



**Summary of
“Report of the Normative Data on Student Attitude and Career Choice Survey
from Select Schools at Ten AMSTI Sites”**

An external evaluation of the results of AMSTI and non-AMSTI Student Surveys was conducted by the University of Alabama, Office of Community Affairs, under the direction of Dr. Estelle Ryan Clavelli.

AMSTI Student Surveys were developed and administered to AMSTI and non-AMSTI students through the internet website *SurveyMonkey.com*. All 2002-07 AMSTI Lead Teachers and administrators of science students in grades 6-8 and math students in grades 6-11 received paper and email copies of a memorandum inviting students to take part in the survey. Electronic and paper copies of a similar memorandum were distributed to lead teachers and administrators who had been accepted into the 2008 AMSTI Summer Institutes for grades 6-8 science and grades 6-11 math. Because their teachers had not yet attended AMSTI Summer Institutes, this latter group constituted the non-AMSTI respondents. Although participation was voluntary, all students in the identified grades were encouraged to complete the survey. Response data was collected by the University of Alabama, Office of Community Affairs. The goal of the study was to gather information to determine the effects of AMSTI on students’ interest, attitudes, preparation for future study, and awareness of careers in math and science.

In addition to gathering student attitudinal information, the external evaluation examined survey responses as they related to findings from the Council of Chief State School Officers (CCSSO) report “Improving Evaluation of Professional Development in Mathematics and Science Education,” released in February 2008. This evaluation provides documentation of the CCSSO criteria that teacher professional development effects on students’ outcomes are measured by a survey instrument that is reliable, valid, and purposeful.

Science Student Surveys

The science student surveys were comprised of three sections. The first section consisted of two demographic questions. The second section had thirteen items which asked students to rate the extent to which they agreed with each statement on a scale that ranged from 1 (strongly disagree) to 5 (strongly agree). The final section included seven multiple response items.

Two groups of science students were surveyed. The 2002-07 AMSTI students represent those taught by teachers who have attended at least one year of AMSTI Summer Institute. The 2002-07 AMSTI students submitted 4,683 completed surveys. The 2008 (non-AMSTI) group represents students whose teachers had not yet been trained in AMSTI Summer Institutes, but had agreed to attend the 2008 session. These students submitted 8,590 completed surveys. This summary reports a comparison of the responses from the two sets of students surveyed.

A greater percentage (2.78% more) of science students in the 2002-07 AMSTI group agreed or strongly agreed that they enjoyed science as compared to the students of teachers who will attend Summer Institute in 2008 (non-AMSTI).

Compared to students of teachers who planned to attend the 2008 Summer Institute (non-AMSTI), 4.1% more students of 2002-07 AMSTI teachers agreed or strongly agreed that science was useful in everyday life.

Survey results showed that 8.83% more students of teachers trained in 2002-07 (AMSTI) strongly agreed that every student in science class is expected to participate and give his/her best effort. While 37.19% of the 2008 (non-AMSTI) group strongly agreed, the difference is noted as the report states, *“The answer with the largest frequency for students from 2002-07 AMSTI science teachers is that they strongly agreed with the statement (46.02%)...”* (p. 137)

Overall, 5.06% more students of 2002-07 AMSTI trained teachers reported that they attempted to do their best. The report cites, *“...the most frequent answer is for both groups, 2002-07 AMSTI science teachers’ students (54.71%) and 2008 (non-)AMSTI science teachers’ students (49.65%), is that the respondents strongly agreed with doing their best in science class.”* (p. 138)

The report documents that 3.54% more students of 2002-07 AMSTI trained teachers expected to go on learning in a college or technical school. The report states, *“Note that most of the respondents strongly agreed with the statement, this is for both groups of students, those from 2002-07 AMSTI science teachers (42.62%) and from 2008 (non-)AMSTI science teachers (39.08%).”* (p. 141)

Figure G1.1 shows a comparison of activities chosen by 2002-07 AMSTI students and 2008 (non-AMSTI) students. The greatest difference in responses is that 19.60% more students of 2002-07 AMSTI teachers reported writing in a journal. The report authors cite another AMSTI advantage (14.25%) by writing, *“We note that a majority of students in 2002-07 explored concepts in the classroom (82.37%) as compared to 68.12% in 2008 (non-AMSTI).”* (p. 156)

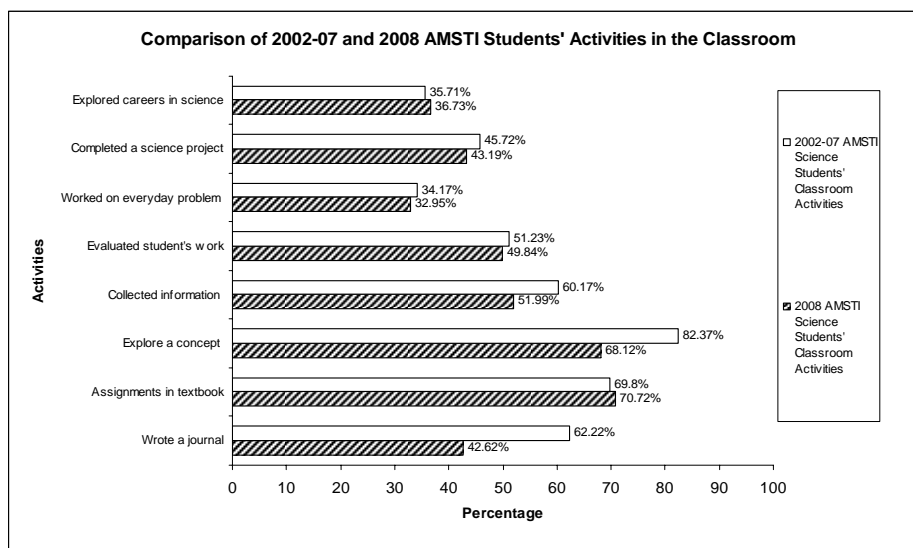


Figure G1.1

In the area of technology, students of teachers trained in 2002-07 (AMSTI) reported more calculator and computer usage in gathering and sharing data (8.63% more), solving problems (8.23% more), taking quizzes (3.82% more), collecting information with sensors (2.87% more), learning about science (2.85% more), and practicing science skills (2.28% more).

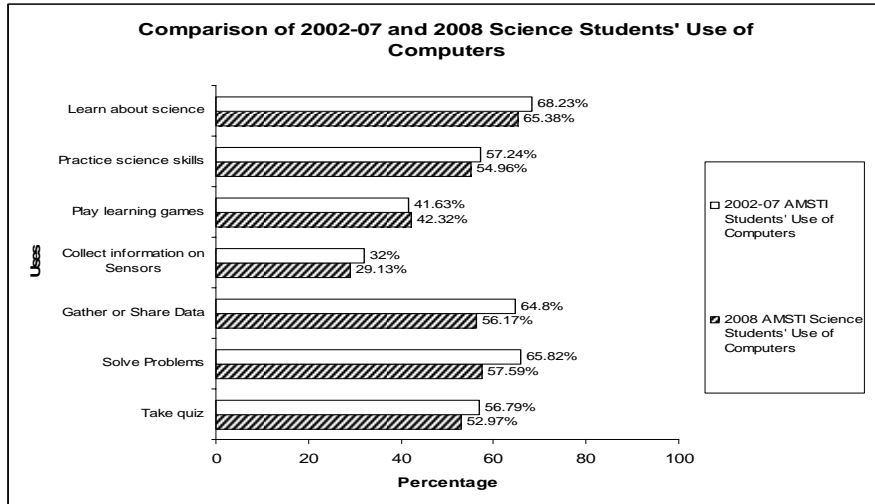


Figure G1.2

Overall, the 2002-07 AMSTI students' perceptions of their teacher were more positive than that of the 2008 students (non-AMSTI). In Figure G1.3 below, 10% more 2002-07 students reported that their teachers planned interesting activities. The advantages in other areas were: makes science exciting (8.21%), gives extra help (6.22%), values my ideas (5.7%), enjoys teaching science (5.61%), expects me to do well (5.22%), and thinks that it is important that I do well (5.12%).

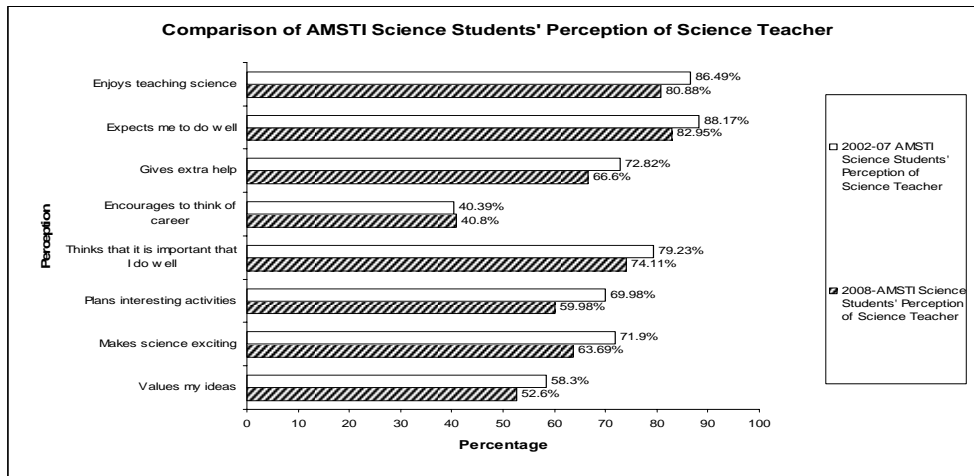


Figure G1.3

Math Student Surveys

The math student surveys were comprised of three sections. The first section consisted of two demographic questions. The second section had thirteen questions that asked students to rate the extent to which they agreed with each statement on a scale that ranged from 1 (strongly disagree) to 5 (strongly agree). The final section included seven multiple response items.

Two groups of math students were surveyed. The 2002-07 AMSTI students represent those taught by teachers who have attended at least one year of AMSTI Summer Institute. The 2002-07 AMSTI students submitted 3,974 completed surveys. The 2008 (non-AMSTI) group represents those students whose teachers had not yet been trained in AMSTI, but had agreed to attend the 2008 Summer Institute. These students submitted 14,103 completed surveys. This summary reports a comparison of the responses from the two sets of students surveyed.

A greater percentage (5.08% more) of math students in the 2002-07 (AMSTI) group agreed or strongly agreed that they enjoyed math as compared to the students of teachers who will attend Summer Institute in 2008 (non-AMSTI).

Compared to students of teachers who planned to attend the 2008 Summer Institute (non-AMSTI), 6.28% more students of 2002-07 AMSTI teachers strongly agreed that math was useful in everyday life.

The percentage of students who agreed or strongly agreed that they are good at mathematics was 5.41% higher for the 2002-07 AMSTI math teachers (61.70%) than for the 2008 (non-AMSTI) group (56.29%).

Students of AMSTI teachers were 6.25% more likely to look forward to math class. 45.25% of math students of 2002-07 AMSTI teachers agreed or strongly agreed that they look forward to math class. This compares to 39% of math students of 2008 (non-AMSTI) teachers.

Survey results showed that 7.04% more students of teachers trained in 2002-07 strongly agreed that every student in math class is expected to participate and give his/her best effort. While 33.16% of the 2008 (non-AMSTI) group strongly agreed, the difference in the responses is noted as the report states, *“The answer with the largest frequency for students from 2002-07 is that they strongly agreed with the statement (40.66%)...”* (p. 151)

Overall, 6.54% more students of 2002-07 AMSTI trained teachers reported that they attempted to do their best. The report notes, *“...the most frequently cited answer is for both groups, 2002-07 AMSTI math teachers’ students (55.97%) and 2008 (non-)AMSTI math teachers’ students (49.43%), is that respondents strongly agreed that they do their best in math class.”* (p. 152)

Students believe math instruction will be helpful to them in the future, with 49.02% of students from 2002-07 math teachers strongly agreeing with the statement. Although 43.01% of students of 2008 (non-AMSTI) math teachers also strongly agreed, the AMSTI advantage is 6.01%.

Over half (53.8%) of the students of 2002-07 AMSTI trained teachers agreed or strongly agreed that they planned to take more advanced math courses in the future. This compares to 48.82% of students of 2008 non-AMSTI teachers, representing an AMSTI advantage of 4.78%.

The report documents that 3.35% more students of 2002-07 AMSTI trained teachers expected to go on learning in a college or technical school. The report states, *“Note that most of the respondents strongly agreed with the statement....those from the 2002-07 AMSTI math teachers (49.85%) and from the 2008 (non-)AMSTI math teachers (46.50%).”* (p. 155)

“AMSTI math students indicated their classroom activities. Figure G2.2 describes the results...In 2002-07, 66.24% of respondents said they worked on hands on activities as compared to 53.36% of respondents in 2008. (12.88% AMSTI advantage) We also note that 62.26% of respondents in 2002-07 said they worked in groups as compared to 51.25% in 2008.” (11.01% AMSTI advantage) (p. 163)

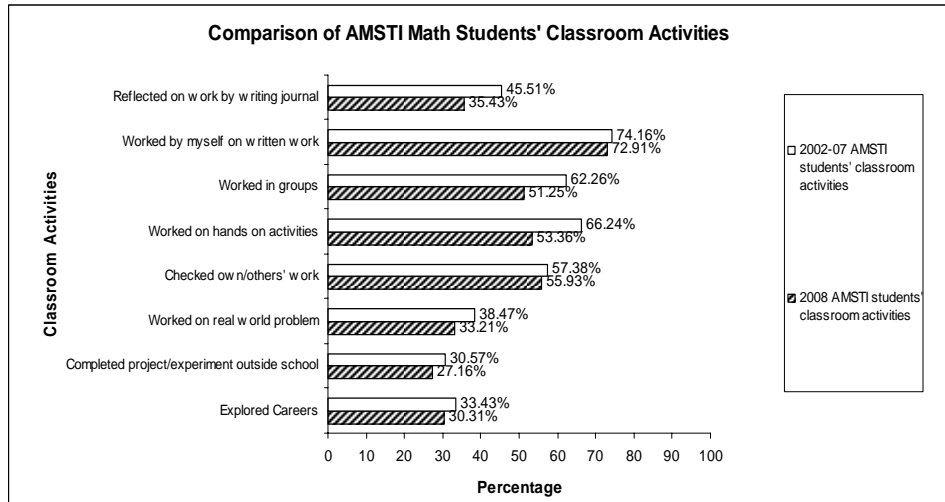


Figure G2.2

“AMSTI math students indicated the use of calculators. Figure G2.3 describes the results...62.26% of respondents in 2002-07 said they used calculators to practice math skills as compared to 56.82% in 2008.” (5.44% AMSTI advantage) (p. 164)

Figure G2.3 also shows that 52.05% of students of 2002-07 AMSTI teachers and 45.49% of students of 2008 (non-AMSTI) teachers reported using calculators to learn about math, resulting in an AMSTI advantage of 6.56%.

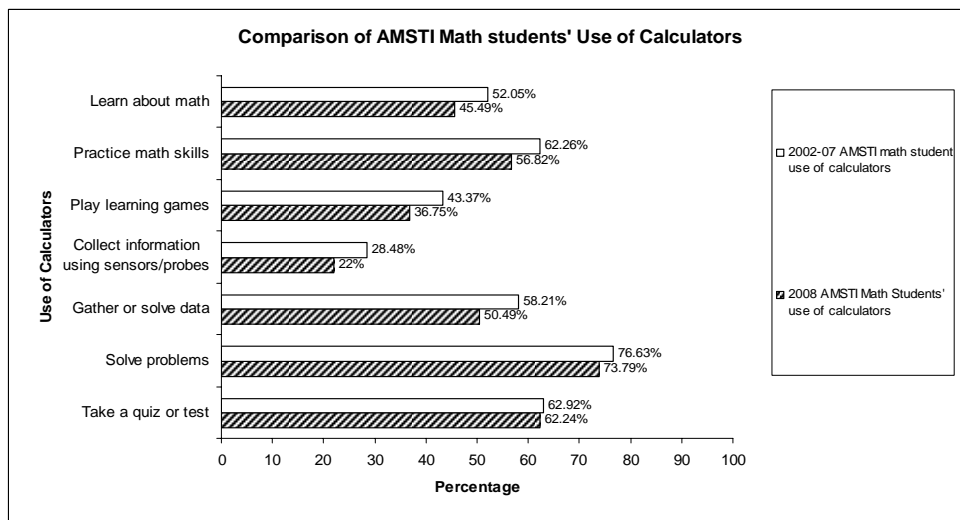


Figure G2.3

Overall, the 2002-07 AMSTI students' perceptions of their teacher were more positive than that of the 2008 non-AMSTI students. In Figure G2.4 below, 14.27% more 2002-07 students reported that their teacher planned interesting activities. The advantages in other areas were: makes math exciting (9.62% more), gives extra help (6.52% more), values my ideas (6.28% more), really enjoys teaching math (6.28% more), is a very good teacher (5.86% more), thinks it is important that I do well (4.99% more), encourages me to think of a career related to mathematics (3.97% more), and expects me to do my best (3.43% more).

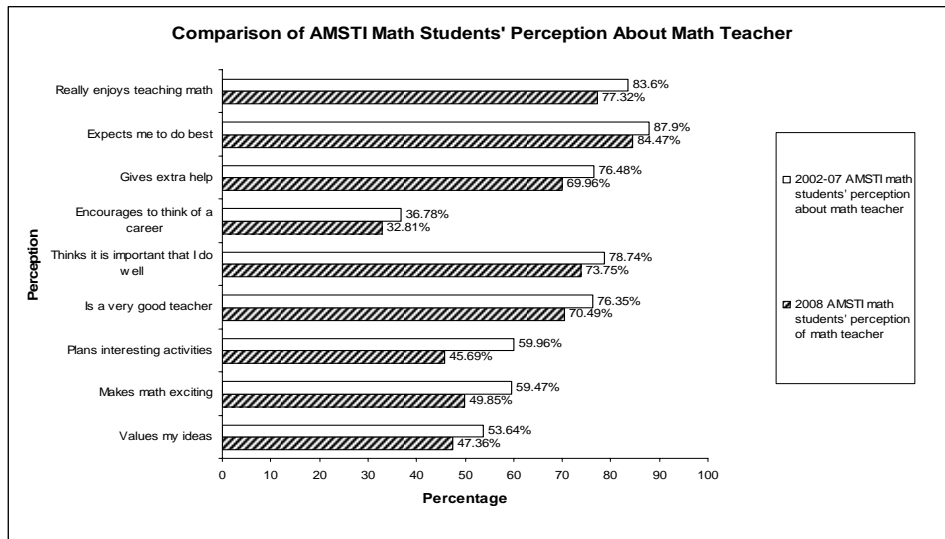


Figure G2.4

Discussion and Recommendations

The authors of the report acknowledged that there were differences between AMSTI and non-AMSTI students' responses, but that the results were limited. Below is information related to the discussion and recommendations in the evaluation.

“The expected outcome of the survey was to ascertain whether or not there were differences in the ways that the science and math students of AMSTI trained teachers and the science and math students of non-AMSTI teachers answered the survey questions. To this end, the science and math surveys revealed high reliability and validity....The results were stable and accurate. The survey questions measured what it intended to measure...attitudes and student behaviors (e.g. taking more math and science courses and future career plans).” (p. 94)

“The CCSSO report suggests that the ‘measure of student outcomes is reliable and valid for the evaluation purpose.’ The survey response items indicate that indeed students’ attitudes... and behaviors... are clearly identifiable. However, the concern appears when we try and show whether or not, there is a difference between the responses from student(s) of AMSTI trained teachers as compare(d) with the responses of students of non-AMSTI teachers. For this to happen, the surveys needed more discriminating questions.” (p. 94)

The evaluator recommended collecting additional demographic data in suggesting that, *“Ethnicity and grade level in these surveys were good indicators of demographic data, but adding gender would provide an additional dimension.” (p. 95)*

“We encourage the AMSTI leadership (to) consider piloting an updated version of the survey at a later date before reusing the survey. In the new version we recommend considering the use of items from the math and science teachers’ surveys.” (p. 96)

“The CCSSO National Report offers clear indicators of how teacher professional development affects science and math teaching and learning. These are relevant guidelines that are worthy of consideration for future investigations.” (p. 98)