CollegeBoard
connect to college success™

Research Notes
Office of Research and Development RN-21

Evaluation of SpringBoard® English Textual Power™ and Mathematics with Meaning™ Pilot Program

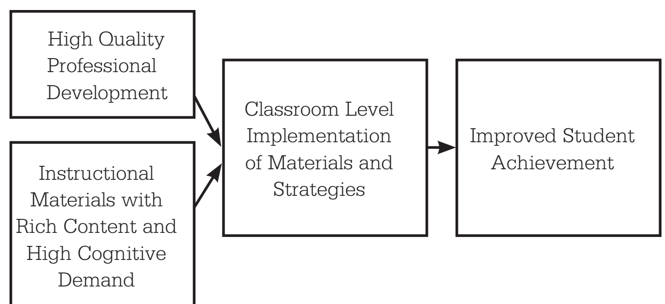
Mary-Margaret Kerns

Introduction

Building on the success of the Advanced Placement Program® and the findings regarding academic intensity and the quality of one's high school curriculum in preparation for success in college (Adelman, 1999), the College Board developed a program in the content areas of English and mathematics designed to prepare students for challenging content as early as grade six and extending through high school. Conceived with the goal of creating high-quality professional development activities with associated instructional strategies embedded in instructional materials rich in content and cognitive demand, the resulting Textual Power and Mathematics with Meaning™ instructional materials and professional development ultimately seek to improve student engagement and achievement in the classroom.

Textual Power and Mathematics with Meaning were piloted in high schools in academic year 2001-02. In academic year 2002-03 Textual Power and Mathematics with Meaning were piloted in both middle schools and high schools. These pilot programs continued in middle schools and high schools in academic year 2003-04. To inform the development process, the College Board contracted with researchers from the American Institutes for Research (AIR) to conduct a formative evaluation of the program. The first 12-month evaluation phase examined the 2002-03 academic year and is referred to as Year 1. The second 12-month evaluation examined the 2003-04 academic year and is referred to as Year 2.

The successful implementation of any educational program or policy is dependent on an assumed set of linked components that will enable the main actors to effect change and desired outcomes (American Institutes for Research, 2003). The implementation and subsequent effect on student achievement is predicated on a set of assumed linkages, depicted as follows:



As such, both of these yearlong evaluation studies examined the questions of classroom *implementation* of Textual Power and Mathematics with Meaning and student *achievement*.

Year 1 Evaluation of Textual Power and Mathematics with Meaning

To address the questions of implementation and achievement, the Year 1 evaluation relied on these sources of data:

- Participant Teacher Survey: Administered in three waves (Introductory, Reflections, and Final) to a nationally representative sample (see Tables 1–3);
- District Administrator Interviews;
- Site Visits: Classroom observations in treatment and comparison classes, teacher interviews, principal interviews, and student focus groups (see Tables 4 and 5);

- Student Work Analyses: Collection and analysis of student work from both treatment and comparison classes (see Table 6); and
- Student Achievement Analyses: Using student-level achievement data for matched treatment and control classes from two districts.

Implementation Findings

The Implementation Process

The teacher is the central implementor of Textual Power and Mathematics with Meaning, but districts, schools, and the College Board play significant roles in the dissemination and support of the programs. Creating an environment for implementation begins as the College Board establishes a relationship with the district, school, and teacher, and supports this relationship by producing unique instructional materials and high-quality professional development. Drawing from the site visit data, findings regarding implementation at the school and district follow:

- **Teacher Buy-in.** Teacher motivation and enthusiasm are central to effective use of the instructional strategies and materials, given the degree of autonomy associated with implementation. The professional development acted as a catalyst for buy-in, receiving praise from teachers and administrators; however, participation in decision making regarding the use of the program influenced teacher investment and dedication to the use of the materials.
- **Curricular Consistency.** Levels of consistency within a school or district affect the capability of teachers to effectively use Textual Power and Mathematics with Meaning. While many districts indicated that the program is a good "fit" with their goals and standards, other districts needed to examine how to incorporate the instructional material topics into their curricula.
- **Professional Community.** The existence of a trained teacher network or interconnected professional community is a key factor in maintaining implementation over time.
- **Instructional Leadership.** The leadership of either a principal or key teacher coordinator was found to be an effective method of instructional support.
- **Student Engagement.** The perception of student engagement together with the belief that Textual Power and Mathematics with Meaning add value to instruction, strongly influenced teachers to make changes to align instructional philosophy and practice with the programs.

Classroom Implementation

Interview and survey data indicate differences in teachers' patterns of use and perceptions of individual units; however, teachers generally perceived the Textual Power and Mathematics with Meaning to be of value in content and student engagement.

- **Usage Trends.** The majority of all teachers reported making minor modifications to the units prior to using them, with Textual Power users more frequently reporting making modifications. Teachers reported using the instructional units with regular students, advanced students, and classes of mixed ability, but few teachers reported using the materials with students of the lowest ability levels.
- **Usage Differences.** Differences between schools, between teachers, and between content disciplines emerged. Teachers of Textual Power were more likely to treat the materials as a comprehensive instructional package. Textual Power teachers commented on the need for more scaffolding, whereas teachers of Mathematics with Meaning felt some assignments were especially challenging because of the reading skills required. The importance of alignment with standards and curricula emerged.
- **Perception of Value.** Despite varying usage patterns and alignment concerns, significantly over 80 percent of both Textual Power and Mathematics with Meaning teachers reported that they felt the instructional materials provide a good framework for what students should know and be able to do.
- **Perception of Engagement.** Despite some questions regarding level of challenge of the instructional materials, on the Final Survey 86 percent of the Mathematics with Meaning teachers and 80 percent of the Textual Power users reported that they agreed or strongly agreed that their students were actively engaged with the instructional units. The interview data reveal that teachers attribute this engagement to the group work, the active nature of the units, and the hands-on activities.

Student Work Analyses

Student work samples from both treatment classes and control classes were analyzed. Textual Power teachers and Mathematics with Meaning teachers submitted student work samples based on the instructional materials and related assignments, and the respective control class teachers submitted assignments they considered typical. The assignments were coded based on the degree to which students exhibited different types of conceptual and technical skills using rubrics developed specifically for the evaluation of Textual Power and Mathematics with Meaning.

- In all categories coded for the English work samples, there was little difference noted between the Textual Power classes and the control classes. The researchers noted that the analysis was hindered by the fluid and creative nature of language and communication, and the diversity within the sample of collected work.
- The Mathematics with Meaning work samples scored much higher than the control group work samples in three of the four mathematics criteria, *conceptual understanding*, *communication*, and *problem solving/reasoning*.

Classroom Observations

The findings from the classroom observations dramatically sharpen the findings regarding classroom implementation and reveal manifest differences between Textual Power and Mathematics with Meaning classes and control classes in several areas. For each separate activity in each classroom observation, researchers coded the observational data with a focus on materials used, activity organization, teaching strategies, and classroom outcomes. Textual Power and Mathematics with Meaning classes differ markedly from the comparison control classes in the following ways:

- The number of distinct instructional activities was generally greater in Textual Power and Mathematics with Meaning classes.
- Textual Power and Mathematics with Meaning classes generally spent more time in interactive classroom modes.
- Textual Power and Mathematics with Meaning teachers spent more time guiding student work as opposed to lecturing.
- Student behavior was markedly better in Textual Power and Mathematics with Meaning classes.
- Teachers spent more time on instruction versus classroom management or unrelated activities in Textual Power and Mathematics with Meaning classes.
- Student engagement as measured by apparent time-on-task was markedly higher in Textual Power and Mathematics with Meaning classes.
- Mathematics with Meaning teachers employed investigative learning strategies more frequently than their counterparts in control classes and used small student learning groups more frequently than the teachers in the control classes.

Achievement Findings

To examine the relationship of instructional materials and instructional strategies associated with Textual Power and Mathematics with Meaning with student achievement, student achievement data at two points, spring 2002 and spring 2003, were analyzed for the same cohort of students. A "pretest/posttest with matched control group" research design was utilized to determine achievement differentials between Textual Power classes and control classes, and Mathematics with Meaning classes and control classes. The control classes were matched on prior achievement, grade level, and courses. Student-level achievement data from two districts—District A and District B—were obtained. In addition, analyses were conducted separately by school level (middle school and high school) and subject (English and mathematics). There were seven separate analyses—two school districts by two school levels by two subjects, minus District B math in middle school where Mathematics with Meaning was not implemented. Hierarchical Linear Modeling (HLM) was used for the analyses. The results of the analyses found both positive and significant effects on student achievement for 2002-03 (Year 1) of the evaluation of Textual Power and Mathematics with Meaning at the following levels (see Table 7):

- District A, High School, Textual Power, $p < .01$
- District A, High School, Mathematics with Meaning, $p < .05$

Follow-up analyses of state mean gains in comparison to District A gains in both Textual Power and Mathematics with Meaning classes revealed that the results in the District A high school analyses were not only statistically significant but of an important magnitude. These achievement findings provide evidence that Textual Power and Mathematics with Meaning can effect positive change in student achievement levels.

Year 2 Evaluation of Textual Power and Mathematics with Meaning

The research activities in the Year 2 evaluation are methodologically similar to those undertaken in Year 1. Although smaller in scope, the Year 2 evaluation was deeply considerate of the Year 1 work, building from those findings but pushing beyond the short-term consideration of implementation to examine the staying power of Textual Power and Mathematics with Meaning.

To address the questions of implementation and achievement in Year 2, the evaluation relied on these sources of data:

- **Site Visits:** Site visits to high schools and middle schools included interviews with teachers and administrators as well as observations of classes with teachers who were using Textual Power and Mathematics with Meaning and comparison classes in English and mathematics respectively (see Table 8).
- **Student Achievement:** Student achievement data from state assessments—District A and District B that were analyzed in Year 1—were analyzed for Textual Power classes and matched control classes, and for Mathematics with Meaning and matched control classes.

Implementation Findings

From the interview data collected at school sites, several themes emerged relevant to the implementation and sustainability of Textual Power and Mathematics with Meaning. The emerging themes follow:

- **Professional Development.** From the perspectives of teachers and administrators, the professional development associated with Textual Power and Mathematics with Meaning is reported as one of the most exciting and beneficial aspects of the program. Teachers from both disciplines describe the experience as positive—specifically the useful activities, active learning, and the opportunity for collective participation. A limited amount of criticism of the content was cited.
- **Pedagogy.** Teachers using Textual Power and Mathematics with Meaning cite the hands-on approach and collaborative nature provided by the instructional activities which provide new ideas and creative methods for engaging students in nontraditional lessons and texts. Successful implementation requires a willingness to try new instructional techniques.
- **Content and Skills.** Most teachers using Textual Power and Mathematics with Meaning agree that the content of the instructional materials are appropriate for their classes and place an emphasis on higher-order and critical thinking skills. However, concern regarding basic skills and state assessments can force teachers to relegate Textual Power and Mathematics with Meaning instructional materials to a lower priority to allow for coverage of basic skills.
- **Materials.** Textual Power and Mathematics with Meaning materials disproportionately were described as comprehensive. The availability of materials emerged as a consideration, as well as future funding to continue the professional development and implementation of the program.

School Capacity

Site visit data revealed the strong influence of school structures and conditions on the depth of implementation. The findings revealed several school capacity elements to be significant factors:

- **Teachers' Knowledge, Skills, and Dispositions.** Teachers across the sites described Textual Power and Mathematics with Meaning as grounded in good teaching practices. Teachers described favorably the comprehensive nature that balances skills with higher-order thinking and problem solving. The teachers' varied descriptions of "usefulness" appears tied to the type of student population with which they work.
- **Program Coherence.** A significant tension exists between a teacher's desire to use Textual Power or Mathematics with Meaning and the perceived necessity to address one or more of the following: state standards, preparation of students for tests, and mandates for other instructional initiatives. Where adoption of Textual Power or Mathematics with Meaning is voluntary, (i.e., teacher choice rather than district adoption), the tension is unavoidable. In schools and districts that endorse Textual Power and Mathematics with Meaning initiatives (e.g., incorporating into pacing guides), this tension appears to be lessened greatly.
- **Professional Community.** The presence of a professional community facilitates coordinated instruction, and teachers find the opportunities for professional conversations stimulating, motivating, and productive. The availability of the professional community to support sustained use of Textual Power or Mathematics with Meaning is a function of program coherence and instructional priorities (i.e., teachers in the professional community recognize the initiatives as closely linked to their instructional objectives).
- **Technical Resources.** Access to resources is directly linked to sustainability. Few sites reported particular difficulty with gaining the resources to support the implementation of Textual Power or Mathematics with Meaning. This may be a function of defining the initiatives as instructional initiatives that emphasize instructional strategies and professional development rather than a curricular program that requires the resources. Funding for future use remains a concern for some districts.

Classroom Observations

The findings from the classroom observations describe the implementation of Textual Power and Mathematics with

Meaning at the level at which the initiatives arguably have their greatest impact—in the classroom. To address the complexities of classroom dynamics, classroom-based factors including teacher-student interactions, types of teaching strategies, and student engagement were examined through direct and detailed classroom observations. Combining the Year 2 observations (see Tables 9 and 10) with the classroom observations from Year 1 reveals manifest differences in several areas between Textual Power classes and English control classes and Mathematics with Meaning classes and mathematics control classes. The differences follow:

Materials Used:

- Teachers trained in Mathematics with Meaning used more manipulatives than the mathematics comparison classes.
- Teachers trained in Textual Power used more text-based material (e.g., fiction, drama, and poetry) than did the English comparison classes.

Classroom Organization:

- Textual Power and English comparison classes had very similar rates of organization in terms of whole-class, small group, and individual groupings.
- Textual Power and English comparison classes had similar rates of student focus in terms of passive and interactive modes.
- Mathematics with Meaning classes exhibited higher rates of organizational strategies that are more interactive (e.g., group work, pair work, and whole-class discussions) than did mathematics comparison classes.
- Mathematics with Meaning teachers spent more time leading and supporting student work than did the comparison classes in which teachers spent more time presenting information.
- Both Textual Power and Mathematics with Meaning classes included a greater number of distinct instructional activities than the respective comparison classes.

Instructional Strategies:

- Textual Power classes used strategies related to Making Meaning from Texts and Creating and Presenting Texts at a higher rate than the comparison classes which had higher rates of Practice and Drill strategies.
- Mathematics with Meaning classes used Problem Solving, Reasoning and Proof, Communication, Connections, and Representation strategies at a higher rate than mathematics comparison classes. The Problem Solving and Communication strategies appearing most frequently were those related to learning, investigating, and practicing mathematical concepts; discussing or writing mathematical explanations; and clearly discussing or writing about mathematics.

Student Engagement:

- Student behavior disturbances occurred less frequently in both Textual Power and Mathematics with Meaning classes than in the respective comparison classes.
- Both Textual Power and Mathematics with Meaning classes had higher rates of student on-task behavior than did the comparison classes.
- Mathematics with Meaning classes exhibited higher rates of student on-task participation in group and other student-centered activities than did the mathematics comparison classes.

The classroom observation data complement the interview data. The findings suggest that students in classes using Textual Power or Mathematics with Meaning are engaged by the work and that the skills in the instructional activities require more complex thought processes and strategies than are typically demanded. These differences appear more dramatic for Mathematics with Meaning, but both Textual Power and Mathematics with Meaning have positive impacts in the classroom.

Achievement Findings

To examine the relationship of instructional materials and instructional strategies associated with Textual Power and Mathematics with Meaning with student achievement, student achievement data at two points in time, spring 2003 and spring 2004, were analyzed for the same cohort of students. Student achievement was measured by state assessments. The same two districts—District A and District B—that were analyzed in the Year 1 evaluation were analyzed in Year 2. A "pretest/posttest with matched control group" research design was utilized to determine achievement differentials between Textual Power classes and control classes, and Mathematics with Meaning classes and control classes. The control classes were matched on prior achievement, grade level, and courses.

Analyses were performed separately for the two school districts (Districts A and B). The analyses were conducted separately by subject (English and mathematics) and by school level (middle and high school). Data were not available for District B middle schools; therefore six analyses were undertaken. Hierarchical Linear Modeling (HLM) was used for the analyses. The results of the analyses found both positive and significant effects on student achievement for

2003-04 (Year 2) of the evaluation of Textual Power and Mathematics with Meaning at the following levels (see Tables 11 and 12):

- District A, High School, Mathematics, $p < .05$
- District A, Middle School, Mathematics, $p < .05$
- District A, Middle School, English, $p < .01$

As the analyses reveal, Mathematics with Meaning and Textual Power were associated with higher achievement in District A at the middle school in both subjects and at the high school in mathematics only. Mathematics with Meaning and Textual Power were not associated with higher achievement in District B at the high school.

Year 2 achievement findings reveal significant achievement gains at the middle school which were not found in the Year 1 achievement analyses. A possible explanation is that Textual Power and Mathematics with Meaning were piloted in middle schools a year later than in high schools, and this suggests that there is a cumulative effect (i.e., more than one year) on teaching and learning associated with Textual Power and Mathematics with Meaning.

Utilization of Findings

The findings associated with the evaluations of Textual Power and Mathematics with Meaning in Years 1 and 2 of the pilot informed the development (i.e., additional instructional materials, enriched instructional strategies materials, and enhanced professional development) of their current forms in the SpringBoard™ Program. While informing the development process, the findings apply to the implementation of the instructional materials, strategies, and professional development at these points in time (i.e., 2002-03, 2003-04). Additional research regarding these components in the larger multicomponent SpringBoard Program should be undertaken to ascertain their contributions to implementation and achievement in SpringBoard classrooms.

The author is Mary-Margaret Kerns, director of college placement and retention research.

References

Adelman, C. (1999). *Answers in the tool box: Academic intensity, attendance patterns, and bachelor's degree attainment*. Washington, D.C.: U.S. Department of Education.

American Institutes for Research. (2003). E*valuation of Mathematics with Meaning and Textual Power pilot programs 2002–2003 school year*. Washington, D.C.: Author.

Table 1

Sample and Response Rates, Introductory Survey

In Scope Sample		
English	108	
Math	118	
Total	226	
Respondents by Subject		
English	83	77%
Math	92	78%
Total	175	77%

Table 3

Sample and Response Rates, Final Survey

In Scope Sample, Final Survey		
English	61	
Math	63	
Site Visit Teachers	2	
Total	126	
Respondents by Subject		
English	53	87%
Math	51	81%
Total	104	83%

Table 2

Number of Reflections Surveys Completed by Teachers

Number of Surveys	*Number of Teachers*
1	59
2	5
3	3
4	3
5	4
6	1

Table 4

Regional and School Characteristics of Site Visit Schools

District	*Region*	*Locale*	*Middle Schools/ High Schools*	*Teachers (MS/ HS)*	*Program(s)*
D	mid-Atlantic	urban	2 / 2	5 / 6	TP/MWM
C	mid-Atlantic	rural	1 / 0	9 / 0	TP/MWM
B	Western	urban	0 / 3	0 / 8	TP/MWM
F	Southern	midsized city	0 / 1	0 / 4	TP/MWM
E	Western	urban	0 / 2	0 / 6	TP
G	mid-Atlantic	rural	2 / 0	3 / 0	MWM

Table 5

Percentages of Types of Students in Classes Observed

	# of Class Obser-vations	*Mean Length of Class in Minutes*	*% of Obser-vations with Honors Students*	*% of Obser-vations with Remedial Students*	*Mean # of Students in Class*	*Mean # of Asian Students*	*Mean # of Black Students*	*Mean # of Hispanic Students*	*Mean # of White Students*	*Mean # of Female Students*
English										
Textual Power	23	78	4%	0%	19	12%	37%	27%	24%	47%
English Comparison	13	75	15%	0%	19	13%	38%	20%	29%	50%
Math										
Mathematics with Meaning	18	73	44%	22%	21	7%	33%	20%	39%	47%
Math Comparison	12	79	33%	33%	20	9%	20%	27%	44%	53%
Total										
Total TP and MwM Classes	41	76	22%	10%	19	10%	35%	24%	31%	47%
Total Comparison	25	77	24%	16%	20	11%	29%	24%	36%	52%
Total	66	76	23%	12%	20	10%	33%	24%	33%	49%

Table 6

Collected Sample Distribution

District	Region	Locale	Math: Pieces of Student Work	Math: Number of Teachers	ELA: Pieces of Student Work	ELA: Number of Teachers
D	mid-Atlantic	urban	27	3	47	4
C	mid-Atlantic	rural	53	4	27	3
B	Western	urban	49	4	10	1
F	Southern	midsized city	10	1	19	2
E	Western	urban	—	—	58	5
G	mid-Atlantic	rural	31	3	—	—

Table 7

HLM Coefficient Estimates for District A High School

Math	*Coefficient Estimates*	*English*	*Coefficient Estimates*
2002 DSS math achievement score	0.60***	2002 DSS reading achievement score	0.65***
Gender (1=female; 0=male)	-17.17**	Gender (1=female; 0=male)	8.11
Race (1=white; 0=otherwise)	2.95	Race (1=white; 0=otherwise)	10.94
Free or reduced lunch (1=student has free or reduced lunch; 0=otherwise)	-19.07*	Free or reduced lunch (1=student has free or reduced lunch; 0=otherwise)	-25.18
LEP (1=student is LEP; 0=otherwise)	-1.62	LEP (1=student is LEP; 0=otherwise)	-9.11
Disability (0=no disability or gifted; 1=diagnosed with disability)	-7.31	Disability (0=no disability or gifted; 1=diagnosed with disability)	-8.51
Teacher Certification (1=noncertified subject/talent expert; 0=certified)	12.92	Teacher Certification (1=noncertified subject/talent expert; 0=certified)	-71.66
Mixed Grade[a] (1=c9; 0=c10)	-49.77***	Mixed Grade (there is only one group)	N.A.
Course (1=Algebra I; 0=Algebra IB)	24.63*	Course (there is only one course)	N.A.
Treatment group (1=treatment; 0=control)[b]	15.18*	Treatment group (1=treatment; 0=control)[c]	45.62**

Note: $*p < .05$; $**p < .01$; $***p < .0001$

[a]The definition of mixed-grade variable is related to the concentration of different students in different grades in the class.

[b]When Math gain scores (2003 scores–2002 scores) were used, p=0.13 for the treatment group coefficient estimate.

[c]When English gain scores (2003 scores–2002 scores) were used, similar results were obtained for the treatment group coefficient estimate.

Table 8

Regional and School Characteristics of Site Visit Schools

District	*Region*	*Locale*	*School level*	*Number of schools visited*	*Number of teachers observed and interviewed*	*MWM/TP teachers interviewed only*	*Program used*
A	South	rural	High	2	11	2	TP/MWM
B	West	urban	High	2	6	0	TP
F	South	midsized city	Middle	2	11	1	TP/MWM
I	Northeast	midsized city	Middle	2	6	0	MWM
J	Southwest	rural	High	1	3	1	TP
K	Midwest	midsized city	High	2	6	1	MWM

Table 9

Numbers of English Observations with Descriptive Information, 2003 and 2004

	Number of Class Observations	*Mean Length of Classes in Minutes*	*Mean Length of Observations in Minutes*	*Percent of Observations with Honors Students*	*Percent of Observations with Remedial Students*	*Mean Number of Students in Classes*
2003						
Textual Power	24	73	62	7%	0%	19
English Comparison	12	66	64	13%	0%	19
2004						
Textual Power	13	81	69	38%	8%	26
English Comparison	7	80	70	29%	43%	26
2003 and 2004						
All Textual Power Classes	37	76	65	16%	3%	21
All English Comparisons	19	71	66	21%	16%	22
All English Classes	56	74	65	18%	7%	21

Table 10

Numbers of Mathematics Observations with Descriptive Information, 2003 and 2004

	Number of Class Observations	*Mean Length of Classes in Minutes*	*Mean Length of Observations in Minutes*	*Percent of Observations with Honors Students*	*Percent of Observations with Remedial Students*	*Mean Number of Students in Classes*
2003						
Mathematics with Meaning	18	73	66	44%	22%	21
Mathematics Comparison	12	79	60	33%	33%	20
2004						
Mathematics with Meaning	15	78	64	27%	13%	22
Mathematics Comparison	8	79	64	25%	25%	22
2003 and 2004						
All MWM Classes	33	76	65	36%	18%	21
All Mathematics Comparisons	20	79	62	30%	30%	21
All Mathematics Classes	53	77	64	34%	23%	21

Table 11

HLM Coefficient Estimates for District A High School

Mathematics	*Coefficient Estimate*	*English*	*Coefficient Estimate*
2003 DSS mathematics achievement score (prior achievement)	0.67***	2003 DSS reading achievement score (prior achievement)	0.92***
Gender (1=female; 0=male)	-16.41**	Gender (1=female; 0=male)	26.71
White (1=white; 0=otherwise)	1.71	White (1=white; 0=otherwise)	72.23
Hispanic (1=Hispanic; 0=otherwise)	-16.54	Hispanic (1=Hispanic; 0=otherwise)	83.94
Black (1=black; 0=otherwise)	-1.57	Black (1=black; 0=otherwise)	34.02
LEP (1=never been considered for LEP; 0=otherwise)	19.04	LEP (1=never been considered for LEP; 0=otherwise)	54.16
IEP (1=no disability or gifted; 0=diagnosed with disability)	-3.80	IEP (1=no disability or gifted; 0=diagnosed with disability)	59.09
Grade 10 (1=grade 10; 0=otherwise)	30.17**	Grade 10 (1=grade 10; 0=otherwise)	136.50**
Grade 11 (1=grade 11; 0=otherwise)	0.00	Grade 11 (1=grade 11; 0=otherwise)	0.00
Grade 12 (1=grade 12; 0=otherwise)	0.00	Course (there is only one course "Eng I")	N.A.
Course 1 (1=Algebra I and class grade[a] C9; 0=otherwise)	-33.97	Treatment Group (1=treatment; 0=control)[d]	-19.92
Course 2 (1=Algebra I Hon and class grade C9; 0=otherwise)	-13.97		
Course 3 (1=Algebra IA and class grade C9; 0=otherwise)	-64.56**		
Course 4 (1=Algebra IA and class grade P9; 0=otherwise)	-81.43***		
Course 5 (1=Algebra IB and class grade C9; 0=otherwise)	-46.33*		
Course 6 (1=Algebra IB and class grade P9; 0=otherwise)	-60.21**		
Course 7 (1=Algebra IB and class grade C10; 0=otherwise)	-50.01**		
Course 8 (1=Algebra II and class grade C10; 0=otherwise)	-17.70		
Course 9 (1=Algebra II and class grade P10; 0=otherwise)	-13.76		
Treatment Group (1=treatment; 0=control)[b]	17.02*[c]		

Note: *p <.05; **p < .01; ***p < .0001

[a]Class Grade is related to the concentration of different students from different grades in a class.

[b]When mathematics gain scores (spring 2004 scores–spring 2003 scores) were used, similar results were obtained for the Treatment Group coefficient estimate.

[c]For those mathematics coefficient estimates that were significant, their interaction with the Treatment Group variable was tested but the interaction with the Treatment Group variable was found to be nonsignificant.

[d]When English gain scores (spring 2004 scores–spring 2003 scores) were used, similar results were obtained for the Treatment Group coefficient estimate.

Table 12

HLM Coefficient Estimates for District A Middle School

Mathematics	*Coefficient Estimate*	*English*	*Coefficient Estimate*
2003 DSS mathematics achievement score (prior achievement)	0.47***	2003 DSS reading achievement score (prior achievement)	0.69***
Gender (1=female; 0=male)	-4.33	Gender (1=female; 0=male)	-1.99
White (1=white; 0=otherwise)	-9.61	White (1=white; 0=otherwise)	-6.26
Hispanic (1=Hispanic; 0=otherwise)	-18.87	Hispanic (1=Hispanic; 0=otherwise)	-20.59
Black (1=black; 0=otherwise)	-45.31**	Black (1=black; 0=otherwise)	-34.58
LEP (1=never been considered for LEP; 0=otherwise)	13.32	LEP (1=never been considered for LEP; 0=otherwise)	16.47
IEP (1=no disability or gifted; 0=diagnosed with disability)	16.10	IEP (1=no disability or gifted; 0=diagnosed with disability)	30.28*
Grade 7 (1=grade 7; 0=otherwise)	46.80	Grade 7 (1=grade 7; 0=otherwise)	35.40***
Grade 8 (1=grade 8; 0=otherwise)	41.14**	Grade 8 (1=grade 8; 0=otherwise)	33.88**
Course 1 (1=Algebra I Hon; 0=otherwise)	73.79***	Course 1 (1=M/J Lang Arts 1; 0=otherwise)	0.00
Course 2 (1=Algebra IA; 0=otherwise)	44.07***	Course 2 (1= M/J Lang Arts 2; 0=otherwise)	0.00
Course 3 (1=Algebra II Hon; 0=otherwise)	117.69***	Course 3 (1= M/J Lang Arts 3; 0=otherwise)	16.34
Course 4 (1=M/J Mathematics 1; 0=otherwise)	0.00	Treatment Group[b] (1=treatment; 0=control)[c]	20.88**[d]
Course 5 (1=M/J Mathematics 2, Adv; 0=otherwise)	43.48		
Treatment Group[a] (1=treatment; 0=control)[a]	22.72*b		

Note: *p <.05; **p < .01; ***p < .0001

[a]When mathematics gain scores (spring 2004 scores–spring 2003 scores) were used, similar results were obtained for the Treatment Group coefficient estimate.

[b]For those mathematics coefficient estimates that were significant, their interaction with the Treatment Group variable was tested but the interaction with the Treatment Group variable was found to be nonsignificant.

[c]When English gain scores (spring 2004 scores–spring 2003 scores) were used, similar results were obtained for the Treatment Group coefficient estimate.

[d]For those English coefficient estimates that were significant, their interaction with the Treatment Group variable was tested, but the interaction with the Treatment Group variable was found to be nonsignificant.

Office of Research and Psychometrics
The College Board
45 Columbus Avenue
New York, NY 10023-6992
212 713-8000