impact of demographics and poverty were the most dominant factors that influenced the achievement levels of high schools, or so the reviewed literature seemed to state. Slight advantages were shown to exist with schools that had specific bell schedules (Baker, Joireman, Clay, & Abbott, 2006). More importantly, some of the research indicated that addressing the short comings of the student directly and in a non-school setting were likely to bring about eventual improvement in student achievement. The literature review also revealed that there were specific steps that schools could take that could bring additional growth in student achievement. The facts showed that researchers had thoroughly studied student populations and how student populations related to test scores. However, literature on how best to improve student performance in schools with clear demographic differences from schools that performed at a higher level showed a lack of consensus (Peterson & Abbott, 2006).

Research from Data in Washington State

Several key studies on possible determining factors influencing student achievement on the Washington Assessment of Student Learning had been written. The impact of a school's daily schedule on WASL achievement was presented in a report by Baker, Joireman, Clay, and Abbott entitled "Schedule Matters, The Relationship between High School Schedules and Student Academic Achievement" (2006). In the year 2006, Peterson and Abbott, in the report "The Power of Early Success 1998-2004: A Follow Up Study on the Determinates of Student Achievement," followed up research on factors that influenced fourth and seventh grade students by looking at the test scores and factors that influenced tenth graders. Both reports provided conclusive data that could have been used by schools attempting to improve student achievement.

In determining the impact of school schedules on student achievement, 296 schools were examined. The schools studied used either a traditional seven day period, a traditional six period day period, a four by four block schedule, an alternating block schedule, or a modified block schedule. The study determined that the traditional seven period day, followed by the traditional six period day schedules, had student populations that performed slightly higher on the WASL compared to students in schools that followed any type of block scheduling (Baker et al., 2006). While fully 41% percent of the 296 high schools in Washington used a traditional six period day, 21.6% of the schools studied used the traditional seven period day. Traditional, in the schools studied, meant that the classes taught were taught every day, followed the same order of classes every day (first period, second period, etc.), and used a semester grading period.

The non-traditional schedules were called block schedules, which meant that the classes in those schools did not meet everyday but stayed in session for a longer time than classes scheduled in a traditional schedule. Schools with a block schedule made up 37% of the schools studied. Only the schools with what was called a modified block (15.9% of the schools in the study used a modified block) showed greater success on the WASL than schools with traditional schedules (Baker et al., 2006).

The study of high school schedules did not show a clear advantage to any particular structure of the school day, as traditional schedules showed only a slight significance over non-traditional schedules. Critical thinking and curriculum expert Robert Marzano had stated that a school's activities and a teacher's activities influenced only around 20% of a high school student's level of achievement. A full 80% of a high school student's achievement resulted from the abilities, background, motivation, and experience of the individual student (Parsley & Labounty, 2007). Since no significant difference was found in high school scheduling practices in terms of improving student achievement, Marzano's ideas on the possible impact of school level practices seemed to offer some contradictory ideas related to the district requirement of more reading and mathematics instruction for students who fell below the 50th percentile on the MAP test.

In an exhaustive follow-up research paper, Peterson and Abbott looked at the tracking of students from fourth to seventh grade done by Jeffery Fouts in the year 2002. After studying Fouts's work on the achievement differences of students between the fourth and seventh grade, Peterson and Abbott continued the study by tracking student progress from the fourth grade to the tenth grade. While growth was apparent for students who functioned at level two and level three in the fourth grade and continued on to test in the

seventh and tenth grade, statistics clearly stated that the majority of level one fourth graders failed to make enough growth to pass the WASL as tenth graders (Peterson & Abbott, 2005).

A level one student was a student that performed at the lowest of the four identified levels on the WASL, scoring below standard at a range that fell below 375. A student needed to score 400 or above on the WASL to pass. A level two student was a student that failed to pass the WASL but had scored at ranges between 375 and 399, which were scores considered close to passing. A level three student was a student that passed the WASL by scoring 400 to 421. A level four student was a student who passed the WASL with a strong test performance scored at 222 or above (Peterson & Abbott, 2005).

The Peterson and Abbott study in 2005 showed that at a state-wide level many level one fourth grade students failed to become level three students by the time the students took the WASL in tenth grade. In the year 1998, 11.3% of fourth grade students that took the WASL reading test earned scores that put the students at level one. The same student population, when studied after the tenth grade WASL was taken in 2004, had 11.5% of the students scoring at level one, a slight increase in the number of level one students from the test taken when the students were fourth graders. While huge improvements were made getting level two students to level three and level three students to level four in reading, the number of the lowest scoring students stayed relatively the same.

The trends in student growth on the WASL mathematics test, referred to as the Math WASL, showed that level one mathematics students made up 40.3% of all fourth graders in 1998. By the time the same students took the tenth grade Mathematics WASL, 29.4% of the student population remained at level one. The 10.9% growth of students testing

above level one over a six year period was followed (in terms of growth) by the 10.1% growth in the number of level four students during that same six year time period. While growth was significant, the fact remained that one fourth of all tenth graders that took the WASL remained at level one despite six years of instruction in Washington's public schools. Ultimately, the number of students that passed the Math WASL at a level three or four grew only by 11% over a six year period.

The Peterson and Abbott study also highlighted the struggles of certain ethnic groups in terms of achievement as measured on the WASL. Peterson and Abbott also noted that the study did not include suggestions for growth. Nor, Peterson and Abbott wrote, did the study reveal any program or change that impacted student learning (2005). The data was clearly measured but failed to give any explanations as to why some tenth graders were able to pass the WASL and some tenth graders were not able to pass the WASL.

High School Student Achievement Studied on a National Level

Research on the best practices for improving high school student achievement revealed that schools across the United States had different approaches to meeting both federal and state expectations. Parsley and LaBounty (2007) used the well-known research of Marzano to support and explore the potential of after-school programs as a means to improve the growth and achievement of low income high school students. Marzano was referenced in the *Principal Leadership* article "Joining Forces" as the article identified three categories that positively influenced student achievement: school-level practices, teacher-level practices, and student-level practices (Parsley & Labounty, 2007). The review of Marzano's research revealed that while school and teacher level practices were significant, fully 80% of student achievement was related to student-level

practices. In short, the success of high school students in school was most greatly impacted by the abilities, attitudes, experiences, and knowledge the student had acquired prior to specific learning opportunities in the classroom. Parsley and LaBounty used Marzano's research to support the need for research-based practices to be applied to programs that focused on student-level practices. The achievement gap could have possibly been narrowed by providing after-school programs that provided students with activities that enriched and motivated.

The fact that schools had no control over many aspects of the home environment was identified as a factor that limited the impact of school and teacher-level practices on student achievement. However, the flexibility of after-school programs, coupled with direct cooperation with the school, could have made inroads that affected parents' communication with the parents' child or children about homework completion, setting goals for the future, and overall supervision of the parents' child or children's academic achievement (Parsely & LaBounty, 2007).

The research of Parsely and LaBounty also examined specific after-school programs that provided enriching and motivating experiences to students that often lagged behind other students in the student-level characteristics that Marzano identified as needed for high levels of student achievement. A break dancing class and a program that taught students how to make movies were highlighted as examples. The key was that those programs motivated students but also provided background knowledge and bridged the communication gap between school and parents (Parsely & LaBounty, 2007).

Perhaps the most widely shared trend in high school reform was the move to prepare students for college. The term "college-readiness" was often used. In an anonymous

study published in *Peer Review* entitled "Data on College Preparation, College Readiness, and Achievement in College", the author attempted to illustrate the perception of colleges and the self-assessments of college students on this issue of how high schools actually prepared students for college (2007).

After years of No Child Left Behind, with the implementation of high-stakes state assessments (like Washington State's WASL), and the addition of more rigorous credit requirements for high school graduation, colleges and college students felt underserved by the nation's high schools. A study of colleges and universities found that only 36% of full-time faculty agreed that students were well-prepared academically (Data on College Preparation, College Readiness, and Achievement in College, 2007).

The same study also showed that a full 56% of university faculty said that underprepared students were a serious cause of stress. When college students were asked to compare current coursework with high school work, the differences were interesting and highlighted the different directions many high schools had gone in the implementation of curriculum and structure. College students said that 75% of student course work emphasized synthesis and making judgments while 79% of college students said college coursework emphasized applying theories to practical situations (Data on College Preparation, College Readiness, and Achievement in College, 2007).

The National Assessment of Educational Progress claimed that only 38% of 17 year-olds had demonstrated an ability to comprehend complicated information that had been assigned as reading. Further information showed that high school students were not asked to work hard, write long papers, or complete extensive assignments outside of the regular school day (Data on College Preparation, College Readiness, and Achievement in

College, 2007). If the impact of NCLB was to focus on the achievements of tenth graders, the focus on college-readiness was clearly not focused on the work being asked of eleventh and twelfth graders. In Washington State, the Office of the Superintendent of Public Instruction's website offered a working list of Essential Academic Learning Requirements for teachers to use in the preparation of lessons. The website only listed Essential Academic Learning Requirements up to the tenth grade. No mention of what was expected for eleventh and twelfth graders was listed (Office of Superintendent of Public Instruction, 2008).

High school student achievement at the local and regional level

Washington Education Association president Charles Hasse told reporter Kathie Durban of Vancouver's newspaper *The Columbian* that 72% of the 78,000 teachers Hasse represented opposed the use of the WASL as a graduation requirement, a jump up from the 59% opposed to the WASL as a graduation requirement in the year 2000. In the same interview, Arcella Hall of the Washington State Association of Principals called sticking to the WASL "an issue of social justice" (Durbin, 2006, p. A1). Hall said that poorer schools with large populations of non-English speakers had been able to find ways to help students pass the WASL, but at a serious cost. While 35% of the students at Hall's school passed the WASL, remedial courses were given to low performing students instead of vocational and elective courses intended to promote career-development and college-readiness (Durbin, 2006).

Measures of Academic Progress

Each state in the United States had adopted some sort of student academic assessment that was unique for the state. Yet, many states desired to collect data on student

achievement that was comparable on a regional and national level. The Northwest Evaluation Association produced an easily-applied student assessment known as the Measures of Academic Progress. The assessment was used by many states and the assessment provided multiple layers of data in the areas of reading, writing, and mathematics.

Some states were able to make connections between student achievement as measured by the Measures of Academic Progress and the likelihood of success on the state's own academic assessment. Washington State was able to calculate the probability of student success on the Washington Assessment of Student Learning using data from Washington students' scores on the Measures of Academic Progress. Michigan was able to calculate the probability of student success on the Michigan Educational Assessment Program also using scores from the Measures of Academic Progress (Shane, 2008).

Washington Assessment of Student Learning

In the year 1993, the Washington State Legislature created the Commission on Student Learning. The commission was given the task of establishing what all students should know and be able to do in eight academic areas. The commission was also charged with creating an assessment system and a system of accountability. The Washington Assessment of Student Learning was a result of the efforts of the commission.

The Washington Assessment of Student Learning became a controversial issue after the state required a minimum passing score on the assessment as a graduation requirement. Large numbers of students failed to achieve a score high enough to meet the graduation requirement, especially in mathematics. The state of Washington

modified the requirement in mathematics by allowing students failing to meet the minimum score to take additional mathematics courses as a substitute for a passing score (Shaw, 2008).

The controversy of the Washington Assessment of Student Learning and graduation requirements served as a hot button issue in the year 2008 election campaign for the Office of Superintendent of Public Instruction. Randy Dorn was elected after campaigning on a platform that promised to replace the Washington Assessment of Student Learning with an assessment that provided many of the characteristics of the Measures of Academic Progress.

Chapter 3

Methodology and Treatment of Data

Introduction

The question that needed to be answered was whether or not requiring additional reading and/or mathematics courses proved successful in raising high school student scores on the MAP test. High school students with MAP scores below the 50^{th} percentile in reading and/or mathematics in the school district were required by school board policy to take additional courses in those subjects. Students required to take two English courses and/or two mathematics courses were called doubles students.

Pre-test and post-test scores of students that took the MAP test were collected from a class of students taking double English classes. Pre-test and post-test scores of student that took the MAP test were collected from a class of students taking double mathematics classes. A statistical hypothesis test was run to compare the pre-test and post-test data to see if there was significant growth in student achievement on the MAP test. The statistical test given was a *t*-test for independent samples.

Methodology

Quantitative research methods were used to support either the hypothesis or null hypothesis. Quantitative research was defined as numerical data collected and analyzed to explain an area of interest (Gay, Mills, & Airasian, 2006). In the study, the quantitative data was collected for the purpose of explaining whether or not students required to take two reading and/or two mathematics classes each day would show significant growth on the Measures of Academic Progress.

Participants

Two groups of high school students were used to create two purposive samples for the study. The students that made up each purposive sample were known to have scored below the 50th percentile on the MAP in either reading and/or mathematics. Therefore, the subjects were believed to represent a given population of lower achieving students, targeted for mandatory remediation in the form of required additional courses. A purposive sample consisted of a sample selected from a group that was believed to be representative a given population (Gay et al., 2006).

The subjects of the first purposive sample were 28 high school freshmen required to take English 1 and the English elective known as Reading Lab. Twenty-five high school sophomores required to take Algebra One and a mathematics elective known as Math Lab were the subjects used to create the second purposive sample. The two samples were referred to as the English sample and the mathematics sample.

The 28 freshmen required to take two English courses were taught by highly-qualified teachers endorsed by the Office of the Superintendant of Public Instruction to teach English to high school students. The 25 high school sophomores were also taught by highly-qualified teachers endorsed by the Office of the Superintendant of Public Instruction to teach mathematics to high school students. Each student in the sample had scored below the 50th percentile in mathematics on the MAP test given in May of 2008.

Instruments

The measuring instrument used in the study was the MAP test. The MAP test was an assessment program designed to provide teachers with information about students that

would allow teachers to improve teaching and learning. The MAP test was aligned with the academic standards of Washington State, allowing the testing data to serve as a predictor of likely student success on the WASL. The MAP test was given to all students that made up the samples in a computer lab. Results of the MAP test were given to students immediately after completion of the test.

MAP data provided to educators proved to be specific in terms of identifying student strengths and weaknesses. For example, a student in reading might have proved to be strong in comprehension but weak in the area of analysis. A math student might have shown strength in numeration but weak in probability. However, a single score was used to rank the student in a percentile that was formed from scores of all students in Washington State that participated in the MAP test.

Design

The study used a pre-test and a post-test for all students in each sample. In early September of 2008, students in each sample took the MAP test. The September scores for each student on the MAP test were used as the pre-test. In mid-January of 2009, the same students were again given the MAP test. The January scores were used as the post-test. The data for the pre-tests and post-tests was collected from the electronic data bank of the school district.

Procedure

A statistical test for significance was given for the pre-test and post-test scores of both the English sample and the mathematics sample. The statistical test given was a *t*-test for independent samples. The study wanted to discover if significance occurred for the

sample required to take two English courses in a semester. The study also wanted to discover if significance occurred for the sample of mathematics students.

Treatment of the Data

The *t*-test for independent samples was run using a "stat-pack" program on a lap-top computer. The data was manually entered into the program. (A table from the probability tables for the distribution of *t* was used from Gay, Mills, and Arasian's book, *Educational Research* (2006).)

Summary

Using MAP score data collected from the school district's data bank, a statistical test was run to provide accurate data for quantitative research. The populations of the samples for the study were known to have scored below the 50^{th} percentile in reading and/or mathematics. All received the same instruction in reading and/or mathematics from highly qualified teachers.

Chapter 4

Analysis of the Data

Introduction

The focus of the study was to discover if students required to take double reading and/or mathematics courses showed significant growth on the MAP test. The students were required to take an additional reading and/or mathematics course if the student scored below the 50th percentile on either the reading or mathematics portions of the MAP test. The extra courses were called doubles classes and the students who took the classes were called doubles students. Students who were below the 50th percentile in reading were required to take an additional English class in the form of an English elective course. The elective course could not be used to fulfill the 4 year English requirement for graduation. The same was true for mathematics.

The doubles requirement came from a school board mandate, which required all students in grades six through ten to take extra courses in reading and/or mathematics if a student scored below the 50th percentile on the MAP test. This requirement was based on the need of each student to pass the WASL. MAP scores were used by the district to determine the likelihood that a student would pass the WASL.

What was unproved was the effectiveness of the doubles courses in helping students significantly improve reading and/or mathematics scores on the MAP test. Indeed, no data on student growth on the MAP was available at the time of the district's requiring

students to take doubles. Years after the requirement, no data on the overall effectiveness of the doubles requirement had been presented to the school board.

Description of the Environment

The study focused on a group of ninth grade students in doubles reading and compared their fall and winter scores in the MAP test after an entire semester of instruction. The study also focused on a group of 10^{th} grade students in doubles mathematics and compared their fall and winters scores on the MAP test after an entire semester of instruction.

The students in the study had all scored below the 50^{th} percentile on the MAP test. Each student in the study was in a doubles class in reading or mathematics and each class was taught by a highly qualified teacher. The students attended a school that had 57 percent of its students qualify for free and reduced lunch. The school also had a Hispanic population of 43 percent. The school's total population was above 1400 students.

A purposive sample of 25 students in doubles English was used to provide data for an independent *t*-test. A purposive sample of 25 students in doubles mathematics was also used to provide data for an independent *t*-test. The fall MAP test score was used as a pre-test and a winter MAP test score was used as a post-test. The winter MAP test was given after an entire semester of instruction in doubles reading and mathematics.

Hypothesis

Students required to take two English classes and/or two mathematics classes each day would show significant growth on the Measures of Academic Progress.

Null Hypothesis

Students required to take two English and/or two mathematics classes each day would not show significant growth on the Measures of Academic Progress.

Results of the Study

The independent *t*-test for the fall sample of 25 9th grade students taking doubles English showed a mean score of 210.16 with a standard deviation of 14.42. Those students' scores on the winter test had a mean of 213.56 with a standard deviation of 13.42. The comparison of the two tests gave a *t*-value of -.84 with 48 degrees of freedom. The test showed that significance was greater than .05.

Table 1

A Comparison of MAP Reading Scores for 9th Grade Doubles Students

	N	Mean	SD	t	DF	p
Fall	25	210.16	14.42	-.84	48	>.05
Winter	25	213. 56	13.42			

The independent *t*-test for the fall sample of 25 10th grade students taking doubles mathematics showed a mean score of 219.92 with a standard deviation of 11.07. Those students' scores on the winter test had a mean of 221.36 with a standard deviation of 13.42. The comparison of the two tests gave a *t*-value of -.40 with 42 degrees of freedom. The test showed that significance was greater than .05.

Table 2

A Comparison of MAP Math Scores for 10th Grade Doubles Students

	N	Mean	SD	t	DF	p
Fall	25	219.92	11.07	-.40	42	>.05
Winter	25	221.36	13.62			

The results of the tests rejected the null hypothesis that students required to take two reading and/or two mathematics classes each day would not show significant growth on the Measures of Academic Progress. The samples used in the study averaged more then two full points of growth.

Findings

Data showed that, taken as a whole, the doubles classes in English and mathematics produced growth in the collective scores of the students required to take the doubles courses. The two samples each had over two points of growth on the MAP test but neither samples had over 4 points of growth. However, when the samples were looked at individually the scores showed that seven of the 25 students in doubles English experienced negative growth. Six of the 25 students in doubles mathematics experienced negative growth. While the majority of students showed slight growth, the improvement in scores could not be considered successful when the expected growth given by the school board was seven points of growth.

The hypothesis that students required to take two English classes and/or two mathematics classes each day would show significant growth on the Measures of Academic Progress was only slightly proven. Statistically, growth was achieved. Yet, the discussion had not taken place over the efficiency of requiring students to take extra courses in the subject of English or mathematics. What remained unanswered was whether or not a few points of growth on the MAP test was worth the time, expense, and frustration of requiring doubles classes.

Discussion

The purpose of requiring high school students to take additional classes in English and/or mathematics based on student MAP scores was intended to give students an improved chance of passing the state mandated WASL. The doubles requirement was based on the concept that more work in a subject area would improve student achievement in the subject. Research of national and state efforts to improve student achievement revealed that requiring more course work in a subject did not address many of the reasons why students were not able to succeed on the WASL or similar tests. If enough time and money was spent on providing more learning opportunities, a slight gain in student achievement was achieved. Yet, research showed that 20% of a school's efforts and/or a teacher's efforts impacted student achievement (Parsley & Labounty, 2007). The overall determining factor relating to student achievement came from the issues related to student-level activity. Demographic studies supported that lower income students performed at lower levels on state mandated exams, such as the WASL. The doubles classes addressed the issues relating to what a school and/or teacher could do to impact student learning but did not address the demographic issues related to student achievement.

Summary

Slight growth in student achievement on the MAP test was achieved by high school students required to take doubles English and/or mathematics courses. However, the doubles requirement did not produce enough growth to put the majority of students in the doubles classes above the 50^{th} percentile in reading and/or mathematics. The study reinforced the possibility that school practices and teacher practices could positively impact a small percentage of high school students' achievement. The doubles

requirement did not address the issues of student-level practices as the doubles requirements provided only additional instruction and drill for students. The doubles classes did not address the impact of socio-economics on student achievement.

Chapter 5

Summary, Conclusions, and Recommendations

Introduction

The purpose of the study was to determine the effectiveness of requiring high school students to take additional English and/or mathematics courses in order to improve student scores in reading and/or mathematics on the MAP test. The data supported the hypothesis that students required to take two reading and/or two mathematics classes each day would show significant growth on the Measures of Academic Progress. Therefore, the null hypothesis was rejected.

Summary

The data showed that the doubles requirement produced slight growth from the students as a group but also produced a significant number of students that showed negative growth. The established connection between student achievement and socio-economic conditions was not addressed by the doubles requirement. Therefore, the study supported in part national studies that showed the student-level practices made up the majority of factors related to student achievement.

Conclusions

Discussions with school administrators, teachers, and students validated this study's findings that slight growth could be achieved if students were required to take additional

English and/or mathematics courses. A few students even showed enough growth to be taken out of the doubles classes and returned to a typical student schedule.

For the majority of students in the study, a few points of growth on the MAP test did little to change the student's overall academic situation. Most of the students were still well below the 50th percentile on the MAP test. Most of the students were still considered to be long shots for passing the WASL. Teachers expressed frustration relating to the conditions of the doubles classes. The students in the doubles classes were often in both doubles English and mathematics. These students rarely had room in a six period day class schedule to take electives courses such as music or physical education - - courses traditionally considered to provide motivation and enrichment. The doubles classes consisted of students who had few classes with the rest of the student population. Administrators noted that the classrooms with the most serious classroom management issues were most often doubles classes filled with doubles students.

Again, the outcome relating to student growth was clear; students would most likely achieve some limited growth. However, the expenses of filling teaching positions to meet the demands of providing doubles classes limited the number of teaching positions in other subjects, especially elective classes. Student moral in the doubles classes was often lower because of a lack of positive student role models and the inability to fit in electives such as music or physical education into a doubles student's schedule.

Recommendations

Instead of requiring students scoring below the 50th percentile to take additional English and/or mathematics courses, providing courses that address the students' needs at the student-level should be provided. The additional instruction and drill work that were

a part of the study provided little growth. A recommendation would be that schools look to provide opportunities for growth in reading and mathematics for all students across the curriculum. Social studies and science courses could be reading intensive and provide ample additional instruction and drill. Science, electives, and physical education could provide hands-on practical mathematics instruction and experiences. Simply aligning state standards in reading and mathematics with other courses would go along way in creating a more efficient student schedule.

Students of poverty are clearly the demographic group that suffers the greatest likelihood of academic failure on the WASL and the MAP test. The impact of poverty on student achievement cannot be overcome simply by focusing on giving students additional lessons and drills in a specific subject. Providing a motivating and inviting school experience for students should be a priority. Remediation needs to be addressed with sensitivity. A creative, well-rounded, and integrated approach towards education would serve low-achieving students more efficiently.

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