



STATE OF ALABAMA
DEPARTMENT OF EDUCATION



Joseph B. Morton
 State Superintendent
 of Education

October 29, 2008

Alabama
 State Board
 of Education

MEMORANDUM

TO: AMSTI Directors

Governor Bob Riley
 President

FROM: Steve Ricks
 AMSTI Director

Randy McKinney
 District I
 Vice President

RE: External Evaluation Results for AMSTI

Betty Peters
 District II

The fifth major study examining the effectiveness of the Alabama Math, Science, and Technology Initiative (AMSTI) confirms that **AMSTI improves student achievement**. The University of Alabama serves as the outside evaluator for AMSTI and has delivered its analysis of 2007 test data. Assessment data analyzed included the *Stanford 10*, the *Alabama High School Graduation Exam (AHSGE)*, the *Alabama Reading and Mathematics Test (ARMT)*, and the *Alabama Direct Assessment of Writing (ADAW)*.

Stephanie W. Bell
 District III

In addition to increasing math and science scores, both reading and writing scores were found to be considerably higher in AMSTI schools as compared with scores from a control group of non-AMSTI schools with similar demographics. Statistical significance was found in many cases. Such findings confirm that AMSTI has successfully included strategies for addressing reading and writing, as the students learn math and science using hands-on activities.

Dr. Ethel H. Hall
 District IV
 Vice President
 Emerita

Ella B. Bell
 District V

On the *Stanford 10*, students in AMSTI schools outperformed students in non-AMSTI schools by up to 9.33 mean percentile rank points in math and 9.75 points in science. On the *ARMT*, up to 14.47 percent more students scored at or above proficiency levels in math as compared to non-AMSTI schools. AMSTI schools also outperformed the control schools by up to 7.47 percentile rank points in reading as measured by the *Stanford 10* and 12.83 percentile rank points in writing on the *ADAW*. Such scores demonstrate that the comprehensive design of AMSTI, which includes reading and writing, is highly effective. It should also be noted that AMSTI schools consistently perform above the state average. This study also validates evaluations from 2003, 2004, 2005, and 2006 that also found AMSTI successful at improving student achievement in math, science, and reading.

David F. Byers, Jr.
 District VI

Sandra Ray
 District VII

Dr. Mary Jane Caylor
 District VIII
 President Pro Tem

We are pleased to report that on every standardized test given by the Alabama Department of Education, AMSTI schools continue to outscore non-AMSTI schools, often dramatically. The following *Summary of AMSTI External Evaluation, Student Achievement Data, 2007* provides a synopsis of two external evaluations and highlights graphs, quotes and major findings presented in the reports.

Joseph B. Morton
 Secretary and
 Executive Officer

RSR/CJ



Summary of AMSTI External Evaluation, Student Achievement Data, 2007

Evaluation data from the Alabama Math, Science, and Technology Initiative's (AMSTI's) external evaluator indicates that AMSTI is making a dramatic difference by improving student achievement. This evaluation confirms the findings of the four former evaluations that showed AMSTI is having a major impact on student achievement. Even while the number of AMSTI Schools in each grade range still remains relatively small (hence large test score differences are needed to achieve statistical significance), the recent study demonstrated "statistically significant differences" between AMSTI Schools and the control groups of Non-AMSTI Schools. The fact that marked improvement was found using multiple assessments further validates that AMSTI is making a real difference in the lives of Alabama's students in terms of math and science instruction. According to the Report of ALL AMSTI Schools Versus Non-AMSTI Schools on 2007 Standardized Tests, in every case, on every standardized test given by the State Department of Education, AMSTI Schools outperformed matched Non-AMSTI Schools – often dramatically.

*Steve Ricks
AMSTI Director*

The following student performance data and quotations were taken from the *Report of First-Year AMSTI Adopters Compared to Non-AMSTI Schools and the State of Alabama on 2007 Standardized Tests* and the *Report of AMSTI Schools Versus Non-AMSTI Schools and the State of Alabama on 2007 Standardized Tests* documents developed for the Alabama Department of Education by the Office of Community Affairs at the University of Alabama.

- External Evaluator: Office of Community Affairs at the University of Alabama
- Examined the performance of all AMSTI Schools and Non-AMSTI Schools in the fifty-five school systems where AMSTI was implemented during the five year period from July 2002 to May 2007
- The report compares 90 AMSTI Schools who adopted the program in 2006 to a control group of 494 Non-AMSTI Schools with similar demographics

The external evaluator examined student performance using data from the following standardized tests: (1) *Stanford Achievement Test* (10th Edition) (SAT-10); (2) *Alabama Reading and Math Test* (ARMT); (3) *Alabama High School Graduation Exam* (AHSGE) (4) *Alabama Direct Assessment of Writing* (ADAW). The analysis was conducted separately for three levels, using the appropriate sets of scores: elementary (Grades K-5), middle (Grades 6-8), and high school (Grades 9-12). AMSTI cohorts (Summer Institute Schools of 2002, Summer Institute Schools of 2003, Summer Institute Schools of 2004, Summer Institute Schools of 2005, and Summer Institute Schools of 2006) were monitored in order to compare the impact of AMSTI on student achievement after one year, two years, three years, four years, and five years of implementation.

Quotations from the Report on the Performance of All AMSTI Schools versus Controls on the 2007 Standardized Tests by the Office of Community Affairs at the University of Alabama.

“Compared to the control group, the AMSTI elementary schools had consistently higher mean percentile ranks on the 2007 (SAT), across grades and subjects.”

“The advantages attributable to the AMSTI program reached statistical significance on the following 2007 SAT tests: fifth-grade Math, Science, and Reading, and fourth-grade Reading.”

“Compared with the control group, the AMSTI elementary schools showed consistently higher percentages of students who passed the 2007 ARMT at Level 4 (highest level).”

“The (ARMT) results show that the advantage of the AMSTI schools reached significance at at least one level of each test. On five out of six tests, the benefits of the AMSTI schools were significant at level 4 (Exceed the standards).”

“Compared with the average elementary school in Alabama, The AMSTI schools had slightly but consistently higher percentages of students who passed the 2007 ARMT at Level 4 (Exceed the standards), across grades and subjects.

“Our findings show that the AMSTI middle schools had slightly but consistently higher mean percentile ranks than the corresponding control schools, across grades and subject areas.”

“The AMSTI middle schools showed consistently higher percentages of students who passed the 2007 ARMT at Level 4 (Exceed the standards).”

“...the 2007 ARMT results of the AMSTI middle schools with the Alabama State overall results identified statistically significant advantages of the AMSTI schools in the Math tests for grade 6 (Levels 1, 3, and 4), grade 7 (Level 1), and grade 8 (Level 2), as well as in Reading for grade 6 (Level 3) and grade 8 (Level 1).”

“...AMSTI benefited 11th-grade high school students by raising the percentage of students who “Passed” the AHSGE tests in all three subject areas (math, science, reading).”

“The results of the analysis indicate that the advantage of the AMSTI group (vs. control group) was statistically significant only on the 11th-grade science test.”

“AMSTI appears to have benefitted the low-performing students, helping them to met the basic requirements for passing (AHSGE).”

“Compared with the average high school in Alabama, the AMSTI adopters had higher cumulative percentages of students who “Passed” and “Passed Advanced” the Science components of the 2007 AHSGE for grades 11 and 12. The advantage of the AMSTI group on the 12th grade Science test (1.21 percentage points) was statistically significant.”

“The advantage of the AMSTI group (over the average Alabama high school) on the 12th-grade Science test (1.21 percentage points) was statistically significant.”

AMSTI Summer Institute Schools 2006: Elementary Schools

Student Test Data for First Year Adopters (SAT-10, ARMT, ADAW)

- “The AMSTI program (over control schools) appears to have helped the 2006 adopters particularly in terms of raising the minimum scores on the 2007 SAT. Those gains ranged between 14 and 24 percentile rank points.”
- “The benefits of AMSTI (over control schools) to elementary schools that joined the program in 2006 appear to have been dramatic decreases in maximum school percentages of students who scored on the 2007 ARMT at Levels 1 and 2 (below standards and approach standards).”
- “Additional benefits attributable to AMSTI (over control schools) were consistent increases in the minimum school percentages of students who scored on the 2007 ARMT at Levels 3 and 4 (meet standards and exceed standards), which varied across grades and subjects between 4.49 and 14.63 percentage points.”
- “The benefits of AMSTI (over Control Schools) to the elementary schools that joined the program in 2006 included a large reduction in the maximum school percentage of students who scored on the 2007 ADAW at Level 1 (below standards) (by 51.45 percentage points) and a substantial increase in the minimum school percentage of students who scored at level 3 (meet standards) (by 22.22 percentage points).”

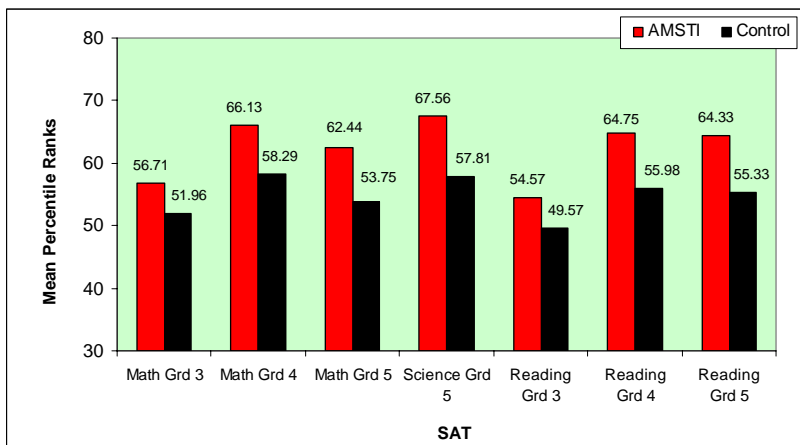


Figure EH-1. UAH Elementary Schools: AMSTI versus Controls: 2007 SAT Mean Percentile Ranks

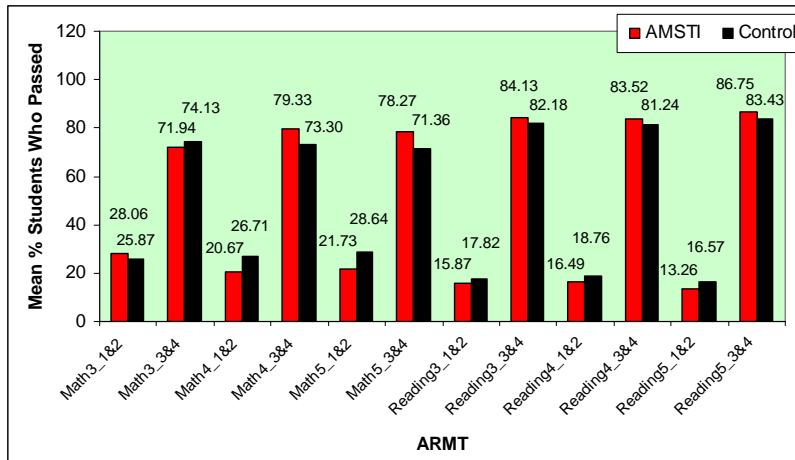


Figure EH-2b. UAH Elementary Schools: AMSTI versus Controls: 2007 ARMT Mean Percentages of Students Who Passed at Combined Levels

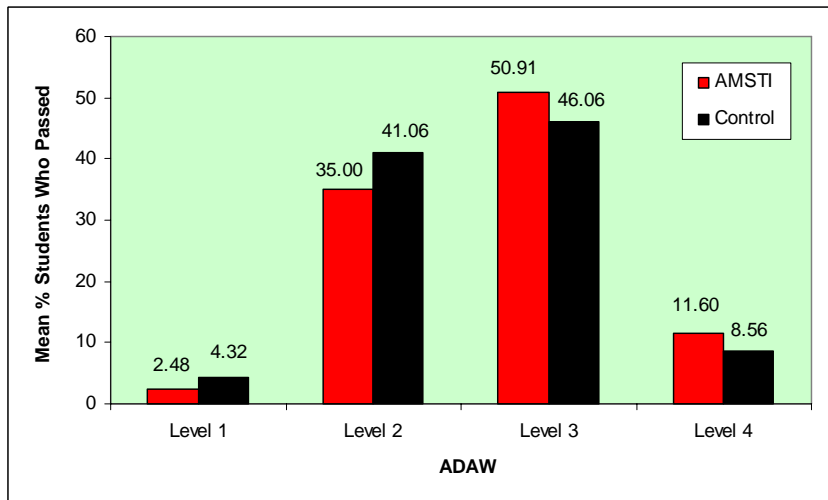


Figure ET-3a. TU Elementary Schools: AMSTI versus Controls: 2007 Fifth-Grade ADAW Mean Percentages of Students Who Passed at Each Level

Student Test Data for All Adopters: Elementary Schools

Stanford Achievement Test (SAT-10)

- “The differences between the AMSTI and the control group across the 2007 SAT subject tests ranged between 2.88 and 6.25 percentile rank points. These findings indicate that the AMSTI program was more effective in grades 3 to 5, across subjects, in terms of student learning than the alternative programs in current use in the same school districts.”
- “The advantages of the AMSTI group were mostly due to the substantial raises in the minimum percentile ranks, which ranged between 14 and 24 percentile rank points. This finding suggests that the AMSTI program helped in particular the low-performance students/schools.”
- “The advantages attributable to the AMSTI program reached statistical significance on the following 2007 SAT tests: fifth-grade Math, Science, and Reading, and fourth-grade Reading.”
- “The AMSTI elementary schools had slightly but consistently higher mean percentile ranks on the 2007 SAT for grades 3 to 5 than the average elementary school in Alabama.”

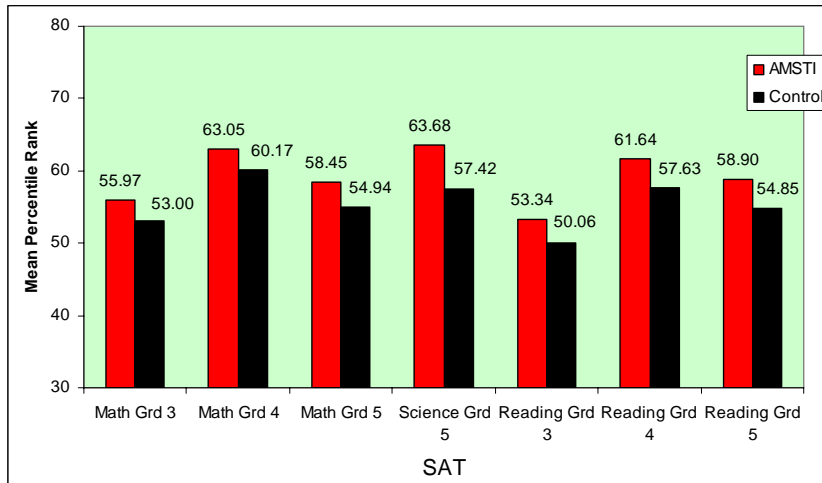


Figure E-1. Elementary Schools: AMSTI versus Controls: 2007 SAT Mean Percentile Ranks

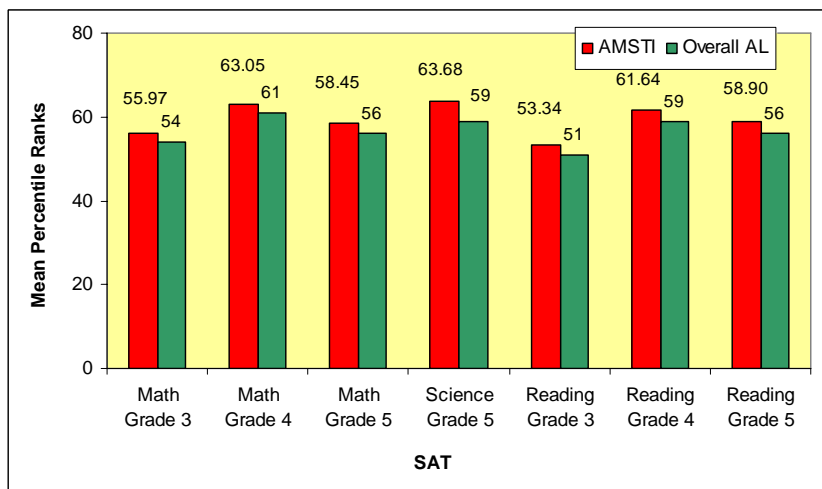


Figure E-4. Elementary Schools: AMSTI versus Alabama State Overall Results: 2007 SAT Mean Percentile Ranks

Alabama Reading and Math Test (ARMT)

- “Compared with the control group, the AMSTI elementary schools showed consistently higher percentages of students who passed the 2007 ARMT at Level 4 (Exceeds standards) and generally lower percentages of students who pass at the lower levels (Below standards, Approach standards).”
- “The results show that the advantages of the AMSTI schools reached significance at at least one level of each test (ARMT). On five out of six tests, the benefits of the AMSTI schools were significant at Level 4 (Exceed the standards).”
- “Compared with the average elementary school in Alabama, the AMSTI schools had slightly but consistently higher percentages of students who passed the 2007 ARMT at Level 4 (Exceed the standards), across grades and subjects.”
- The advantages of the AMSTI elementary schools (compared to all Alabama schools) were statistically significant in grades 4 and 5 at at least two levels per grade (on the ARMT).”

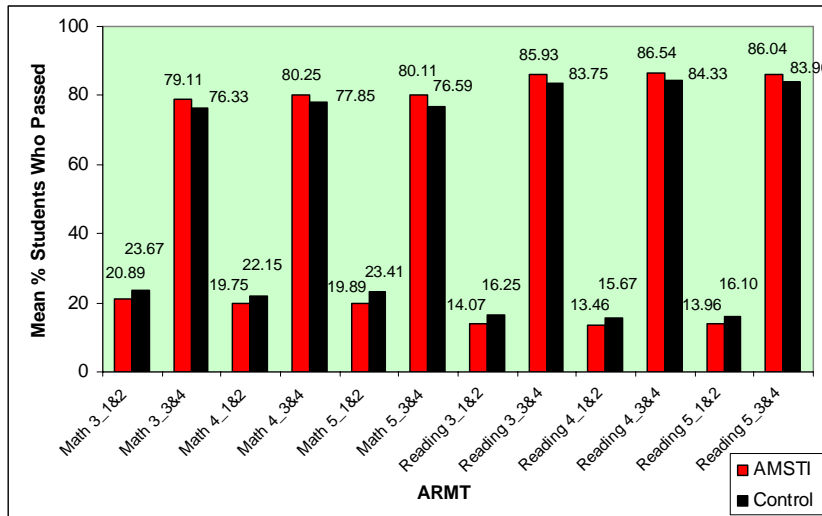


Figure E-2b. Elementary Schools: AMSTI versus Controls: 2007 ARMT Mean Percentages of Students Who Passed at Combined Levels

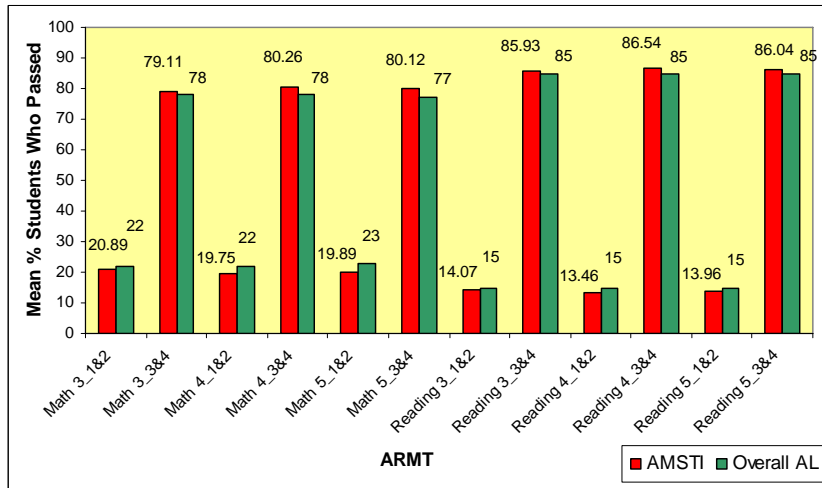


Figure E-5b. Elementary Schools: AMSTI versus Alabama State Overall Results: 2007 ARMT Mean Percentage of Students Who Passed at Combined Levels

AMSTI Summer Institute Schools of 2006: Middle Schools

Student Test Data for First Time Adopters (SAT-10, ARMT)

- “The benefits of 2006 AMSTI adopters relative to controls included substantial raises in the school minimum percentile ranks for each test, which varied across grades and subjects between 8 and 28 percentile rank points (on the SAT). This finding indicates that AMSTI benefited particularly low-performing students.”
- “The benefits of AMSTI to the middle schools (on the ARMT) that joined the program in 2006 included...some double-digit increases in the minimum percentages, which occurred mostly at level 3 (Meets standards).”

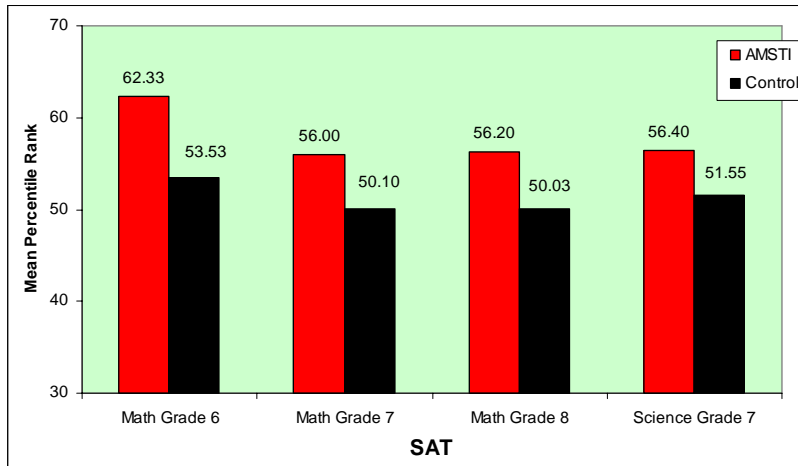


Figure MH-1. UAH Middle Schools: AMSTI versus Controls: 2007 SAT Mean Percentile Ranks

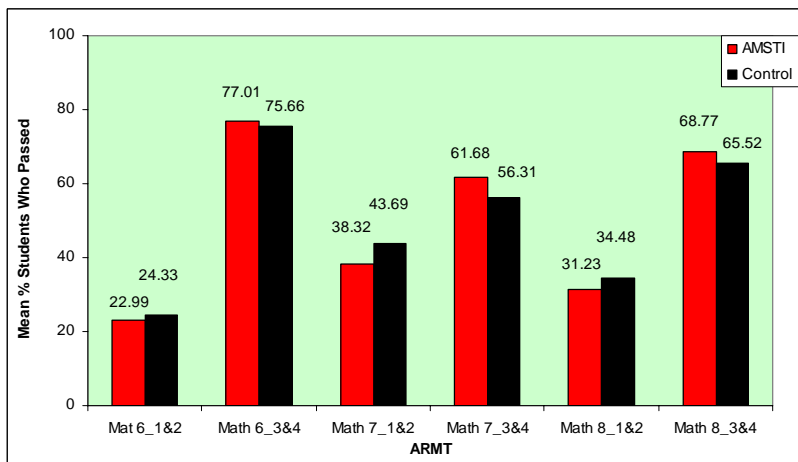


Figure MF-2b. UNA Middle Schools: AMSTI versus Controls: 2007 ARMT Mean Percentages of Students Who Passed at Combined Levels: Math

Student Test Data for All Adopters: Middle Schools

Stanford Achievement Test Data (SAT-10)

- “Our findings show that the AMSTI middle schools had slightly but consistently higher mean percentile ranks than the corresponding control schools, across grades and subject areas.”
- “A great benefit of AMSTI for middle school students revealed by the analysis of the 2007 SAT scores was the substantial raise in the school minimum percentile ranks for each test (compared to control schools), which varied across grades and subjects between 15 and 22 percentile rank points.”
- The group of AMSTI middle schools had generally slightly higher mean percentile ranks on the 2007 SAT for grades 6 to 8 than the average middle school in Alabama. The greatest advantages were found on the sixth-grade Math test (3.07 percentile rank points) and Reading test (2.16 percentile points).”

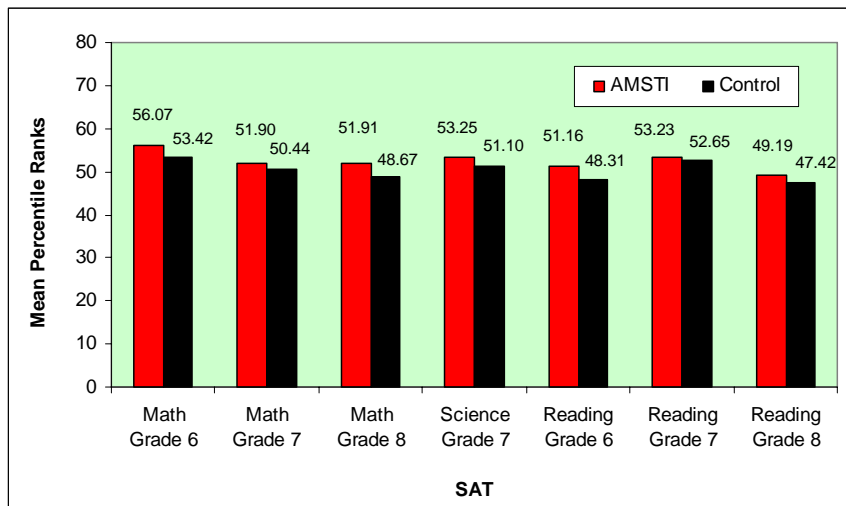


Figure M-1. Middle Schools: AMSTI versus Controls: 2007 SAT Mean Percentile Ranks

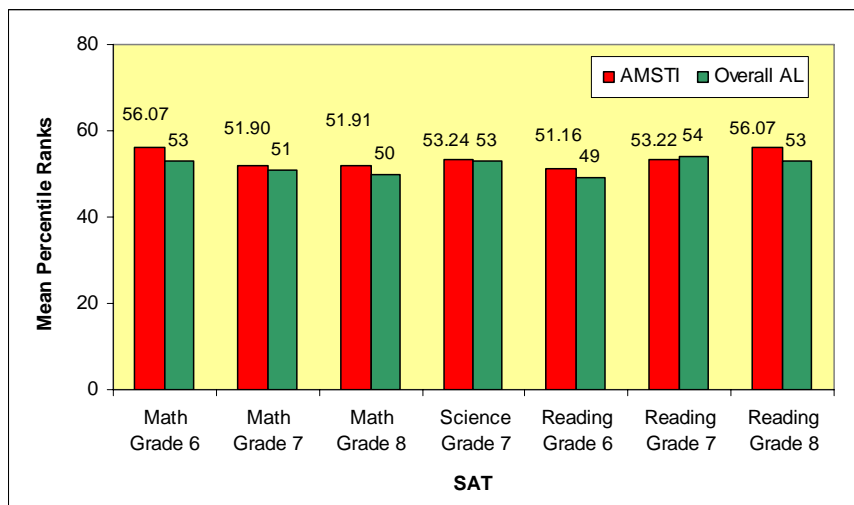


Figure M-4. Middle Schools: AMSTI versus Alabama State Overall Results: 2007 SAT Mean Percentile Ranks

Alabama Reading and Math Test (ARMT)

- The AMSTI middle schools showed consistently higher percentages of students who passed the 2007 ARMT at Level 4 (Exceeds standards). The greatest advantage of the AMSTI middle schools at Levels 3 and 4 combined was on the eighth-grade Math test (4.9% more AMSTI students scored on the 2007 ARMT at those levels).
- "...tests that compared the 2007 ARMT results of the AMSTI middle schools with the Alabama State overall results identified statistically significant advantages of the AMSTI schools in the Math tests for grade 6 (Levels 1, 3, and 4), grade 7 (Level 1), and grade 8 (Level 2), as well as in Reading for grade 6 (Level 3) and grade 8 (Level 1)."

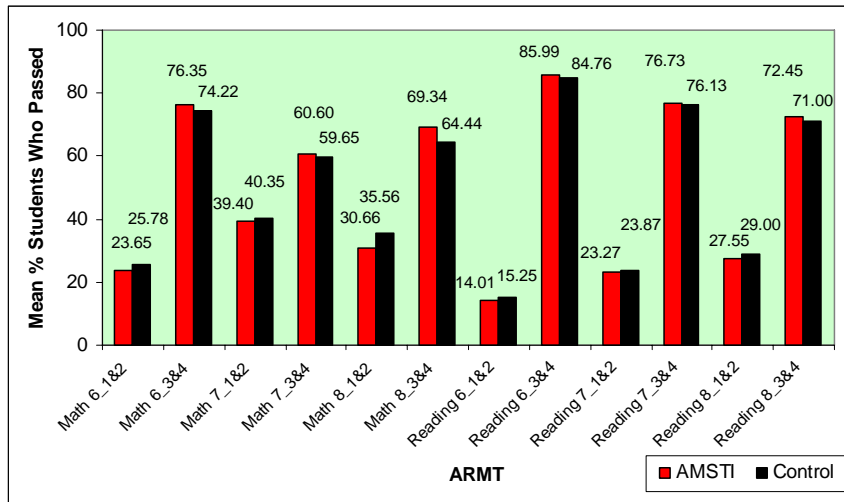


Figure M-2b. Middle Schools: AMSTI versus Controls: 2007 ARMT Mean Percentages of Students Who Passed at Combined Levels

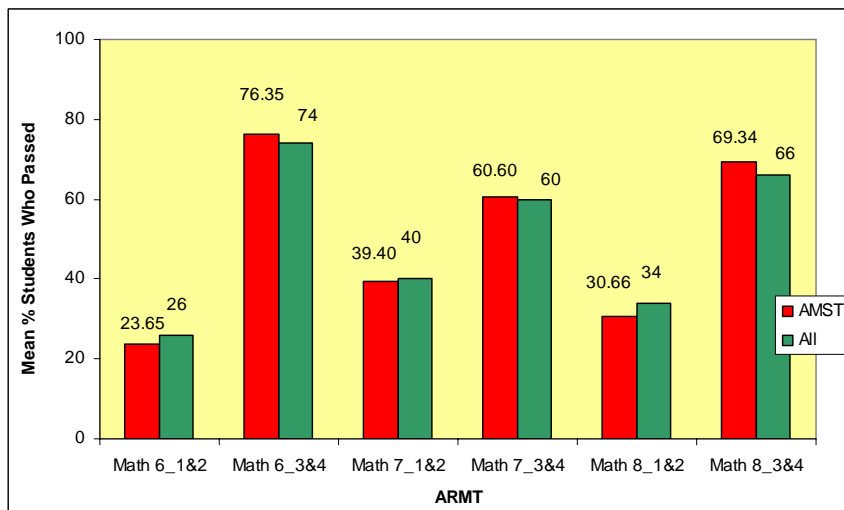


Figure M-5b. Middle Schools: AMSTI Adopters versus Alabama State Overall Results: 2007 ARMT Mean Percentage of Students Who Passed at Combined Levels: Math

AMSTI Summer Institute Schools of 2006: High Schools

Alabama High School Graduation Exam Data (AHSGE)

- “The AMSTI high schools had advantages over the controls on the 11th-grade Math and Science tests (2.04 and 4.41 percentage points, respectively) and on the 12th- grade Science and Reading tests (3.96 and 3.62 percentage points, respectively).”
- “...the differences between the high schools that joined the AMSTI program in 2006 and the average high school in Alabama in terms of percentages of students who scored at the Pass and Pass Advanced levels combined reached statistical significance only in the Reading tests for the 11th grade and for the 12th grade.”

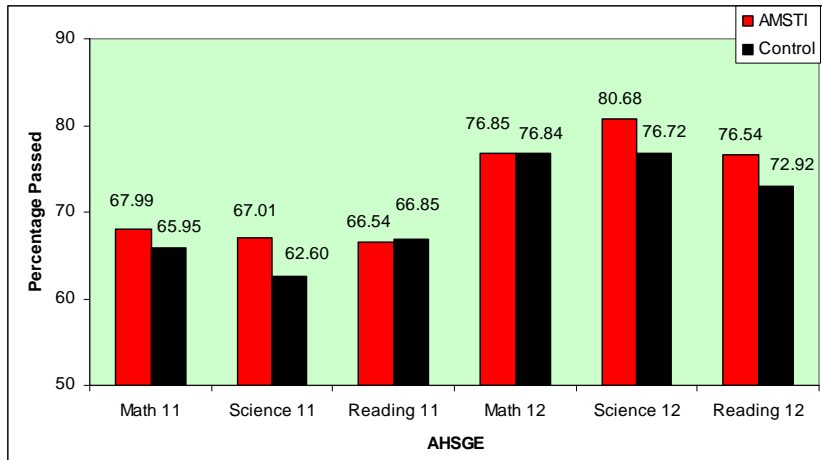


Figure H-1a. All High Schools: AMSTI Adopters versus Controls: Mean Percentages of Students Who Passed the 2007 AHSGE

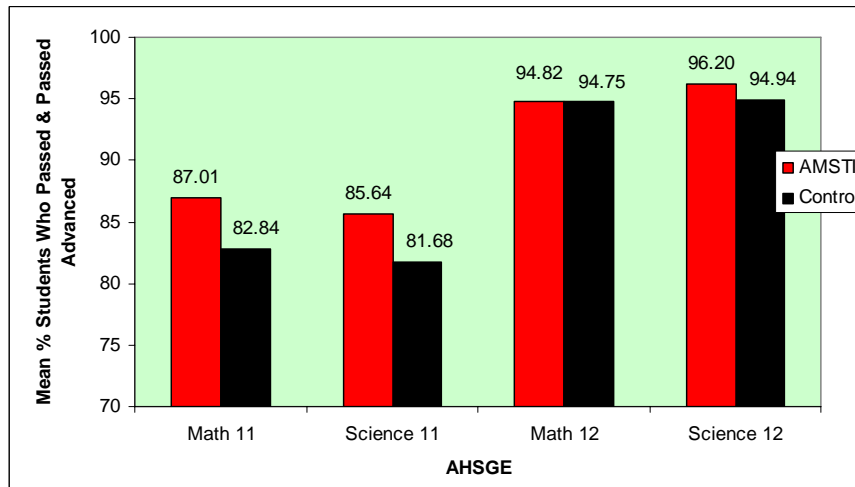


Figure HT-1. TU High Schools: AMSTI Adopters versus Controls: Cumulative Mean Percentages of Students Who Passed and Passed Advanced the 2007 AHSGE: Math & Science

Student Test Data for All Adopters: High Schools

Alabama High School Graduation Exam (AHSGE)

- “...AMSTI benefited 11th-grade high school students by raising the percentage of students who “Passed” the AHSGE in all three subject areas. The AMSTI advantages over the control group ranged between 1.82 and 6.18 percentage points.”
- “In the 12th grade, the AMSTI group had higher percentages of students who “Passed” the Science and Reading components of the 2007 AHSGE (AMSTI advantage of 1.57 and 1.98 percentage points, respectively), and a higher percentage of students who “Passed Advanced” the Math component (AMSTI advantage of 1.53 percentage points). These results point to the merit of AMSTI in helping low-performance students to meet the basic requirements for passing the 2007 AHSGE.”
- “The results of the analysis indicate that the advantage of the AMSTI group was statistically significant only on the 11th-grade Science test (AMSTI vs. Controls).”
- “Compared with the average high school in Alabama, the AMSTI adopters had higher cumulative percentages of students who “Passed” and “Passed Advanced” the Science components of the 2007 AHSGE for grades 11 and 12.”

- “The advantage of the AMSTI group (over the average Alabama high school) on the 12th-grade Science test (1.21 percentage points) was statistically significant.”

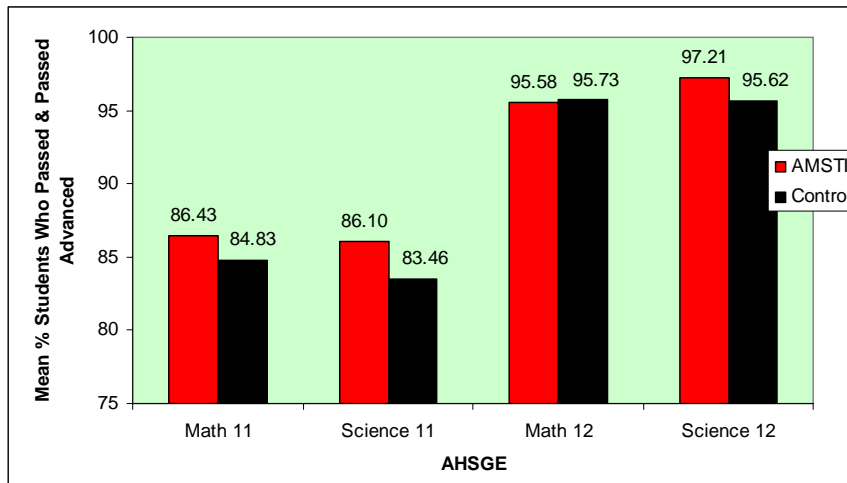


Figure H-1. High Schools: AMSTI Adopters Versus Controls: Cumulative Mean Percentages of Students Who Passed and Passed Advanced the 2007 AHSGE: Math & Science

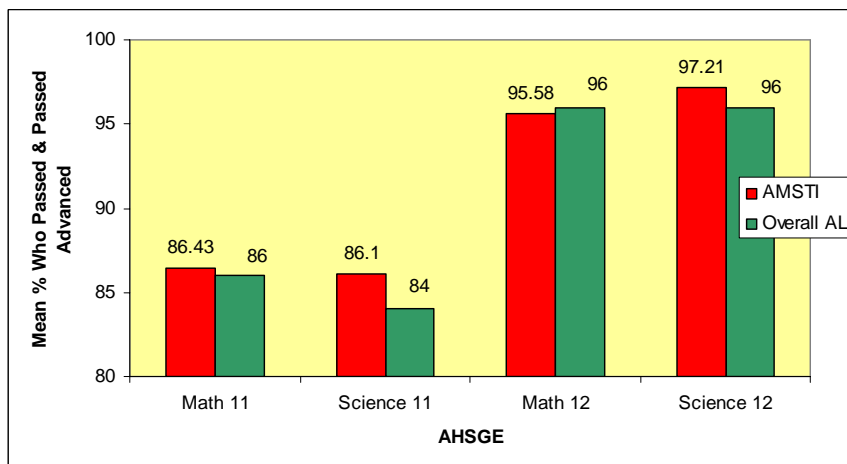


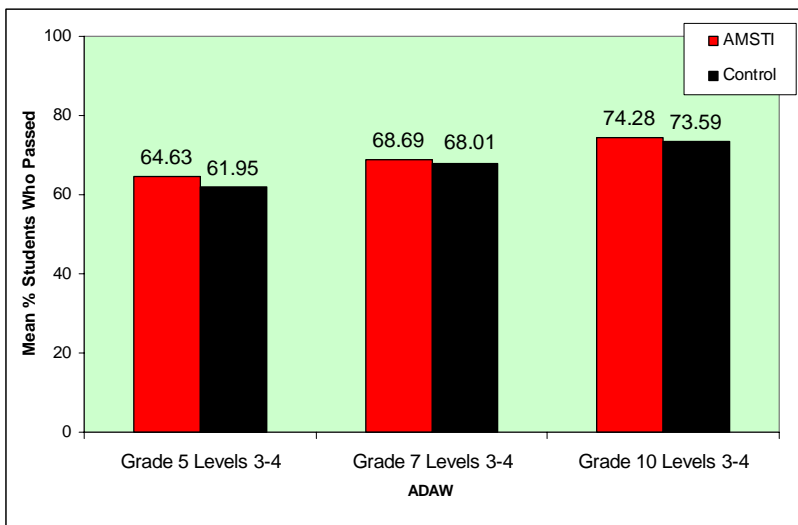
Figure H-3. High Schools: AMSTI Versus Alabama State Overall Results: 2007 AHSGE Cumulative Mean Percentages of Students Who Passed or Passed Advanced: Math & Science

All Grades

Alabama Direct Assessment of Writing (ADAW)

- “The net advantage of the AMSTI group (over the control schools) in terms of mean percentage of students who cleared the 2007 ADAW at Levels 3 (Meet the standards) and 4 (Exceed the standards) combined amounted to 2.67 points. These findings suggest that the AMSTI program was effective in improving students’ writing skills and helping them to clear the ADAW.”
- “...the fifth grade 2007 ADAW results of the AMSTI schools with the Alabama State overall results identified a statistically significant advantage of the AMSTI schools at Level 2 (Partially meets standards) of the ADAW, and Level 4 (Exceeds standards).”

- “At the combined levels of the 2007 ADAW (1-2 vs. 3-4), the AMSTI elementary schools had a 2.63% advantage over the average school in Alabama.”
- “The 2007 ADAW data for the seventh grade show that the AMSTI middle schools had slightly lower mean percentages of students who passed at Levels 1 and 2 (i.e., Alert and Caution) and slightly higher mean percentages of students who passed at Levels 3 and 4 (i.e., Clear with Caution and Clear). The AMSTI advantages over the control group at the combined Levels 3 and 4 amounted to 0.68%.”
- “Compared with the control group, the AMSTI high schools had a slightly lower mean percentage of students who passed the 2007 10th-grade ADAW at Level 1 (Alert) and a slightly higher percentage of students who passed at Level 3 (Clear with Caution). The net advantage of the AMSTI group at combined levels (1-2 vs. 3-4) was 0.69 percentage points.”



*ADAW Means by Grade
Combined Levels 3-4*

The high school science component of AMSTI is provided by the Alabama Science in Motion (ASIM). This program serves science teachers in a number of the Non-AMSTI Schools as well as in AMSTI Schools. Hence, a comparison of schools using AMSTI science (ASIM) with those not using it is not accurately reflected in the data. The fact that some Non-AMSTI Schools are utilizing ASIM could cause smaller differences in data between AMSTI and Non-AMSTI schools in high school science.