



## Summary of “Report of the Normative Data from Teacher/Principal/Administrator Surveys from Select Schools at Ten AMSTI Sites”

An external evaluation of the results of Alabama Math, Science, and Technology Initiative (AMSTI) teacher and administrator surveys was conducted by the University of Alabama, Office of Community Affairs, under the direction of Dr. Estelle Ryan Clavelli.

AMSTI surveys were developed and administered to AMSTI teachers and principals through the internet website *SurveyMonkey.com*. All AMSTI Lead Teachers and administrators received paper and email copies of a memorandum inviting them to take part in the survey. Although participation was voluntary, all teachers and administrators who had attended AMSTI Summer Institute training were encouraged to complete a survey. Response data was collected by the University of Alabama, Office of Community Affairs. The goal of the study was to gather information that would assist schools with the implementation of AMSTI methods and materials.

In addition to gathering information to assist schools with the implementation of AMSTI, the external evaluation examined teacher and administrator 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 report addresses CCSSO findings, “1. report measurable effects of teacher professional development, 2. content focus plus sufficient time plus an in-school component equals significant effects, and 7. link teacher knowledge gain to change in classroom practices.”

### Science Teacher Surveys

The Science Teachers’ survey consisted of three sections. The first section had nine demographic questions. The second section had sixteen questions that asked for the extent to which science teachers agreed with each statement. The scale ranged from 1 (strongly disagree) to 5 (strongly agree). The final section consisted of six multiple response items. The data was analyzed for completed responses of 378 science teachers. Selected passages from this section of the report are below.

*“...there are 170 respondents (37.3%) who use AMSTI curricular materials 2-4 times per week, while 141 respondents (44.97%) use them daily...” (p. 21-22)*

*“...88% of the teachers who used the curricular materials daily and 84.1% who used the curricular materials 2-4 times per week agreed that the AMSTI modules address the ACOS (Alabama Course of Study)...” (p. 32-33)*

*“Science teachers communicated the type of assistance received from AMSTI specialists...the most frequent response was that AMSTI specialists contacted the respondents by phone, email, or a visit to the school (93.65%).” (p. 37)*

“Science teachers assessed the benefits associated with AMSTI...AMSTI kits and materials are the one with the highest number of responses (98.41%).” (p. 38)

“There were three key factors that the survey identified: professional development, content and learning outcome, and change in practice. This speaks well to CCSSO finding 1 that points out the importance of AMSTI’s positive ‘...measurable effects on the teachers’ professional development.’” (p. 90)

“...frequent users of AMSTI content report: addressing the ACOS; seeing students’ level of achievement increase; noting a more positive attitude; observing better attendance; and finding students engaged in learning activities. This aligns well with CCSSO finding 2 that ‘content plus sufficient time plus an in-school component should equal significant...(student learning)...effects.’” (p. 91)

“AMSTI teachers report that they:

- Plan activities that increase students’ interest in science
- Plan lessons to cultivate student awareness of the real world application of science
- Facilitate student learning through heterogeneous cooperative groups
- Use textbooks as a resource instead of as the primary instructional tool
- Utilize a variety of instructional strategies to engage students who struggle in science
- Require students to explain their reasoning/supply evidence to support an answer
- Help students to see connections between science and other disciplines, and
- Ask students to consider alternative solutions/explanations.

This last finding supports CCSSO finding 7. Professional development that ‘link(s) teacher knowledge gain to change in classroom practice’ significantly affects teaching practices.” (p. 91-92)

“Figure 5.1 offers a comparison of the number of actual hours AMSTI specialists gave teachers as compared to the number of hours that teachers say they would like help...two teacher groups felt they needed more help than they presently received. They are: first, teachers who expressed the need for 1-2 hours of assistance per week and second, teachers who desired 1-2 hours per month.” (p. 99-100)

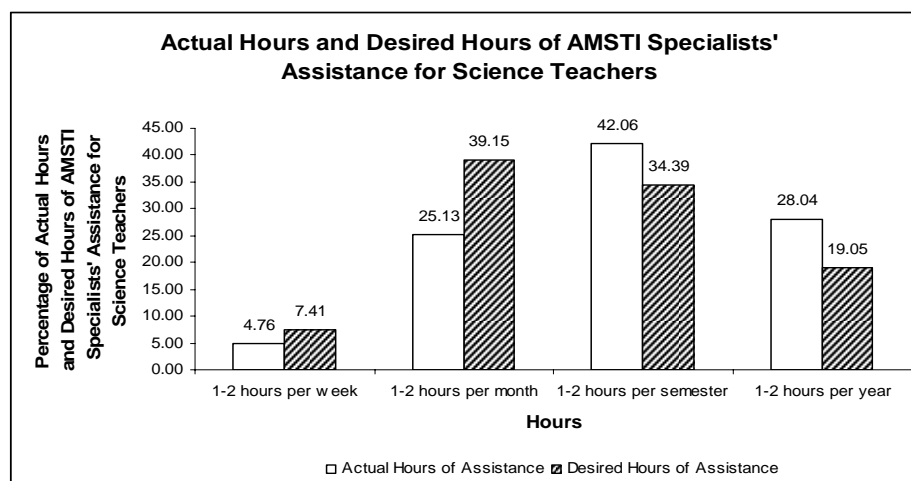


Figure 5.1

## Math Teacher Surveys

The Math Teachers' survey consisted of three sections. The first section had nine demographic questions. The second section had fifteen questions that asked for the extent to which math teachers agreed with each statement. The scale ranged from 1 (strongly disagree) to 5 (strongly agree). The final section consisted of six multiple response items. The data was analyzed for completed responses of 625 math teachers. Selected passages from this section of the report are below.

*"...there are 246 respondents (39.36%) who use AMSTI curricular materials 2-4 times per week, while 177 respondents (28.32%) use them daily." (p. 49)*

*"...87% of the teachers who used the curricular materials daily and 85.3% who used the curricular materials 2-4 times a week agreed that the AMSTI modules address the Alabama Course of Study..." (p. 60)*

*"The items on the survey measured the construct professional development as related to the training that AMSTI provided math teachers and the teaching and learning that takes place in their classroom. Three central factors were revealed: professional development, content and learning outcome, and change in practice. These three findings also align with CCSSO findings." (p. 92)*

*"...observations also line up well with CCSSO finding 2 'content focus plus sufficient time plus an in-school component equals significant effects.' AMSTI training and professional training over 6-15 hours in general, shows student activities in math class that:*

- *Practice routine computation/algorithms*
- *Use concrete materials*
- *Work on investigations or projects*
- *Make formal presentations*
- *Write reflections*
- *Record, represent, and/or analyze data*
- *Answer textbook or worksheet questions*
- *Read other math related materials, and*
- *Take notes during presentations." (p. 93-94)*

*"As a result of AMSTI math training the teachers revealed their students' practices. They include a positive and significant effect of technology on student learning with expanded use of calculators and computer. Math strategies implemented by the (AMSTI) teachers include:*

- *Consider alternative solutions/explanations*
- *Connections between math and other disciplines*
- *Explain reasoning and evidence to support an answer*
- *Engage students who struggle in math*
- *Use of textbooks as a resource*
- *Heterogeneous cooperative groups*
- *Awareness of real world applications of math, and*
- *Increase in students' interest." (p. 94)*

*“AMSTI professional development significantly affects teachers’ knowledge. In turn, classroom practices change. This supports CCSSO finding 7 where assessment ‘link(s) teacher knowledge gain to change in classroom practices.’” (p. 94)*

*“96.80% of all teachers say that AMSTI math kits and materials are a professional development benefit. In effect, teachers say that math kits and curricular materials are the most important way that the AMSTI training affects content and learning outcome.” (p. 94)*

*“In figure 5.2 we see the number of hours that AMSTI specialists gave math teachers compared to the desired number of hours...There are two groups of teachers who report that they need more assistance than they presently receive. They are the teachers in the 1-2 hours per week range and those in the 1-2 hours per month range.” (p. 100-101)*

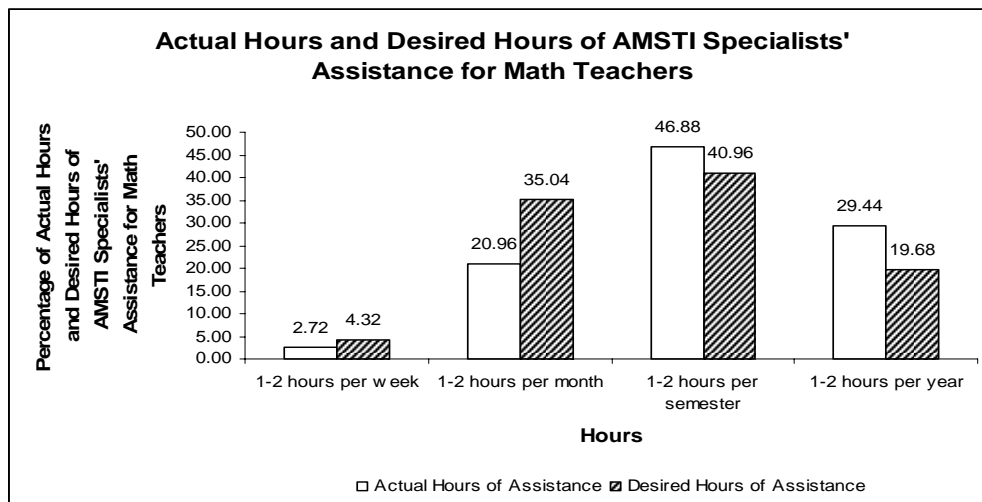


Figure 5.2

## Administrator Surveys

The Administrators’ survey consisted of three sections. The first section had six demographic questions. The second section had twenty-six questions that asked for the extent to which administrators agreed with each statement. The scale ranged from 1 (strongly disagree) to 5 (strongly agree). The final section consisted of six multiple response items related to administrators’ perceptions about AMSTI in their schools. The data was analyzed for completed responses of 103 administrators. Below are selected passages from this section of the report.

*“In observing math teachers who attend AMSTI Summer Institute, administrators noticed some students’ classroom behaviors...students working in cooperative groups have the largest frequency of responses (95.15%)...students communicating mathematical ideas either verbally or in writing (81.55%) and students involved in investigations of mathematical concepts (81.55%).” (p. 82-83)*

*“...in observing science teachers who attended AMSTI Summer Institute, administrators noticed some students’ classroom behaviors...the largest frequencies are students working in cooperative groups (98.06%) and students involved investigations of scientific concepts (97.09%).” (p. 84)*

*“Administrators communicated the type of assistance received from AMSTI specialists. These responses are AMSTI specialists contacted the administrators by phone, email, or a visit to the school (97.09%) and AMSTI specialists notified administrators and teachers of professional development opportunities (91.26%)...AMSTI specialists discussed with teachers ways to supplement the AMSTI modules (86.41%) and AMSTI specialists helped teachers plan, adapt, or teach a lesson (83.50%).” (p. 86)*

*“Administrators assessed the benefits associated with AMSTI...These benefits are AMSTI kits and materials (99.03%) and professional development (92.23%)...support of AMSTI site specialists (85.44%).” (p. 87)*

*“The AMSTI professional development appears consistent and reliable. This aligns with the CCSSO finding 1: ‘report measurable effects of teacher professional development.’” (p. 95-96)*

*“CCSSO Finding 2: ‘content and student outcomes.’ AMSTI professional development appears to consistently make a difference over time and place. Administrators recognize the change in student behavior and when observing in classrooms they see students in cooperative groups, using technology and engaged in active learning.” (p. 98)*

*“CCSSO finding 7: ‘link teacher knowledge gain to change in classroom.’ Administrators correlate change in learning environment with a change in teacher practices...All in all, there are evidence based indicators that AMSTI is working. Professional development is available. It impacts both teaching and learning.” (p. 98)*

## **Recommendations**

The survey of teachers’ and administrators’ perceptions demonstrated high reliability and validity. The authors of the report urge AMSTI to consider a more formal study of this type to be published and shared on a national level. Selected passages from this section of the report are below.

*“...we encourage the AMSTI direction to consider advancing their investigations of the math and science teachers and administrators perceptions of AMSTI to the level of a formal research project now that their surveys have been piloted and analyzed for reliability and validity.” (p. 102)*

*“We strongly urge consideration of a mechanism in Summer Institute that helps teachers rate their own perceived needs category. AMSTI specialists could offer additional support to those who are uncertain. This would increase the chance that more teachers would use AMSTI methodology in their classrooms.” (p. 102)*

*“The fact that the CCSSO national report and the AMSTI science and math teacher and administrator surveys share similar findings begs the question, is there sufficient evidence to encourage the AMSTI direction to share their professional development model nationally?” (p. 102)*