



## Summary of AMSTI External Evaluation, Student Achievement Data, 2006

*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 three 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 2006 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 State Coordinator*

The following student performance data and quotations were taken from the *Analysis of AMSTI 2005 Adopters Versus Non-AMSTI Schools on the 2006 Standardized Tests* and the *Report of All AMSTI Schools Versus Non-AMSTI Schools on 2006 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 twenty-seven school systems where AMSTI was implemented during the four year period from July 2002 to May 2006
- The report compares 107 AMSTI Schools who adopted the program in 2005 to a control group of 348 Non-AMSTI Schools with similar demographics

The external evaluator examined student performance using data from the following standardized tests: (1) *Stanford Achievement Test* (10<sup>th</sup> Edition); (2) *Alabama Reading and Math Test*; (3) *Alabama High School Graduation Exam*. 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, and Summer Institute Schools of 2005) were monitored in order to compare the impact of AMSTI on student achievement after one year, two years, three years, and four years of implementation.

**Quotations from the *Impact of AMSTI on Student Performance on Standardized Tests* by the Office of Community Affairs at the University of Alabama.**

“...the AMSTI program helped a larger percentage of a school’s students to actualize their potential and pass the 2006 ARMT for grades 6 to 8 at the highest level.” (*This statement was also made about grades 3 to 5*)

“The advantages attributable to the AMSTI program reached statistical significance on all tests, which confirms the robust effectiveness of the AMSTI program in improving students’ performance in all subject areas tested by the SAT in grades 3 to 5.”

“Compared with the overall Alabama results, the 2005 AMSTI adopters had generally higher cumulative percentages of students who Passed and Passed Advanced the 2006 AHSGE.....These findings indicate the superior effectiveness of the AMSTI program in terms of student learning, as measured by the 2006 AHSGE.”

“The major benefit of AMSTI in terms of students’ writing abilities was a shift from Level 2 (close to meeting the standards) to Level 3 (meeting the minimum standards).” (*From analysis of the 10<sup>th</sup> Grade ADAW for all AMSTI schools*)

“The advantages of the AMSTI group were mostly due to the substantial raises in the minimum percentile ranks, .... This finding suggests that the AMSTI program helped in particular the low-performance students/schools.” (*From analysis of grade 3-5 SAT for all AMSTI schools*)

“The analysis of variance that compared the AMSTI and the corresponding control schools on the 2006 ARMT for grades 6 to 8 identified statistically significant advantages of the AMSTI group on the eighth-grade Reading test.”

“The differences between the AMSTI and the control groups across the SAT subject tests ranged between 6.36 and 10.18 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.”

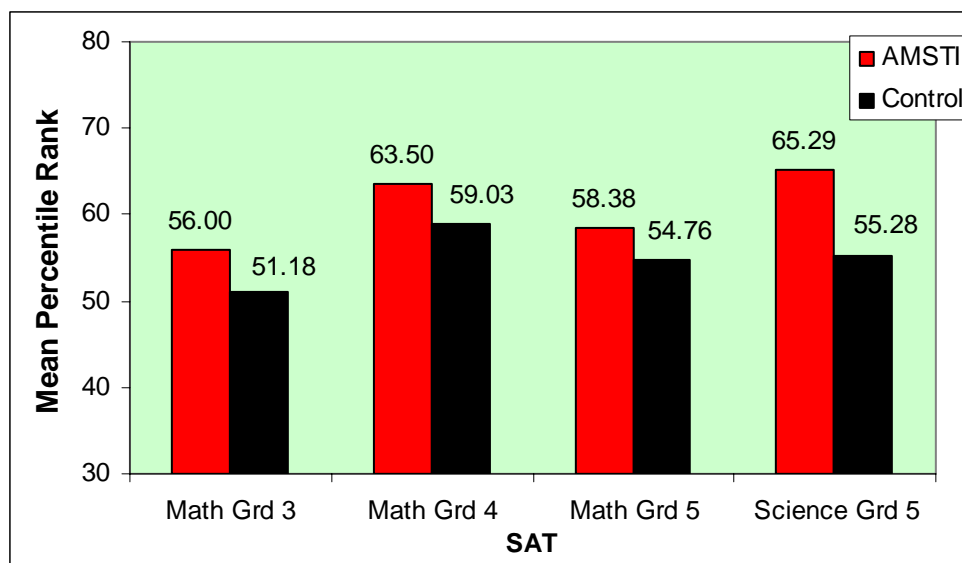
“The AMSTI advantages varied across grades and subjects between 1.96 and 5.19 percentage points. These findings indicate that the AMSTI high schools tended to be more effective than the controls in terms of student learning, as measured by the AHSGE.”

## AMSTI Summer Institute Schools 2005: Elementary Schools

### Stanford Achievement Test Data for First Year Adopters

- AMSTI Schools consistently scored higher than Non-AMSTI Schools after one year of implementation. Differences in math and science scores varied between 3.62 and 10.01 percentile rank points.
- “The advantages attributable to the AMSTI program reached statistical significance in grades 3 and 4 on the Reading component of SAT and in grade 5 on the Science component of the SAT.”
- “...AMSTI elementary schools that joined the AMSTI program in 2005 had consistently higher mean percentile ranks than the corresponding control schools, across subjects.”

*Figure E-1. Elementary Schools: 2006 SAT Mean Percentile Ranks of the 2005 AMSTI Adopters and the Corresponding Controls: Math & Science*

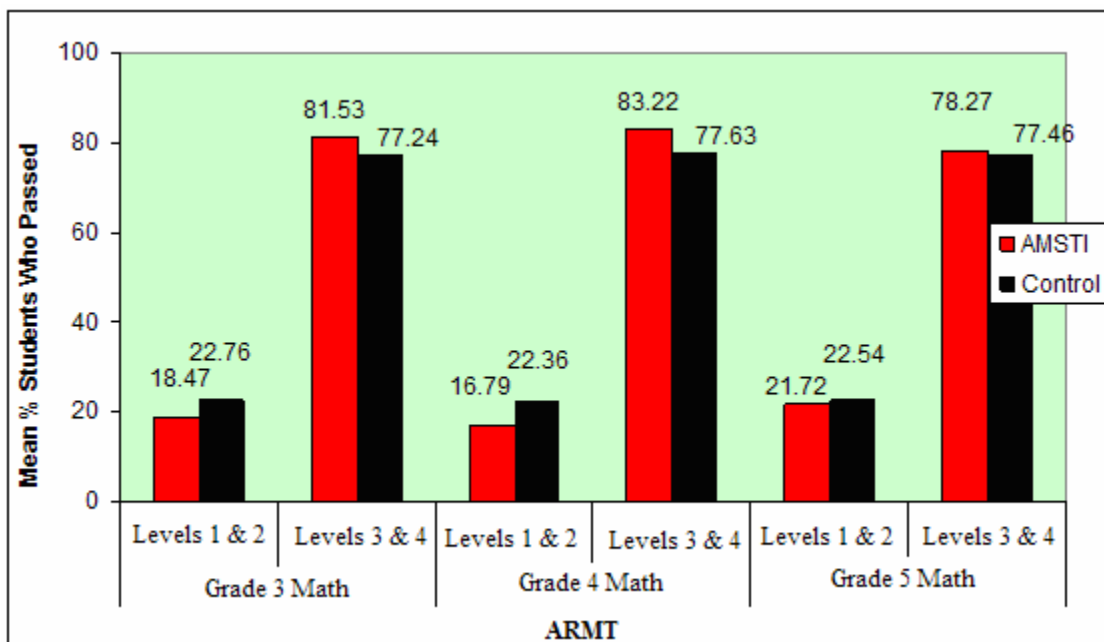


## AMSTI Summer Institute Schools of 2005: Elementary Schools

### Alabama Reading and Mathematics Test Data for First Year Adopters

- AMSTI Schools have lower mean percentages of students below standards (Levels 1 and 2) and consistently higher mean percentages of students who met or exceeded the standards (Levels 3 and 4).
- AMSTI Schools have “consistently higher percentages of students who scored at level 4 than the corresponding percentages at the control schools. This finding indicates that the AMSTI program helped a larger percentage of a school’s students to actualize their potential and pass the highest level of the ARMT for grades 3 to 5.”
- For AMSTI Schools, percentages of students who passed at each level on all sections of the ARMT show less variability (smaller standard deviation) than those for control schools, indicating that the achievement gap is smaller.
- The advantage of AMSTI Schools as compared to control schools reached statistical significance for Levels 3 and 4 (Met or Exceeded Standards) on the 5<sup>th</sup> grade Reading portion of the ARMT.

*Figure E-2b. Elementary Schools: 2005 AMSTI Adopters Versus Controls: 2006 ARMT Mean Percentages of Students Who Passed at Combined Levels: Math*

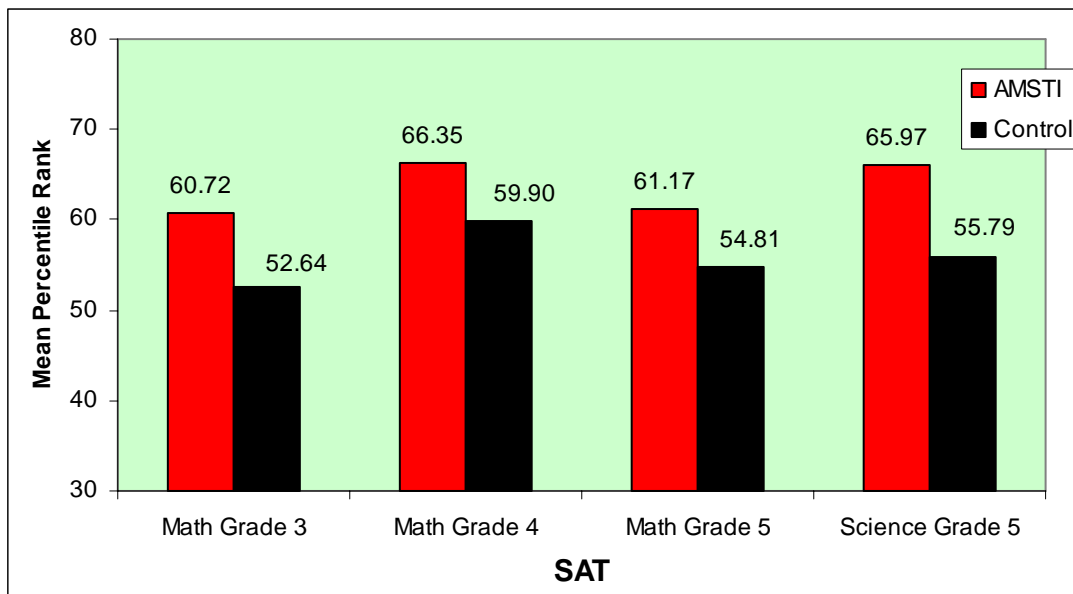


## All AMSTI adopters: Elementary Schools

### Stanford Achievement Test Data

- “The advantages attributable to the AMSTI program reached statistical significance on all tests, which confirms the robust effectiveness of the AMSTI program in improving students’ performance in all subject areas tested by the SAT in grades 3 to 5.”
- “...AMSTI elementary schools had consistently higher mean percentile ranks than the corresponding control schools, across grades and subjects.”
- “The differences between the AMSTI and the control groups across the SAT subject tests ranged between 6.36 and 10.18 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.”
- AMSTI schools experienced substantial raises in their minimum percentile ranks, which ranged between 18 and 23 percentile rank points. This finding suggests that AMSTI is helping lower performing students and/or schools.

*Figure E-1. Elementary Schools: 2006 SAT Mean Percentile Ranks of the AMSTI and Control Groups: Math & Science*

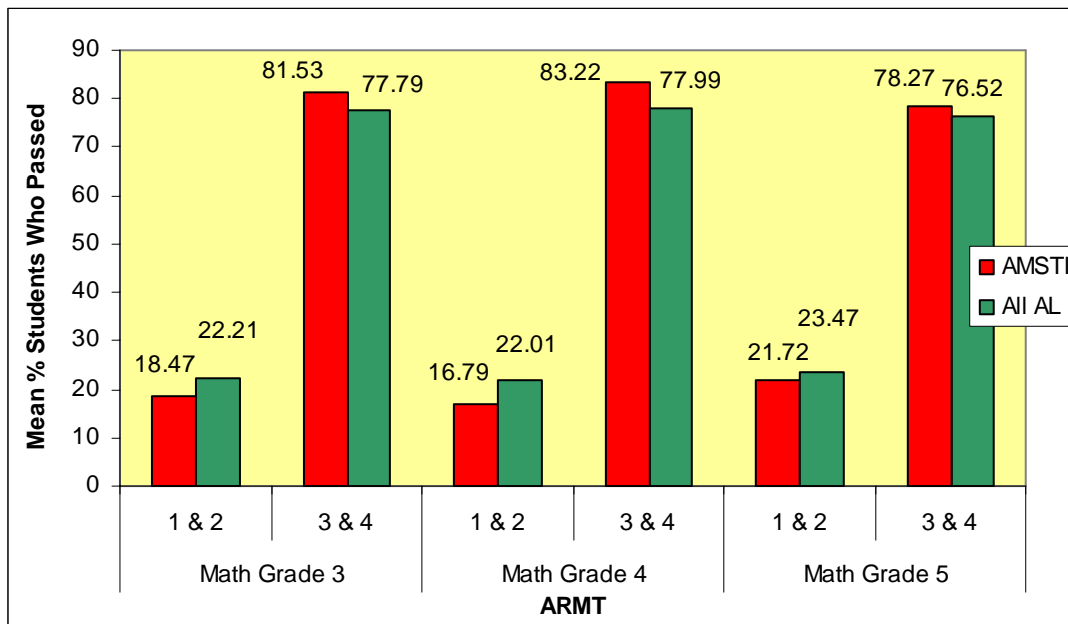


## All AMSTI Adopters: Elementary Schools

### Alabama Reading and Mathematics Test Data

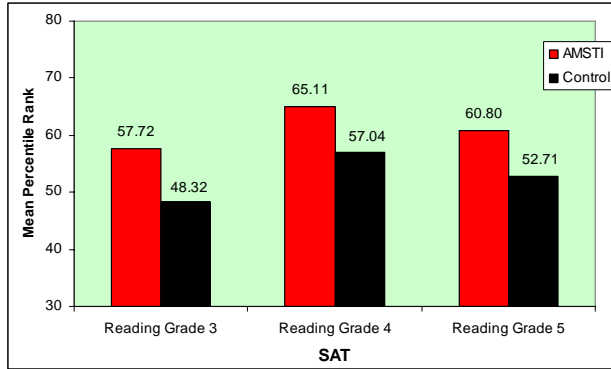
- “Compared with the control group, the AMSTI elementary schools showed consistently higher percentages of students who passed at level 4 (Exceed the standards). The AMSTI advantages at that level varied across grades and subjects between 4.86 and 9.49 percentage points.”
- “The net advantages of the AMSTI elementary schools in terms of percentages of students who met and exceeded the standards (i.e. passed the 2006 ARMT at Levels 3 and 4 combined) ranged between 3.49 and 6.32 percentage points.”
- Analysis of variance showed the statistical significance of AMSTI schools’ advantage over the control group on five out of six tests at Level 4 (Exceed the standards), and on three out of six tests at Level 3 (Meet the standards).

*Figure E-5b. Elementary Schools: Comparison of the 2006 ARMT Mean Percentage of Students Who Passed at Combined Levels: AMSTI Schools Versus Alabama State Overall Results: Math*



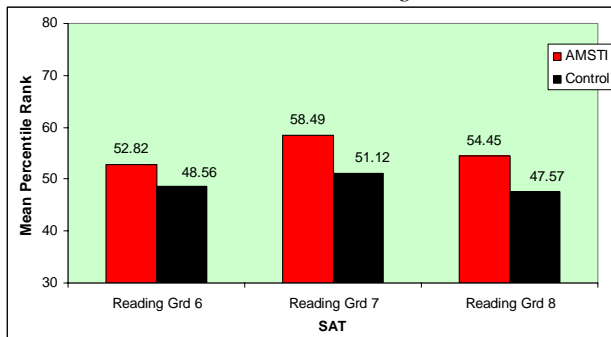
## All AMSTI Adopters: SAT and AHSGE Reading Data

Figure E-1. Elementary Schools: 2006 SAT Mean Percentile Ranks of the AMSTI and Control Groups: Reading



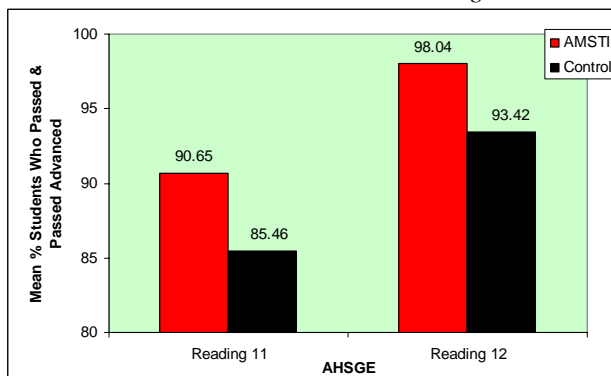
- AMSTI schools displayed an advantage over Non-AMSTI Schools in the area of reading in grades 3 through 5 ranging from 8.07 to 9.40 percentile rank points.
- The advantage attributable to AMSTI was statistically significant for reading in grades 3 through 5.

Figure M-1. Middle Schools: AMSTI Versus Control: 2006 SAT Mean Percentile Ranks: Reading



- This trend continued in the middle school with AMSTI Schools demonstrating advantages over Non-AMSTI Schools ranging from 4.26 to 7.37 percentile ranking points in reading.

Figure H-1. High Schools: 2005 AMSTI Adopters Versus Controls: Mean Percentages of Students Who Passed and Passed Advanced the 2006 AHSGE: Reading

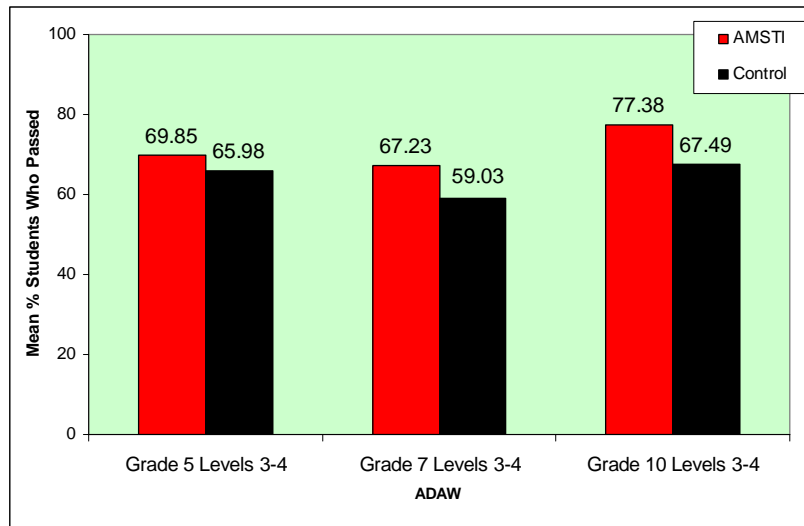


- Again, the trend continued in the high school with AMSTI Schools demonstrating advantages over Non-AMSTI Schools ranging from 4.62 to 5.19 mean percentage points.

## All AMSTI Adopters: Alabama Direct Assessment of Writing

- The advantage of the AMSTI group in terms of mean percentage of students who cleared the 2006 ADAW at Levels 3 and 4 (i.e., Clear with Caution and Clear) combined ranged from 3.87 percentage points to 9.89 percentage points. “These findings suggest that the AMSTI program was effective in improving students’ writing skills and helping them to clear the ADAW.”
- “...although AMSTI was primarily designed to deliver Math and Science instruction, its writing requirements, such as the Science Notebooks and the Math Journals, tend to systematically enhance students’ writing skills.”
- “...the advantages of the AMSTI middle schools over the controls reached statistical significance at Levels 2, 3, and 4 (Caution, Clear with Caution, and Clear).”
- “...the impact of AMSTI on the 10<sup>th</sup>-grade students’ performance reached significance at Levels 2 and 3, where the major shift took place. These findings point to the effectiveness of the AMSTI writing requirements in helping the students to meet the minimum writing standards for the 10<sup>th</sup> grade.”

**ADAW Means by Grade  
Combined Levels 3-4**

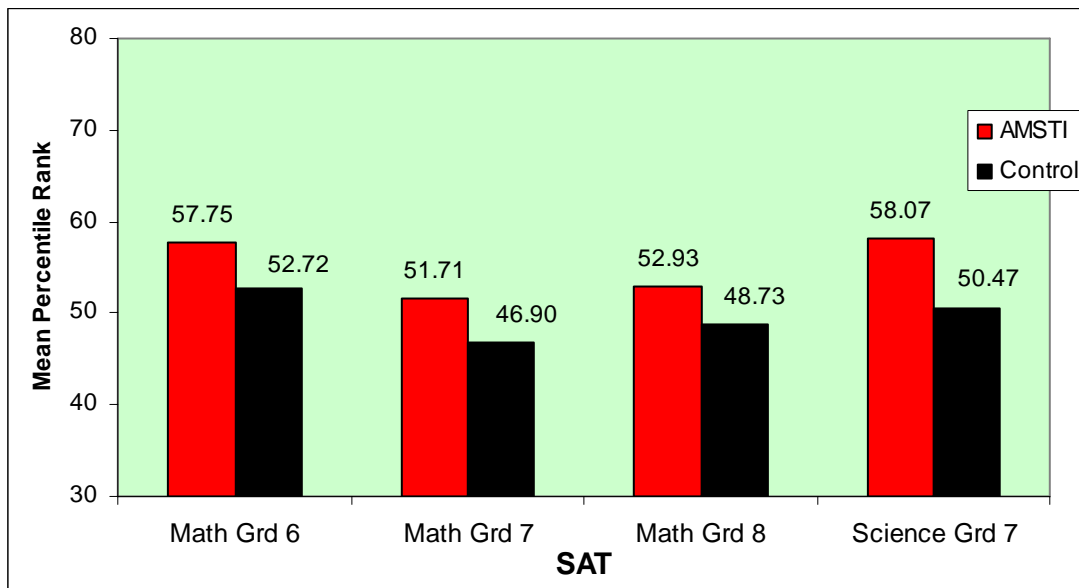


## AMSTI Summer Institute Schools of 2005: Middle Schools

### Stanford Achievement Test Data

- The AMSTI Schools demonstrated an advantage over Non-AMSTI schools ranging from 4.20 to 7.60 percentile rank points.
- "...the AMSTI program was more effective in grades 6 to 8, across subjects, in terms of student learning when compared with the alternative programs in current use in the same school districts."

*Figure M-1. Middle Schools: 2006 SAT Mean Percentile Ranks of the 2005 AMSTI Adopters and the Corresponding Controls: Math & Science*

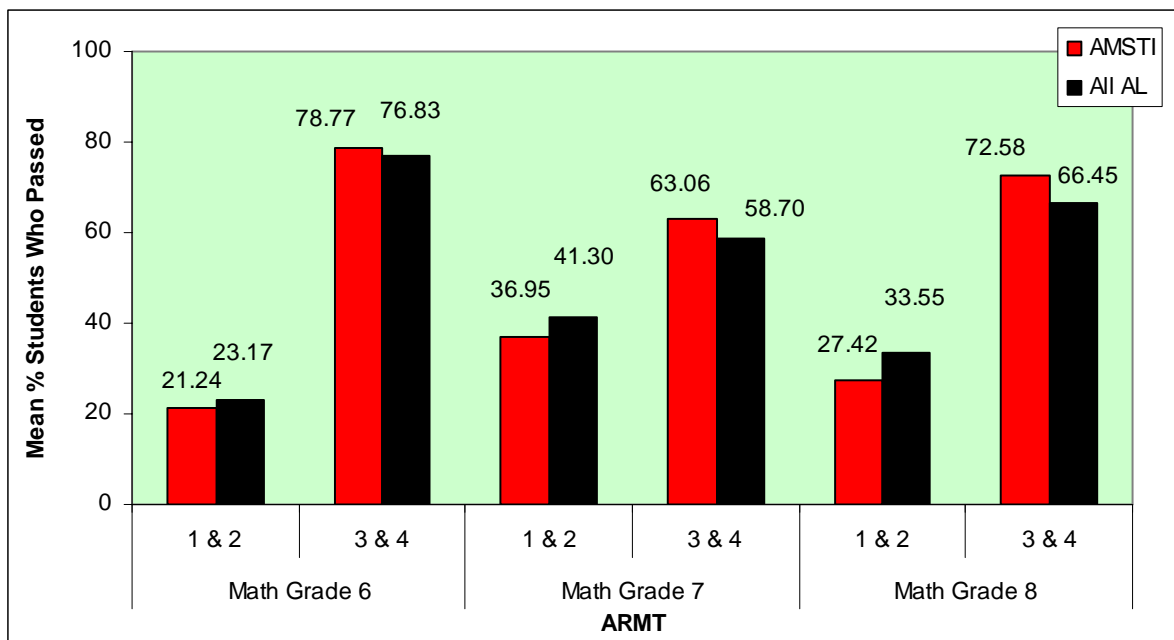


## AMSTI Summer Institute Schools of 2005: Middle Schools

### Alabama Reading and Mathematics Test Data

- “The middle schools that adopted AMSTI in 2005 showed consistently higher percentages of students who passed the 2006 ARMT at Level 4 (Exceed Standards).”
- “Compared with the control group, the AMSTI group had consistently higher mean percentages of students who passed at Level 4 (AMSTI advantages at that level ranged between 4.13 and 8.38 percentage points).”
- “Another advantage of the AMSTI middle schools (2005 adopters) is that the standard deviations of most of their ARMT percentages are smaller than the corresponding percentages of the control schools.” The smaller standard deviation indicates that differences in students’ scores are becoming less pronounced and could be an indication that the achievement gaps are beginning to close.

*Figure M-2b. Middle Schools: 2005 AMSTI Adopters Versus Controls: 2006 ARMT Mean Percentages of Students Who Passed at Combined Levels: Math*

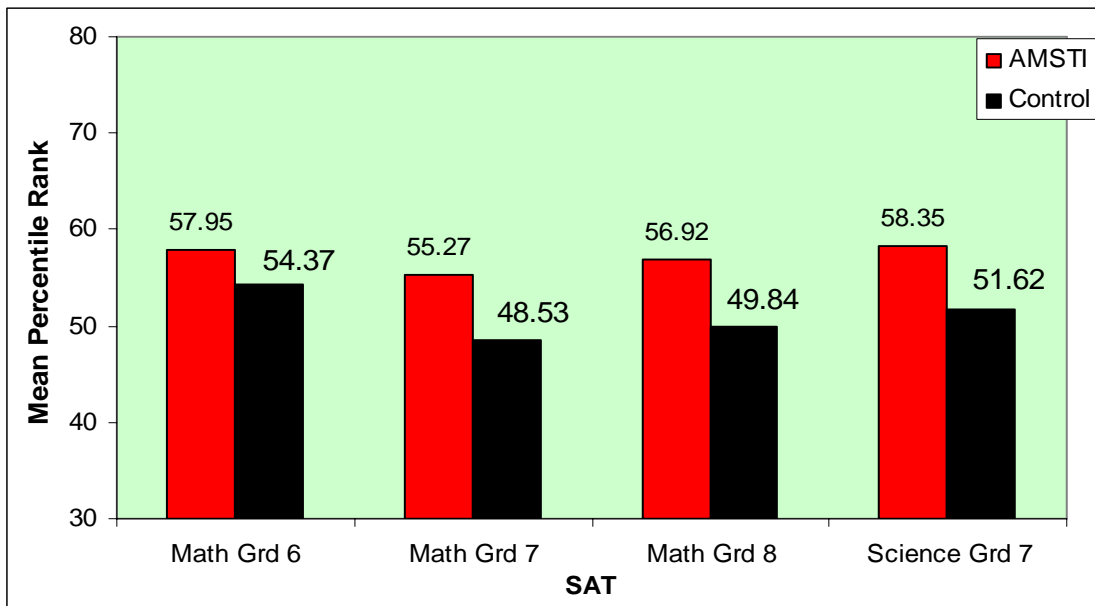


## All AMSTI Adopters: Middle Schools

### Stanford Achievement Test Data

- “The AMSTI middle schools had consistently higher mean percentile ranks than the corresponding control schools, across subject areas. These differences between groups across subject tests ranged between 3.58 and 7.37 percentile rank points.”
- “...the advantages attributable to the AMSTI program reached statistical significance in grades 7 and 8, across subjects.”
- “The advantage of the AMSTI middle schools over the average middle school in Alabama on the SAT for grades 6 to 8 ranged between 4.35 and 6.92 percentile rank points.”

Figure M-1. Middle Schools: AMSTI Versus Control: 2006 SAT Mean Percentile Ranks: Math & Science

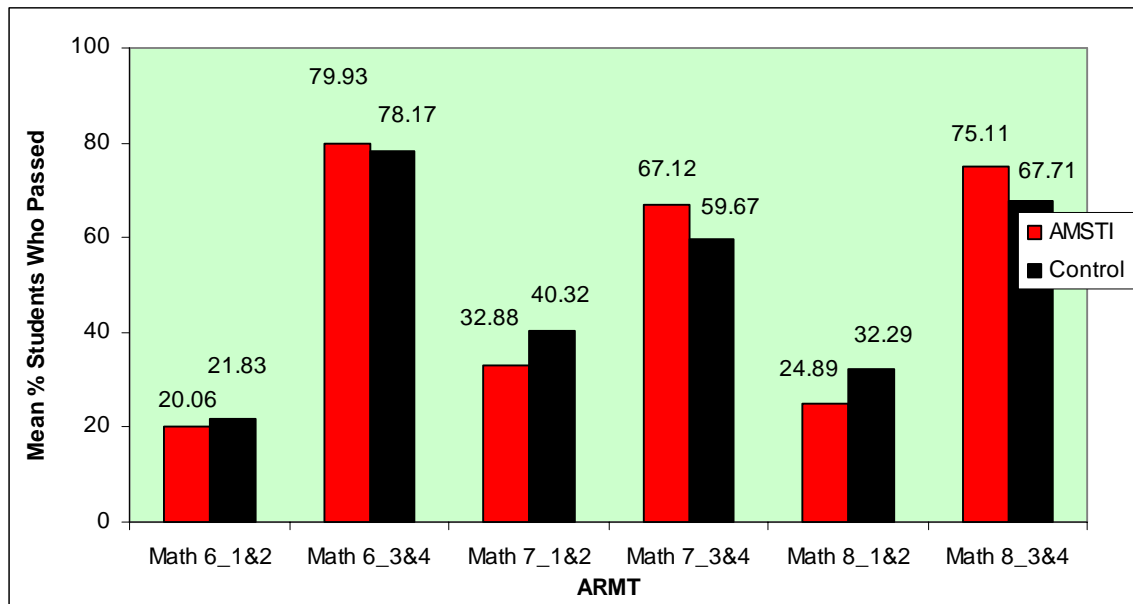


## All AMSTI Adopters: Middle Schools

### Alabama Reading and Mathematics Test Data

- “The AMSTI middle schools showed consistently higher percentages of students who passed the 2006 ARMT at Level 4 (Exceed the Standards).”
- “Additional benefits of the AMSTI program included higher minimums and substantially higher maximums at Levels 3 and/or 4 of the 2006 ARMT. All of these findings indicate the effectiveness of AMSTI in helping students to meet and exceed the ARMT standards for passing.”

*Figure M-2b. Middle Schools: AMSTI Versus Control:  
2006 ARMT Mean Percentages of Students Who Passed at Combined Levels: Math*

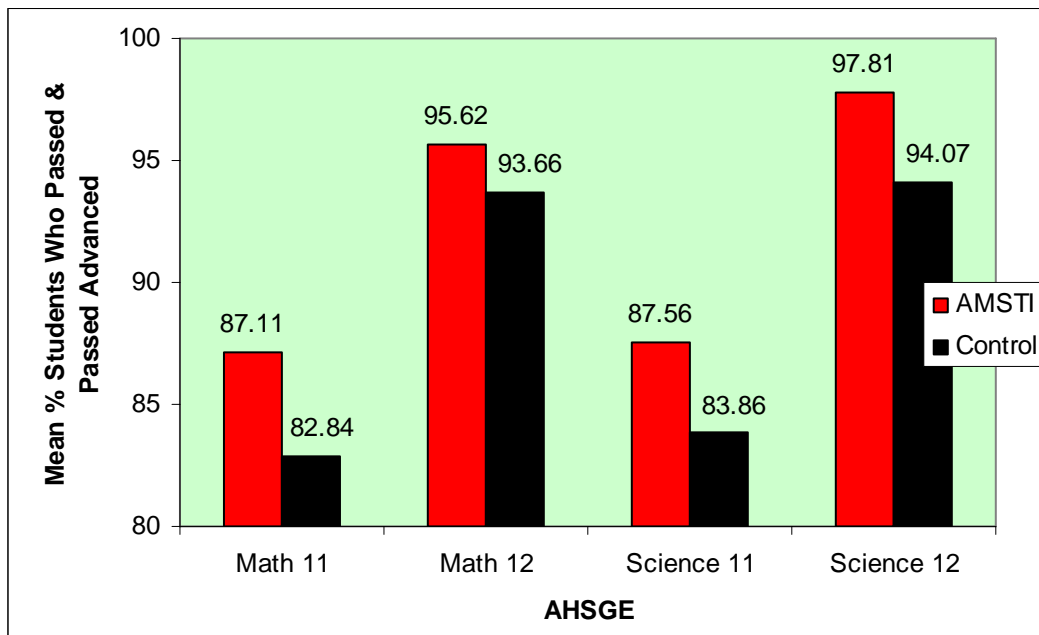


## AMSTI Summer Institute Schools of 2005: High Schools

### Alabama High School Graduation Exam Data

- “Compared with the control high schools, the 2005 AMSTI adopters had generally higher percentages of students who Passed or Passed Advanced the 2006 AHSGE than the control schools had.”
- “The AMSTI advantages varied across grades and subjects between 1.96 and 5.19 percentage points. These findings indicate that the AMSTI high schools tended to be more effective than the controls in terms of student learning, as measured by the AHSGE.”
- “The 2005 AMSTI adopters had generally higher cumulative percentages of students who Passed and Passed Advanced the 2006 AHSGE than the average high school in Alabama.”

*Figure H-1. High Schools: 2005 AMSTI Adopters Versus Controls: Mean Percentages of Students Who Passed and Passed Advanced the 2006 AHSGE: Math & Science*



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.