Report

MSTA Final Report

Mathematics and Science Teacher Academy Evaluation

Prepared for
Minnesota Department of Education

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Hezel Associates, LLC
731 James Street, Suite 300
Syracuse, NY 13203
315-422-3512
hezel@hezel.com

EXECUTIVE SUMMARY

In a time of evolving Algebraic standards and expectations for Minnesota teachers and students, the establishment of quality professional development and technical assistance can help educators move more confidently toward greater mathematics understanding and, subsequently, successful teaching and learning. To this end, the Minnesota Department of Education has developed the Math and Science Teacher Academy (MSTA), a statewide infrastructure focused on the improvement of mathematics and science instruction.

External evaluator Hezel Associates, LLC has supported the MSTA initiative through formative and summative research since the program's inception during the summer of 2008, examining MSTA implementation and initial impact since its launch. Utilizing multi-method and quasi-experimental designs that called upon both primary and secondary data provided a comprehensive opportunity to determine whether changes in teacher behavior and, subsequently, student performance that may be detected across Minnesota are attributable to MSTA implementation. Data collection has been coordinated and consistent across regional Teacher Centers, the cornerstone of MSTA implementation, so that valid comparisons could be made; concurrently, evaluators gathered in-depth information unique to each Center.

While measureable gains in teacher Algebra knowledge and student performance have yet to be seen, data suggest strengths and areas of improvement for MSTA to date, resulting in the following commendations and recommendations:

A. STATEWIDE IMPLEMENTATION

1. Commendations

MSTA encourages various configurations of PLC implementation, which empowers regions to conduct PLCs in ways that are most appropriate for their constituents.

MSTA encourages various configurations of Algebra workshops.

2. Recommendations

Consider providing clearer messages to the regional Teacher Centers, principals and teachers about what MSTA participation entails.

The promotion of lesson study as a specific modality for conveying MSTA content could provide a valuable framework for regions that struggled to coordinate MSTA implementation.

Consider endorsing technical assistance that can take place as locally as possible.

Support the unique roles of Teacher Center partners in each region.

Consider extending the evaluation period to determine the impacts of MSTA on teachers and students.

B. Center-Specific Implementation

1. Commendations

Region 11 had a sizeable design team, comprising of representatives from six education partners – each of whom, with different backgrounds, provided unique contributions and perspectives.

Providing multiple formats for technical assistance is useful. For example, Region 11, created a web site that provided various relevant documents, including all module training documents, examples of assessments and research articles.

At the end of the school year, various elements of PLCs were given the highest possible rating of "excellent" by the greatest percentage of teachers in Regions 7 and 3. Regions 5, 6 & 8 and 11 also ranked in the top regions to obtain "excellent" ratings for at least one element listed on the PLC survey.

PLC goals were viewed as strongly emphasized by teachers in Regions 3 and 11, followed by 7 and 10.

In some regions, the Higher Education partners went "above and beyond" with their level of support for MSTA – particularly in Region 10.

2. Recommendations

Some regions, such as Region 1 & 2, described how recruiting schools and teachers to participate in MSTA over the summer was a challenge. If possible, more rapid messaging about the MSTA grant opportunity and acceptance of awards could be beneficial.

Principals need more information about MSTA (this need was particularly evident in Region 4).

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INTRODUCTION

As external evaluators, Hezel Associates has supported Minnesota's Math and Science Teacher Academy initiative through formative and summative research since the program's inception during the summer of 2008. Our evaluation has taken a formative-summative approach, examining MSTA implementation and initial impact while the program is underway. All regional Teacher Centers have been involved extensively in the evaluation, as well as MSTA-participating teachers throughout the State. Initial findings, commendations and recommendations have been shared with both the Minnesota Department of Education (MDE) and Teacher Centers throughout the evaluation so that ongoing feedback could inform MSTA progress during the 2008-2009 school year. In particular, formative aspects of the evaluation focused on how the new program was progressing as Centers, partner colleges at each Center and the participating K-12 entities were evolving in their relationships. Summative evaluation activities have considered the effectiveness of MSTA statewide and within each of the regional Teacher Centers.

The evaluation team's logic model assumes a diffusion effect, suggesting that changes in teacher behavior might be expected to have a greater impact on students than changes in school leadership behavior. Utilizing multi-method and quasi-experimental designs that called upon both primary and secondary data provided a comprehensive opportunity to determine whether, in fact, changes that may be detected across Minnesota are attributable to MSTA implementation in the way that our logic model suggests. Data collection has been coordinated and consistent across Centers so that valid comparisons could be made and, concurrently, we collected in-depth information that was unique for each Center.

In this third and final report of the MSTA evaluation's activities, findings, commendations and recommendations, we focus on presenting new information that has not been presented elsewhere[1] (i.e. activities and findings related to work completed during the spring of 2009). We combine this new information with key points that were described in previous reports to arrive at overall findings, commendations and recommendations for MSTA's first year of implementation and impact. Significant findings were not only determined within each research activity, but were examined across activities to both inform key trends within regions and to address our overarching research questions for MSTA implementation across Centers.

[1] Please refer to Reports 1 and 2 for prior methods, findings, commendations and recommendations.

METHODS

A. DISCUSSION OF GENERAL APPROACH

As in all sound evaluations, a set of core questions drives the evaluation of Minnesota's MSTA initiative. The four questions that fueled the evaluation examined the way(s) in which MSTA was implemented and whether, how, and under what conditions MSTA exerted a meaningful impact on teacher and student outcomes:

1. In what ways do each of the State's regional Teacher Centers develop and administer MSTA professional development for teachers?
2. In what ways do Teacher Centers, districts, schools and teachers interpret and implement the goals of MSTA?
3. To what extent are Teacher Center partnerships effective at facilitating the achievement of MSTA's goals?
4. To what extent does MSTA contribute to changes in teaching practice, student performance and school improvement outcomes?

The evaluation team addressed these research questions in a series of activities that unfolded logically over the course of the one-year project, ranging from more general formative and summative evaluation activities that took place in all participating MSTA sites, to more specific activities that involved a selected group of MSTA and non-MSTA comparison sites.

B. DATA COLLECTION ACTIVITIES AND ANALYSIS PROCEDURES

1. Activity 1: Preliminary consultation with MDE

The first evaluation activity was a focused consultation with key personnel at MDE during August 2008 for the purpose of gathering both specific and exploratory information[2]. This face-to-face meeting helped the evaluation team learn more about the performance indicators for each component of MSTA including:

- Quality of the math professional development modules,
- Effectiveness of the delivery of the Grades 6-8 Algebra Connected to Number module,
- Effectiveness of the technical assistance provided by the MSTA Teacher Centers, and
- Quality and effectiveness of the infrastructure and activities of MSTA to provide and support assistance to improve math instruction.

[2] The agenda and summary notes are in Report 1, submitted to MDE on October 31, 2008.

These four components represent the focus of the evaluation across all Centers, so understanding state-level expectations about each one provided an essential foundation to our evaluation work. This first consultation with MDE staff also explored the nature and context of the MSTA Centers, their partner relationships, rationale for the MSTA concept, first-year expectations for MSTA operations across the State, and expected use of the evaluation findings.

2. Activity 2: Focus group interviews with MSTA Centers

Focus group interviews with each of the nine MSTA Centers occurred in late September and early October 2008. Staff from the Regional Center, K-12/ECSU affiliates and Higher Education partners were identified and then invited to attend a one-hour teleconference. This activity provided baseline data about MSTA implementation and informed the development of instruments used during the evaluation. A second round of MSTA Center focus group interviews occurred during the case study site visits in January, February and March of 2009. This time, eight out of nine of these interviews were face-to-face meetings.

3. Activity 3: Spring deployment of MSTA Algebra workshop survey

To complete the collection of trend data describing the content, efficacy and outcomes of MSTA cohort meetings and training modules, Hezel Associates launched an email campaign in early May 2009 asking participants[3] to complete a final (spring) round of online surveys. After three total rounds of surveys distributed throughout the 2008-2009 school year, the Hezel team summarized outcomes and identified developments related to participants' MSTA workshop/activity experiences. Response rates are presented in Table 1 below; at least 25 percent of participants from all regions completed surveys.

[3] Evaluators received contact information from participating teachers within each regional Teacher Center, followed by regular correspondences with Centers to keep current.

Table 1. Spring 2009 post-workshop survey response rates:

Center	Number of MSTA participating teachers	Number of Responses	Response Rate for Region	Percent of Total Responses
Northwest Service Coop Region 1 & 2	56	22	39.3%	5.0%
Northeast Service Coop Region 3	48	12	25.0%	2.8%
Lakes Country Service Coop Region 4	34	11	32.4%	2.5%
Brainerd Region 5	35	18	51.4%	4.1%
SW/WC Service Coop Region 6 & 8	92	42	45.7%	9.6%
Resource Training and Solutions Region 7	125	44	35.2%	10.1%
South Central Service Coop Region 9	43	14	32.6%	3.2%
Southeast Service Coop Region 10	39	10	25.6%	2.3%
Metro Educ. Service Unit Region 11	511	263	51.5%	60.3%
Total	***983***	***436***	***44.4%***	***100.0%***

As with prior workshops, survey respondents following the spring Algebra workshop were predominantly (76-83%) middle school mathematics teachers (grades 6-8), and most had not attended a STEM (Science, Technology, Engineering, and Math) related workshop in the past five years (77.3%). More than one-third (36.3%) of respondents had greater than 15 years of teaching experience, while a quarter of respondents (25.7%) had been teaching for five years or less. However, teachers seem to have less experience teaching mathematics at the middle school level, as 35.5 percent of respondents have been teaching middle school math for five years or less, while only 21.8 percent have been doing so for more than 15 years. Almost half of Region 5 respondents (n=8, 44.4%) had been teaching for at least 21 years, compared to just over 20 percent of teachers from all other regions. Further, about 27.8 percent of Region 5 respondents had been teaching middle school math for just as long, compared to only 11.7 percent of teachers from other regions with 21+ years of mathematics teaching experience.

After closing the survey later in May, the Hezel team cleaned the data, calculated descriptive statistics on all closed-ended questions, and coded and analyzed all open-ended responses. Cross-tabulations were conducted on survey items that showed variability in responses, which were considered along with context provided by case study data. Details specific to each region are presented in the *Findings* section below, as well as outcomes that inform the evaluation's research questions across regions.

4. Activity 5[4]: Comparative case studies of MSTA implementation

Case studies were conducted to provide in-depth information about MSTA beyond what the online surveys could reveal. These visits helped to more concretely articulate the similarities and differences in MSTA implementation and impact across Minnesota. Additionally, the site visits provided context to inform the creation of the four rubric checklists provided to MDE. MDE was consulted when establishing the case study site selection methodology and when designing the site visit protocols (see Appendix 1). The Hezel team met all of MDE's requests for participation in the case studies, including representation of one to two STEM sites, securing one or two MSTA participating schools for each region and observing PLCs[5]. With minimal influence from MDE, Hezel Associates selected and contacted specific MSTA sites to represent unique combinations of characteristics and student demographics (i.e., geographic location, district size, AYP status and free/reduced lunch percentage) (Table 2).

Table 2. Case study site demographics

# schools	Grade levels	District size*	Geographic Location	AYP status	Free/ reduced lunch	Student ethnicity	LEP
18 schools (2 are STEM schools)	PK-6 (three schools) K-6 (two schools) 5-8 (one school) 6-8 (five schools) 7-8 (one school) 7-9 (one school) 7-12 (five schools)	2 large schools 9 medium schools 7 small schools	City: large (1) Suburb: large (1) Suburb: small (1) Town: remote (3 schools) Town: distant (2 schools) Town: fringe (1) Rural: remote (7 schools) Rural: distant (1) Rural: fringe (1)	9 non-AYP schools 9 AYP schools	Three schools 11-20% Three schools 21-30% Five schools 31-40% Four schools 41-50% Two schools 51-60% One school > 60% (92%)	American Indian: seven schools 0-0.4%, five 0.5-1.4%, five 1.5-2.0%, one >2.0% Asian: seven schools 0-0.4%, six 0.5-1.4%, three 1.5-2.0%, two >2.0% (1=57.7%) Hispanic: four schools 0-0.4%, three 0.5-1.4%, four 1.5-3.4%, seven 3.5-9.9% Black: four schools 0-0.4%, nine 0.5-1.4%, four 1.5-9.9%, one>10% (23.6%) White: one school <10%, three 70-90%, five 91-95%, nine 96-99%	Eleven schools 0% Six schools 1-5% One school >5% (62%)

**MDE defines small as 1000 students in the district or under, medium as 1001-10,000 students and large as over 10,000 students.*

[4] Activity 4 was originally intended to examine MSTA Leadership workshops, but the evaluation team instead focused on Algebra workshops and, with MDE's permission, omitted the original Activity 4.
[5] PLC observations were not in the original proposal.

In some cases, the MSTA regional Coordinator was utilized to facilitate participation after Hezel Associates had initiated contact with the selected schools. A letter of support from two Assistant Commissioners at MDE was also provided to the chosen sites to encourage participation. In some instances, the first-choice sites that provided ideal variety in demographics did not want to participate for various reasons or did not respond, resulting in contacting second-choice sites. Ultimately, 18 schools across the state were visited for the case studies.

Between January and March of 2009, the Hezel team conducted the site visits in each region. As needed, evaluators went to two schools to represent the district if one of the grades (such as sixth) was in another building. Visits typically lasted two to three days (though two visits lasted one day each). Ultimately, 95 research activities were conducted across all sites (Table 3).

Table 3. Case study site research activities

Activity	Total sessions conducted	Total number of attendees	Positions	Duration (in minutes)
Teacher Focus Group Interviews	24	63 teachers	Typically grades 6-8, + 1 special ed. and 1 PLC lead teacher	30-60 min
Teacher Observations (lesson studies in one region)	44	43 teachers observed in classrooms (+17 in lesson study)	Two 5th grade teachers; Six 6th grade teachers; Fourteen 7th grade teachers; Seventeen 8th grade teachers; Three 9-12th grade teachers; One special education teacher	25-75 min
Administrator Interview	13	17 participants	11 principals; 2 curriculum Coordinators; 1 superintendent; 1 dean of students; 1 director of teaching and learning; 1 math coach (k-6)	25-60 min
MSTA Center/Higher Education/K-12 partner Focus Group Interviews	9	30 participants	MSTA Center Coordinators/staff: 9 MSTA consultants/math specialists: 6 Higher Education partners/professors: 11 K-12 partners/sponsors: 4	30-100+ min
PLC	5	42 participants	Spanned grades 5-12 (principals and MSTA Coordinator attended one)	Typically 30-60 min (one lasted 6 hrs)

These activities involved teacher focus group interviews, observations of randomly-selected teachers, an administrator interview and a focus group interview with MSTA

Center representatives, K-12 partners and Higher Education partners[6]. A math PLC was also observed if it coincided with the site visit.

The visiting evaluators created anonymous summary reports for each region, which were examined for state-wide and region-specific key findings and themes. As part of the formative evaluation process, the case study findings were shared with MDE in April 2009 via web conferencing. Afterwards, at MDE's request, the Hezel team sent each regional Center its own site visit summary, designed to encourage reflection and dialogue.

5. Activities 6 and 7: Spring deployment of combined technical assistance, PLC and data-driven decision making survey

Similar to the post-module Algebra survey, the third and final round of surveys informing PLC (Professional Learning Communities) implementation, data-driven decision making and technical assistance activities was distributed to MSTA teachers in early May. Hezel Associates considered all three rounds of survey data, collected along with contextual data provided by case studies, to summarize outcomes and identify trends throughout the 2008-2009 school year related to:

- Magnitude of PLC implementation and associated impacts of PLC implementation on student learning
- Elements of data-driven decision making
- Collaborations, school norms/values and reflective practices within each Teacher Center
- Technical support requested by teachers and provided by Teacher Centers during MSTA implementation

Response rates for this spring round of surveys are presented in Table 4 below. The overall response rate was 40.4 percent and more than 26.0 percent of participants from each region completed surveys. Most of the respondents work with students in grades six through eight (92.4%), but some also work with high school students (12.3%) or kindergarten through fifth grade students (6.8%). Years of teaching experience ranged from one to forty years, with an average of 13.6. About one-third (32.6%) of the survey respondents work in Q Comp schools, which purposefully focus on PLC and professional development activities.

[6] One regional Center's focus group was conducted via telephone rather than in-person due to scheduling conflicts.

Table 4. Spring 2009 PLC survey response rates:

Center	Number of MSTA participating teachers	Number of Responses	Response Rate for Region	Percent of Total Responses
Northwest Service Coop Region 1 & 2	56	22	39.3%	5.5%
Northeast Service Coop Region 3	48	13	27.1%	3.3%
Lakes Country Service Coop Region 4	34	9	26.5%	2.3%
Brainerd Region 5	35	16	45.7%	4.0%
SW/WC Service Coop Region 6 & 8	92	24	26.1%	6.0%
Resource Training and Solutions Region 7	125	33	26.4%	8.3%
South Central Service Coop Region 9	43	22	51.2%	5.5%
Southeast Service Coop Region 10	39	12	30.8%	3.0%
Metro Educ. Service Unit Region 11	511	246	48.1%	62.0%
Total	***983***	***397***	***40.4%***	***100.0%***

As with the Algebra survey described above, the Hezel team cleaned the survey data and performed descriptive analyses, then sought outcomes both specific to each region and across regions to address overarching research questions.

6. Activity 8: Quasi-experiment/student performance data analysis

In addition to the primary research described above, the evaluation team analyzed secondary data to determine MSTA's ultimate impact on students. To do this, we utilized a quasi-experimental design to determine whether any change in student knowledge of mathematics could be directly attributed to MSTA professional development. The quasi-experimental design utilized the MCA-II data to measure student mathematics achievement, a longitudinal database of scores from those math tests, and a comparison group of students with similar demographic characteristics as MSTA-participating schools that were involved in the case studies.

Evaluators first designated case study sites as the participation, or treatment, group. To identify the comparison group, demographic characteristics used to stratify the schools to create a sample for the on-site visits were then used to match similar non-participating schools in each Center. For this, evaluators utilized a database of Minnesota schools and accompanying characteristics and test scores provided by MDE.

MCA-II math scores from both the participation group and the comparison group were obtained before MSTA implementation in schools (2006-2007 & 2007-2008) and one year

after implementation (2008-2009). Evaluators received the "pre-test" scores from MDE in Spring 2009 to begin preliminary analyses, while the "post-test" scores were obtained in July as MCA-IIs are not administered until mid-April. Since state test data in Minnesota is not accessible by teacher, evaluators relied on scores of all math students in the target grade levels (6-8) across each school in the participation and comparison groups. In order to attribute change to MSTA participation as accurately as possible at the school level without delineation by individual participating teachers, the Hezel team first calculated MSTA dosage of each case study site by finding the proportion of participating MSTA math teachers in the target grade levels (6-8) out of all eligible math teachers onsite.

Data was analyzed using an SPSS function called Analysis of Covariance (ANCOVA), which determines if the participation group of students experienced gain or growth relative to the gains of the corresponding control group of students. In addition, ANCOVA allows us to determine which independent variables, such as demographic variables, might have contributed to any gains realized in math achievement. Individual student scores at each site were tracked by identification (e.g. MARSS) number, and only matched pairs of students across testing periods were used for analysis for both participation and control groups. Evaluators then corroborated statistically significant findings with key findings from all other research activities to arrive at an overall characterization of the nature and magnitude of MSTA impact on schools and student learning, cited in the findings and recommendations below.

7. MSTA implementation checklists

The extensive formative-summative research undertaken by the Hezel team has informed the development of a set of final evaluation checklists that contain vetted criteria for characterizing the quality and sustainability of MSTA implementation in multiple and diverse settings. Evaluators have ensured that efforts to characterize MSTA implementation connect logically with Hezel Associates' work to date. In total, the Hezel team has generated four checklists, intended for:

- Mathematics module development quality
- Mathematics module delivery quality
- School-level checklists for characterizing the efficacy of MSTA implementation support from regional Centers, the nature of PLC and data-driven decision making implementation, and classroom-level MSTA implementation and impact
- Teacher Center quality including the effectiveness of infrastructures, partnerships and technical support provided to multiple and diverse stakeholders

The checklists have undergone several types of vetting, including inspection against current research on best practices for mathematics instruction, technical assistance/professional development directed towards teaching and learning, PLCs, and data-driven decision making. Further, the evaluation's content expert who is familiar with Minnesota Standards was involved from the formative stages to final editing. The Hezel team then requested targeted feedback from MSTA-implementing administrators and teachers on the thoroughness and efficacy of the checklists.

8. Document review

Although not articulated in the proposal as a formal or distinct evaluation activity, document review has been an additional source of data for the MSTA evaluation. MDE has provided a wealth of MSTA-related historical information to Hezel Associates, including the regional Center applications, regional monthly progress reports and power point presentations given by each region during a February 2009 meeting held at MDE. WebEx meeting agenda minutes have also been periodically shared with Hezel Associates. During case study site visits, some regional Center Coordinators and participating teachers provided the evaluators with handouts or binders detailing the Algebra module training agendas, instructional resources and background reading.

FINDINGS

The findings below are derived from a combination of data gathered by all of the methods described above and are organized by research question. Where appropriate, we describe key trends within regions and overarching themes for MSTA implementation across Centers. With the addition of Spring 2009 survey data (see Appendices 2 and 3) and case study highlights, outcomes are clearly delineated as year-end status and as comparative trend data where appropriate. Finally, a discussion of findings articulates the limitations of and issues with data and processes that have a potential impact on the evaluation's outcomes, as well as implications for the future of MSTA.

A. IN WHAT WAYS DO EACH OF THE STATE'S REGIONAL TEACHER CENTERS DEVELOP AND ADMINISTER MSTA PROFESSIONAL DEVELOPMENT FOR TEACHERS?

1. Modalities

There are two key ways that MSTA participants received professional development: through Algebra Connected to Number workshops and through locally-implemented professional learning communities (PLCs).

a. Algebra Connected to Number Workshops

(1) Structural factors

At the time of spring survey distribution, 72.7 percent of survey respondents[7] had received at least 19 total hours of formal Algebra Connected to Number workshop training throughout the school year (compared to 34.2% with 19+ hours at the time of the winter survey). The amount of Algebra Connected to Number training varied by region; the majority of respondents from Region 3 (91.6%), Region 9 (78.5%), Region 7 (70.5%) and Region 4 (63.7%) received 25 or more hours of formal training (with more than half of Region 7 teachers – 52.3% - receiving greater than 30 hours). Teachers from Region 5, however, received much less formal training, with 44.4 percent of respondents (n=8) reporting six or fewer hours (and 66.6% reporting a maximum of 12 hours).

Participants that completed the survey predominantly attended workshops quarterly (41.4%) or monthly (28.1%). Almost no one reported more frequent training, while only a handful (13.3%) attended sessions less frequently (semesterly or summer only). However, 62.5 percent of Region 10 teachers who completed surveys attended a workshop only in the summer or once a semester, as did half of Region 5 teachers.

[7] Note that the number of training hours is being reported by individual teachers, which differs from the actual number of training hours offered by their region.

More than three-quarters of survey respondents found the workshops to be combinations of self-guided and facilitated activities throughout the year. Reports from MSTA Coordinators and partners corroborated, describing both speakers and breakout sessions early in the year; there were many opportunities for teamwork (the largest region, 11, had groups of about 50 teachers), and there were often rotation systems in place (for instance, one regional Center described rotating groups in and out of a computer lab for *Moodle* training). Algebra workshops were offered in a variety of formats across the regions, according to regional Center Coordinators and partners (Table 5). All teachers typically met regionally, though some regions offered 'sub-region' locations and multiple workshop dates to accommodate participants.

Table 5. Algebra workshop formats by region

Region[8]	Frequency	Who attended	Format/Accommodations
1 & 2	4 total meetings	All participating teachers	Meetings held at Teacher Center
3	Quarterly	All participating teachers	Option to visit one of four sub-region locations
4	3 total meetings (a 4th meeting was cancelled)	All participating teachers	Teachers meet at Teacher Center; 4-day summer workshop, single day follow-ups
5	2-day summer workshop only	All participating teachers	Teachers meet at Teacher Center
6 & 8	Monthly	All participating teachers	2-3 different locations for each meeting are offered
7	2 meetings for all teachers; 6 meetings for lead math teachers	Summer workshop and one follow-up meeting attended by all teachers; Lead math teacher attends subsequent meetings	Meetings held at Teacher Center
9	Every other month	Two sets of trainings for teachers and admin (3 total meetings for admin)	2 training dates are offered for each meeting at the Center
10	3 total meetings	All participating teachers	Multi-day meetings at central location
11	6 total meetings	All participating teachers, plus trainings for principals	For each meeting topic, multiple dates and locations are offered

Differences in the diffusion of information, resources and procedures related to Algebra workshops were also reported across the regional Centers. Some diffusion models were strictly top-down, while others were more decentralized and evolved from local dynamics that were in place before MSTA began (evaluators observed that local models with dedicated/accessible Center-based personnel seem to work efficiently).

(2) Workshop focus and goals

Workshop modules have covered a variety of topics throughout the school year. Teachers were introduced to several major Algebraic concepts early in the workshop

[8] Region identities have been kept anonymous to protect our data sources.

series, including patterns, functions, equivalent forms for simple Algebraic expressions, different uses of variables, relating and representing relationships, and contextualized problems. However, throughout the year, teachers seem to have most utilized their improved understanding of mathematical concepts such as ratios, proportions, and the equal sign. When openly describing their takeaways throughout the Algebra workshops, the greatest proportions of teachers cited different modes of presenting or visually interpreting their reinforced math content and understanding (showing non-linear relationships, addressing the equal sign, etc.) – as well as the importance of a hands-on approach (i.e. student discovery, manipulatives).

A few regions involved the use of lesson studies throughout the year. As a representative from one region explained, "Lesson study is a new concept in teaching Algebra strategies. Minnesota moved Algebra I to 8th grade…Many of the teachers never had to teach it. We had to get them ready for these requirements…and give them a foundation to work from and a lesson plan so they could teach more effectively."

Aside from mathematics content and concepts, Centers and teachers also reported focusing on *new* state standards for mathematics during their MSTA Algebra workshops. One Coordinator explained, "Teachers come in knowing there are new standards, but didn't know the old standards. We compared the difference between the two. We're showing how the activities tie to math." Teachers in several regions appreciated this focus on clarifying the standards, but would have liked to learn more specific strategies for incorporating the standards into their lessons (see below).

At least three Centers reported covering SMART goals, particularly in connection with workshop conversation surrounding data usage; however, this focus was rarely mentioned by teachers. While several regions would have liked to focus more on data-driven decision making, Centers found this challenging, and teachers did not find this particularly prevalent in sessions. One MSTA Coordinator commented, "This is the one thing we are a bit weak on because of logistics. [Teachers] don't know where to get their data or how to interpret it. They don't know where their kids are at."

Finally, MSTA's Algebra workshops were ultimately focused on helping schools implement PLCs in order to encourage follow-through with the MSTA workshop content (see below). Most Center Coordinators and partners described the PLCs as the cornerstone (and ultimate factor) of success within the MSTA initiative.

b. Professional Learning Communities

Information about PLCs was obtained via case study site visits, monthly progress reports from the Regional Centers and the three rounds of teacher PLC surveys. During the case study site visit, the school administrator, teachers and Teacher Center staff were each asked about PLCs. Additionally, five PLCs were observed during the visits.

(1) Structural and contextual factors

There are numerous interpretations and configurations of professional learning communities across the state. Because of the varied structure and context of PLCs, some teachers initially experienced difficulty when trying to accurately complete the MSTA evaluation's PLC surveys, resulting in some choosing to not respond at all[9]. The frequency, duration, location, format and focus of PLCs vary across the state. For example, different PLC definitions and configurations were present in the 18 case study sites (Table 6).

Table 6. PLC configurations at case study sites.

Region	Frequency	Format/Attendees	Focus
1 & 2	Four times a year	Refers to regional workshops for all participating teachers at Center	Lesson planning process, use of manipulatives with Algebra content
3	Quarterly	Refers to regional workshops as PLCs/All participating teachers across at 4 sub-regions	Covers SMART goals, TIMSS, Algebra content
4	School PLCs not prevalent/ regular; teachers refer to MSTA trainings as PLCs while Teacher Center refers to *Moodle*	Lack of PLC structures; primarily faculty-wide meetings. One school's math team meets weekly, but not because of MSTA	When teachers meet at school, not specific to math (general strategies); math team meets to cover dept. issues/lessons
5	Meet before and after lesson study observations; no formal PLC beyond that	All math teachers	Lesson study process, Algebra content
6 & 8	Irregular (some meet regularly while other sites have difficulty implementing)	Varied/ at different levels of implementation (some started to use *Moodle* across districts; others meet as dept. in schools)	Several noted a lacking connection between MSTA and PLC; SMART goals, lesson studies
7	Monthly	All math teachers grades 5-8	PLCs prior to MSTA; lesson study processes and Algebra concepts
9	Weekly	Department-wide	PLCs prior to MSTA - more focus on student work; more top-down than teacher-driven, little math content
10	Once every 4-6 weeks	All MSTA participants	Lesson study process
11	Weekly	Department-wide, school-level	PLCs prior to MSTA; cover pacing, common assessments, school-level data

In comparison to the above table that only references the case study sites, the surveys indicate similar findings. For example, similar proportions of teachers said they

[9] Across the state, "PLC" is not necessarily a term some schools use; consequently, the survey titles, questions and invitations were adjusted in the winter and spring deployment rounds to refer to whatever structure was being used for collaborative and routine professional development.

participate in PLCs weekly, twice a month, or monthly and fewer said daily or less than monthly (Table 7). This distribution was consistent over the year, with the exception of "less than monthly" peaking in the winter. Regions with higher percentages of "less than monthly" PLC attendance in the Spring 2009 survey include Region 3 (76.9%), Region 4 (50.0%), and Region 10 (44.4%)[10]. The frequency with which the PLC meetings were held (regardless of attendance) is very similar to their frequency of actual participation. Although only asked in the fall survey, 38.7 percent of respondents said their participation was voluntary and 61.3 percent said it was non-voluntary.

Table 7. How frequently do you participate in the PLC?

Survey Round	n	Daily	Weekly	Twice a month	Monthly	Less than monthly
Fall 2008	163	2.5%	35.6%	29.4%	27.6%	4.9%
Winter 2009	295	1.7%	20.3%	31.9%	26.1%	20.0%
Spring 2009	302	1.0%	25.2%	30.8%	28.8%	14.2%

Throughout the course of the year, more than 65.0 percent of survey respondents said their typical PLC meeting duration was 60 minutes or less. PLC group size was consistently 10 people or fewer for more than 90.0 percent of the survey respondents. Larger group size was typically cited by teachers who considered the Algebra module trainings to be a PLC. Time of day for the PLC meetings varied across MSTA participants, both state-wide and within regions (Table 8). In the spring round of surveys, *before* the school day was the most common meeting time in Region 11 (41.0%); *during* the school day was most common for Region 1 & 2 (40.0%), Region 3 (76.9%), Region 4 (50.0%) and Region 5 (75.0%); and *after* the school day was most common for Region 6 & 8 (43.8%), Region 7 (50.0%), Region 9 (62.5%) and Region 10 (55.6%).

Table 8. What time of day are the PLC meetings normally held?

Survey Round	n	Before the school day	During the school day	After the school day	It varies
Fall 2008	162	27.8%	25.3%	18.5%	28.4%
Winter 2009	296	21.3%	30.4%	29.1%	19.3%
Spring 2009	303	30.7%	26.4%	25.4%	17.5%

Teachers' experience with PLCs prior to MSTA implementation was varied. In the beginning of the 2008-2009 year, 85.4 percent said there is a PLC, community of practice or learning team in their school or district. About the same percentage (84.3%, n=161) said they also personally participated in a PLC in which some or all of the time is devoted to mathematics instruction.

At the time of the fall PLC survey, the teachers had been a PLC member less than one year (55.5%), one to three years (31.1%) or more than three years (13.4%). The teacher

[10] Note, however, an additional 23.9 percent of teachers (n=95) did not respond to this question. Additionally, respondents are reporting on varied definitions of PLCs.

sample size rose from 226 (in the fall) to 397 (in the spring), however, the greatest percentage still had the same level of experiences with PLCs: less than one year (54.3%), one to three years (32.5%) or more than three years (13.1%). Teachers having the most PLC experience (three years or more) were from Region 9 (31.8%), Region 11 (26.1%) and Region 4 (22.2%). In both the winter and spring, about three-quarters of the survey respondents reported being a current member of a MSTA PLC (80.6% and 76.2%, respectively).

Many of the case study sites used a combination of face-to-face and virtual modalities to conduct PLCs. Larger schools and districts tended to have PLCs described as consistently scheduled in-person meetings that focus on reviewing student data and modifying instruction accordingly. More schools had subject area-specific PLCs (75.9%), than grade-specific (21.7%) or PLCs organized in other fashions (2.4%). As one regional Center described, "We're encouraging them to develop PLCs, but it's a steep learning curve. They are having PLCs before or after school. Some have an intense 15 minutes, some have an hour." In at least two regions (H and I), the meetings for the Algebra module trainings were referred to as PLCs. Teachers in these regions claimed the "other" PLC meetings they had at their own building were much less MSTA-specific. Smaller schools and districts, particularly those that are remote, rely on some form of electronic communications (such as *Moodle* or email) to conduct their PLCs.

The greatest proportion of respondents rated various aspects of PLC functions as "good" or "very good" over the course of the year. Table 9 illustrates that averages were consistently between a three (good) and four (very good) for each element and for each of the three survey rounds.

Table 9. Average rating of PLC elements at three times during 2008 - 2009*

Element	Fall 2008	Winter 2009	Spring 2009
Sense of community and teamwork among members	3.62	3.63	3.65
Shared responsibilities among team members	3.62	3.42	3.33
Sense of shared norms and values	3.62	3.57	3.51
Climate of trust and respect	3.71	3.83	3.78
Connections to individually-defined goals	3.47	3.35	3.34
Commitment to group-defined goals	3.54	3.44	3.42
Using student data to make instructional decisions	Not asked	3.35	3.31

**In this scale, 1 represents poor, 2 represents fair, 3 represents good, 4 represents very good and 5 represents excellent.*

In the final round of surveys, a climate of trust and respect was most highly rated for PLC functions (66.5% said either "very good" or "excellent"), followed by a sense of community and teamwork among members (57.8% said either "very good" or "excellent"). Region 7 received the greatest percentage of teachers giving the highest possible rating (excellent) for all seven items in Table 9. Region 3 received the second-highest rating for four elements.

Support for PLCs warrants attention, given MSTA participants only rated PLC support as "fair" to "good" (Table 10). District support of PLCs in the school was most favorably rated during all three survey deployments, as compared to support in the form of time for PLC meetings or the school community considering PLCs important. As the number of responses rose for each survey round, the average rating slightly declined for many of the characteristics, with the exception of improvements in support of providing time for PLC meetings.

Table 10. Average rating of PLC support at three times during 2008 - 2009*.

Characteristic	Fall 2008	Winter 2009	Spring 2009
The PLC is considered important by the wider school community	3.02	2.93	2.85
Extra time and effort spent on the PLC is recognized and/or rewarded	2.49	2.44	2.38
Support in the form of sufficient, quality, convenient time for meeting is provided	2.76	2.79	2.85
School administrators are actively involved in/support the PLC	3.19	3.04	2.90
The school district supports PLCs in my school	3.50	3.32	3.24

**In this scale, 1 represents poor, 2 represents fair, 3 represents good, 4 represents very good and 5 represents excellent.*

(2) Availability and use of resources

When indicating communication tools that teachers used in their PLCs, email was the most common (72.8%), followed by print materials (39.8%). Only 12.6 percent use a web site (including discussion boards, announcements, blogs, etc.) for PLC communication, which concurs with other data revealing *Moodle* was not used as much as expected.

Teachers reported minimal use of tools or access to resources that prepared them for PLC meetings. Roughly one-quarter of teachers prepared for PLCs by looking at professional journals or books (27.0%) or accessing professional organization web sites (25.2%). Thirty-nine percent attended workshops or webinars that help them feel better informed for PLC meetings. Slightly more respondents said they did not receive formal training on PLCs from their regional Teacher Center (55.3%) than those that did (44.7%).

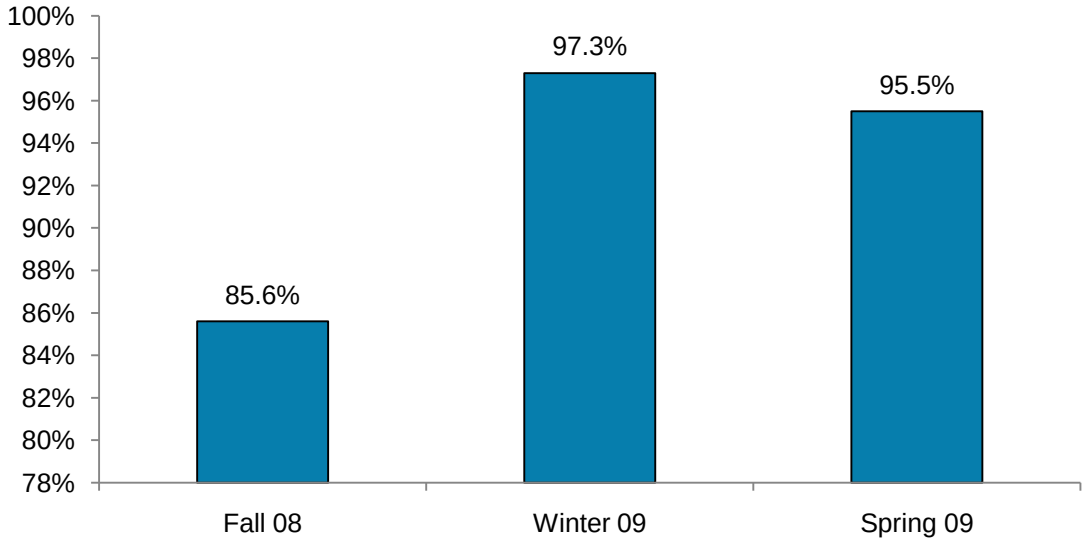
(3) PLC focus and goals

Many, but not all, of the survey respondents indicated participation in a mathematics-specific PLC. In the fall round of surveys, 85.6 percent indicated there was a mathematics-specific PLC at their school and this number increased over time[11] (Figure 1). The spring round of surveys revealed that mathematics-specific PLCs were

[11] Note that these percentages reflect *those who answered the question* (the valid percent), and do not include those who skipped the question.

particularly prevalent (92.3% or higher) in most regions, with the exception of Regions 4 and 5[12] (66.7% and 77.8%, respectively).

Figure 1. Percentage of teachers who believe their MSTA PLC is mathematics-specific in the fall, winter and spring:



Goal emphasis within PLCs was tracked over time. Increase in teacher knowledge about student learning and growth received the most emphasis in the spring round of surveys (60.5%), followed by increase in teacher use of multiple instructional strategies (53.1%) and increase in teacher content knowledge related to Algebra (43.1%). These three goals received the same high level of emphasis in the previous rounds of surveys, as well. By the spring, strong emphasis on these goals was particularly prevalent in Regions 3, 11, 7 and 10 (Table 11).

Table 11. Top three regions emphasizing each PLC goal:

Increase teacher knowledge about student learning and growth	Increase teacher use of multiple instructional technologies	Increase teacher content knowledge related to Algebra
Region 3 84.6% (n=13)	Region 3 84.6% (n=13)	Region 3 84.6% (n=13)
Region 11 67.1% (n=246)	Region 11 57.7% (n=246)	Region 11 47.6% (n=246)
Region 10 58.3% (n=12)	Region 7 51.5% (n=33)	Region 7 45.5% (n=33)

[12] Note, however, that the number of respondents for this question from Regions 4 and 5 were particularly low (6 and 9, respectively).

2. Effectiveness of each modality

a. Algebra Connected to Number Workshops

(1) Efficacy of workshop process

Since early in the suite of workshops, participants have been generally pleased with the offerings. As gauged in the fall, very few participants – about only 18 percent – felt their workshops had been covering material too quickly (though greater than 60 percent of Region 5 teachers reported feeling this way), and 80 percent reported the facilitators were well-prepared. Participants were particularly satisfied with the materials, activities and handouts they received at workshops throughout the year.

Some of the regions sought feedback from teacher attendees after the module sessions and learned how they would modify the module delivery in future years. Teacher Centers heard suggestions such as dividing up the teachers according to grade level, offering trainings at different times or locations, changing the order of presented topics, etc. Several teachers noted missing class to attend trainings and observations, particularly toward the end of the year, as a challenge. One teacher focus group participant suggested that the earlier the MSTA timeline is shifted in the school year, the more prepared they could be for making appropriate arrangements. "We are being pulled all the time. I don't see my students enough. We have other immediate needs," explained another participant. Further, some teachers believed a full day of training, in which some parts may not be relevant to them, is too much at one time. Some suggested shorter sessions held more frequently, while others would like to gather in smaller, sub-regional groups to increase the relevance and applicability of content presented. Many teachers did not feel there was enough incentive to participate in MSTA, which had become such a significant time commitment (involving long travel to workshops and extended workdays to accommodate meetings). One explained, "We're overwhelmed with what we're doing at school…but we're not getting credit or money."

Teacher Centers would have liked more clarification and structure from the State on what was expected of the modules (which may explain similar sentiments among teachers regarding content, described below); several deferred to Higher Education partners in module development. Some Centers were disconcerted that each region could have its own plan (they were not all implementing MSTA the same way state-wide). Other Center staff requested more opportunities to come together during the process (WebEx meetings were not necessarily sufficient or effective).

(2) Efficacy of workshop content

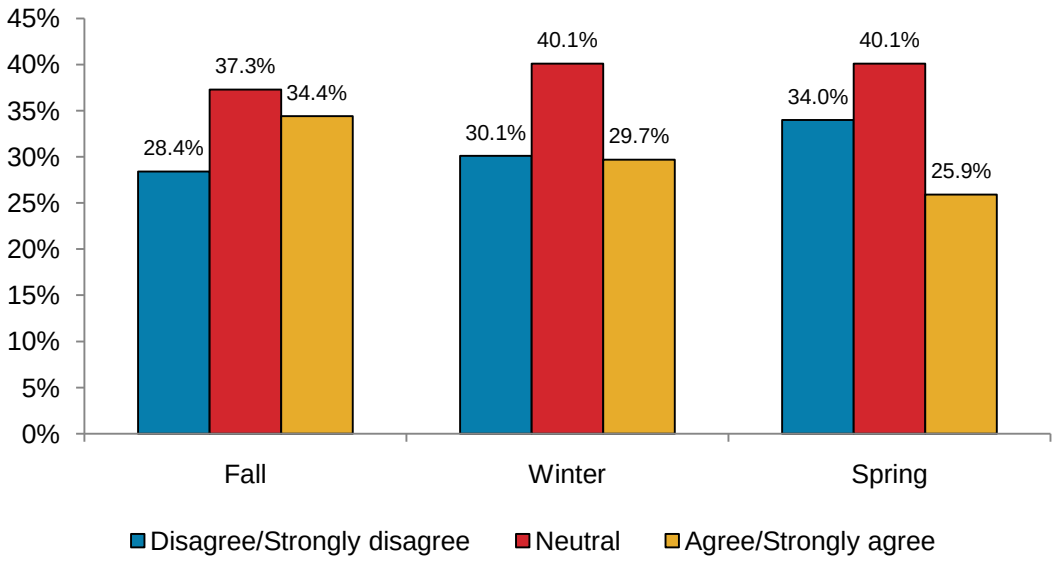
Overall, teachers were generally pleased with the content conveyed during MSTA workshops. Some middle school teachers felt they may have not learned much *new* Algebra content at their workshops, but felt the content-focused segments were particularly valuable to elementary teachers who may not have been as familiar with the concepts presented. Many felt the sessions should be extended to address a greater

span of grade levels to this effect. Both teachers and Center staff agree that improvements in Algebraic understanding and presentation, especially as foundations for student understanding for years to come, have been particularly key. One Higher Education partner provided an example:

> One of the things I've seen that amazes me is I'm going from the beginning sessions where they came maybe already knowing what lines of *best fit* meant…but as the math folks have unfolded different ways of approaching lines of best fit and slope, the depth of understanding of the participants has increased. And I see it in their complexity of understanding all the way through fifth grade. So these teachers now recognize that when they're doing something in fifth and sixth grade, they're doing something that will support the kind of Algebraic thinking students need in later years.

While teachers were generally satisfied with the modules, several participants still felt (or were unsure) that they needed more information than what was provided in the workshops to implement MSTA strategies (See Figure 2). This need has not changed significantly since the fall, and is similar across all regions.

Figure 2. Teachers who felt they still needed information/clarification to implement the strategies presented at the workshops throughout the year:



Some MSTA Coordinators and partners mentioned in the fall that the initial modules were more introductory and abstract, and later in-person and PLC sessions would go more in-depth into content and tangible strategies for conveying content to students. This continual need for clarification could be due to the weaker-than-anticipated implementation of the PLCs in schools (which facilitators had identified as vital to elaboration and implementation of MSTA strategies).

Out of 105 participants who specified in the spring, the greatest proportion (37.2%) would have liked a larger repertoire of *specific strategies* (i.e. equality strategies, model practices) to use with a *variety* of circumstances/learners and for incorporating module topics (i.e., process standards, combination of science/engineering with math) into their curriculum. Being able to better incorporate specific MSTA learning in the classroom was key for teachers. Some felt that the workshops focused too heavily on individual problems rather than the overall strategies behind those problems that they could implement immediately. Many would also like more information related to specific grade levels. These needs generally reflect requests made throughout the entire year.

Some participants also noted a disconnect both within the workshops and in the transition between the workshop and school practice. For instance, teachers found the workshop speakers were sometimes portraying different approaches and overlapped with what had already been covered in a previous session. One explained:

> We have talked about the same things for a few sessions but we still don't really get it. Different people are presenting each time. We don't know what the rules are because of different messaging. It feels like the trainers aren't on the same page…We rush through so much. Instead, let's do one thing and let's do it well.

Several teachers did not feel momentum or continual focus from the sessions once they returned to their buildings, and did not have sufficient time to implement what they had learned. This sentiment was especially prevalent among schools where PLCs were not sufficiently established. One teacher explained, "We were given a lot of written resources, but we want time to align it with our curriculum. It's very intense and we don't get through it all. Adding MSTA activities in is difficult." A teacher at another site commented: "There is not a lot of follow-up. There has been no expectation to attend…I only went in the summer. There is no incentive for PLCs. Our administrators are giving us the time and resources, but I have so much else going on, it's not worth it if I'm not getting compensated. I don't know what the goal of the Academy is."

School culture has not evolved significantly as a result of teachers' participation in the workshops. One teacher explained, "My teaching and philosophy has not changed, but I have received resources." Teachers typically agreed that MSTA has given them several more tools to work with in the classroom, and MSTA often aligns with and supports the schools' foci and activities already taking place (i.e., PLCs, emphasis on lesson collaboration).

(3) Efficacy of workshop content – Lesson Study

As teachers began working through the lesson study process in the handful of regions offering this approach, some were frustrated by the extensive requirements (i.e., additional reading, paperwork). One teacher, expressing a common sentiment, found the lesson study process was "overwhelming," and added that while it was beneficial to

get new ideas, each teacher could develop good lessons and share them without any additional formalities. Another described the time commitment as "brutal" considering the end result is a single lesson. This could be, as some Center staff explained, because not all teachers fully understand the lesson study is designed to be about a process more than a result; some teachers are still focused on the "product" being a single highly-refined lesson, and were therefore concerned that all their time and effort might not be justified. Another regional Center staff person speculated that teachers might be uncomfortable with lesson study because it represents a new approach to professional development, including observation and critique, which they may not yet be used to. One teacher, however, added that there had not been enough consideration of the practicality of adapting lesson study to Minnesota schools, and that there were institutional factors including school schedules and teaching culture that made lesson study difficult for them.

Some teachers were also confused about the process they were to undertake regarding the lesson studies. They would have liked more information prior to the first workshop or more time during the session to start the lesson with guidance from facilitators. MSTA Coordinators recognized the need in the future to "sell" the lesson study at schools and to clarify MSTA's intentions for the lesson study to facilitate follow-through.

Despite some confusion and lack of follow-through, most teachers enjoyed the opportunity to observe one another, as well as the chance to discuss and collaborate around lessons. Most would be open to more of these types of activities. In fact, one school in which this collaboration was particularly successful felt the lesson study process had "staying power," meaning if MSTA dissolved, lesson studies, including the PLCs, would remain intact. The lesson study process seemed particularly successful in schools in which the culture was already centered around mutual collaboration, observation and critique. Evaluators on-site noted from observations of lessons and meetings that Algebra-specific items were a stronger focus in schools with lesson study than in those not implementing this strategy.

b. Professional Learning Communities

(1) Growth resulting from PLC participation

About one-third (36.4%) of Spring 2009 survey respondents were not a part of a PLC prior to MSTA. An additional 42.1percent had some PLC experience, up to two years, revealing that PLCs were relatively new to many MSTA participants. This history lays the foundation for the amount of growth teachers could experience from PLC participation.

When asked to rate the amount of professional growth as a result of involvement in the MSTA PLC in the spring of 2009, the greatest proportion of teachers indicated "some

growth" in four pre-defined areas (Table 12). About a quarter or less of the respondents reported no or very little growth for each of the four dimensions. The distribution of percentages was very similar for the winter 2009 surveys. According to crosstab analysis, the responses of no or very little growth corresponded with teachers rating their PLCs in various areas as fair or poor. Teachers who reported some or significant growth tended to also rate their PLCs as good, very good or excellent. Content knowledge related to Algebra particularly peaked in Region 3, of which 100.0 percent had some or significant growth by the end of the year. The regions that claimed the least amount of growth in content knowledge related to Algebra were 6 & 8 and 9 (both had 43.8% report no or very little growth). Teachers who dramatically increased their knowledge about student math learning and growth (92.3% or higher said some or significant) were from Regions 3, 4 and 5. The greatest percentage of teachers reporting some or significant growth in use of multiple instructional strategies as a result of MSTA PLCs was from Region 3 (92.3%) and Region 5 (87.5%). Lastly, the most growth in understanding of the Minnesota Academic Standards for Mathematics was in Regions 4, 10 and 5, although perhaps teachers in the other regions already knew about the new Standards from other sources.

Table 12. Professional growth as a result of involvement in the MSTA PLC (Spring 2009).

Area	n	No growth	Very little growth	Some growth	Significant growth
Content knowledge related to Algebra	303	7.6%	20.1%	61.1%	11.2%
Knowledge about student math learning and growth	301	2.7%	13.6%	69.1%	14.6%
Use of multiple instructional strategies	302	4.0%	16.6%	62.9%	16.6%
Understanding of the Minnesota Academic Standards for Mathematics	301	6.3%	27.6%	53.5%	12.6%

Some MSTA participating schools already had PLCs in place, but felt they became more purposeful and effective during the past school year and commented on increased benefits since MSTA's inception. Some schools started to have PLCs because of MSTA participation, which has resulted in increased teacher interactions.

Regardless of data source, reported benefits of PLCs include:

- Increased sharing/dialogue about strategies and resources
- Increased reflective practices –such as observing other teachers
- Increased consistency in vocabulary, planning and timing of lessons (students are repeatedly hearing terms in different classrooms)
- The shift to department-wide PLCs (spanning grade levels)
- Purposefully mapping curriculum emphasis to coincide with the MCA-II test

- High regard for PLC leaders (and their role), in schools that had this designation

(2) Challenges associated with PLC implementation

The most obvious challenge is some schools merely do not have PLCs yet, as they were intended. In some cases, schools have "meetings", but not necessarily "PLCs." The discussion points in these meetings are not impacting instructional delivery to a measurable degree. Teachers indicated some of their sharing occurs in a much less formal setting, such as at lunch, in the hall, or out on the playground.

Smaller schools and districts, in particular, tend to not have traditional face-to-face PLCs because their department is too small. Conversing electronically is challenging for some teachers. Virtual meetings require teacher motivation to deliberately go online to "chat" with other teachers. Some teachers voiced a preference in the convenience of verbal conversation. MSTA participating teachers had mixed comfort levels with using online tools. Some had been using these tools in college or in previous years at the school, whereas others were learning how to use online mechanisms, such as *Moodle*, for the first time. During a PLC meeting observed during the winter of 2009, the leader took the teachers to the computer lab to remind them how to use *Moodle* and even offered a monetary incentive to upload resources or post comments.

Administrative support to set up PLCs varies. Some principals carefully integrate meeting times into teachers' work day, while others have to meet before or after school. Some schools do not have the structures in place yet for PLCs. Additionally, some principals are out of touch with what is being covered in PLCs, where in others, they direct the teachers' discussions or periodically attend the meetings.

Regardless of data source, reported challenges of PLCs include:

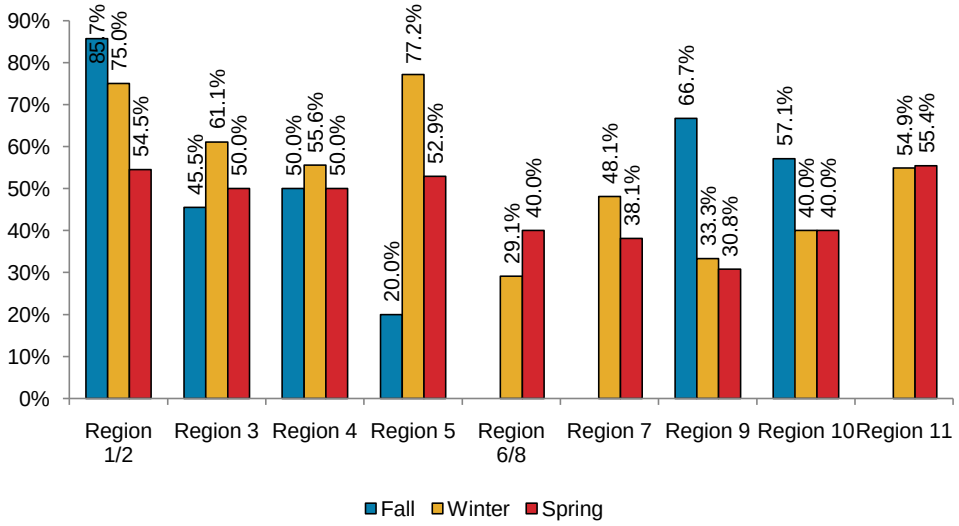
- PLCs are slow to form and regular meetings are difficult to hold.
- It is difficult for teachers to find time to gather and talk about math (teachers will need continuing administrative support to set aside regular development time).
- There is the expectation of roll out to other teachers in the building if not every eligible sixth, seventh and eighth grade teacher attends the Algebra modules. *Not all MSTA participants find or have opportunities to share with their relevant colleagues* during PLCs once they return to their building. For example, some schools selected one teacher per grade level to "represent" the school. In another region, a rule was set up for one teacher per district to attend the summer institute.

B. In what ways do Teacher Centers, districts, schools and teachers interpret and implement the goals of MSTA?

1. Expectations for implementing MSTA goals

By Spring 2009, teachers were predominantly implementing MSTA strategies either weekly (50.7%) or monthly (35.1%). Regions showed different trends in intended frequency of usage throughout the year (Figure 3). Regions 1 & 2, 7, 9 and 10 saw decreases in weekly use over time, while Regions 3, 4 and 5 saw spikes in weekly use midway through implementation, which dropped again by spring. In these cases, regions instead increased their monthly usage. This could be, as described above, due to teachers' desire for more strategies that can translate MSTA workshop content and goals to direct classroom implementation with students. The inconsistent presence and implementation of PLCs reported across regions could have also contributed to decreased incorporation of MSTA strategies toward the end of the year, as well as the lack of motivation and incentives described earlier by participants.

Figure 3. Percentage of teachers who used strategies presented in MSTA workshops at least weekly – fall*, winter and spring:



*Regions 6 & 8, 7 and 11 are "N/A" in the fall due to low response rates or later MSTA deployment.

In the spring, teachers had been typically using MSTA strategies with either a whole class of students (75.7%)[13] or in conversations with one other teacher (75.5%). To a lesser extent, about half the participants had been using workshop strategies during a

[13] Only 50.0% for Region 5

team meeting, with small groups of students, with individual students, or to help differentiate instruction. Fewer teachers reported using these strategies in their professional reflection (33.7%) or in conversations with a school leader (30.3%), while almost no one (9.4%) shared these strategies in school-wide staff meetings. These trends have been fairly consistent throughout the school year. For now, teachers appear hesitant to move from more tentative, personal uses of MSTA's Algebra content (i.e., in their own classrooms, in private conversations) to spreading the word about MSTA strategies in a more influential venue (i.e., with school leaders and in staff meetings). Perhaps participants may be willing to make this transition when they not only become more familiar with the concepts addressed by the workshops, but as they are also exposed to more overall strategies for classroom implementation and are allowed more time to observe efficacy/impacts (both of which participants suggested for future modules).

All regions are striving toward a common goal of becoming better with teaching Algebra at the middle school level. As described earlier, by the spring, workshop strategies teachers ultimately found to be most useful were alternative presentations or interpretations of Algebra concepts and understanding. Specifically, almost a quarter of survey respondents (24.8%, n=78) implemented strategies from their *equal sign* discussions, while another 15 percent implemented strategies for presenting *ratios*, *proportions* and *patterns*. While few teachers (n=7) mentioned the lesson study as the most useful component presented in their workshops, participants implementing lesson studies were collaborating and found the peer observations helpful with Algebraic teaching and learning (see above).

Several MSTA participants did not understand the future goals for MSTA, or whether MSTA will exist in the future. Congruently, some Center Coordinators felt they could have been better prepared for implementation and goal setting; one recalled setting the bar too high, while another felt teachers did not necessarily know what they were getting into. Others believed the PLCs were key for putting the goals of MSTA into motion; one Coordinator said of the difficulties, "We're encouraging them to develop PLCs, but it's a steep learning curve."A Higher Education partner added that MSTA implementation is dependent upon "…creating PLCs in particular schools in which the teachers are able to have the whole be much more than the sum of its parts."

2. MSTA technical assistance

Technical assistance provided to MSTA participants throughout implementation is a crucial element for providing ongoing support for MSTA goal achievement. Teachers, however, shared mixed reactions about the technical support they had been receiving from the Centers.

Both surveyed and interviewed participants predominantly sought clarification of assignments/expectations for MSTA work, followed by support with implementation –

i.e., feedback on observations, lesson study process and individual goal setting. By the spring, very few survey respondents (4.8%, n=21)[14] had asked their regional Teacher Center for technical assistance linked to MSTA. To date, almost half those who sought technical assistance (47.6%, n=10) had done so on only one or two occasions, while an additional 23.8 percent requested assistance a total of three times. Little time had been spent corresponding with the Centers and receiving assistance per request – 42.9 percent (n=9) of responding teachers had spent an average of less than one hour with the Centers for each request, while another 42.9 percent had spent one to three hours.

Teachers requested assistance primarily via email, but also by phone and *Moodle* postings. In some regions, tools like *Moodle* appeared ineffective in this capacity; several teachers rarely went online to post ideas and questions. Greater than half of 21 surveyed participants (57.1%) noted that support varied between remote and onsite attention by the Centers, while another one-third solely described remote assistance. Some interviewed teachers mentioned scheduled site visits "meant a lot" to them when someone came out to see them. At least three regions provided on-site consultation at the teachers' request. One group felt that while Center staff and professors were willing to come to their school, these visits would be more likely to occur if they were actually scheduled rather than portrayed as an "open invitation."

The consensus among interviewed teachers was that more frequent, consistent and substantive technical support from Teacher Centers for MSTA implementation is needed. Some saw the Center staff at meetings, but did not hear from them otherwise. When teachers had questions, the response time via email was occasionally slower than anticipated. From the Teacher Center perspective, one Coordinator voiced a common sentiment: "I think there is an expectation on the part of the grant that there would be a lot of teacher requests for technical assistance. We have not seen that at all. We are trying to create PLCs where they look to one another for technical assistance and how they should try something and how it works." During a focus group, teachers commented, "The Teacher Center keeps changing its story. It needs to be consistent." However, Center staff reported that without more time and resources dedicated to MSTA, they struggle to provide the necessary technical support.

Higher Education partners seemed to play a smaller role in providing technical assistance at the schools than initially anticipated. One MSTA Center Coordinator stated that the Higher Education partner "will not follow up with teachers" since that "is not part of the model;" however, all teachers from this region believed that the Higher Education partners "were going to give us more math strategies, but they ended up being only observers." Teachers in another region had expected more follow-up training from the Higher Education partner since they had provided the summer institute. Some school administrators, on the other hand, would have liked to have

[14] Too few to distinguish by region

been "pulled in" more so they could provide proper support themselves, while in another region, the MSTA Center Coordinator described the school principal as the ideal first line of support for implementation.

One particularly successful approach, described in at least two regions, had been providing online and physical resources as supportive supplements. One Center had provided an actual lending library for schools, including resources like math manipulatives. Teachers greatly appreciated this, and participants in other regions would have liked similar provisions. Otherwise, despite the issues teachers reported with technical support from the Centers – and despite the obstacles Centers noted in providing this assistance – surveyed participants were generally pleased with the quality of the assistance with which they were ultimately provided. Eighty percent of surveyed respondents were generally satisfied with their overall correspondence with Centers (52.6% of whom were *very* satisfied[15]), while approximately 85 percent were pleased with the speed, duration, format, clarity and outcomes of the assistance (again, greater than half of whom were typically *very* satisfied).

C. To what extent are Teacher Center partnerships effective at facilitating the achievement of MSTA's goals?

1. Teacher Center partnerships

Regions had varied experiences with the individuals comprising their partnerships, even though each of the three entities (Teacher Center, K-12 partner and Higher Education) was expected to play a unique role. Some regions had partners such as a small consulting firm specializing in math curriculum (EdSights), SciMath MN or a professor out of state (DePaul University in Chicago), others partnered with one college or university, and yet others selected multiple Higher Education partners. One region developed a sizeable design team comprised of representatives from six different educational partners. All partners were given the opportunity to describe their collaboration and perceptions of progress towards meeting MSTA's goals during focus group interviews that took place at the beginning and middle of the 2008-2009 school year (protocols in Appendix 1).

Many of the nine Centers describe the quality of their partnerships as "good" and the level of effort among partners as equal and/or fairly distributed for planning, implementing and supporting MSTA. The Teacher Centers felt that partners provided useful training to MSTA participants. One region (G) was proud to be reaching out to rural districts, serving as a "curriculum director" for those that otherwise did not have one. Teacher Centers that provided on-site consultations were well received by MSTA-participating teachers. In some cases, this was someone from the Teacher Center, for others it was a K-12 or Higher Education partner.

[15] 4-pt scale: very satisfied, somewhat satisfied, somewhat unsatisfied, very unsatisfied

In fewer regions, partnerships were less cohesive, most frequently stemming from the Higher Education component. Finding a common meeting time was challenging for some partners, particularly professors, who were sometimes absent from team meetings (and the evaluation's focus group meetings). A MSTA Coordinator cited, "Communication has been a problem because of everyone's different schedules. We're in and out at different times." Multiple Teacher Center Coordinators and professors found it difficult to incorporate MSTA into their other professional responsibilities and under-estimated the time demands of MSTA. A MSTA Coordinator explained, "Expectations from MDE have been unclear. Things keep changing. I have only four percent of my time designated for MSTA and MDE is asking a lot of us." In one region, the Higher Education partners did not communicate to the MSTA Coordinator that they were leaving their positions after the initial application process. In another region, two Higher Education partners revealed they would not contribute to MSTA next year, but the specific reasons were not disclosed.

2. Overall achievement of goals

During the application stage, each MSTA applicant articulated goals relating to a plan for: the formation of the Teacher Center infrastructure, refining and delivering the grade six to eight Algebra Connected to Number module, developing an additional K-12 mathematics teacher module and providing technical assistance. An example of a positive statement from a region (A) during the case study site visit was, "We are on track for meeting our defined goals. We were very clear in our goals. We are all very happy." Another Center partner indicated, "This is the best staff development that I've been a part of. It's due to the wonderful people in charge of this program. It's the right people coming together."

Each region cooperated in providing MDE with monthly progress reports[16] to monitor overall achievement of MSTA goals, as well as mid-year and year-end reports. Although different approaches were used, the regions ultimately worked toward a common goal of improving teaching Algebra at the middle school level. Teachers were particularly collaborative in regions offering lesson study process and/or peer observations. A Teacher Center partner described, "The teachers didn't know how to teach the new (math) Standards but are now progressing very well."

The regional Center partners and teacher participants were somewhat unclear in understanding future goals. During case study site visits, teachers and principals questioned if MSTA is recurring and if it will focus on a different mathematics topic or switch to science. Not all teachers are willing to participate again, now

[16] These reports were not consistently forwarded to the evaluators for document review. The year-end reports were not given to the evaluators, which included self-reports of each region's success in meeting their particular self-defined goals.

knowing the time involved for the meetings and the "homework" load. A Teacher Center partner explained, "The teachers were not aware of all the readings they had to do." Most teachers were happy with the presenters of the Algebra modules, but a few were dissatisfied with not being allowed enough time for asking questions during the trainings, not receiving timely feedback to questions, or not receiving guidance tailored to teachers working with middle school-age students.

Some teachers consistently went to MSTA module trainings and attended PLCs, while others did not. The "dosage" of MSTA at the teacher level certainly impacts the overall achievement of MSTA goals.

According to the regional Centers, PLCs and data-driven decision making are tougher aspects of MSTA, with regard to goal achievement. These kinds of practices will take varying amounts of time to impact teachers and students, depending on existing structures and administrative support at each school.

D. To what extent does MSTA contribute to changes in teaching practice, student performance and school improvement outcomes?

1. Data-driven decision making

a. District/school culture and context

Teachers and school leaders, while not yet heavily implementing data-driven practices, generally have a favorable outlook on using data to guide instructional decision making.

Greater than half of participants surveyed in the spring (52.8%) believe data-driven decision making has a *moderate* influence on their day-to-day work functions, while a quarter of teachers find this to be a *slight* influence and another 21 percent describe data having a *very great* influence.[17] Notably, almost no one (1.8%) finds data to have *no* influence on their practices. Participants find their schools *strongly* emphasize[18] *reviewing state assessment scores* (74.6%) and *making AYP* (73.9%) in guiding teacher decision making, and – to a lesser extent – utilizing *formative* (48.9%) and *local* (48.2%) assessments; the remainder primarily find these student performance measures are instead *somewhat* emphasized in their schools. Fewer teachers have felt urged to rely on results from standardized national tests and assessments found in workbook guides, most of whom find these are, at most, *somewhat* emphasized in their schools. Further, more than half of surveyed participants (72.1%) talk with colleagues about data at least monthly.

[17] This breakdown is generally representative of all regions.
[18] As opposed to *somewhat* or *not at all* emphasized

Almost all teachers (92.4%) in the spring, as in the winter and fall, continued to find student assessment data important to the instructional process; more participants have come to believe that fellow staff members are in agreement (79-77% in the spring and winter, compared to 62.3% in the fall) – this is perhaps due to reported increases in communication/collaboration from participating in MSTA activities throughout the year. Almost all surveyed participants (94.5%) find that when staff members examine student data together, they can better identify areas for improvement. However, while 72.7 percent of teachers at the beginning of the program expected to spend more time systematically examining their students' performance data as a result of participating in MSTA, less than 60 percent adopted this practice by the winter and spring.

While the above context appears promising and MSTA schools are generally inclusive of data, these trends have not changed significantly throughout the year, suggesting MSTA's impact on data culture in schools is yet to be determined.

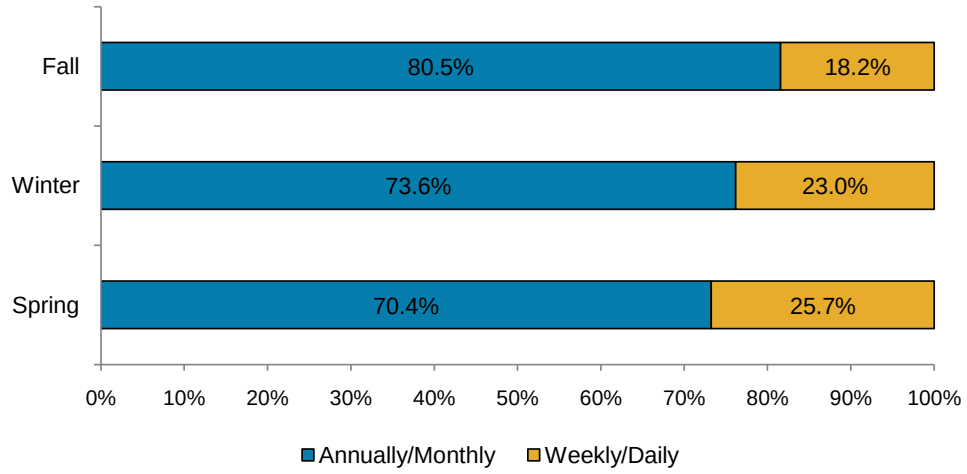
b. User skills, knowledge and applications

Despite the favorable disposition schools have shown towards data-driven decision making, data practices do not yet have a strong presence, and several schools still struggle. In reviewing existing practices, teachers most frequently access student assessment scores to differentiate instruction and to identify individual student performance (55% of whom use data to each end either *weekly* or *daily*); this was generally the case throughout the year, though Region 1 & 2, 3 and 9 teachers who did so at least weekly increased by about 30 percent since the winter. Overall, teachers are less likely to use data to regularly assess their own professional development needs, perform item analyses[19], or to compare individual student data to that of a larger group[20]. While there have not been significant shifts in specific uses of student data, there have been slight increases throughout the year in frequency of overall state test data usage to inform teachers' mathematics instruction (Figure 4). Notably, about 40 percent of Region 3 (41.7%) and Region 7 (39.6%) teachers used student data weekly or daily in their instruction by the spring (up 17% since winter for Region 7).

[19] Almost half of Region 3 teachers, 46.2%, do so at least weekly – up 20% since winter and fall

[20] Greater than half of Region 1 & 2, 3 and 5 teachers do so at least weekly – up 18% for Regions 1 & 2 and 5 since winter (approx. same for Region 3)

Figure 4. Regularity of teachers who typically use student data from state mathematics tests to inform their instruction in the fall (n=77), winter (n=328) and spring (n=432):



Data-driven decision making was addressed to at least a small extent in several PLCs and workshops, in which MCA-II and NWEA data were topics of conversation, as reported by both teachers and Teacher Center staff; this could have attributed to the slight increase in data usage reported in Figure 4 as the year progressed. Because some PLCs are school-level, teachers were able to look at their building's data and issues impacting them specifically. A few regions were also creating SMART goals as a result of looking at the data, and principals in one region were learning to use data in MSTA trainings held specifically for them. However, in several schools where educators were regularly reviewing data, both teachers and administrators reported already having a history of looking at data and revising their curriculum planning prior to MSTA.

Conversely, data-driven practices are described in many regions as the weakest part of their MSTA implementation; more is needed in terms of relevant data and professional development in order to provide an in-depth diagnosis of student learning issues. Teachers surveyed in the spring predominantly found they were still only *a little* (30.9%) or *moderately* (45.1%) comfortable[21] with using student performance data systems (this has not changed significantly throughout the year, though, notably, 30.8% of Region 3 teachers felt very comfortable with this by the spring). Some schools that had reviewed data processes at the summer Institute and early in the school year felt there had not been much follow-up, and teachers could not provide specifics about what they had learned. Throughout the year, while greater than 80 percent of surveyed teachers had already attended trainings regarding interpreting and using student data, about half had consistently expressed interest in receiving more professional development in this area.

[21] 4-pt. scale: *Not at all*, *A little*, *Moderately*, or *Very* comfortable

2. Teaching practice

At this point in time (one year after program implementation), data shows mixed results on the impact of MSTA on teaching practices. Due to varied configurations and delivery of MSTA across the state, teachers in "stronger" regions reported some changes and impacts, whereas teachers in less effective regions reported fewer impacts on their practice. While MSTA's overarching goal is to support Algebra teaching and learning, several Teacher Centers are not implementing Algebra-specific structures, processes and supports necessary to affect Algebra teaching and learning or realizing Algebra-specific outcomes. The biggest takeaway for MSTA-participating teachers seems to be increased collegiality and collaboration, rather than new Algebra knowledge.

In regions where it was well-executed and coordinated, teachers attribute MSTA to impacting lesson planning and/or delivery. For example, in Region 1 & 2, one of the main foundations of MSTA lesson planning, the five Representations of Concepts, is being implemented in classrooms with the aid of math manipulatives from the regional Center. A different regional Center explained they are "being a resource as teachers transition from old to new standards. Some of the small districts would have waited to start teaching the newer standards (if they did not join MSTA)." Being cautiously optimistic, other regions credited teachers for learning new activities or approaches, but they may have *not yet necessarily implemented them*, due to reasons such as time of year for that mathematic concept or preparation time to present a new activity.

Other impacts on teacher practice include using new methods to assess student learning other than formal examinations. In some classrooms, teachers were observed trying new configurations of student groups to shift away from whole class instruction. Teachers are paying more attention to individual student needs by asking all students to show their answer (such as raising their dry erase board for the teacher to view or using the *Smartboard* clickers to immediately view each student's answer to a mathematics problem).

At the middle and end of the year, when asked to describe the frequency of various teaching practices as result of MSTA participation, teachers' average response for each practice was "sometimes." In the spring, encouraging students to be active, participatory learners had the highest average (3.61), in which a three represents "sometimes" and a four represents "often." Switching to frequency counts, "often" was the most prevalent frequency for four practices and "sometimes" was most common for offering differentiation and using various means to assess student knowledge (Table 13). In crosstab analysis of reflection on teaching practices occurring often, the PLC is viewed by the wider community as important most often was rated "good" (49 out of 144), the effort and time spent on the PLC is rewarded or recognized was most often rated "fair" (46 out of 144) and the school district supports PLCs in my school was equally most often rated "good" and "very good" (43 out of 144 each). Encouraging

students to be active, participatory learners most often correlated with teachers who rated their PLCs as "good", although only "fair" in the time and effort being rewarded or recognized.

Table 13. Regularity of various practices as a result of MSTA participation (Spring 2009).

Practice	n	Never	Rarely	Sometimes	Often
Reflect on my teaching practices	298	2.0%	6.0%	43.6%	48.3%
Design lessons with belief that all students can achieve high academic standards	298	3.0%	4.7%	37.6%	54.7%
Encourage students to be active, participatory learners	297	2.7%	2.7%	25.6%	69.0%
Offer differentiated learning experiences	298	3.7%	9.7%	63.8%	22.8%
Use various means to assess student knowledge	296	2.7%	9.5%	54.7%	33.1%
Communicate with colleagues about student learning	299	2.0%	5.7%	41.1%	51.2%

Frequency of additional practices regarding mathematics instruction reveal use of classroom assessments to inform mathematics instruction is most routine (34.2% said daily and 50.9% said weekly). The percentage of teachers who enlist other practices just as frequently (daily + weekly) are listed below in Table 14; these other practices are, notably, less frequently utilized than classroom assessments. However, teachers who have used *state standards* at least weekly throughout the year have increased from under half in the fall (49.4%) to almost 70 percent by the spring.

Table 14. Daily/weekly usage of the following instructional practices The most common practices implemented by teachers (Spring 2009):

Statement	Mode
I use classroom assessments to inform my instruction.	(81.5%)
I use state standards to inform my mathematics instruction.	(67.2%)
I use local standardized mathematics assessments to inform my instruction.	(31.8%)
I use student data from state mathematics tests to inform my instruction.	(25.7%)

In using a five-point scale to rate degree of agreement, typically 70-95 percent of the teachers in Spring 2009 either said "agree" or "strongly agree" to statements such as "I have a good understanding of the 2007 Minnesota Academics Standards for Mathematics" (87.1%), "I know which mathematics content standards are relevant to every lesson I teach" (72.8%) and "I feel comfortable teaching the mathematics content

standards" (93.5%). The statement with the least amount of agreement (only 49.5%) was "My classroom assessments reflect the same format as the state assessments."

With regards to being comfortable explaining to a colleague how to use strategies for integration of various subjects into mathematics, three-quarters of teachers (75.3%) are comfortable or very comfortable discussing how to connect number concepts to Algebra in mathematics. Approximately half (51.6%) are comfortable or very comfortable explaining specific strategies for integrating the five National Council of Teachers of Mathematics (NCTM) process standards with the Minnesota Academic Standards for Mathematics.

MSTA participating teachers need more time to feel comfortable integrating other subjects into mathematics. For example, in the Spring 2009 survey, 75.3 percent were comfortable or very comfortable with being able to explain to a colleague specific strategies for connecting number concepts to Algebra in mathematics instruction, but integrating science (28.1%), engineering (19.5%) and technology (51.9%) is comfortable for fewer teachers.

Teachers rated changes in teaching practice over the course of the year, attributable to MSTA participation. By the end of the year, about three-quarters agreed or strongly agreed with statements such as:

- "I have a better understanding of how to align mathematics content standards with specific number or Algebra lessons" (72.6%)
- "I provide students in my class with learning experiences that align closely with the 2007 Minnesota Academic Standards for Mathematics" (73.5%)
- "The strategies I learned will enhance my students' mathematics performance on state mathematics tests."(74.1%)

3. Student performance

During the case study site visits, the regional Centers, principals and teachers had mixed feelings about looking at student impacts after one year of MSTA. In fact, this varied perspective was even evident within the same region. For example, within the same region, the Center partners felt it was too early to look at student impacts and defended that their goals were carefully articulated to not expect detection at the student level in the first year. On the other hand, principals within this region optimistically shared that they anticipate seeing improvements in student data.

Notwithstanding the concerns expressed by MSTA participants, we studied the achievement of students as a result of implementing MSTA. Using a Quasi-experimental design, a total of 11,639 student records were entered into a SPSS database. Of these, 6,801 were students in MSTA schools and 4,838 students were in matched control group schools.

Table 15 below indicates the mean or average scale scores for MCA-II Math for three different grade cohorts across three years. MSTA became operational in schools in the fall of 2008, so the 2008-2009 scores reflect the only year in the table that may have been affected by MSTA implementation. The 4th grade MSTA cohort scores declined slightly over the years – 457 to 555 to 653. The 5th grade MSTA cohort declined slightly from 554 to 653 to 751. The 6th grade cohort declined slightly from 653 to 753 to 852. Since scale scores were used for this analysis, the actual scores increase as a function of grade level. The scale scores range in the 300s for 3rd graders, the 400's for 4th graders, and so on. After the MSTA implementation year of 2008-2009, the greatest difference between the MSTA scores and the control group scores was only 2.9 in 6th grade, with the control group having the higher scores. Table 16 indicates the N counts for each grade and year.

Table 15. Mean MCA-II Math Scale Scores for MSTA Schools and Control Group

Grade	2006-2007		2007-2008		2008-2009	
	MSTA	Control	MSTA	Control	MSTA	Control
4	457.6	458.4				
5	554.5	554.1	555.0	555.5		
6	653.0	654.9	653.9	654.0	653.9	656.0
7			753.3	754.3	751.9	753.1
8					852.3	852.0

Table 16. Counts for MSTA and Control Groups by Grade Cohort

Grade	2006-2007		2007-2008		2008-2009	
	MSTA	Control	MSTA	Control	MSTA	Control
4	1323	794				
5	1806	1613	1354	821		
6	1776	1584	1977	1750	1445	860
7			1938	1778	2253	1891
8					2186	1883

Analysis of Covariance (ANCOVA) was conducted on this data in order to determine what variables contributed the most to the dependent variable. In this case, the dependent variable was gain or change in MCA-II Math scores from 2007-2008 to 2008-2009. This seems like a reasonable dependent variable since our hypothesis is that student achievement scores would increase due the implementation of MSTA during the 2008-2009 school year. The covariates in this test included the test score gains from 2006-2007 to 2007-2008 and all the student demographic variables available in the MDE Universal File. The results of the ANCOVA analysis are presented in Table 17 below. Also reported in Table 17 are the Pearson Correlations of these variables to the dependent variable, which also indicates the effect size.

Table 17. ANCOVA and correlation results with *Gain from 2008 to 2009*

Variable	F ratio	Correlation (MSTA)	Correlation (Control)
Gain 2007 to 2008	1427.6**	-.36**	-.37**
Gender	.009		
LEP	5.1*	.02	.03*
Special Ed.	4.5*	.04**	.00
Free/Reduced	9.3**	.05**	.05**
Migrant	.05		
Ethnicity	.81	.01	.04**
Language Code	1.5	-.02	-.04*
MSTA/Control	.06		

*p<.05
**p<.01

The ANCOVA results indicate that Gain from 2007 to 2008, LEP (Limited English Proficient), Special Ed., and Free and Reduced lunch status are the variables that contribute the most to the dependent variable of Gain from 2008 to 2009. Assignment to MSTA or control groups did not have a contributing influence on test score gains from 2008 to 2009. Although some of the variables show statistically significant results, only one variable, Gain 2007 to 2008, showed a substantial correlation. Correlations of at least .3 are considered to have a moderate effect on the dependent variable. The F ratio and the negative correlations for this variable indicate that as test score gains decrease from 2007 to 2008, test score gains in 2008 to 2009 increase and vice versa. It is therefore prudent to examine the MSTA implementation year further by comparing MSTA students and control students relative to both 2008 to 2009 test score gains and 2007 to 2008 test score gains. A t-test for independent means performs this function and the results are displayed in Table 18 below.

Table 18. t-tests between MSTA and control group with mean MCA-II Math gains

	2007-2008 Mean MCA-II Math Gain	2008-2009 Mean MCA-II Math Gain
MSTA	99.17	99.08
Control	99.18	99.20
t value	-.056	-.71

*p<.05
**p<.01

The mean gains in the table above are artifacts of the scale scores. Therefore, a gain of 100 indicates no gain in tested achievement. Since these mean gains are less than 100, the achievement from one year to another in both the MSTA group and the control group declines slightly. The critical test is the difference in mean gains in 2008-2009, the MSTA implementation year, between the MSTA group and the control group. The difference between the groups is so slight that the t-tests reveal no statistically significant difference between the groups.

A similar analysis was conducted using the Algebra strand in the MCA-II Math test. The strands are reported as raw scores (e.g. number of Algebra items answered correctly). The maximum number of items possible varied from test to test, so in order to make valid comparisons, the Algebra score was calculated as a ratio of the number of items answered correctly to the maximum number of items. Consequently, the Algebra score is always a value less than 1, since one hundred percent correct would be a score of 1.

Table 19. Mean Algebra Scores for MSTA Schools and Control Group

Grade	2006-07		2007-08		2008-09	
	MSTA	Control	MSTA	Control	MSTA	Control
4	.79	.80				
5	.78	.77	.72	.75		
6	.60	.63	.55	.55	.63	.65
7			.57	.57	.68	.71
8					.69	.67

Table 19 reveals that MSTA Algebra scores in the 4th grade cohort declined across the three years – from .79 to .72 to .63. MSTA Algebra scores in the 5th and 6th grade cohort declined from 2006-2007 to 2007-2008 but increased from 2007-2008 to 2008-2009, the MSTA implementation year. This is in contrast to the MCA-II Math scores which declined across all three years.

In order to determine the level of contribution that independent variables have on the dependent variable, Algebra gains in 2008-2009, ANCOVA and correlations were again conducted. Table 20 shows the results.

Table 20. ANCOVA and correlation results with *Algebra score gains from 2008 to 2009*

Variable	F ratio	Correlation (MSTA)	Correlation (Control)
Gain 2007 to 2008	2220.3**	-.42**	-.46**
Gender	2.4		
LEP	.23		
Special Ed.	.29		
Free/Reduced	.175		
Migrant	1.6		
Ethnicity	.16		
Language Code	.88		
MSTA/Control	4.52*		

*p<.05
**p<.01

Since the student demographic variables did not show a significant contribution to 2008-2009 Algebra gains, correlations need not be conducted to show effect size. However, ANCOVA revealed that previous year Algebra gains did have a significant impact on Algebra gains in 2008-2009, so correlations were conducted to see the effect

size. These correlations are relatively high, which indicates that there is a fairly large effect of 2007 to 2008 gain to 2008-2009 gains. Again, the fact the correlations are negative indicates that as gains go down from 2006-2007 to 2007 -2008, gains tend to go up from 2007-2008 to 2008-2009 and vice versa. Also, assignment to a MSTA group or a control group contributes to the dependent variable. Therefore, t-tests examining the effects of the two groups on Algebra gains in the MSTA implementation year of 2008-2009 were conducted. Table 21 below illustrates the results of the t-tests.

Table 21. t-tests between MSTA and control group with mean Algebra gains

	2007-2008 Mean Algebra Gain	2008-2009 Mean Algebra Gain
MSTA	-.10	.08
Control	-.11	.09
t-value	1.49	-.86

*p<.05
**p<.01

Even though the MSTA Algebra gains in 2007-2008 were negative and MSTA Algebra gains in 2008-2009 were positive, the same was true for the control group. Consequently, we cannot say that the implementation year gains in Algebra were due to the treatment of MSTA.

Next, similar analyses were conducted with data disaggregated by region. The table below illustrates the number of students in the database by region by group.

Table 22. Number of students by region by group

Region	MSTA	Control
1 & 2	307	123
3	693	243
4	859	705
5	343	174
6 & 8	725	136
7	1338	960
9	599	548
10	472	414
11	1465	1535

Since t-tests between the MSTA group and the control group were justified when examining MCA-II Math gains and Algebra strand scores, t-tests by region were also conducted. Tables 23 and 24 below illustrate achievement gains in the implementation year of 2008-2009 by region and by group.

Table 23. Mean scores and t-tests by region and group for MCA-II Math gains in 2008-2009

Region	MSTA	Control	t-value
1 & 2	97.4	97.9	-.68
3	99.7	97.2	3.5**
4	98.2	98.7	-1.1
5	98.7	97.7	1.2
6 & 8	100.5	98.8	2.1*
7	99.7	100.5	-2.0*
9	99.4	99.2	.32
10	96.4	100.9	-8.1**
11	99.3	98.8	1.5

*p<.05
**p<.01

Table 24. Mean scores and t-tests by region and group for Algebra gains in 2008-2009

Region	MSTA	Control	t-value
1 & 2	.07	.18	-3.47**
3	.07	.07	-.22
4	.09	.08	1.1
5	.06	.04	.88
6 & 8	.08	.20	-4.42**
7	.09	.08	.85
9	.11	.12	-.72
10	.03	.08	-2.35*
11	.09	.08	1.2

*p<.05
**p<.01

Whereas there is no significant statistical difference between the MSTA and control groups during the implementation year of 2008-2009 when examining gains across all regions, there are some significant differences when disaggregating the data by region. The two regions that demonstrated statistically significant gains in both MCA-II Math scores and with the Algebra strand are Region 6 & 8 and Region 10. However, the results are inconclusive. Region 6 & 8 shows a significant difference in favor of MSTA over the control group using MCA-II Math scores, but a significant difference in favor of the control group over MSTA when using Algebra scores. Region 10 shows a significant difference between the two groups using both MCA-II Math scores and Algebra scores, but the gains are larger for the control group than they are for the MSTA group. Region 3 shows a significant difference in favor of MSTA using MCA-II Math scores, but no difference when using Algebra scores. Region 1 & 2 shows a significant difference in favor of the control group using Algebra scores, but no difference when using MCA-II Math scores.

E. Discussion of Findings

1. Overall impact of MSTA

For teachers, the largest impression left by MSTA has been, by far, increased collegiality and sharing with one another within and outside their districts, rather than increases in new Algebra knowledge. This was not only noted and appreciated by teachers, but administrators also noticed the positive impact of teachers having a chance to watch and learn from each other. However, almost all stakeholders – Teacher Center staff/partners, teachers, school leaders – believe it is too soon to look at the impact MSTA has on students and teachers, particularly at sites where implementation was less coordinated or robust. Indeed, our examination of impact on teacher and student-level outcomes yielded largely inconclusive findings.

One regional Center staff person shared, "I think they [teachers] are open to new technology tips and ideas, but they're cautious about how they want to implement it into their own planning. They're just not at the point where they will use some of the new items." Several teachers believed there was already an emphasis on standards and improving curriculum at their schools, limiting MSTA's impact. According to one administrator, "We are looking at student work differently, but I am not sure if it is from MSTA. It's been a nice effect to have MSTA on top of it. This grant is doing things we already had in place. PLCs weren't new; neither was looking at student work." Another principal believed that although teachers are collaborating and "students like to see teachers collaborate," the MSTA process is "not active yet." With all this in mind, most educators, when asked if the school had benefited overall from MSTA participation, cautiously agreed. However, parties do recognize MSTA's capability for impact in the future. A teacher added of this potential, "We don't have solutions yet, but (because of MSTA) we know what our instructional and student problems are."

In some districts, particularly those focusing on the lesson study, it was evident that teachers were learning the new standards and were making a concerted effort to analyze their curriculum and focus on student learning. In fact, greater than three-quarters of teachers surveyed in spring believed they were more prepared to help their students transition to Algebraic thinking and develop Algebraic concepts, not only because of their own deeper understanding of Algebra (76.3%),[22] but also because of their improved understanding of student thinking (78.1%).[23] Teachers are particularly more aware that the mathematic topics they present in their grade level, and how they do so, will impact students as they progress to higher grade levels. Conversations in select schools have also reportedly changed as a result of MSTA, particularly because of the increased collegiality across grade levels. By the spring, 74.6 percent found teachers

[22] Only 55.6% of Region 5 teachers
[23] Both are typically representative of all regions and similar throughout the year

at their school work together to define effective instruction (compared to just 56.6% of teachers at the beginning of the school year).[24]

One principal summarized the key elements of MSTA: "It came at a great time. There are a lot of good math things out there but the PLC piece in addition to the content has been great. It's the best of both worlds…The PLC is the key." Several MSTA stakeholders agreed PLCs were intended to be the cornerstone of the program's success, and where success occurred, credit was often given to the PLC. As the strength of the program appears to lie with the PLC, perhaps sites struggling to see impact as a result of MSTA would come to see more benefits with stronger PLC activities and subsequently greater reinforcement of MSTA practices and rewards.

While MSTA's overarching goal is to support Algebra teaching and learning, many regions have not yet seen student impacts specific to the Algebra standards. Not all teachers had been implementing new lessons or approaches introduced to them in the Academy; one teacher explains, "This [MSTA] is all in addition to what I do. It's not immediately benefitting my kids and I want incentive that is immediate." Teachers also believe that to see true impacts, schools need to provide access to proper equipment and technology in order to truly implement MSTA practices; for instance, some schools have math textbooks from 1996, so they are not geared towards the newest Standards they are learning with MSTA.

While MSTA Coordinators and teachers are uncertain about the funds available for future MSTA activities – and what will be done with them – they nevertheless stressed the continuation of the MSTA program as essential to tangible impacts. MSTA's impacts on Algebra teaching and learning might be limited in this initial year – however, teachers and administrators generally agreed that the focus on aligning math instruction between grade levels has the beginnings for lasting impact. As the PLCs become more deeply rooted across the sites, the potential for MSTA success is poised to grow.

2. Limitations/issues impacting MSTA project or evaluation

A number of limitations associated with this evaluation should be carefully considered along with the findings, commendations and recommendations presented below. First, the quasi-experimental design examined impacts on student achievement after only one year of MSTA implementation. According to the literature and practitioners we surveyed and interviewed, as well as common sense, it is reasonable that one year is too soon an expectation for achievement effects.

Second, precise figures reflecting MSTA participants were difficult to obtain, due to fluctuations in data that we received. Third, we did not track each teachers' attendance

[24] Representative of all regions

at each Algebra module workshop (nor are we sure that the Centers collected this consistently) as part of the evaluation. More information about the degree of teacher attendance or participation for the Algebra modules could provide additional insight to the potential effects at the teacher and student levels. The less a teacher actually attended the MSTA workshops, the lower the likelihood of finding any impacts attributable to MSTA implementation.

Fourth, the sustainability of MSTA has been in question and a concern across the state (both at the Teacher Center level and at the school level) that could have affected the robustness with which MSTA components were implemented. Messaging about the long-term implications of MSTA, beyond 2008 to 2009, may need to provide additional information about the enduring vision of the initiative.

RECOMMENDATIONS AND CONCLUSIONS

Here, we present the commendations and recommendations for MSTA based on research activities and findings for the 2008-2009 evaluation period, organized by statewide and Center-specific aspects of program implementation and impact.

A. STATEWIDE IMPLEMENTATION

1. Commendations

MSTA encourages various configurations of PLC implementation, which empowers regions to conduct PLCs in ways that are most appropriate for their constituents. PLCs represent a critical modality for conveying MSTA content and building local capacities to teach Algebra effectively. In the strongest cases, PLCs foster a climate of trust and respect among members who value the sense of community and teamwork inherent in their PLC interactions. Where schools had PLCs in place prior to MSTA, they became more purposeful and effective during the past school year since MSTA's inception. Where increases in content knowledge related to Algebra were detected during the evaluation, those increases were attributed to PLCs. Face-to-face PLC meetings appear to be more convenient to incorporate into teachers' schedules, although teachers may be less pleased about an extended work day if these meetings occur before or after school. The PLC resources and communications available to support virtual interactions have been welcomed by those teachers feeling isolated and wanting to hear about others' experiences and ideas.

MSTA encourages various configurations of Algebra workshops. As with PLCs, each Center's implementation of the Algebra workshop(s) was locally directed and addressed individual regions' priorities. Across all Centers, there were many opportunities for teamwork among teacher participants, a variety of workshop formats, and differentiated presentation styles to facilitate teachers' interpretations of math content and understanding. Suggestions for ways to conduct Algebra workshops included breaking up teachers according to grade level, and including more advanced content, particularly for secondary/upper middle math teachers.

2. Recommendations

Consider providing **clearer messages to the regional Teacher Centers, principals and teachers about what MSTA participation entails**. The Teacher Centers tended to under-budget their time devoted to MSTA. Partners at one Center commented, "We didn't know what all the expectations would be. The monthly reports were not in the initial grant. We need more time to do management and paper work." In some regions, principals and teachers did not consistently receive clear messages about expectations for MSTA participation. Teachers were confused about the number of Algebra trainings to attend, the time commitment (year-long, not one-time), reimbursement issues for

time and travel expenses, etc. In some regions, teachers in other grade levels (not just sixth, seventh and eighth) also participated in MSTA. Misinformation contributed to a steady drop off in teacher attendance at some of the modules after the initial summer session (i.e. Region 9). Further, messages about MSTA beyond the current implementation year would facilitate participation and buy-in.

The promotion of lesson study as a specific modality for conveying MSTA content could provide a valuable framework for regions that struggled to coordinate MSTA implementation. Lesson study was particularly useful in schools in which the culture was already collaborative and peer observation and critique were accepted. Through lesson study, the barriers of peer observation and critique can be lessened. If lesson study is to be endorsed by MSTA, careful messaging about what lesson study can and cannot do ensures that teachers feel successful with the process of designing a few thorough lessons without the disappointment of expecting many lessons to result from their work.

Consider endorsing technical assistance that can take place as locally as possible. MSTA's technical assistance received mixed reactions generally, but was most valuable to teachers when providers met with teachers in their classrooms. This finding corroborated with the common concern that more information was needed for teachers to implement MSTA strategies in their classrooms. Frequent, on-site and substantive technical support is needed to fully translate content discussed during MSTA workshops or PLCs into positive teaching practices. Alternatively, one strategy for providing technical assistance that worked well in a region that could not offer on-site assistance was the investment in online and physical resources – such as a lending library with math manipulatives – that could be loaned to any MSTA-participating school within a region.

Support the unique roles of Teacher Center partners in each region. Though each partner was expected to play a unique role in MSTA development and implementation, some regional partnerships flourished while others struggled. In particular, frustrations with scheduling and, more generally, the role of Higher Education contributor(s) limited the region-level capacity to fully implement MSTA.

Consider extending the evaluation period to determine the impacts of MSTA on teachers and students. During the first year of program implementation, the Centers spent time recruiting participants and partners, coordinating events/activities and developing modules, while teachers learned new information and strategies. While the Centers gained insight as to what worked well and what could be improved in future years of providing MSTA, and teachers reported increases in collegiality and collaboration, teachers did not show measurable gains in Algebra knowledge after MSTA's first year of implementation. Expectedly, with only anecdotal changes detected

among teachers, changes in student understanding of Algebra content could not be attributed to MSTA. Anecdotally, however, some teachers reported using new methods to assess student learning (rather than formal examinations) and a new understanding of how to apply Algebra content in their classrooms.

Being that it was the first year, teachers may need more time to actually implement and incorporate this new information into their lessons. This was particularly evident when the topic in the module agenda did not coincide with the time of year that teachers present the topic to their students. Also, since PLCs represent a critical modality for implementing MSTA content locally, time for PLC maturation is necessary in order to detect measurable impacts on teaching and learning that might be attributable to MSTA.

B. Center-Specific Implementation

1. Commendations

Region 11 had a **sizeable design team**, comprising of representatives from six education partners. Each member, with different backgrounds, provided unique contributions and perspectives. Planning and training were particularly robust in this region.

Providing multiple formats for technical assistance is useful. For example, Region 11, created a web site that provided various relevant documents, including all module training documents, examples of assessments and research articles. Teachers could use the website to sign up for sessions, read announcements and communicate with each other (and the trainers). The website was also accessible by PLC leaders, curriculum directors, district math specialists and principals. This allowed others to stay up to date about MSTA, without relying on participating teachers to designate time to share with others after the training sessions.

At the end of the school year, various **elements of PLCs were given the highest possible rating of "excellent"** by the greatest percentage of teachers in Regions 7 and 3. Regions 5, 6 & 8 and 11 also ranked in the top regions to obtain "excellent" ratings for at least one element listed on the PLC survey.

PLC goals were viewed as strongly emphasized by teachers in Regions 3 and 11, followed by 7 and 10. These goals include an increase in teacher knowledge about student learning and growth, an increase in teacher use of multiple instructional technologies and an increase in teacher content knowledge related to Algebra.

In some regions, the **Higher Education partners went "above and beyond" with their level of support for MSTA.** For example, in Region 10, these partners put considerable time and effort into reaching out to local businesses and organizations (such as a local medical facility) that have given financial and technical support to the educational

community. In multiple focus groups, it was revealed that the Higher Education partners dedicated more time to MSTA (for phone or in-person meetings, email communications, module development, answering teachers' questions, etc.) than they anticipated.

2. Recommendations

Some regions, such as Region 1 & 2, described how recruiting schools and teachers to participate in MSTA over the summer was a challenge. **If possible, more rapid messaging about the MSTA grant opportunity and acceptance of awards could be beneficial.**

Principals need more information about MSTA. Case studies revealed principals in some regions did not have enough information to answer the evaluation interview questions or they had questions of their own. Increased deliberate communications from participating teachers and/or the regional Teacher Center to the principals is suggested. This need was particularly evident in Region 4, during which principals reported they did not have as much information as they would have liked.

Appendices

Appendix 1:
Case Study Instruments

MSTA School Leader Interview Protocol

Date:
Time:
School:
Teacher Center name and region number:

Attendees: (indicate their affiliation or title as well)

Hezel Associates' interviewer:

School leader:

Instructions:
Introduce yourself and Hezel Associates.
State purpose of interview:

We are looking to learn information about MSTA's Teacher Centers

- Programming expectations
- Infrastructure and partnership development
- Nature of technical support provided to participating schools
- Expectations for dovetailing MSTA with other existing programs that support the improvement of mathematics instruction
- Relationships with state and regional organizations providing related staff development
- Implementation of MSTA's four components
- Understand the nature of MSTA Teacher Center leadership

Explain the rules.

There are no right/wrong answers
Be honest and candid

Your comments will remain anonymous in reports we provide to MDE. We are looking for general themes both across and within the regional Centers.
Provide estimated time of completion (30 minutes).

In order to fully and accurately capture the key points from today's discussion, I would like to audio record the conversation. Can I please have a verbal consent from you that you are comfortable with me recording our conversation?

Thank you for your time.

1. Do you feel that MSTA will have a sustainable impact on your school? Why/why not?

2. Let's talk about the programming/activities that your regional Center provides middle schools participating in MSTA. Please describe what you would call the key components of MSTA implementation within your school.

3. All participating MSTA schools are to receive technical support from their regional Center. Please describe the technical support that you receive from your Teacher Center relative to MSTA (probe for nature, frequency and duration).
    - How did you learn that your school would receive this technical support?
    - Is technical support for developing teachers' algebra thinking and understanding provided throughout the year? Is this on a regularly scheduled basis or an on call basis? Does this work for you?
    - Have you received any feedback from your teachers about this technical assistance? If so, what has it been?
    - Has the technical assistance affected your leadership in any way? Please explain.
    - Is the technical assistance you have received sufficient? Please explain.

4. How has your school implemented professional learning communities as part of the MSTA structure?
    - If an outsider walked into your school, how would (s)he know that PLCs are operating there?
    - How would you characterize your efforts or role, as a leader, to focus PLC activities around mathematics teaching and learning in your school?
    - Has your school changed its organizational structure (e.g. block scheduling, common meeting time, release staff, etc.) in order to facilitate the work of PLCs? If so, how?
    - In what ways have the PLCs helped teachers properly implement MSTA generally and improve math instruction specifically?

5. Overall, do you feel your school has benefitted from participating in MSTA?
    - If so, in what ways? (Such as impact on student performance/achievement, increase in teacher satisfaction, increase in teacher content knowledge, positive changes in the school culture, etc.)

- If not, what could be done to improve your experience?

6. How has your school implemented data-driven practice as part of the MSTA structure?
    - If an outsider walked into your school, how would (s)he know that strong data-driven practices are happening there?
    - How would you characterize your efforts, as a leader, to focus data-driven practices around mathematics teaching and learning in your school?
    - Has your school changed its organizational structure (e.g. block scheduling, common meeting time, release staff, etc.) or provision of resources (e.g. new technology, training, etc.) in order to facilitate data-driven practice? If so, how?

MSTA Teacher Center/Partner Focus Group Protocol

Date:
Time:
Teacher Center name and region number:
Location (in person or conference call):

Attendees: (indicate their affiliation or title as well)

Hezel Associates focus group leader:

Hezel Associates scribe:

MSTA Coordinator/project director at Teacher Center:

Higher education partner(s) (should include at least one mathematics faculty):

K-12 Partner(s):

Instructions:
Introduce yourself and Hezel Associates.
State purpose of focus group:

We are looking to learn information about MSTA's Teacher Centers

- Programming expectations
- Infrastructure and partnership development
- Nature of technical support provided to participating middle schools
- Expectations for dovetailing MSTA with other existing programs that support the improvement of mathematics instruction
- Relationships with state and regional organizations providing related staff development
- Implementation of MSTA's four components
- Understand the nature of MSTA Teacher Center leadership

Explain the rules.

There are no right/wrong answers.
Be honest and candid: you don't need to agree with what others are saying.
Respect others' statements.
Try to be brief so we may cover as many questions as possible.

Your comments will remain anonymous in reports we provide to MDE. We are looking for general themes both across and within the regional Centers.

Provide estimated time of completion (45-60 minutes).

In order to fully and accurately capture the key points from today's discussion, I would like to audio record the conversation. Can I please have a verbal consent from each of you that you are comfortable with me recording our focus group?

Thank them for their time.

---

1. I would like to ask you some questions about the Teacher Center's leadership.
    - Has anything happened at the leadership level that you feel has impacted (either positively or negatively) the implementation of MSTA in your region? (Probe for high leadership turnover, vacant positions, particularly dynamic leaders, participatory leadership styles, etc.)
    - What, if any, role has MSTA technical assistance played in leadership activities?
    - Who is involved in leading the MSTA effort in your region? (probe for number of people, roles)
    - Are sufficient resources dedicated to the MSTA leadership effort (e.g. full time leadership positions, workshops/PD, meetings, support materials, etc.) If not, what is lacking and why?
    - Have organizational structures changed to accommodate MSTA implementation? If so, how?
2. Let's talk about the programming/activities that your regional Center provides middle schools participating in MSTA. Please describe what you would call the key components of MSTA implementation within your Center.
3. Please describe the kind of technical support that you provide to participating middle schools.(probe for nature, frequency and duration)
    - How did you determine that you would provide that type of technical support?

- Did you conduct a needs assessment of participating schools to determine what to provide?

- Is technical support for developing teachers' Algebra thinking and understanding provided throughout the year?
  If technical support is provided throughout the year, how is it provided? Please describe. (i.e., on call basis, regularly scheduled basic, etc.)

- What, if any, role does the Higher Education partner play in the development or provision of technical assistance? Please describe.

4. How are schools implementing professional learning communities and data-driven practice as part of the MSTA structure?
   - If an outsider walked into an MSTA school, how would (s)he know that PLCs and data-driven practice are thriving there?

   - How would you characterize leaders' efforts to focus PLC and data-driven practices around mathematics teaching and learning?

   - In what ways have you noticed that the PLCs help teachers properly implement MSTA generally and improve math instruction specifically? Please give examples.

5. Do you feel your Center is on track with reaching the goals expressed in your Center application?
   If no, in what ways is the Center not on track? How can this be fixed?

MSTA Teacher Focus Group Protocol

Date:
Time:
School:
Teacher Center name and region number:

Attendees: (indicate their grade level as well)
Hezel Associates focus group leader:

Hezel Associates scribe:

Teachers:
1.
2.
3.
4.
5.

Instructions:
Introduce yourself and Hezel Associates.
State purpose of focus group:

We are looking to learn information about MSTA's Teacher Centers

- Programming expectations
- Infrastructure and partnership development
- Nature of technical support provided to participating middle schools
- Expectations for dovetailing MSTA with other existing programs that support the improvement of mathematics instruction
- Relationships with state and regional organizations providing related staff development
- Implementation of MSTA's four components
- Understand the nature of MSTA Teacher Center leadership

Explain the rules.

There are no right/wrong answers.
Be honest and candid: you don't need to agree with what others are saying.
Respect others' statements.
Try to be brief so we may cover as many questions as possible.

Your comments will remain anonymous in reports we provide to MDE. We are looking for general themes both across and within the regional Centers.

Provide estimated time of completion (45-60 minutes).

In order to fully and accurately capture the key points from today's discussion, I would like to audio record the conversation. Can I please have a verbal consent from each of you that you are comfortable with me recording our focus group?

Thank you for your time.

---

1. Do you feel that MSTA will have a sustainable impact on your school? Why/why not?

2. Let's talk about the programming/activities that your regional Center provides middle schools participating in MSTA. Please describe what you would call the key components of MSTA implementation within your school.

3. All participating MSTA schools are to receive technical support from their regional Center. Please describe the technical support that you receive from your Teacher Center relative to MSTA. (probe for nature, frequency and duration)
    - How did you learn that your school would receive this technical support?
    - Is technical support for developing teachers' Algebra thinking and understanding provided throughout the year? Is this on a regularly scheduled basis or an on call basis? Does this work for you?
    - Are you pleased with this technical assistance? Why or why not?
    - Is the technical assistance you have received sufficient? Please explain.
    - Has the technical assistance affected your teaching in any way? If so, how? If no, why not?

4. How has your school implemented professional learning communities as part of the MSTA structure?
    a. Has your school changed its organizational structure (e.g. block scheduling, common meeting time, release staff, etc.) in order to facilitate the work of PLCs? If so, how?
    b. How often do PLCs meet? Is there a PLC leader? If so, what is his/her role? Background?
    c. What role has your principal had in supporting the PLC?
    - If an outsider walked into your school, how would (s)he know that PLCs are operating there?

- Are your PLC activities focused around mathematics teaching and learning?
- In what ways have the PLCs helped teachers properly implement MSTA generally and improve math instruction specifically?

5. Overall, do you feel your school has benefitted from participating in MSTA?
    - If so, in what ways?(such as impact on student performance or achievement, increase in teacher satisfaction, increase in teacher content knowledge, positive changes in the school culture, etc.)

    - If not, what could be done to improve your experience?

6. How has your school implemented data-driven practice as part of the MSTA structure?
    - If an outsider walked into your school, how would (s)he know that strong data-driven practices are happening there?
    - Do you engage in data-driven practices around mathematics teaching and learning? Please describe.

MSTA Classroom Observation Protocol

BEFORE THE OBSERVATION: (if the teacher has time to talk to you)

Explain:

- Who you are –from an independent evaluation group, not MDE.
- Why you're observing them – formative study for Minnesota Department of Education to gauge MSTA.
- The observation is confidential and nothing observed or said here will be shared with other personnel in the district or used to evaluate the teacher in any way – only our research team will review the observation notes.
- Thank teacher for allowing us the opportunity to visit his/her classroom.
- Do you have any questions about this observation or about our evaluation?

Date: _____ **School Name:** _____
District Name: _____ **Observer Name:** _____
Teacher Name: _____ **Grade Level(s):** _____
Start Time: _____ **End Time:** _____
Region #: _____
Focus or purpose of math lesson: _____

Number of Participants: _____ Students
_____ Teachers, Teacher's Aides etc.
_____ Other, please specify: _____

A. **Learning Context** (check all that apply)

1. Indicate the student configurations.

____ students are working independently (____ desks _____away from desk (e.g., rug, sitting area, other table) _____center)
____ students are working in pairs (buddies)
____ students are working in small groups with each other
____ students are working with the teacher for small group instruction
____ students are working as a whole group
____ students' positions change during the observation (describe)

2. Which content areas are covered in the lesson?

____ math ____ science ____technology
____engineering ____ other (describe) _____

B. Lesson Specifics

3. What instructional materials or resources is the teacher(s) using? (check all that apply)

____ computer
____overhead or digital projector
____SmartBoard
____ chalkboard/dry erase board
____ posters or other visual displays (signs/cards)
____audio (CD, cassette)
____ instructional video (DVD, internet)
____ teachers' guide from math curriculum
____ home-made materials/props
____other (please describe) _____

4. What materials are the students using? (check all that apply)

____ textbook from math curriculum
____ workbook/practice book from math curriculum
____ manipulatives (blocks, tiles, etc.)
____ photocopied worksheet
____ computer
____ math tools (calculator, ruler, scale, etc.)
____ teacher-made materials
____ assessment
____other (please describe) _____

5. The lesson is a… ____ introduction ____ presentation of the main content of the lesson ____review

6. The learning objectives were communicated to the students. ____ yes ____ no

7. The lesson is accurate. ___ yes ___ somewhat ___no

   Indicators: The teacher is giving accurate statements that are consistent with authoritative knowledge/competence in the relevant area of expertise; curriculum/materials are not disproven, outdated, biased, or causing substantial student errors.

C. Student experiences

8. Is student progress monitored throughout the lesson? ____yes ____no

9. Is instruction adjusted based on student need? ____ yes ____no _____ n/a

10. What evidence suggests that this lesson is appropriate for the students' grade level? ***Please describe.*** (some examples are below)

    ____ students show understanding of topic or skill

    ____ ability to complete task/student performance

    ____students understand instructions (not asking for clarification)

    ____ students are making connections to other mathematical concepts or other subject areas

    ____ other (please describe)

11. What evidence suggests that the students are learning? ***Please describe.*** (some examples are below)

    ____ dialogue with each other or teacher about the subject
    ____ students are processing ideas to arrive at conclusions or interpretations
    ____ students are making connections to the world beyond the classroom –public or personal experiences
    ____ students are correctly completing the written task (e.g., calculation, drawing, diagram, etc.)
    ____ students are verbally and clearly explaining the math work (how they got to their answer)
    ____ students and teachers discuss learning needs from previous classroom assessments
    ____ other (please describe)

11a. Approximately what percentage of students display evidence of learning?

___ 0-24% ___ 25-49% ___ 50-74% ___ 75-100%

12. What evidence suggests that the students are engaged? ***Please describe.*** (some examples are below)

____ students are completing their work/being productive because they are being held accountable or know what is expected of them
____ students are attentive (quiet and listening when appropriate)
____students are responding to teacher questions
____students are participating/active in their learning (e.g., hands-on activities, projects, experiments)
____other (please describe)

12a. Approximately what percentage of students display evidence of engagement?

___ 0-24% ___ 25-49% ___ 50-74% ___ 75-100%

Note: an observation transcript is not necessary, but please indicate below anything significant in the discussion or valuable quotes that capture the essence of the instruction or students' experiences.

AFTER THE OBSERVATION (optional -if the teacher has time to talk to you)

Ask the teacher:

a. Has your participation in MSTA trainings (whether it's the Algebra workshops, train the trainer or lesson study approach) and/or PLCs impacted how you prepared for or presented today's lesson?
    i. If yes, in what ways?
    ii. What new strategies are you implementing?
    iii. How are you planning to implement them?

b. Was this lesson typical for your math instruction (did you do anything different because I was observing you)?

c. Please summarize for me the purpose of your lesson.

d. Was today's topic/skill one of the Algebra standards that will be tested on the newer 8th grade MN state math test that is being initiated in 2011?

e. How do you think the students responded to the lesson? (amount of learning, interest, etc.)

MSTA PLC Observation Protocol

BEFORE THE OBSERVATION: (if the group has time to talk to you)

Explain:

- Who you are –from an independent evaluation group, not MDE.
- Why you're observing them – formative study for Minnesota Department of Education to gauge MSTA.
- The observation is confidential and nothing observed or said here will be shared with other personnel in the district or used to evaluate the teachers in any way – only our research team will review the observation notes.
- Thank teachers for allowing us the opportunity to visit their PLC
- What is the main focus of your PLC generally, and what is the focus for today's meeting?
- Do you have any questions about this observation or about the evaluation in general?

Date: _____ **School Name:** _____
District Name: _____ **Observer Name:** _____
Region #: _____
Start Time: _____ **End Time:** _____

Main Focus of PLC: _____
Today's Focus of PLC: _____
Frequency of PLC face to face meeting (if known): _____
Duration of PLC face to face meeting (if known): _____

Number of Participants: _____ Teachers
_____ Administrators
_____ Other, please specify: _____

Number of absent participants (if known):
Teacher names and grade level or subject area: (list each)

1. Who is leading/facilitating the discussion?

2. Which content areas are covered in today's PLC?
   ____ math ____ science ____technology
   ____engineering ____ other (describe) _____

3. What resources are being used to guide the discussion? (check all that apply)
   ____ in-house staff ___ external presenter ____article (or other reading material)
   ____ media (video tape, internet, etc.) ____other (please describe) _____

4. What are the PLC members talking about today? (check all that apply)
   ____ student learning and effective teaching
   ____ promoting equity and high expectations
   ____ building leadership capacity
   ____ development of shared norms and values
   ____ data-based decision making (reviewing or comparing student data)
   ____ collaborative planning
   ____ curriculum development
   ____ specific materials, resources
   ____ technology (software, websites, equipment)
   ____ MN state standards or assessments
   ____ other (please describe) _____

5. What audience are the teachers talking about? (check all that apply)
   ____individual students
   ____ classroom-level issues
   ____school-wide issues
   ____district-wide issues
   ____ state-wide issues
   ____other (please describe) _____

6. Is this an on-going or isolated discussion for this topic? (if known)

   ____ on-going ____isolated ____don't know

7. Do the PLC members have "homework" such as an application in class, reflections, or further reading about the topic? ____yes ____no

   7a. If yes, please describe.

8. Approximately what percentage of teachers are participating in the discussion?

   ___ 0-24% ___ 25-49% ___ 50-74% ___ 75-100%

9. Was there evidence of a shared vision and culture?

   ____yes, very much ____a moderate amount ____none or very little

   If yes, provide a brief example.

10. Was there evidence of mutual support, commitment, and collegiality?

    ____yes, very much ____a moderate amount ____none or very little

    If yes, provide a brief example.

11. Was there evidence of reflective dialogue?

    ____yes, very much ____a moderate amount ____none or very little

    If yes, provide a brief example.

12. Was there evidence of members walking away with something learned or new? (did they find any solutions or strategies?) ____yes ____no

13. Was there evidence of any networks or partnerships that look beyond the school for sources of learning? ____yes ____no

14. To what extent did the discussion have a…

	No extent	Little extent	Some extent	Great extent
a. focus on professional learning				
b. culture of collaboration				
c. focus on results (changes in teacher practice and student achievement)				

15. Rate the presence of the following in today's PLC:

	Not present	Somewhat present	Strongly present
Openness to improvement			
Trust and respect			
A foundation in the knowledge and skills of teaching			
Supportive leadership			
Socialization and school structures that extend the school's mission			

16. Did the PLC members mention any challenges or barriers in the school that are impacting MSTA implementation?

    16a. If yes, please describe. (i.e., lack of time, communication, agreement or shared vision, cooperation, etc.)

Note: an observation transcript is not necessary, but please indicate below anything significant in the discussion or valuable quotes that capture the essence of the participants' experiences.

Appendix 2:
Year-End Algebra Post-Module Survey Results

Table 1. To date, how many hours of formal Algebra Connected to Number training have you received?

Region	n	6 hours or fewer	7-12 hours	13-18 hours	19-24 hours	25-30 hours	Greater than 30 hours
Region 1 & 2	22	9.1%	4.5%	13.6%	22.7%	36.4%	13.6%
Region 3	12	0.0%	0.0	8.3%	0.0%	58.3%	33.3%
Region 4	11	0.0%	18.2%	9.1%	9.1%	36.4%	27.3%
Region 5	18	44.4%	22.2%	22.2%	5.6%	5.6%	0.0%
Region 6 & 8	42	4.8%	11.9%	9.5%	35.7%	33.3%	4.8%
Region 7	44	9.1%	2.3%	9.1%	9.1%	18.2%	52.3%
Region 9	14	7.1%	7.1%	0.0%	7.1%	57.1%	21.4%
Region 10	10	10.0%	20.0%	0.0%	30.0%	20.0%	20.0%
Region 11	263	11.8%	6.8%	7.2%	29.3%	29.3%	15.6%
All regions	***436***	***11.2%***	***7.8%***	***8.3%***	***24.5%***	***29.6%***	***18.6%***

Table 2. If greater than 30 hours, please specify (n=65):

Response	Frequency	Percent
31-35 hours	13	20.0%
36-40 hours	12	18.5%
41-45 hours	5	7.7%
46-50 hours	6	9.2%
51-55 hours	3	4.6%
56-60 hours	14	21.5%
Greater than 70 hours	2	3.1%

Table 3. How frequently is Algebra Connected to Number training offered in your region?

Region	n	Summer only	Semesterly	Quarterly	Monthly	Weekly	Other
Region 1 & 2	21	14.3%	4.8%	66.7%	4.8%	0.0%	9.5%
Region 3	10	0.0%	10.0%	50.0%	30.0%	0.0%	10.0%
Region 4	10	30.0%	0.0%	40.0%	10.0%	0.0%	20.0%
Region 5	16	18.8%	31.3%	0.0%	0.0%	0.0%	50.0%
Region 6 & 8	39	0.0%	0.0%	10.3%	84.6%	0.0%	5.1%
Region 7	44	18.2%	27.3%	27.3%	4.5%	0.0%	22.7%
Region 9	13	7.7%	15.4%	30.8%	23.1%	0.0%	23.1%
Region 10	8	25.0%	37.5%	12.5%	0.0%	0.0%	25.0%
Region 11	245	1.2%	2.9%	50.6%	29.0%	1.2%	15.1%
All regions	***406***	***5.7%***	***7.6%***	***41.4%***	***28.1%***	***0.7%***	***16.5%***

Table 4. If other, please specify (n=79):

Response	Frequency	Percent
Unsure	36	45.6%
Summer, and periodically throughout the school year	18	22.8%
Five times a year	8	10.1%
Not offered	4	5.1%
It varies	3	3.8%
Other	10	12.7%

Table 5. Regarding my mathematics instruction, typically: I use student data from state mathematics tests to inform my instruction.

Region	n	Never	Annually	Monthly	Weekly	Daily
Region 1 & 2	22	0.0%	50.0%	22.7%	27.3%	0.0%
Region 3	12	8.3%	33.3%	16.7%	16.7%	25.0%
Region 4	11	0.0%	54.5%	18.2%	27.3%	0.0%
Region 5	18	16.7%	33.3%	38.9%	11.1%	0.0%
Region 6 & 8	42	0.0%	40.5%	26.2%	23.8%	9.5%
Region 7	43	2.3%	37.2%	20.9%	34.9%	4.7%
Region 9	14	0.0%	42.9%	28.6%	28.6%	0.0%
Region 10	10	10.0%	60.0%	30.0%	0.0%	0.0%
Region 11	260	4.2%	42.7%	30.0%	18.1%	5.0%
All regions	***432***	***3.9%***	***42.4%***	***28.0%***	***20.6%***	***5.1%***

Table 6. Regarding my mathematics instruction, typically: I use state standards to inform my mathematics instruction.

Region	n	Never	Annually	Monthly	Weekly	Daily
Region 1 & 2	22	0.0%	18.2%	27.3%	18.2%	36.4%
Region 3	12	0.0%	0.0%	0.0%	50.0%	50.0%
Region 4	11	0.0%	27.3%	9.1%	18.2%	45.5%
Region 5	18	11.1%	11.1%	50.0%	16.7%	11.1%
Region 6 & 8	42	0.0%	21.4%	16.7%	35.7%	26.2%
Region 7	43	2.3%	14.0%	16.3%	27.9%	39.5%
Region 9	14	0.0%	7.1%	28.6%	28.6%	35.7%
Region 10	10	0.0%	30.0%	30.0%	20.0%	20.0%
Region 11	262	0.0%	13.7%	14.1%	32.4%	39.7%
All regions	***434***	***0.7%***	***14.7%***	***17.1%***	***30.6%***	***36.9%***

Table 7. Regarding my mathematics instruction, typically: I use classroom assessments to inform my instruction.

Region	n	Never	Annually	Monthly	Weekly	Daily
Region 1 & 2	22	0.0%	0.0%	13.6%	59.1%	27.3%
Region 3	12	0.0%	0.0%	8.3%	41.7%	50.0%
Region 4	11	0.0%	0.0%	18.2%	54.5%	27.3%
Region 5	18	5.6%	0.0%	11.1%	44.4%	38.9%
Region 6 & 8	41	0.0%	4.9%	14.6%	43.9%	36.6%
Region 7	43	0.0%	2.3%	7.0%	60.5%	30.2%
Region 9	14	0.0%	0.0%	7.1%	64.3%	28.6%
Region 10	10	0.0%	0.0%	20.0%	80.0%	0.0%
Region 11	259	0.0%	1.2%	14.3%	48.6%	35.9%
All regions	***430***	***0.2%***	***1.4%***	***13.3%***	***50.9%***	***34.2%***

Table 8. Regarding my mathematics instruction, typically: I use local standardized mathematics assessments to inform my instruction.

Region	n	Never	Annually	Monthly	Weekly	Daily
Region 1 & 2	22	18.2%	13.6%	27.3%	36.4%	4.5%
Region 3	12	0.0%	25.0%	41.7%	25.0%	8.3%
Region 4	11	9.1%	27.3%	27.3%	18.2%	18.2%
Region 5	18	27.8%	16.7%	27.8%	22.2%	5.6%
Region 6 & 8	42	21.4%	21.4%	23.8%	21.4%	11.9%
Region 7	43	7.0%	20.9%	30.2%	23.3%	18.6%
Region 9	14	0.0%	35.7%	14.3%	35.7%	14.3%
Region 10	10	30.0%	30.0%	10.0%	30.0%	0.0%
Region 11	261	7.3%	33.3%	31.0%	19.5%	8.8%
All regions	***433***	***10.2%***	***28.9%***	***29.1%***	***21.9%***	***9.9%***

Table 9. I consistently use our school's curriculum to develop instructional plans for the year.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	0.0%	13.6%	50.0%	36.4%
Region 3	12	8.3%	8.3%	0.0%	33.3%	50.0%
Region 4	11	0.0%	0.0%	0.0%	27.3%	72.7%
Region 5	18	0.0%	0.0%	16.7%	61.1%	22.2%
Region 6 & 8	42	0.0%	0.0%	4.8%	71.4%	23.8%
Region 7	43	0.0%	0.0%	7.0%	46.5%	46.5%
Region 9	14	0.0%	0.0%	21.4%	35.7%	42.9%
Region 10	10	0.0%	0.0%	10.0%	30.0%	60.0%
Region 11	263	0.4%	2.3%	6.8%	44.9%	45.6%
All regions	***435***	***0.5%***	***1.6%***	***7.6%***	***47.1%***	***43.2%***

Table 10. I have a good understanding of the 2007 Minnesota Academic Standards for Mathematics.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	0.0%	0.0%	63.6%	36.4%
Region 3	12	0.0%	0.0%	8.3%	41.7%	50.0%
Region 4	11	0.0%	0.0%	9.1%	36.4%	54.5%
Region 5	18	0.0%	16.7%	22.2%	55.6%	5.6%
Region 6 & 8	42	0.0%	0.0%	16.7%	64.3%	19.0%
Region 7	44	0.0%	6.8%	9.1%	54.5%	29.5%
Region 9	14	0.0%	0.0%	7.1%	50.0%	42.9%
Region 10	10	0.0%	0.0%	20.0%	40.0%	40.0%
Region 11	261	0.8%	0.4%	10.3%	64.0%	24.5%
All regions	***434***	***0.5%***	***1.6%***	***10.8%***	***60.4%***	***26.7%***

Table 11. I know which mathematics content standards are relevant to every lesson I teach

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	4.5%	9.1%	72.7%	13.6%
Region 3	12	0.0%	0.0%	16.7%	50.0%	33.3%
Region 4	11	0.0%	0.0%	18.2%	45.5%	36.4%
Region 5	18	0.0%	33.3%	16.7%	50.0%	0.0%
Region 6 & 8	42	2.4%	4.8%	33.3%	47.6%	11.9%
Region 7	43	0.0%	7.0%	14.0%	53.5%	25.6%
Region 9	14	0.0%	0.0%	21.4%	71.4%	7.1%
Region 10	10	10.0%	30.0%	10.0%	40.0%	10.0%
Region 11	263	0.0%	6.5%	19.4%	56.7%	17.5%
All regions	***435***	***0.5%***	***7.4%***	***19.3%***	***55.6%***	***17.2%***

Table 12. I feel comfortable teaching the mathematics content standards.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	0.0%	0.0%	63.6%	36.4%
Region 3	12	0.0%	0.0%	0.0%	58.3%	41.7%
Region 4	11	0.0%	0.0%	0.0%	27.3%	72.7%
Region 5	18	0.0%	22.2%	11.1%	66.7%	0.0%
Region 6 & 8	41	0.0%	0.0%	4.9%	56.1%	39.0%
Region 7	43	0.0%	0.0%	7.0%	55.8%	37.2%
Region 9	14	0.0%	0.0%	14.3%	64.3%	21.4%
Region 10	10	0.0%	0.0%	10.0%	70.0%	20.0%
Region 11	261	0.0%	0.8%	4.6%	49.4%	45.2%
All regions	***432***	***0.0%***	***1.4%***	***5.1%***	***52.8%***	***40.7%***

Table 13. My classroom assessments reflect the same format as the state assessments.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	13.6%	40.9%	31.8%	13.6%
Region 3	12	0.0%	16.7%	8.3%	50.0%	25.0%
Region 4	11	0.0%	27.3%	9.1%	36.4%	27.3%
Region 5	18	0.0%	22.2%	27.8%	38.9%	11.1%
Region 6 & 8	41	4.9%	9.8%	36.6%	43.9%	4.9%
Region 7	43	0.0%	16.3%	34.9%	41.9%	7.0%
Region 9	14	0.0%	21.4%	28.6%	28.6%	21.4%
Region 10	10	0.0%	40.0%	50.0%	10.0%	0.0%
Region 11	261	4.2%	18.4%	27.6%	41.0%	8.8%
All regions	***432***	***3.0%***	***18.1%***	***29.4%***	***39.8%***	***9.7%***

Table 14. My classroom assessments are closely aligned to the state standards.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	0.0%	4.5%	77.3%	18.2%
Region 3	12	0.0%	0.0%	0.0%	66.7%	33.3%
Region 4	11	0.0%	0.0%	18.2%	63.6%	18.2%
Region 5	18	0.0%	22.2%	11.1%	44.4%	22.2%
Region 6 & 8	42	0.0%	4.8%	26.2%	57.1%	11.9%
Region 7	43	0.0%	0.0%	11.6%	55.8%	32.6%
Region 9	14	0.0%	7.1%	21.4%	35.7%	35.7%
Region 10	10	0.0%	10.0%	30.0%	60.0%	0.0%
Region 11	263	0.0%	3.0%	20.5%	57.0%	19.4%
All regions	***435***	***0.0%***	***3.7%***	***18.6%***	***57.2%***	***20.5%***

Table 15. My classroom assessments are aligned to different cognitive levels.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	9.1%	13.6%	59.1%	18.2%
Region 3	12	0.0%	0.0%	8.3%	66.7%	25.0%
Region 4	11	0.0%	0.0%	9.1%	90.1%	0.0%
Region 5	18	0.0%	11.1%	16.7%	66.7%	5.6%
Region 6 & 8	42	0.0%	9.5%	28.6%	50.0%	11.9%
Region 7	43	0.0%	0.0%	23.3%	72.1%	4.7%
Region 9	14	0.0%	7.1%	21.4%	71.4%	0.0%
Region 10	10	0.0%	30.0%	10.0%	60.0%	0.0%
Region 11	262	0.0%	5.3%	19.1%	64.5%	11.1%
All regions	***434***	***0.0%***	***6.0%***	***19.4%***	***64.5%***	***10.1%***

Table 16. My colleagues and I share instructional strategies and materials we have developed or found successful.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	0.0%	9.1%	72.7%	18.2%
Region 3	12	0.0%	8.3%	8.3%	41.7%	41.7%
Region 4	11	0.0%	18.2%	9.1%	54.5%	18.2%
Region 5	18	0.0%	16.7%	5.6%	55.6%	22.2%
Region 6 & 8	42	0.0%	2.4%	9.5%	66.7%	21.4%
Region 7	44	0.0%	6.8%	9.1%	45.5%	38.6%
Region 9	14	0.0%	0.0%	14.3%	57.1%	28.6%
Region 10	10	0.0%	20.0%	20.0%	50.0%	10.0%
Region 11	262	0.0%	2.7%	5.7%	43.5%	48.1%
All regions	***435***	***0.0%***	***4.4%***	***7.4%***	***48.7%***	***39.5%***

Table 17. Teachers at my school work together to define effective instruction

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	4.5%	13.6%	18.2%	54.5%	9.1%
Region 3	12	0.0%	16.7%	16.7%	50.0%	16.7%
Region 4	10	0.0%	0.0%	20.0%	80.0%	0.0%
Region 5	18	0.0%	16.7%	27.8%	38.9%	16.7%
Region 6 & 8	42	0.0%	7.1%	31.0%	40.5%	21.4%
Region 7	43	0.0%	4.7%	18.6%	53.5%	23.3%
Region 9	14	0.0%	0.0%	42.9%	28.6%	28.6%
Region 10	10	0.0%	20.0%	40.0%	30.0%	10.0%
Region 11	262	0.4%	5.0%	13.7%	45.8%	35.1%
All regions	***433***	***0.5%***	***6.5%***	***18.5%***	***46.2%***	***28.4%***

Table 18. I feel that student assessment data are important to the instructional process

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	0.0%	0.0%	72.7%	27.3%
Region 3	12	0.0%	0.0%	8.3%	58.3%	33.3%
Region 4	11	0.0%	0.0%	9.1%	72.7%	18.2%
Region 5	18	0.0%	16.7%	5.6%	55.6%	22.2%
Region 6 & 8	42	0.0%	0.0%	4.8%	66.7%	28.6%
Region 7	44	0.0%	2.3%	2.3%	63.6%	31.8%
Region 9	14	0.0%	0.0%	0.0%	71.4%	28.6%
Region 10	10	0.0%	0.0%	20.0%	60.0%	20.0%
Region 11	263	0.0%	1.9%	6.1%	61.2%	30.8%
All regions	***436***	***0.0%***	***2.1%***	***5.5%***	***62.8%***	***29.6%***

Table 19. Staff members in my school are in agreement that student assessment data are important to the instructional process.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	0.0%	27.3%	72.7%	0.0%
Region 3	12	0.0%	8.3%	33.3%	50.0%	8.3%
Region 4	11	0.0%	0.0%	18.2%	81.8%	0.0%
Region 5	17	0.0%	29.4%	17.6%	41.2%	11.8%
Region 6 & 8	42	2.4%	2.4%	11.9%	64.3%	19.0%
Region 7	44	0.0%	4.5%	9.1%	68.2%	18.2%
Region 9	14	0.0%	0.0%	28.6%	50.0%	21.4%
Region 10	10	10.0%	10.0%	0.0%	70.0%	10.0%
Region 11	262	0.4%	4.6%	14.9%	61.8%	18.3%
All regions	***434***	***0.7%***	***5.1%***	***15.4%***	***62.4%***	***16.4%***

Table 20. When staff examine student data together, we can better identify areas for improvement

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	0.0%	4.5%	72.7%	22.7%
Region 3	12	0.0%	0.0%	0.0%	66.7%	33.3%
Region 4	11	0.0%	0.0%	0.0%	63.6%	36.4%
Region 5	18	0.0%	0.0%	5.6%	61.1%	33.3%
Region 6 & 8	42	0.0%	0.0%	4.8%	61.9%	33.3%
Region 7	44	0.0%	2.3%	4.5%	56.8%	36.4%
Region 9	14	0.0%	0.0%	7.1%	64.3%	28.6%
Region 10	10	0.0%	0.0%	30.0%	30.0%	40.0%
Region 11	263	0.0%	1.5%	3.4%	66.2%	28.9%
All regions	***436***	***0.0%***	***1.1%***	***4.4%***	***64.0%***	***30.5%***

Table 21. Integrating instructional technology into my lessons can augment my mathematics instruction.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	0.0%	4.5%	81.8%	13.6%
Region 3	12	0.0%	0.0%	0.0%	58.3%	41.7%
Region 4	11	0.0%	0.0%	0.0%	63.6%	36.4%
Region 5	18	0.0%	0.0%	0.0%	72.2%	27.8%
Region 6 & 8	41	0.0%	0.0%	4.9%	61.0%	34.1%
Region 7	44	0.0%	0.0%	11.4%	56.8%	31.8%
Region 9	14	0.0%	0.0%	0.0%	42.9%	57.1%
Region 10	10	0.0%	10.0%	0.0%	50.0%	40.0%
Region 11	261	0.0%	0.4%	5.7%	59.0%	34.9%
All regions	***433***	***0.0%***	***0.5%***	***5.3%***	***60.0%***	***34.2%***

Table 22. Integrating applications from other content areas (i.e. science, engineering) can enhance my instruction of mathematics.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	0.0%	4.5%	68.2%	27.3%
Region 3	11	0.0%	0.0%	0.0%	63.6%	36.4%
Region 4	11	0.0%	0.0%	0.0%	63.6%	36.4%
Region 5	18	0.0%	0.0%	11.1%	66.7%	22.2%
Region 6 & 8	42	0.0%	2.4%	2.4%	66.7%	28.6%
Region 7	44	0.0%	0.0%	11.4%	61.4%	27.3%
Region 9	14	0.0%	0.0%	14.3%	64.3%	21.4%
Region 10	10	0.0%	0.0%	0.0%	60.0%	40.0%
Region 11	262	0.0%	1.1%	8.8%	61.5%	28.6%
All regions	***434***	***0.0%***	***0.9%***	***7.8%***	***62.7%***	***28.6%***

Table 23. Integrating applications from other content areas (i.e. science, engineering) can increase the relevance of mathematics for students.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	0.0%	4.5%	63.6%	31.8%
Region 3	12	0.0%	0.0%	0.0%	58.3%	41.7%
Region 4	11	0.0%	0.0%	0.0%	54.5%	45.5%
Region 5	18	0.0%	0.0%	0.0%	77.8%	22.2%
Region 6 & 8	42	2.4%	0.0%	2.4%	61.9%	33.3%
Region 7	44	0.0%	0.0%	9.1%	50.0%	40.9%
Region 9	14	0.0%	0.0%	0.0%	71.4%	28.6%
Region 10	10	0.0%	0.0%	0.0%	60.0%	40.0%
Region 11	261	0.0%	0.4%	5.0%	60.5%	34.1%
All regions	***434***	***0.2%***	***0.2%***	***4.4%***	***60.6%***	***34.6%***

Table 24. As a result of the MSTA workshop, how comfortable would you feel explaining the following topics to a colleague? *Specific strategies for connecting number concepts to Algebra in mathematics instruction*.

Region	n	Very uncomfortable	Uncomfortable	Neutral	Comfortable	Very comfortable
Region 1 & 2	22	0.0%	0.0%	4.5%	77.3%	18.2%
Region 3	12	0.0%	0.0%	16.7%	50.0%	33.3%
Region 4	11	0.0%	0.0%	18.2%	63.6%	18.2%
Region 5	18	5.6%	22.2%	38.9%	33.3%	0.0%
Region 6 & 8	41	0.0%	7.3%	34.1%	53.7%	4.9%
Region 7	42	0.0%	7.1%	23.8%	57.1%	11.9%
Region 9	14	0.0%	14.3%	14.3%	50.0%	21.4%
Region 10	10	0.0%	10.0%	40.0%	40.0%	10.0%
Region 11	262	0.4%	3.8%	15.3%	68.3%	12.2%
All regions	***432***	***0.5%***	***5.3%***	***19.0%***	***63.0%***	***12.3%***

Table 25. As a result of the MSTA workshop, how comfortable would you feel explaining the following topics to a colleague? Specific strategies for integrating the five NCTM process standards with the Minnesota Academic Standards for Mathematics.

Region	n	Very uncomfortable	Uncomfortable	Neutral	Comfortable	Very comfortable
Region 1 & 2	22	4.5%	4.5%	22.7%	50.0%	18.2%
Region 3	12	0.0%	0.0%	16.7%	66.7%	16.7%
Region 4	11	9.1%	0.0%	36.4%	54.5%	0.0%
Region 5	18	5.6%	22.2%	44.4%	27.8%	0.0%
Region 6 & 8	41	0.0%	19.5%	36.6%	41.5%	2.4%
Region 7	41	2.4%	7.3%	46.3%	39.0%	4.9%
Region 9	14	7.1%	7.1%	28.6%	42.9%	14.3%
Region 10	9	0.0%	22.2%	11.1%	44.4%	22.2%
Region 11	261	1.9%	11.9%	34.5%	44.4%	7.3%
All regions	***429***	***2.3%***	***11.7%***	***34.5%***	***44.1%***	***7.5%***

Table 26. As a result of the MSTA workshop, how comfortable would you feel explaining the following topics to a colleague? *Specific strategies for integrating science into mathematics instruction.*

Region	n	Very uncomfortable	Uncomfortable	Neutral	Comfortable	Very comfortable
Region 1 & 2	22	4.5%	13.6%	45.5%	31.8%	4.5%
Region 3	12	8.3%	8.3%	41.7%	16.7%	25.0%
Region 4	11	0.0%	9.1%	63.6%	18.2%	9.1%
Region 5	18	5.6%	38.9%	22.2%	27.8%	5.6%
Region 6 & 8	41	4.9%	17.1%	39.0%	39.0%	0.0%
Region 7	41	9.8%	7.3%	56.1%	22.0%	4.9%
Region 9	14	0.0%	28.6%	21.4%	42.9%	7.1%
Region 10	10	10.0%	30.0%	10.0%	40.0%	10.0%
Region 11	262	3.4%	32.1%	41.6%	19.8%	3.1%
All regions	***431***	***4.4%***	***26.2%***	***41.3%***	***23.9%***	***4.2%***

Table 27. As a result of the MSTA workshop, how comfortable would you feel explaining the following topics to a colleague? *Specific strategies for integrating engineering into mathematics instruction.*

Region	n	Very uncomfortable	Uncomfortable	Neutral	Comfortable	Very comfortable
Region 1 & 2	22	4.5%	22.7%	36.4%	31.8%	4.5%
Region 3	10	10.0%	20.0%	20.0%	40.0%	10.0%
Region 4	11	0.0%	36.4%	36.4%	27.3%	0.0%
Region 5	18	11.1%	50.0%	22.2%	11.1%	5.6%
Region 6 & 8	41	12.2%	29.3%	31.7%	26.8%	0.0%
Region 7	42	9.5%	21.4%	45.2%	19.0%	4.8%
Region 9	14	7.1%	21.4%	35.7%	28.6%	7.1%
Region 10	10	10.0%	20.0%	50.0%	20.0%	0.0%
Region 11	262	6.9%	40.8%	38.2%	13.0%	1.1%
All regions	***430***	***7.7%***	***35.6%***	***37.2%***	***17.4%***	***2.1%***

Table 28. As a result of the MSTA workshop, how comfortable would you feel explaining the following topics to a colleague? *Specific strategies for integrating technology into mathematics instruction.*

Region	n	Very uncomfortable	Uncomfortable	Neutral	Comfortable	Very comfortable
Region 1 & 2	22	0.0%	9.1%	27.3%	59.1%	4.5%
Region 3	12	8.3%	0.0%	16.7%	50.0%	25.0%
Region 4	11	0.0%	0.0%	27.3%	63.6%	9.1%
Region 5	18	11.1%	16.7%	44.4%	27.8%	0.0%
Region 6 & 8	41	0.0%	9.8%	19.5%	65.9%	4.9%
Region 7	42	4.8%	4.8%	31.0%	42.9%	16.7%
Region 9	14	0.0%	21.4%	7.1%	50.0%	21.4%
Region 10	10	10.0%	10.0%	0.0%	60.0%	20.0%
Region 11	262	2.7%	15.6%	37.4%	35.1%	9.2%
All regions	***432***	***3.0%***	***13.0%***	***32.2%***	***41.9%***	***10.0%***

Table 29. As a result of the MSTA workshop: I have a better understanding of how to align mathematics content standards with specific number or Algebra lessons.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	4.5%	4.5%	68.2%	22.7%
Region 3	12	0.0%	0.0%	8.3%	58.3%	33.3%
Region 4	11	0.0%	0.0%	0.0%	81.8%	18.2%
Region 5	18	5.6%	16.7%	11.1%	55.6%	11.1%
Region 6 & 8	40	0.0%	10.0%	37.5%	47.5%	5.0%
Region 7	43	0.0%	7.0%	20.9%	55.8%	16.3%
Region 9	14	7.1%	0.0%	21.4%	50.0%	21.4%
Region 10	10	0.0%	0.0%	10.0%	90.0%	0.0%
Region 11	262	2.7%	7.3%	17.9%	64.1%	8.0%
All regions	***432***	***2.1%***	***6.9%***	***18.3%***	***62.0%***	***10.6%***

Table 30. As a result of the MSTA workshop: I am more prepared to help my students transition to Algebraic thinking through number because I have a deeper understanding of Algebra.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	4.5%	18.2%	59.1%	18.2%
Region 3	11	0.0%	0.0%	9.1%	63.6%	27.3%
Region 4	11	0.0%	0.0%	9.1%	63.6%	27.3%
Region 5	18	5.6%	11.1%	27.8%	50.0%	5.6%
Region 6 & 8	40	0.0%	10.0%	22.5%	65.0%	2.5%
Region 7	43	0.0%	7.0%	23.3%	44.2%	25.6%
Region 9	14	7.1%	0.0%	28.6%	42.9%	21.4%
Region 10	10	0.0%	20.0%	0.0%	80.0%	0.0%
Region 11	261	1.5%	4.2%	14.9%	63.2%	16.1%
All regions	***430***	***1.4%***	***5.3%***	***17.0%***	***60.5%***	***15.8%***

Table 31. As a result of the MSTA workshop: I have a better understanding of students' mathematical thinking and how to extend their prior knowledge to develop concepts related to Algebra.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	4.5%	13.6%	63.6%	18.2%
Region 3	12	0.0%	0.0%	16.7%	58.3%	25.0%
Region 4	11	0.0%	0.0%	9.1%	72.7%	18.2%
Region 5	18	5.6%	0.0%	22.2%	72.2%	0.0%
Region 6 & 8	39	0.0%	10.3%	23.1%	56.4%	10.3%
Region 7	43	0.0%	4.7%	14.0%	60.5%	20.9%
Region 9	14	0.0%	0.0%	28.6%	42.9%	28.6%
Region 10	10	0.0%	10.0%	20.0%	50.0%	20.0%
Region 11	261	1.1%	2.3%	17.2%	62.5%	16.9%
All regions	***430***	***0.9%***	***3.3%***	***17.7%***	***61.4%***	***16.7%***

Table 32. As a result of the MSTA workshop: I provide more opportunities for my students to explain their understanding of number as it relates to Algebra.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	4.5%	9.1%	68.2%	18.2%
Region 3	12	0.0%	0.0%	16.7%	41.7%	41.7%
Region 4	11	0.0%	0.0%	18.2%	63.6%	18.2%
Region 5	18	5.6%	11.1%	27.8%	50.0%	5.6%
Region 6 & 8	40	0.0%	7.5%	30.0%	52.5%	10.0%
Region 7	43	0.0%	7.0%	23.3%	51.2%	18.6%
Region 9	14	0.0%	0.0%	21.4%	57.1%	21.4%
Region 10	10	0.0%	20.0%	20.0%	60.0%	0.0%
Region 11	260	0.8%	5.4%	12.3%	69.2%	12.3%
All regions	***430***	***0.7%***	***5.8%***	***16.3%***	***63.5%***	***13.7%***

Table 33. As a result of the MSTA workshop: I provide students in my class with learning experiences that align closely with the 2007 Minnesota Academic Standards for Mathematics.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	4.5%	9.1%	63.6%	22.7%
Region 3	12	0.0%	0.0%	8.3%	50.0%	41.7%
Region 4	11	0.0%	0.0%	18.2%	54.5%	27.3%
Region 5	18	5.6%	16.7%	16.7%	44.4%	16.7%
Region 6 & 8	40	0.0%	5.0%	27.5%	62.5%	5.0%
Region 7	43	0.0%	7.0%	16.3%	55.8%	20.9%
Region 9	13	0.0%	7.7%	23.1%	46.2%	23.1%
Region 10	10	0.0%	0.0%	20.0%	80.0%	0.0%
Region 11	262	1.5%	5.0%	21.0%	61.1%	11.5%
All regions	***431***	***1.2%***	***5.3%***	***20.0%***	***59.6%***	***13.9%***

Table 34. As a result of the MSTA workshop: I use various methods (e.g. oral questioning, student self-assessment, peer assessment, portfolios, projects) as well as paper-pencil tests to assess student progress and achievement.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	4.5%	4.5%	63.6%	27.3%
Region 3	12	0.0%	0.0%	8.3%	50.0%	41.7%
Region 4	11	0.0%	9.1%	9.1%	63.6%	18.2%
Region 5	18	0.0%	16.7%	16.7%	66.7%	0.0%
Region 6 & 8	41	0.0%	4.9%	17.1%	70.7%	7.3%
Region 7	42	0.0%	7.1%	21.4%	50.0%	21.4%
Region 9	14	0.0%	0.0%	28.6%	42.9%	28.6%
Region 10	10	0.0%	30.0%	0.0%	60.0%	10.0%
Region 11	262	1.5%	9.5%	16.0%	56.9%	16.0%
All regions	***432***	***0.9%***	***8.8%***	***15.7%***	***57.9%***	***16.7%***

Table 35. As a result of the MSTA workshop: I am more involved with other teachers in discussions about whether students' performance is 'up to standard' or 'not up to standard.'

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	4.5%	22.7%	68.2%	4.5%
Region 3	12	0.0%	0.0%	25.0%	58.3%	16.7%
Region 4	11	0.0%	18.2%	9.1%	63.6%	9.1%
Region 5	18	0.0%	16.7%	22.2%	55.6%	5.6%
Region 6 & 8	41	0.0%	7.3%	26.8%	58.5%	7.3%
Region 7	42	0.0%	7.1%	28.6%	58.5%	7.3%
Region 9	13	0.0%	7.7%	30.8%	46.2%	15.4%
Region 10	10	0.0%	30.0%	10.0%	50.0%	10.0%
Region 11	261	1.1%	9.6%	19.2%	59.0%	11.1%
All regions	***430***	***0.7%***	***9.5%***	***21.2%***	***57.4%***	***11.2%***

Table 36. As a result of the MSTA workshop: I spend more time systematically examining my students' achievement and performance data.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	9.1%	40.9%	40.9%	9.1%
Region 3	12	0.0%	0.0%	25.0%	66.7%	8.3%
Region 4	11	0.0%	0.0%	27.3%	63.6%	9.1%
Region 5	18	0.0%	22.2%	27.8%	50.0%	0.0%
Region 6 & 8	41	0.0%	7.3%	43.9%	43.9%	4.9%
Region 7	41	0.0%	14.6%	31.7%	43.9%	9.8%
Region 9	13	0.0%	0.0%	30.0%	53.8%	15.4%
Region 10	10	0.0%	30.0%	30.0%	40.0%	0.0%
Region 11	260	1.5%	8.8%	30.0%	51.2%	8.5%
All regions	***428***	***0.9%***	***9.6%***	***31.8%***	***49.8%***	***7.9%***

Table 37. As a result of the MSTA workshop: I feel more comfortable connecting mathematics concepts with science, technology and engineering applications in my mathematics instruction.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	4.5%	45.5%	45.5%	4.5%
Region 3	11	9.1%	0.0%	18.2%	36.4%	36.4%
Region 4	11	9.1%	9.1%	36.4%	36.4%	9.1%
Region 5	18	0.0%	33.3%	44.4%	22.2%	0.0%
Region 6 & 8	41	0.0%	17.1%	48.8%	34.1%	0.0%
Region 7	42	2.4%	11.9%	45.2%	31.0l%	9.5%
Region 9	14	0.0%	0.0%	57.1%	28.6%	14.3%
Region 10	10	10.0%	10.0%	20.0%	60.0%	0.0%
Region 11	261	4.2%	25.7%	43.3%	22.6%	4.2%
All regions	***430***	***3.5%***	***20.5%***	***43.3%***	***27.4%***	***5.3%***

Table 38. As a result of the MSTA workshop: *The strategies I learned will* enhance my students' mathematics performance on state mathematics tests.

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	0.0%	0.0%	9.1%	68.2%	22.7%
Region 3	12	0.0%	0.0%	8.3%	58.3%	33.3%
Region 4	11	0.0%	0.0%	9.1%	72.7%	18.2%
Region 5	18	0.0%	22.2%	5.6%	66.7%	5.6%
Region 6 & 8	41	0.0%	7.3%	26.8%	58.5%	7.3%
Region 7	40	0.0%	5.0%	27.5%	60.0%	7.5%
Region 9	14	0.0%	0.0%	35.7%	42.9%	21.4%
Region 10	9	0.0%	0.0%	11.1%	77.8%	11.1%
Region 11	262	2.3%	3.8%	20.2%	64.5%	9.2%
All regions	***429***	***1.4%***	***4.4%***	***20.0%***	***63.4%***	***10.7%***

Table 39. Which strategies presented in the Algebra workshop(s) have you used in your classroom? (n=317)

Response	Frequency	Percent
Equal sign	78	24.6%
Ratios and proportions	27	8.5%
Many/all	26	8.2%
Hands-on strategies and diagrams	23	7.3%
Student assessments and interviews	23	7.3%
Patterns	21	6.6%
None	15	4.7%
Group work	14	4.4%
Differentiated instruction	13	4.1%
Open-ended questions	9	2.8%
Vocabulary	8	2.5%
Lesson study	6	1.9%
The arrow method	5	1.6%
Graphing calculators	5	1.6%
Cover-up method	4	1.3%
Items from the textbook	4	1.3%
Other	36	11.4%

Table 40. Which MSTA strategies have been *most useful* for raising student mathematics achievement? (n=290)

Response	Frequency	Percent
Equal sign discussions	66	22.8%
Ratio and proportions	29	10.0%
Different questioning techniques and teaching methods	21	7.2%
None	20	6.9%
Allowing students to problem solve and work in groups	19	6.6%
Student assessment	19	6.6%
Balancing and solving equations	17	5.9%
All of them	16	5.5%
Collaboration with other teachers	15	5.2%
Visuals and hands-on strategies	15	5.2%
Patterns	11	3.8%
Lesson study	7	2.4%
Vocabulary	5	1.7%
Other	30	10.3%

Table 41. Which strategies have been *least useful* for raising student mathematics achievement? (n=221)

Response	Frequency	Percent
Don't know/ None	75	33.9%
Equation day	28	12.7%
Ratio and proportion	25	11.3%
Strategies that are too advanced	22	10.0%
Patterns	20	9.1%
Technology	12	5.4%
The course itself was too lengthy	8	3.6%
Many	6	2.7%
Summative assessment	6	2.7%
Lesson Study	3	1.4%
Other	16	7.2%

Table 42. About how often are you using at least one strategy learned during the workshop?

Region	n	Never	More than once a week	Once a week	Once a month	Once a semester	Once a year	Less than once a year
Region 1 & 2	22	0.0%	40.9%	13.6%	40.9%	0.0%	0.0%	4.5%
Region 3	12	8.3%	25.0%	25.0%	25.0%	16.7%	0.0%	0.0%
Region 4	10	0.0%	20.0%	30.0%	40.0%	10.0%	0.0%	0.0%
Region 5	17	5.9%	23.5%	29.4%	17.6%	23.5%	0.0%	0.0%
Region 6 & 8	40	10.0%	12.5%	27.5%	27.5%	17.5%	5.0%	0.0%
Region 7	42	0.0%	9.5%	28.6%	42.9%	9.5%	9.5%	0.0%
Region 9	13	0.0%	0.0%	30.8%	53.8%	15.4%	0.0%	0.0%
Region 10	10	0.0%	0.0%	40.0%	40.0%	10.0%	10.0%	0.0%
Region 11	258	3.9%	15.9%	39.5%	34.9%	5.0%	0.4%	0.4%
All regions	***424***	***3.8%***	***16.0%***	***34.7%***	***35.1%***	***8.0%***	***1.9%***	***0.5%***

Table 43. In what way are you using what you learned during the workshop(s)? (Please select all that apply): *In conversations with one other teacher*

Region	n	Percent
Region 1 & 2	18	81.8%
Region 3	10	83.3%
Region 4	8	72.7%
Region 5	12	66.7%
Region 6 & 8	24	57.1%
Region 7	32	72.7%
Region 9	12	85.7%
Region 10	7	70.0%
Region 11	206	78.3%
All regions	***329***	***75.5%***

Table 44. In what ways are you using what you learned during the workshop(s)? (Please select all that apply): *During a team meeting*

Region	n	Percent
Region 1 & 2	14	63.6%
Region 3	7	58.3%
Region 4	4	36.4%
Region 5	11	61.1%
Region 6 & 8	18	42.9%
Region 7	22	50.0%
Region 9	6	42.9%
Region 10	4	40.0%
Region 11	153	58.2%
All regions	***239***	***54.8%***

Table 45. In what ways are you using what you learned during the workshop(s)? (Please select all that apply): *During a school-wide staff meeting*

Region	n	Percent
Region 1 & 2	5	22.7%
Region 3	0	0.0%
Region 4	2	18.2%
Region 5	1	5.6%
Region 6 & 8	6	14.3%
Region 7	3	6.8%
Region 9	1	7.1%
Region 10	1	10.0%
Region 11	22	8.4%
All regions	***41***	***9.4%***

Table 46. In what ways are you using what you learned during the workshop(s)? (Please select all that apply): *In conversations with a school leader*

Region	n	Percent
Region 1 & 2	10	45.5%
Region 3	6	50.0%
Region 4	3	27.3%
Region 5	5	27.8%
Region 6 & 8	12	28.6%
Region 7	18	40.9%
Region 9	6	42.9%
Region 10	3	30.0%
Region 11	69	26.2%
All regions	***132***	***30.3%***

Table 47. In what ways are you using what you learned during the workshop(s)? (Please select all that apply): *With a whole class of students*

Region	n	Percent
Region 1 & 2	18	81.8%
Region 3	10	83.3%
Region 4	9	81.8%
Region 5	9	50.0%
Region 6 & 8	30	71.4%
Region 7	31	70.5%
Region 9	12	85.7%
Region 10	9	90.0%
Region 11	202	76.8%
All regions	***330***	***75.7%***

Table 48. In what ways are you using what you learned during the workshop(s)? (Please select all that apply): *With a small group of students*

Region	n	Percent
Region 1 & 2	14	63.6%
Region 3	6	50.0%
Region 4	7	63.6%
Region 5	9	50.0%
Region 6 & 8	12	28.6%
Region 7	19	43.2%
Region 9	8	57.1%
Region 10	8	80.0%
Region 11	157	59.7%
All regions	***240***	***55.1%***

Table 49. In what ways are you using what you learned during the workshop(s)? (Please select all that apply): *With one student*

Region	n	Percent
Region 1 & 2	14	63.6%
Region 3	6	50.0%
Region 4	4	36.4%
Region 5	5	27.8%
Region 6 & 8	11	26.2%
Region 7	18	40.9%
Region 9	7	50.0%
Region 10	5	50.0%
Region 11	148	56.3%
All regions	***218***	***50.0%***

Table 50. In what ways are you using what you learned during the workshop(s)? (Please select all that apply): *To help differentiate instruction*

Region	n	Percent
Region 1 & 2	13	59.1%
Region 3	7	58.3%
Region 4	3	27.3%
Region 5	10	55.6%
Region 6 & 8	20	47.6%
Region 7	23	52.3%
Region 9	7	50.0%
Region 10	6	60.0%
Region 11	130	49.4%
All regions	***219***	***50.2%***

Table 51. In what ways are you using what you learned during the workshop(s)? (Please select all that apply): *To facilitate your professional reflection*

Region	n	Percent
Region 1 & 2	11	50.0%
Region 3	6	50.0%
Region 4	3	27.3%
Region 5	8	44.4%
Region 6 & 8	11	26.2%
Region 7	15	34.1%
Region 9	4	28.6%
Region 10	3	30.0%
Region 11	86	32.7%
All regions	***147***	***33.7%***

Table 52. In what ways are you using what you learned during the workshop(s)? (Please select all that apply): *Other*

Region	n	Percent
Region 1 & 2	0	0.0%
Region 3	0	0.0%
Region 4	0	0.0%
Region 5	0	0.0%
Region 6 & 8	0	0.0%
Region 7	0	0.0%
Region 9	0	0.0%
Region 10	0	0.0%
Region 11	9	3.4%
All regions	***9***	***2.1%***

Table 53. If other, please specify (n=10):

Response	Frequency	Percent
The teachers aren't using what they learned	5	50.0%
They were using them before they attended the workshop	2	20.0%

Table 54. I feel I still need information/clarification to implement the strategies presented at the workshop(s).

Region	n	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Region 1 & 2	22	4.5%	36.4%	36.4%	22.7%	0.0%
Region 3	12	8.3%	25.0%	41.7%	16.7%	8.3%
Region 4	11	0.0%	9.1%	45.5%	36.4%	9.1%
Region 5	17	0.0%	17.6%	41.2%	29.4%	11.8%
Region 6 & 8	42	0.0%	23.8%	52.4%	19.0%	4.8%
Region 7	42	2.4%	23.8%	45.2%	21.4%	7.1%
Region 9	14	7.1%	14.3%	64.3%	14.3%	0.0%
Region 10	10	10.0%	10.0%	60.0%	10.0%	10.0%
Region 11	259	8.5%	31.3%	35.1%	23.2%	1.9%
All regions	***429***	***6.3%***	***27.7%***	***40.1***	***22.4%***	***3.5%***

Table 55. In what areas do you feel you need further clarification/training? (n=105)

Response	Frequency	Percent
None	22	20.1%
Integrating subjects into math or the curriculum	15	14.3%
Strategies	13	12.4%
Differentiated instruction	11	10.5%
How content relates to standards	6	5.7%
All	6	5.7%
Ratio and proportion	4	3.8%
Solving equations	4	3.8%
Technology	4	3.8%
More materials	3	2.9%
Organized instruction	3	2.9%
Other	14	13.3%

Table 56. What is your gender?

Region	n	Female	Male
Region 1 & 2	22	59.1%	40.9%
Region 3	12	66.7%	33.3%
Region 4	11	72.7%	27.3%
Region 5	18	50.0%	50.0%
Region 6 & 8	41	61.0%	39.0%
Region 7	43	74.4%	25.6%
Region 9	14	28.6%	71.4%
Region 10	10	60.0%	40.0%
Region 11	262	70.2%	29.8%
All regions	***433***	***66.7%***	***33.3%***

Table 57. How many years of teaching experience do you have?

Region	n	Less than 1 year	1-5 years	6-10 years	11-15 years	16-20 years	21 or more years
Region 1 & 2	22	0.0%	9.1%	27.3%	22.7%	27.3%	13.6%
Region 3	12	0.0%	16.7%	25.0%	8.3%	25.0%	25.0%
Region 4	11	9.1%	27.3%	0.0%	9.1%	27.3%	27.3%
Region 5	18	5.6%	11.1%	16.7%	16.7%	5.6%	44.4%
Region 6 & 8	42	4.8%	21.4%	14.3%	26.2%	7/1%	26.2%
Region 7	44	6.8%	29.5%	15.9%	22.7%	13.6%	11.4%
Region 9	14	0.0%	7.1%	21.4%	28.6%	28.6%	14.3%
Region 10	10	0.0%	30.0%	10.0%	30.0%	10.0%	20.0%
Region 11	263	0.8%	25.9%	20.9%	16.3%	16.3%	19.4%
All regions	***436***	***2.1%***	***23.6%***	***19.3%***	***18.6%***	***16.1%***	***20.2%***

Table 58. How many years have you been teaching middle school mathematics?

Region	n	Less than 1 year	1-5 years	6-10 years	11-15 years	16-20 years	21 or more years
Region 1 & 2	21	0.0%	22.7%	31.8%	13.6%	18.2%	9.1%
Region 3	0	8.3%	16.7%	25.0%	8.3%	25.0%	16.7%
Region 4	0	9.1%	45.5%	9.1%	9.1%	18.2%	9.1%
Region 5	0	16.7%	22.2%	27.8%	5.6%	0.0%	27.8%
Region 6 & 8	36	14.3%	23.8%	16.7%	16.7%	4.8%	9.5%
Region 7	41	9.1%	31.8%	20.5%	15.9%	9.1%	6.8%
Region 9	11	0.0%	28.6%	14.3%	14.3%	14.3%	7.1%
Region 10	9	0.0%	50.0%	20.0%	0.0%	20.0%	0.0%
Region 11	258	2.7%	31.9%	24.0%	17.5%	9.5%	12.5%
All regions	***417***	***5.0%***	***30.5%***	***22.7%***	***15.6%***	***10.1%***	***11.7%***

Table 59. What is your current role in your school?

Region	n	Classroom teacher	Teacher Leader or Teacher on Special Assignment	District Administrator	Other
Region 1 & 2	22	81.8%	9.1%	0.0%	9.1%
Region 3	12	100.0%	0.0%	0.0%	0.0%
Region 4	11	100.0%	0.0%	0.0%	0.0%
Region 5	18	83.3%	11.1%	0.0%	5.6%
Region 6 & 8	42	92.9%	0.0%	0.0%	7.1%
Region 7	44	95.5%	2.3%	0.0%	2.3%
Region 9	14	71.4%	7.1%	7.1%	14.3%
Region 10	10	80.0%	10.0%	10.0%	0.0%
Region 11	263	95.1%	2.7%	0.0%	2.3%
All regions	***436***	***92.9%***	***3.2%***	***0.5%***	***3.4%***

Table 60. If other, please specify (n=19)

Response	Frequency	Percent
Special Education teacher	8	42.1%
Math specialist	2	10.5%
Regular teacher	2	10.5%
Title I	2	10.5%

Table 61. If you are a teacher or teacher leader, what is your primary content area assignment?

Region	n	I am not a teacher	Math	Science	Special Ed	ESL	Elem Ed	Other
Region 1 & 2	22	0.0%	72.7%	0.0%	13.6%	0.0%	9.1%	4.5%
Region 3	12	0.0%	91.7%	0.0%	0.0%	0.0%	8.3%	0.0%
Region 4	11	0.0%	54.5%	18.2%	0.0%	0.0%	18.2%	9.1%
Region 5	18	0.0%	33.3%	5.6%	22.2%	0.0%	22.2%	16.7%
Region 6 & 8	42	0.0%	61.9%	2.4%	0.0%	2.4%	33.3%	0.0%
Region 7	44	2.3%	70.5%	2.3%	4.5%	2.3%	13.6%	4.5%
Region 9	14	0.0%	57.1%	7.1%	7.1%	0.0%	14.3%	14.3%
Region 10	10	0.0%	70.0%	10.0%	0.0%	0.0%	0.0%	20.0%
Region 11	263	0.4%	84.4%	1.1%	5.7%	1.1%	3.4%	3.8%
All regions	***436***	***0.5%***	***76.4%***	***2.3%***	***5.7%***	***1.1%***	***9.2%***	***4.8%***

Table 62. If other, please specify. (n=25)

Response	Frequency	Percent
Combined math and science	8	32.0%
Language arts	6	24.0%
All	4	16.0%
Business	2	8.0%
Social studies	2	8.0%
Special education	2	8.0%
Technology integration	1	4.0%

Table 63. If you are a teacher or teacher leader, what grade level do you currently teach?

Region	n	I am not a teacher	PK-5	6	7	8	9-12	Other
Region 1 & 2	22	0.0%	4.5%	13.6%	13.6%	18.2%	13.6%	36.4%
Region 3	12	0.0%	0.0%	33.3%	25.0%	16.7%	0.0%	25.0%
Region 4	11	0.0%	9.1%	36.4%	18.2%	27.3%	0.0%	9.1%
Region 5	18	0.0%	0.0%	38.9%	16.7%	11.1%	11.1%	22.2%
Region 6 & 8	42	0.0%	23.8%	23.8%	11.9%	21.4%	4.8%	14.3%
Region 7	44	2.3%	9.1%	20.5%	31.8%	18.2%	11.4%	6.8%
Region 9	14	0.0%	7.1%	28.6%	7.1%	21.4%	14.3%	21.4%
Region 10	10	0.0%	0.0%	20.0%	20.0%	40.0%	10.0%	10.0%
Region 11	263	0.8%	1.1%	22.4%	33.1%	29.7%	3.8%	9.1%
All regions	***436***	***0.7%***	***4.6%***	***23.4%***	***27.5%***	***25.9%***	***5.7%***	***12.2%***

Table 64. If other, please specify (n=57)

Response	Frequency	Percent
Middle school	17	29.8%
7^{th}-12^{th} grade	13	22.8%
7^{th} and 8^{th} grade	8	14.0%
7^{th} through 9^{th} grade	6	10.5%
Kindergarten through 6^{th} or 8^{th} grade	4	7.0%

Table 65. Have you ever attended a STEM (Science, Technology, Engineering and Math) related workshop in the past 5 years?

Region	n	Yes	No
Region 1 & 2	22	36.4%	636%
Region 3	12	41.7%	58.3%
Region 4	11	36.4%	63.6%
Region 5	18	11.1%	88.9%
Region 6 & 8	42	19.0%	81.0%
Region 7	44	27.3%	72.7%
Region 9	14	14.3%	85.7%
Region 10	10	40.0%	60.0%
Region 11	263	20.5%	79.5%
All regions	***436***	***22.7%***	***77.3%***

Appendix 3:
PLC, Data-Driven Decision Making and Technical Assistance Survey Results

Table 1. Your position:

Region	n	Regional Center staff	PLC coach	Teacher	Other
Region 1 & 2	20	0.0%	0.0%	100.0%	0.0%
Region 3	13	0.0%	0.0%	100.0%	0.0%
Region 4	9	0.0%	0.0%	100.0%	0.0%
Region 5	16	0.0%	6.3%	93.8%	0.0%
Region 6 & 8	23	0.0%	0.0%	100.0%	0.0%
Region 7	32	0.0%	3.1%	96.9%	0.0%
Region 9	19	0.0%	0.0%	100.0%	0.0%
Region 10	11	0.0%	0.0%	100.0%	0.0%
Region 11	244	0.4%	9.0%	90.6%	0.0%
Total:	***387***	***0.3%***	***6.2%***	***93.5%***	***0.0%***

Table 2. The grade levels you work with (check all that apply):

Region	n	Elementary school	Middle school	High school
Region 1 & 2	22	22.7%	95.5%	31.8%
Region 3	13	0.0%	92.3%	53.8%
Region 4	9	22.2%	88.9%	11.1%
Region 5	16	12.5%	93.8%	12.5%
Region 6 & 8	24	29.2%	79.2%	25.0%
Region 7	33	18.2%	75.8%	12.1%
Region 9	22	9.1%	81.8%	31.8%
Region 10	12	0.0%	91.7%	16.7%
Region 11	246	1.2%	96.7%	5.3%
All regions	***397***	***6.8%***	***92.4%***	***12.3%***

Table 3. Please indicate the number of years you have been teaching (if applicable):

Region	n	0-7	8-14	15-21	22-28	29-35	36-42
Region 1 & 2	22	27.3%	18.2%	36.4%	4.6%	13.6%	0.0%
Region 3	13	38.5%	15.4%	15.4%	15.4%	7.7%	7.7%
Region 4	9	33.3%	11.1%	33.3%	11.1%	0.0%	11.1%
Region 5	15	33.3%	26.7%	13.3%	13.3%	13.3%	0.0%
Region 6 & 8	24	25.0%	29.2%	12.5%	20.8%	12.5%	0.0%
Region 7	32	37.5%	28.1%	18.8%	3.1%	9.4%	3.1%
Region 9	21	9.5%	38.1%	33.3%	9.5%	4.8%	4.8%
Region 10	12	33.3%	25.0%	16.7%	8.3%	16.7%	0.0%
Region 11	245	34.3%	29.0%	17.1%	8.2%	9.4%	2.0%
All regions	***393***	***32.3%***	***27.7%***	***19.1%***	***8.9%***	***9.7%***	***2.3%***

Table 4. Is your school a Q Comp school?

Region	n	Yes	No
Region 1 & 2	22	4.5%	95.5%
Region 3	12	0.0%	100.0%
Region 4	9	0.0%	100.0%
Region 5	16	0.0%	100.0%
Region 6 & 8	23	13.0%	87.0%
Region 7	33	6.1%	93.9%
Region 9	22	27.3%	72.7%
Region 10	12	16.7%	83.3%
Region 11	244	46.7%	53.3%
All regions	***393***	***32.6%***	***67.4%***

Table 5. How many years have you been involved in a PLC prior to your involvement in the Mathematics and Science Teacher Academy?

Region	n	None	Less than 1 year	Two years	Three years	Greater than 3 years
Region 1 & 2	22	45.5%	22.7%	22.7%	9.1%	0.0%
Region 3	13	46.2%	23.1%	15.4%	0.0%	15.4%
Region 4	9	44.4%	33.3%	0.0%	22.2%	0.0%
Region 5	16	43.8%	18.8%	37.5%	0.0%	0.0%
Region 6 & 8	24	50.0%	16.7%	16.7%	12.5%	4.2%
Region 7	33	54.5%	21.2%	15.2%	0.0%	9.1%
Region 9	22	27.3%	13.6%	27.3%	9.1%	22.7%
Region 10	12	16.7%	50.0%	25.0%	8.3%	0.0%
Region 11	245	32.2%	15.1%	26.5%	9.4%	16.7%
All regions	***396***	***36.4%***	***17.9%***	***24.2%***	***8.3%***	***13.1%***

Table 6. Are you currently a member of a MSTA PLC?

Region	n	Yes	No
Region 1 & 2	22	68.2%	31.8%
Region 3	13	100.0%	0.0%
Region 4	9	44.4%	55.6%
Region 5	16	50.0%	50.0%
Region 6 & 8	24	66.7%	33.3%
Region 7	33	66.7%	33.3%
Region 9	21	71.4%	28.6%
Region 10	12	75.0%	25.0%
Region 11	245	81.2%	18.8%
All regions	***395***	***76.2%***	***23.8%***

Table 7. Is your MSTA PLC specific to mathematics instruction?

Region	n	Yes	No
Region 1 & 2	15	100.0%	0.0%
Region 3	13	92.3%	7.7%
Region 4	6	66.7%	33.3%
Region 5	9	77.8%	22.2%
Region 6 & 8	16	93.8%	6.3%
Region 7	22	100.0%	0.0%
Region 9	16	93.8%	6.3%
Region 10	9	100.0%	0.0%
Region 11	203	96.6%	3.4%
All regions	***309***	***95.5%***	***4.5%***

Table 8. If "No," what percentage of your PLC time focuses on mathematics?

Region	n	1-25%	26-50%	51-75%	Greater than 75%
Region 1 & 2	0	0.0%	0.0%	0.0%	0.0%
Region 3	1	0.0%	0.0%	100.0%	0.0%
Region 4	3	33.3%	0.0%	0.0%	66.7%
Region 5	2	50.0%	50.0%	0.0%	0.0%
Region 6 & 8	3	33.3%	0.0%	0.0%	66.7%
Region 7	1	0.0%	0.0%	0.0%	100.0%
Region 9	5	40.0%	0.0%	20.0%	40.0%
Region 11	31	6.5%	9.7%	16.1%	67.7%
All regions	***48***	***14.6%***	***8.3%***	***14.6%***	***62.5%***

Table 9. How frequently do you participate in the PLC?

Region	n	Daily	Weekly	Twice a month	Monthly	Less than monthly
Region 1 & 2	15	0.0%	20.0%	6.7%	40.0%	33.3%
Region 3	13	0.0%	0.0%	7.7%	15.4%	76.9%
Region 4	4	0.0%	25.0%	0.0%	25.0%	50.0%
Region 5	8	0.0%	12.5%	0.0%	50.0%	37.5%
Region 6 & 8	16	0.0%	0.0%	6.3%	81.3%	12.5%
Region 7	22	0.0%	18.2%	27.3%	22.7%	31.8%
Region 9	16	0.0%	0.0%	25.0%	62.5%	12.5%
Region 10	9	0.0%	11.1%	11.1%	33.3%	44.4%
Region 11	199	1.5%	33.2%	39.7%	21.6%	4.0%
All regions	***302***	***1.0%***	***25.2%***	***30.8%***	***28.8%***	***14.2%***

Table 10. How often are the PLC meetings held (regardless of your participation)?

Region	n	Daily	Weekly	Twice a month	Monthly	Less than monthly
Region 1 & 2	15	0.0%	26.7%	0.0%	33.3%	40.0%
Region 3	13	0.0%	7.7%	0.0%	7.7%	84.6%
Region 4	4	0.0%	25.0%	0.0%	25.0%	50.0%
Region 5	8	0.0%	12.5%	0.0%	36.5%	50.0%
Region 6 & 8	16	0.0%	0.0%	6.3%	81.3%	12.5%
Region 7	22	0.0%	18.2%	27.3%	22.7%	31.8%
Region 9	16	0.0%	0.0%	25.0%	62.5%	12.5%
Region 10	9	0.0%	11.1%	11.1%	22.2%	55.6%
Region 11	191	1.0%	31.9%	43.5%	19.9%	3.7%
All regions	***294***	***0.7%***	***24.8%***	***32.3%***	***26.5%***	***15.6%***

Table 11. How long are your PLC meetings?

Region	n	Less than 60 minutes	Between 60 and 90 minutes	More than 90 minutes
Region 1 & 2	15	80.0%	0.0%	20.0%
Region 3	13	7.7%	7.7%	84.6%
Region 4	4	50.0%	25.0%	25.0%
Region 5	8	12.5%	25.0%	62.5%
Region 6 & 8	16	62.5%	31.3%	6.3%
Region 7	22	50.0%	45.5%	4.5%
Region 9	16	50.0%	43.8%	6.3%
Region 10	9	66.7%	11.1%	22.2%
Region 11	200	82.5%	13.0%	4.5%
All regions	***303***	***71.3%***	***17.5%***	***11.2%***

Table 12. Although fluctuations may exist, what is the average group size of your PLC meetings?

Region	n	1-5 people	6-10 people	11 or more people
Region 1 & 2	15	66.7%	13.3%	20.0%
Region 3	13	7.7%	53.8%	38.5%
Region 4	4	100.0%	0.0%	0.0%
Region 5	8	87.5%	12.5%	0.0%
Region 6 & 8	16	81.3%	18.8%	0.0%
Region 7	22	86.4%	9.1%	4.5%
Region 9	16	81.3%	18.8%	0.0%
Region 10	9	44.4%	44.4%	11.1%
Region 11	200	42.5%	49.5%	8.0%
All regions	***303***	***51.5%***	***39.9%***	***8.6%***

Table 13. How is the PLC organized?

Region	n	By grade level	By subject area	Other
Region 1 & 2	4	75.0%	25.0%	0.0%
Region 3	2	0.0%	100.0%	0.0%
Region 4	2	50.0%	50.0%	0.0%
Region 5	3	0.0%	100.0%	0.0%
Region 6 & 8	6	16.7%	83.3%	0.0%
Region 7	4	25.0%	75.0%	0.0%
Region 9	7	0.0%	100.0%	0.0%
Region 10	4	0.0%	100.0%	0.0%
Region 11	51	23.5%	72.5%	3.9%
All regions	***83***	***21.7%***	***75.9%***	***2.4%***

Table 14. What time of day are the PLC meetings normally held?

Region	n	Before the school day	During the school day	After the school day	It varies
Region 1 & 2	15	26.7%	40.0%	20.0%	13.3%
Region 3	13	7.7%	76.9%	0.0%	15.4%
Region 4	4	0.0%	50.0%	0.0%	50.0%
Region 5	8	0.0%	75.0%	12.5%	12.5%
Region 6 & 8	16	6.3%	12.5%	43.8%	37.5%
Region 7	22	9.1%	22.7%	50.0%	18.2%
Region 9	16	12.5%	0.0%	62.5%	25.0%
Region 10	9	11.1%	22.2%	55.6%	11.1%
Region 11	200	41.0%	23.5%	20.0%	15.5%
All regions	***303***	***30.7%***	***26.4%***	***25.4%***	***17.5%***

Table 15. Which goals are emphasized in the PLC (check all that apply)?

Region	n	Increase teacher content knowledge related to Algebra	Increase teacher knowledge about student learning and growth	Increase teacher use of multiple instructional technologies	Other
Region 1 & 2	22	27.3%	45.5%	50.0%	0.0%
Region 3	13	84.6%	84.6%	84.6%	0.0%
Region 4	9	33.3%	33.3%	22.2%	0.0%
Region 5	16	6.3%	43.8%	18.8%	0.0%
Region 6 & 8	24	33.3%	37.5%	41.7%	0.0%
Region 7	33	45.5%	54.5%	51.5%	0.0%
Region 9	22	27.3%	45.5%	45.5%	0.0%
Region 10	12	33.3%	58.3%	41.7%	0.0%
Region 11	246	47.6%	67.1%	57.7%	0.0%
All regions	***397***	***43.1%***	***60.5%***	***53.1%***	***0.0%***

Table 16. Indicate your professional growth as a result of your involvement in the MSTA PLC: *Content knowledge related to Algebra*.

Region	n	No growth	Very little growth	Some growth	Significant growth
Region 1 & 2	15	6.7%	20.0%	60.0%	13.3%
Region 3	13	7.7%	15.4%	53.8%	23.1%
Region 4	4	0.0%	0.0%	50.0%	50.0%
Region 5	8	25.0%	0.0%	50.0%	25.0%
Region 6 & 8	16	12.5%	31.3%	50.0%	6.3%
Region 7	22	4.5%	13.6%	72.7%	9.1%
Region 9	16	6.3%	37.5%	50.0%	6.3%
Region 10	9	11.1%	11.1%	55.6%	22.2%
Region 11	200	7.0%	20.5%	63.0%	9.5%
All regions	***303***	***7.6%***	***20.1%***	***61.1%***	***11.2%***

Table 17. Indicate your professional growth as a result of your involvement in the MSTA PLC: *Knowledge about student math learning and growth*.

Region	n	No growth	Very little growth	Some growth	Significant growth
Region 1 & 2	15	0.0%	13.3%	73.3%	13.3%
Region 3	13	7.7%	0.0%	69.2%	23.1%
Region 4	4	0.0%	0.0%	50.0%	50.0%
Region 5	8	0.0%	0.0%	100.0%	0.0%
Region 6 & 8	16	0.0%	18.8%	75.0%	6.3%
Region 7	22	0.0%	13.6%	59.1%	27.3%
Region 9	16	6.3%	12.5%	75.0%	6.3%
Region 10	9	0.0%	44.4%	55.6%	0.0%
Region 11	198	3.0%	13.6%	68.7%	14.6%
All regions	***301***	***2.7%***	***13.6%***	***69.1%***	***14.6%***

Table 18. Indicate your professional growth as a result of your involvement in the MSTA PLC: *Use of multiple instructional strategies*.

Region	n	No growth	Very little growth	Some growth	Significant growth
Region 1 & 2	15	6.7%	13.3%	60.0%	20.0%
Region 3	13	7.7%	0.0%	76.9%	15.4%
Region 4	4	0.0%	25.0%	25.0%	50.0%
Region 5	8	0.0%	12.5%	87.5%	0.0%
Region 6 & 8	16	0.0%	18.8%	81.3%	0.0%
Region 7	22	4.5%	18.2%	50.0%	27.3%
Region 9	16	6.3%	12.5%	68.8%	12.5%
Region 10	9	0.0%	22.2%	77.8%	0.0%
Region 11	199	4.0%	17.6%	60.8%	17.6%
All regions	***302***	***4.0%***	***16.6%***	***62.9%***	***16.6%***

Table 19. Indicate your professional growth as a result of your involvement in the MSTA PLC: *Understanding of the Minnesota Academic Standards for Mathematics*.

Region	n	No growth	Very little growth	Some growth	Significant growth
Region 1 & 2	15	6.7%	13.3%	46.7%	33.3%
Region 3	13	15.4%	0.0%	38.5%	46.2%
Region 4	4	0.0%	0.0%	50.0%	50.0%
Region 5	7	14.3%	0.0%	85.7%	0.0%
Region 6 & 8	16	0.0%	25.0%	68.8%	6.3%
Region 7	22	4.5%	31.8%	59.1%	4.5%
Region 9	16	12.5%	25.0%	56.3%	6.3%
Region 10	9	0.0%	11.1%	55.6%	33.3%
Region 11	199	6.0%	32.7%	51.8%	9.5%
All regions	***301***	***6.3%***	***27.6%***	***53.5%***	***12.6%***

Table 20. Please rate your sense of how your PLC is functioning on each of the following elements: *Sense of community and teamwork among members*.

Region	n	Poor	Fair	Good	Very Good	Excellent
Region 1 & 2	15	6.7%	13.3%	33.3%	46.7%	0.0%
Region 3	13	0.0%	7.7%	30.8%	46.2%	15.4%
Region 4	4	0.0%	25.0%	0.0%	75.0%	0.0%
Region 5	8	0.0%	0.0%	37.5%	50.0%	12.5%
Region 6 & 8	16	0.0%	12.5%	25.0%	43.8%	18.8%
Region 7	22	4.5%	13.6%	18.2%	27.3%	36.4%
Region 9	16	6.3%	6.3%	25.0%	56.3%	6.3%
Region 10	9	11.1%	0.0%	55.6%	22.2%	11.1%
Region 11	200	2.0%	9.5%	31.0%	32.5%	25.0%
All regions	***303***	***2.6%***	***9.6%***	***30.0%***	***36.0%***	***21.8%***

Table 21. Please rate your sense of how your PLC is functioning on each of the following elements: *Shared responsibilities among team members*.

Region	n	Poor	Fair	Good	Very Good	Excellent
Region 1 & 2	15	6.7%	20.0%	26.7%	40.0%	6.7%
Region 3	13	7.7%	0.0%	53.8%	23.1%	15.4%
Region 4	4	0.0%	25.0%	0.0%	75.0%	0.0%
Region 5	8	0.0%	12.5%	37.5%	25.0%	25.0%
Region 6 & 8	16	6.3%	18.8%	31.3%	25.0%	18.8%
Region 7	22	9.1%	9.1%	18.2%	36.4%	27.3%
Region 9	16	6.3%	12.5%	31.3%	43.8%	6.3%
Region 10	9	11.1%	33.3%	33.3%	22.2%	0.0%
Region 11	199	5.0%	13.6%	37.2%	32.2%	12.1%
All regions	***302***	***5.6%***	***13.9%***	***34.8%***	***32.8%***	***12.9%***

Table 22. Please rate your sense of how your PLC is functioning on each of the following elements: *Sense of shared norms and values*.

Region	n	Poor	Fair	Good	Very Good	Excellent
Region 1 & 2	15	6.7%	20.0%	33.3%	40.0%	0.0%
Region 3	13	0.0%	7.7%	38.5%	38.5%	15.4%
Region 4	4	0.0%	25.0%	0.0%	75.0%	0.0%
Region 5	8	0.0%	25.0%	25.0%	37.5%	12.5%
Region 6 & 8	16	0.0%	18.8%	18.8%	43.8%	18.8%
Region 7	22	0.0%	9.1%	27.3%	36.4%	27.3%
Region 9	16	6.3%	6.3%	37.5%	50.0%	0.0%
Region 10	9	11.1%	11.1%	33.3%	33.3%	11.1%
Region 11	199	3.5%	9.0%	35.2%	35.7%	16.6%
All regions	***302***	***3.3%***	***10.6%***	***33.1%***	***37.7%***	***15.2%***

Table 23. Please rate your sense of how your PLC is functioning on each of the following elements: *Climate of trust and respect*.

Region	n	Poor	Fair	Good	Very Good	Excellent
Region 1 & 2	15	13.3%	13.3%	20.0%	40.0%	13.3%
Region 3	13	0.0%	7.7%	7.7%	53.8%	30.8%
Region 4	4	0.0%	25.0%	0.0%	75.0%	0.0%
Region 5	7	0.0%	14.3%	0.0%	71.4%	14.3%
Region 6 & 8	16	0.0%	6.3%	25.0%	50.0%	18.8%
Region 7	22	0.0%	9.1%	27.3%	22.7%	40.9%
Region 9	16	6.3%	12.5%	25.0%	43.8%	12.5%
Region 10	9	11.1%	0.0%	33.3%	55.6%	0.0%
Region 11	199	0.5%	7.5%	25.1%	42.2%	24.6%
All regions	***301***	***1.7%***	***8.3%***	***23.6%***	***43.2%***	***23.3%***

Table 24. Please rate your sense of how your PLC is functioning on each of the following elements: *Connections to individually defined goals*.

Region	n	Poor	Fair	Good	Very Good	Excellent
Region 1 & 2	15	0.0%	14.3%	40.0%	46.7%	0.0%
Region 3	13	0.0%	0.0%	46.2%	38.5%	15.4%
Region 4	4	0.0%	25.0%	0.0%	75.0%	0.0%
Region 5	8	0.0%	12.5%	50.0%	37.5%	0.0%
Region 6 & 8	16	0.0%	12.5%	56.3%	18.8%	12.5%
Region 7	22	0.0%	13.6%	36.4%	27.3%	22.7%
Region 9	16	12.5%	0.0%	56.3%	25.0%	6.3%
Region 10	9	0.0%	44.4%	33.3%	22.2%	0.0%
Region 11	198	1.5%	16.7%	40.4%	30.3%	11.1%
All regions	***301***	***1.7%***	***15.3%***	***41.5%***	***30.9%***	***10.6%***

Table 25. Please rate your sense of how your PLC is functioning on each of the following elements: *Commitment to group-defined goals*.

Region	n	Poor	Fair	Good	Very Good	Excellent
Region 1 & 2	15	6.7%	20.0%	33.3%	40.0%	0.0%
Region 3	13	0.0%	0.0%	46.2%	38.5%	15.4%
Region 4	4	0.0%	25.0%	0.0%	75.0%	0.0%
Region 5	8	0.0%	12.5%	37.5%	50.0%	0.0%
Region 6 & 8	16	6.3%	0.0%	37.5%	43.8%	12.5%
Region 7	22	0.0%	4.5%	31.8%	36.4%	27.3%
Region 9	16	6.3%	12.5%	43.8%	37.5%	0.0%
Region 10	9	11.1%	11.1%	66.7%	0.0%	11.1%
Region 11	199	2.5%	13.1%	36.2%	36.2%	12.1%
All regions	***302***	***3.0%***	***11.6%***	***37.1%***	***36.8%***	***11.6%***

Table 26. Please rate your sense of how your PLC is functioning on each of the following elements: *Using student data to make instructional decisions*.

Region	n	Poor	Fair	Good	Very Good	Excellent
Region 1 & 2	15	6.7%	13.3%	66.7%	13.3%	0.0%
Region 3	13	7.7%	23.1%	30.8%	23.1%	15.4%
Region 4	4	0.0%	25.0%	0.0%	75.0%	0.0%
Region 5	8	25.0%	12.5%	37.5%	12.5%	12.5%
Region 6 & 8	16	6.3%	6.3%	25.0%	50.0%	12.5%
Region 7	22	0.0%	13.6%	36.4%	31.8%	18.2%
Region 9	16	12.5%	6.3%	25.0%	43.8%	12.5%
Region 10	9	22.2%	11.1%	11.1%	55.6%	0.0%
Region 11	198	4.0%	16.7%	33.8%	33.3%	12.1%
All regions	***301***	***5.6%***	***15.3%***	***33.6%***	***33.9%***	***11.6%***

Table 27. Please rate the following characteristics regarding support for the PLC you are involved in. *The PLC is considered important by the wider school community*.

Region	n	Poor	Fair	Good	Very Good	Excellent
Region 1 & 2	15	20.0%	20.0%	33.3%	26.7%	0.0%
Region 3	13	15.4%	23.1%	46.2%	15.4%	0.0%
Region 4	4	0.0%	25.0%	25.0%	50.0%	0.0%
Region 5	8	12.5%	50.0%	25.0%	12.5%	0.0%
Region 6 & 8	16	31.3%	12.5%	37.5%	12.5%	6.3%
Region 7	22	13.6%	31.8%	36.4%	9.1%	9.1%
Region 9	16	6.3%	12.5%	50.0%	25.0%	6.3%
Region 10	9	22.2%	11.1%	33.3%	33.3%	0.0%
Region 11	200	10.0%	25.0%	36.0%	20.5%	8.5%
All regions	***303***	***12.2%***	***24.1%***	***36.6%***	***20.1%***	***6.9%***

Table 28. Please rate the following characteristics regarding support for the PLC you are involved in. *Extra time and effort spent on the PLC is recognized and/or rewarded*.

Region	n	Poor	Fair	Good	Very Good	Excellent
Region 1 & 2	15	33.3%	33.3%	6.7%	26.7%	0.0%
Region 3	13	30.8%	38.5%	23.1%	0.0%	7.7%
Region 4	4	0.0%	50.0%	25.0%	25.0%	0.0%
Region 5	8	37.5%	12.5%	37.5%	12.5%	0.0%
Region 6 & 8	16	50.0%	43.8%	0.0%	6.3%	0.0%
Region 7	22	9.1%	50.0%	4.5%	22.7%	13.6%
Region 9	16	18.8%	18.8%	43.8%	18.8%	0.0%
Region 10	9	22.2%	66.7%	11.1%	0.0%	0.0%
Region 11	200	23.5%	32.5%	27.5%	11.5%	5.0%
All regions	***303***	***24.4%***	***34.7%***	***23.8%***	***12.5%***	***4.6%***

Table 29. Please rate the following characteristics regarding support for the PLC you are involved in. *Support in the form of sufficient, quality, convenient time for meeting is provided*.

Region	n	Poor	Fair	Good	Very Good	Excellent
Region 1 & 2	15	20.0%	13.3%	20.0%	40.0%	6.7%
Region 3	13	0.0%	23.1%	38.5%	23.1%	15.4%
Region 4	4	0.0%	25.0%	50.0%	25.0%	0.0%
Region 5	7	0.0%	14.3%	28.6%	57.1%	0.0%
Region 6 & 8	16	43.8%	18.8%	6.3%	25.0%	6.3%
Region 7	22	13.6%	27.3%	36.4%	13.6%	9.1%
Region 9	16	12.5%	18.8%	50.0%	18.8%	0.0%
Region 10	9	44.4%	22.2%	22.2%	0.0%	11.1%
Region 11	199	17.6%	18.1%	33.2%	21.1%	10.1%
All regions	***301***	***17.9%***	***18.9%***	***32.2%***	***21.9%***	***9.0%***

Table 30. Please rate the following characteristics regarding support for the PLC you are involved in. *School administrators are actively involved in/support the PLC.*

Region	n	Poor	Fair	Good	Very Good	Excellent
Region 1 & 2	15	26.7%	13.3%	13.3%	33.3%	13.3%
Region 3	13	15.4%	30.8%	38.5%	7.7%	7.7%
Region 4	4	0.0%	25.0%	25.0%	50.0%	0.0%
Region 5	8	0.0%	37.5%	0.0%	37.5%	25.0%
Region 6 & 8	16	25.0%	43.8%	12.5%	6.3%	12.5%
Region 7	21	9.5%	42.9%	28.6%	14.3%	4.8%
Region 9	16	12.5%	12.5%	43.8%	31.3%	0.0%
Region 10	9	0.0%	22.2%	33.3%	33.3%	11.1%
Region 11	199	13.1%	23.6%	32.2%	19.6%	11.6%
All regions	***301***	**13.3%**	***25.6%***	***29.9%***	***20.6%***	***10.6%***

Table 31. Please rate the following characteristics regarding support for the PLC you are involved in. *The school district supports PLCs in my school*.

Region	n	Poor	Fair	Good	Very Good	Excellent
Region 1 & 2	15	6.7%	26.7%	20.0%	46.7%	0.0%
Region 3	13	7.7%	23.1%	30.8%	23.1%	15.4%
Region 4	4	0.0%	25.0%	0.0%	75.0%	0.0%
Region 5	8	0.0%	12.5%	12.5%	62.5$	12.5%
Region 6 & 8	15	13.3%	46.7%	20.0%	6.7%	13.3%
Region 7	22	4.5%	13.6%	63.6%	4.5%	13.6%
Region 9	15	6.7%	0.0%	46.7%	40.0%	6.7%
Region 10	9	0.0%	11.1%	22.2%	55.6%	11.1%
Region 11	200	6.5%	16.5%	37.0%	24.0%	16.0%
All regions	***301***	***6.3%***	***17.6%***	***35.9%***	***26.2%***	***14.0%***

Table 32. How frequently do you use the following teaching practices as a result of your participation in the Mathematics and Science Teacher Academy? *Reflect on my teaching practices*

Region	n	Never	Rarely	Sometimes	Often
Region 1 & 2	15	0.0%	6.7%	40.0%	53.3%
Region 3	12	0.0%	0.0%	41.7%	58.3%
Region 4	4	0.0%	0.0%	25.0%	75.0%
Region 5	8	0.0%	0.0%	75.0%	25.0%
Region 6 & 8	16	0.0%	18.8%	31.3%	50.0%
Region 7	21	0.0%	9.5%	42.9%	47.6%
Region 9	16	6.3%	0.0%	37.5%	56.3%
Region 10	9	0.0%	11.1%	44.4%	44.4%
Region 11	197	2.5%	5.6%	44.7%	47.2%
All regions	***298***	***2.0%***	***6.0%***	***43.6%***	***48.3%***

Table 33. How frequently do you use the following teaching practices as a result of your participation in the Mathematics and Science Teacher Academy? *Design lessons with belief that all students can achieve high academic standards*

Region	n	Never	Rarely	Sometimes	Often
Region 1 & 2	15	0.0%	0.0%	26.7%	73.3%
Region 3	12	0.0%	0.0%	33.3%	66.7%
Region 4	4	0.0%	0.0%	50.0%	50.0%
Region 5	8	0.0%	12.5%	50.0%	37.5%
Region 6 & 8	16	0.0%	12.5%	31.3%	56.3%
Region 7	21	0.0%	4.8%	42.9%	52.4%
Region 9	16	6.3%	6.3%	56.3%	31.3%
Region 10	9	0.0%	11.1%	33.3%	55.6%
Region 11	197	4.1%	4.1%	36.5%	55.3%
All regions	***298***	***3.0%***	***4.7%***	***37.6%***	***54.7%***

Table 34. How frequently do you use the following teaching practices as a result of your participation in the Mathematics and Science Teaching Academy? *Encourage students to be active, participatory learners*

Region	n	Never	Rarely	Sometimes	Often
Region 1 & 2	15	0.0%	0.0%	20.0%	80.0%
Region 3	12	0.0%	0.0%	33.3%	66.7%
Region 4	4	0.0%	0.0%	25.0%	75.0%
Region 5	8	0.0%	0.0%	37.5%	62.5%
Region 6 & 8	16	0.0%	6.3%	18.8%	75.0%
Region 7	21	0.0%	9.5%	23.8%	66.7%
Region 9	16	6.3%	0.0%	31.3%	62.5%
Region 10	9	0.0%	0.0%	22.2%	77.8%
Region 11	196	3.6%	2.6%	25.5%	68.4%
All regions	***297***	***2.7%***	***2.7%***	***25.6%***	***69.0%***

Table 35. How frequently do you use the following teaching practices as a result of your participation in the Mathematics and Science Teacher Academy? *Offer differentiated learning experiences*

Region	n	Never	Rarely	Sometimes	Often
Region 1 & 2	15	0.0%	6.7%	53.3%	40.0%
Region 3	12	0.0%	0.0%	75.0%	25.0%
Region 4	4	0.0%	0.0%	75.0%	25.0%
Region 5	8	0.0%	12.5%	87.5%	0.0%
Region 6 & 8	16	6.3%	12.5%	56.3%	25.0%
Region 7	21	4.8%	4.8%	71.4%	19.0%
Region 9	16	6.3%	18.8%	62.5%	12.5%
Region 10	9	0.0%	22.2%	55.6%	22.2%
Region 11	197	4.1%	9.6%	62.9%	23.4%
All regions	***298***	***3.7%***	***9.7%***	***63.8%***	***22.8%***

Table 36. How frequently do you use the following teaching practices as a result of your participation in the Mathematics and Science Teaching Academy? *Use various means to assess student knowledge*

Region	n	Never	Rarely	Sometimes	Often
Region 1 & 2	15	0.0%	0.0%	60.0%	40.0%
Region 3	12	0.0%	8.3%	41.7%	50.0%
Region 4	4	0.0%	0.0%	50.0%	50.0%
Region 5	8	0.0%	25.0%	50.0%	25.0%
Region 6 & 8	16	0.0%	18.8%	43.8%	37.5%
Region 7	21	0.0%	19.0%	57.1%	23.8%
Region 9	16	6.3%	6.3%	75.0%	12.5%
Region 10	8	0.0%	12.5%	37.5%	50.0%
Region 11	196	3.6%	8.2%	55.1%	33.2%
All regions	***296***	***2.7%***	***9.5%***	***54.7%***	***33.1%***

Table 37. How frequently do you use the following teaching practices as a result of your participation in the Mathematics and Science Teaching Academy? *Communicate with colleagues about student learning*

Region	n	Never	Rarely	Sometimes	Often
Region 1 & 2	15	0.0%	6.7%	46.7%	46.7%
Region 3	12	0.0%	0.0%	66.7%	33.3%
Region 4	4	0.0%	25.0%	50.0%	25.0%
Region 5	8	0.0%	12.5%	50.0%	37.5%
Region 6 & 8	16	0.0%	6.3%	43.8%	50.0%
Region 7	21	0.0%	14.3%	38.1%	47.6%
Region 9	16	6.3%	6.3%	50.0%	37.5%
Region 10	9	0.0%	0.0%	77.8%	22.2%
Region 11	198	2.5%	4.5%	36.4%	56.6%
All regions	***299***	***2.0%***	***5.7%***	***41.1%***	***51.2%***

Table 38. What communication tools are used within your PLC (check all that apply)?

Region	n	List-serv	Email	Website	Print materials	Instant messenger	Other
Region 1 & 2	22	0.0%	59.1%	13.6%	31.8%	0.0%	0.0%
Region 3	13	7.7%	100.0%	76.9%	46.2%	0.0%	0.0%
Region 4	9	0.0%	33.3%	33.3%	22.2%	11.1%	0.0%
Region 5	16	0.0%	43.8%	0.0%	37.5%	0.0%	0.0%
Region 6 & 8	24	0.0%	58.3%	25.0%	37.5%	0.0%	0.0%
Region 7	33	6.1%	60.6%	42.4%	18.2%	0.0%	0.0%
Region 9	22	0.0%	72.7%	9.1%	18.2%	0.0%	0.0%
Region 10	12	0.0%	66.7%	0.0%	8.3%	0.0%	0.0%
Region 11	246	4.1%	79.3%	4.9%	47.6%	0.8%	0.0%
All regions	***397***	***3.3%***	***72.8%***	***12.6%***	***39.8%***	***0.8%***	0.0%

Table 39. Which of the following tools or resources do you access to better inform yourself or prepare for your PLC meetings (check all that apply)?

Region	n	Professional journals and books	Professional organization websites	Other PD opportunities	Current research	Other
Region 1 & 2	22	31.8%	22.7%	54.5%	18.2%	0.0%
Region 3	13	46.2%	53.8%	53.8%	23.1%	0.0%
Region 4	9	11.1%	0.0%	33.3%	22.2%	0.0%
Region 5	16	12.5%	6.3%	18.8%	25.0%	0.0%
Region 6 & 8	24	20.8%	29.2%	41.7%	12.5%	0.0%
Region 7	33	36.4%	27.3%	30.3%	21.2%	0.0%
Region 9	22	31.8%	40.9%	36.4%	22.7%	0.0%
Region 10	12	41.7%	41.7%	41.7%	25.0%	0.0%
Region 11	246	25.2%	23.2%	39.8%	24.0%	0.4%
All regions	***397***	***27.0%***	***25.2%***	***39.3%***	***22.7%***	***0.3%***

Table 40. Did you receive formal training on PLCs from your regional Teacher Center?

Region	n	Yes	No
Region 1 & 2	15	66.7%	33.3%
Region 3	13	23.1%	76.9%
Region 4	4	25.0%	75.0%
Region 5	8	62.5%	37.5%
Region 6 & 8	16	43.8%	56.3%
Region 7	22	50.0%	50.0%
Region 9	15	80.0%	20.0%
Region 10	9	55.6%	44.4%
Region 11	198	40.4%	59.6%
All regions	***300***	***44.7%***	***55.3%***

Table 41. To what degree does data-driven decision making influence your day-to-day work functions?

Region	n	No influence	Slight influence	Moderate influence	Very great influence
Region 1 & 2	22	0.0%	22.7%	50.0%	27.3%
Region 3	13	0.0%	15.4%	69.2%	15.4%
Region 4	9	0.0%	11.1%	66.7%	22.2%
Region 5	16	0.0%	31.3%	62.5%	6.3%
Region 6 & 8	24	4.2%	20.8%	54.2%	20.8%
Region 7	32	3.1%	34.4%	37.5%	25.0%
Region 9	22	0.0%	27.3%	40.9%	31.8%
Region 10	12	0.0%	16.7%	50.0%	33.3%
Region 11	246	2.0%	24.8%	54.1%	19.1%
All regions	***396***	***1.8%***	***24.7%***	***52.8%***	***20.7%***

Table 42. To what extent is each of the following student performance measures emphasized in your school to guide decision making? *State assessment scores*.

Region	n	Not at all	Somewhat	Strongly
Region 1 & 2	22	0.0%	31.8%	68.2%
Region 3	13	0.0%	23.1%	76.9%
Region 4	9	0.0%	22.2%	77.8%
Region 5	16	0.0%	43.8%	56.3%
Region 6 & 8	24	0.0%	12.5%	87.5%
Region 7	33	0.0%	21.2%	78.8%
Region 9	22	0.0%	31.8%	68.2%
Region 10	12	0.0%	16.7%	83.3%
Region 11	243	0.8%	24.7%	74.5%
All regions	***394***	***0.5%***	***24.9%***	***74.6%***

Table 43. To what extent are each of the following student performance measures emphasized in your school to guide decision making? *Formative assessment*.

Region	n	Not at all	Somewhat	Strongly
Region 1 & 2	22	0.0%	86.4%	13.6%
Region 3	13	7.7%	76.9%	15.4%
Region 4	9	0.0%	66.7%	33.3%
Region 5	15	0.0%	66.7%	33.3%
Region 6 & 8	24	0.0%	50.0%	50.0%
Region 7	33	0.0%	63.6%	36.4%
Region 9	22	4.5%	54.5%	40.9%
Region 10	12	8.3%	50.0%	41.7%
Region 11	245	1.6%	40.4%	58.0%
All regions	***395***	***1.8%***	***49.4%***	***48.9%***

Table 44. To what extent is each of the following student performance measures emphasized in your school to guide decision making? *Meeting AYP*.

Region	n	Not at all	Somewhat	Strongly
Region 1 & 2	22	4.5%	18.2%	77.3%
Region 3	13	7.7%	23.1%	69.2%
Region 4	9	0.0%	33.3%	66.7%
Region 5	16	6.3%	25.0%	68.8%
Region 6 & 8	24	8.3%	4.2%	87.5%
Region 7	33	6.1%	9.1%	84.8%
Region 9	22	0.0%	22.7%	77.3%
Region 10	12	0.0%	8.3%	91.7%
Region 11	243	2.5%	27.2%	70.4%
All regions	***394***	***3.3%***	***22.8%***	***73.9%***

Table 45. To what extent is each of the following student performance measures emphasized in your school to guide decision making? *Local assessments*.

Region	n	Not at all	Somewhat	Strongly
Region 1 & 2	22	4.5%	36.4%	59.1%
Region 3	13	0.0%	61.5%	38.5%
Region 4	9	0.0%	55.6%	44.4%
Region 5	16	6.3%	62.5%	31.3%
Region 6 & 8	24	4.2%	50.0%	45.8%
Region 7	33	3.0%	60.6%	36.4%
Region 9	22	0.0%	54.5%	45.5%
Region 10	12	0.0%	66.7%	33.3%
Region 11	245	1.6%	46.5%	51.8%
All regions	***396***	***2.0%***	***49.7%***	***48.2%***

Table 46. To what extent is each of the following student performance measures emphasized in your school to guide decision making? *Assessments provided in the teachers' guide and workbooks.*

Region	n	Not at all	Somewhat	Strongly
Region 1 & 2	22	13.6%	68.2%	18.2%
Region 3	13	23.1%	69.2%	7.7%
Region 4	9	0.0%	66.7%	33.3%
Region 5	16	6.3%	68.8%	25.0%
Region 6 & 8	24	4.2%	70.8%	25.0%
Region 7	33	12.1%	69.7%	18.2%
Region 9	21	4.8%	76.2%	19.0%
Region 10	12	8.3%	58.3%	33.3%
Region 11	243	15.6%	61.7%	22.6%
All regions	***393***	***13.2%***	***64.6%***	***22.1%***

Table 47. To what extent is each of the following student performance measures emphasized in your school to guide decision making? *Standardized national math tests*.

Region	n	Not at all	Somewhat	Strongly
Region 1 & 2	22	13.6%	59.1%	27.3%
Region 3	13	15.4%	46.2%	38.5%
Region 4	9	11.1%	66.7%	22.2%
Region 5	16	18.8%	56.3%	25.0%
Region 6 & 8	23	4.3%	52.2%	43.5%
Region 7	33	9.1%	45.5%	45.5%
Region 9	22	22.7%	54.5%	22.7%
Region 10	12	8.3%	50.0%	41.7%
Region 11	245	11.0%	48.2%	40.8%
All regions	***395***	***11.6%***	***49.9%***	***38.5%***

Table 48. How often do you access student assessment scores of any kind to do the following*? Identify individual students' performance*.

Region	n	Daily	Weekly	Monthly	Quarterly	Annually	Other
Region 1 & 2	22	13.6%	50.0%	27.3%	4.5%	4.5%	0.0%
Region 3	13	23.1%	46.2%	15.4%	7.7%	7.7%	0.0%
Region 4	9	11.1%	55.6%	11.1%	22.2%	0.0%	0.0%
Region 5	16	12.5%	56.3%	18.8%	6.3%	6.3%	0.0%
Region 6 & 8	24	8.3%	50.0%	12.5%	16.7%	12.5%	0.0%
Region 7	32	21.9%	25.0%	31.3%	12.5%	9.4%	0.0%
Region 9	22	18.2%	50.0%	9.1%	13.6%	9.1%	0.0%
Region 10	12	8.3%	50.0%	8.3%	16.7%	16.7%	0.0%
Region 11	245	14.3%	36.7%	20.4%	20.0%	8.6%	0.0%
All regions	***395***	***14.7%***	***40.0%***	***19.7%***	***17.0%***	***8.6%***	0.0%

Table 49. How often do you access student assessment scores of any kind to do the following? *Compare individual students' performance with that of a larger group*.

Region	n	Daily	Weekly	Monthly	Quarterly	Annually	Never
Region 1 & 2	22	0.0%	54.5%	22.7%	4.5%	18.2%	0.0%
Region 3	13	0.0%	53.8%	7.7%	15.4%	7.7%	15.4%
Region 4	9	0.0%	33.3%	22.2%	44.4%	0.0%	0.0%
Region 5	16	12.5%	37.5%	18.8%	6.3%	25.0%	0.0%
Region 6 & 8	24	8.3%	20.8%	33.3%	20.8%	12.5%	4.2%
Region 7	33	12.1%	24.2%	30.3%	24.2%	9.1%	0.0%
Region 9	22	9.1%	27.3%	27.3%	31.8%	4.5%	0.0%
Region 10	12	8.3%	16.7%	16.7%	25.0%	25.0%	8.3%
Region 11	244	5.3%	27.5%	27.9%	24.6%	12.7%	2.0%
All regions	***395***	***6.1%***	***29.4%***	***26.6%***	***23.0%***	***12.7%***	***2.3%***

Table 50. How often do you access student assessment scores of any kind to do the following? *Perform item analysis*.

Region	n	Daily	Weekly	Monthly	Quarterly	Annually	Never
Region 1 & 2	22	9.1%	9.1%	22.7%	45.5%	13.6%	0.0%
Region 3	13	0.0%	46.2%	15.4%	0.0%	15.4%	23.1%
Region 4	9	0.0%	33.3%	11.1%	33.3%	22.2%	0.0%
Region 5	16	0.0%	12.5%	43.8%	18.8%	6.3%	18.8%
Region 6 & 8	24	4.2%	20.8%	25.0%	12.5%	25.0%	12.5%
Region 7	33	3.0%	12.1%	48.5%	18.2%	15.2%	3.0%
Region 9	22	4.5%	18.2%	31.8%	18.2%	27.3%	0.0%
Region 10	12	8.3%	0.0%	25.0%	16.7%	33.3%	16.7%
Region 11	243	2.5%	14.0%	26.3%	28.0%	20.2%	9.1%
All regions	***394***	***3.0%***	***15.2%***	***28.2%***	***25.1%***	***19.8%***	***8.6%***

Table 51. How often do you access student assessment scores of any kind to do the following? *Differentiate instruction*.

Region	n	Daily	Weekly	Monthly	Quarterly	Annually	Never
Region 1 & 2	22	13.6%	50.0%	18.2%	9.1%	0.0%	9.1%
Region 3	13	23.1%	46.2%	7.7%	0.0%	15.4%	7.7%
Region 4	9	22.2%	44.4%	11.1%	22.2%	0.0%	0.0%
Region 5	16	31.3%	31.3%	12.5%	6.3%	12.5%	6.3%
Region 6 & 8	24	12.5%	41.7%	16.7%	16.7%	0.0%	12.5%
Region 7	32	28.1%	31.3%	21.9%	12.5%	6.3%	0.0%
Region 9	22	4.5%	40.9%	27.3%	13.6%	13.6%	0.0%
Region 10	12	16.7%	50.0%	8.3%	16.7%	0.0%	8.3%
Region 11	242	26.0%	26.9%	22.7%	14.0%	6.2%	4.1%
All regions	***392***	***23.2%***	***32.1%***	***20.7%***	***13.3%***	***6.1%***	***4.6%***

Table 52. How often do you access student assessment scores of any kind to do the following? *Assess your own professional development needs*.

Region	n	Daily	Weekly	Monthly	Quarterly	Annually	Never
Region 1 & 2	22	4.5%	18.2%	27.3%	31.8%	13.6%	4.5%
Region 3	13	15.4%	15.4%	38.5%	0.0%	23.1%	7.7%
Region 4	9	0.0%	11.1%	33.3%	11.1%	44.4%	0.0%
Region 5	16	6.3%	31.3%	25.0%	25.0%	12.5%	0.0%
Region 6 & 8	24	8.3%	12.5%	25.0%	20.8%	29.2%	4.2%
Region 7	32	6.3%	21.9%	37.5%	15.6%	18.8%	0.0%
Region 9	22	22.7%	13.6%	31.8%	18.2%	13.6%	0.0%
Region 10	12	8.3%	16.7%	33.3%	16.7%	25.0%	0.0%
Region 11	244	9.8%	16.0%	24.2%	25.4%	19.3%	5.3%
All regions	***394***	***9.6%***	***16.8%***	***26.9%***	***22.8%***	***19.8%***	***4.1%***

Table 53. How often do you access student assessment scores of any kind to do the following? *Discuss data with colleagues*.

Region	n	Daily	Weekly	Monthly	Quarterly	Annually	Never
Region 1 & 2	22	4.5%	40.9%	18.2%	27.3%	9.1%	0.0%
Region 3	13	15.4%	23.1%	15.4%	38.5%	7.7%	0.0%
Region 4	9	22.2%	11.1%	11.1%	22.2%	22.2%	11.1%
Region 5	16	12.5%	37.5%	25.0%	18.8%	6.3%	0.0%
Region 6 & 8	24	4.2%	29.2%	33.3%	25.0%	4.2%	4.2%
Region 7	33	12.1%	27.3%	30.3%	27.3%	3.0%	0.0%
Region 9	22	4.5%	27.3%	45.5%	22.7%	0.0%	0.0%
Region 10	12	16.7%	33.3%	16.7%	16.7%	16.7%	0.0%
Region 11	244	11.1%	29.5%	34.8%	18.0%	5.7%	0.8%
All regions	***395***	***10.6%***	***29.6%***	***31.9%***	***20.8%***	***6.1%***	***1.0%***

Table 54. How comfortable are you with using student performance data systems?

Region	n	Not at all	A little	Moderately	Very comfortable
Region 1 & 2	22	0.0%	31.8%	54.5%	13.6%
Region 3	13	7.7%	15.4%	46.2%	30.8%
Region 4	9	0.0%	55.6%	33.3%	11.1%
Region 5	16	25.0%	37.5%	25.0%	12.5%
Region 6 & 8	24	4.2%	41.7%	29.2%	25.0%
Region 7	33	6.1%	36.4%	48.5%	9.1%
Region 9	22	4.5%	27.3%	45.5%	22.7%
Region 10	12	0.0%	25.0%	66.7%	8.3%
Region 11	244	7.0%	29.1%	45.9%	18.0%
All regions	***395***	***6.6%***	***30.9%***	***45.1%***	***17.5%***

Table 55. I have already had some professional development about interpreting and using student assessment data.

Region	n	Yes	No
Region 1 & 2	22	86.4%	13.6%
Region 3	13	84.6%	15.4%
Region 4	9	88.9%	11.1%
Region 5	15	80.0%	20.0%
Region 6 & 8	24	91.7%	8.3%
Region 7	33	84.8%	15.2%
Region 9	22	90.9%	9.1%
Region 10	12	83.3%	16.7%
Region 11	245	79.2%	20.8%
All regions	***395***	***82.0%***	***18.0%***

Table 56. I would like to attend professional development about interpreting and using student assessment data.

Region	n	Yes	No
Region 1 & 2	22	72.7%	27.3%
Region 3	13	76.9%	23.1%
Region 4	9	88.9%	11.1%
Region 5	14	42.9%	57.1%
Region 6 & 8	24	54.2%	45.8%
Region 7	32	40.6%	59.4%
Region 9	22	36.4%	63.6%
Region 10	12	33.3%	66.7%
Region 11	246	47.6%	52.4%
All regions	***394***	***49.5%***	***50.5%***

Table 57. Have you asked your regional Teacher Center for technical assistance related to your work for MSTA?

Region	n	Yes	No
Region 1 & 2	22	18.2%	81.8%
Region 3	13	15.4%	84.6%
Region 4	9	0.0%	100.0%
Region 5	16	6.3%	93.8%
Region 6 & 8	24	8.3%	91.7%
Region 7	33	15.2%	84.8%
Region 9	22	0.0%	100.0%
Region 10	12	8.3%	91.7%
Region 11	243	1.6%	98.4%
All regions	***394***	***4.8%***	***95.2%***

Table 58. What kind of technical assistance have you sought (check all that apply)? *Clarification of assignments or expectations for MSTA work*

Region	n	Percent
Region 1 & 2	22	9.1%
Region 3	13	7.7%
Region 4	9	0.0%
Region 5	16	6.3%
Region 6 & 8	24	4.2%
Region 7	33	12.1%
Region 9	22	0.0%
Region 10	12	0.0%
Region 11	246	1.6%
All regions	***397***	***3.3%***

Table 59. What kind of technical assistance have you sought (check all that apply)? *Support to implement PLCs*

Region	n	Percent
Region 1 & 2	22	9.1%
Region 3	13	0.0%
Region 4	9	0.0%
Region 5	16	0.0%
Region 6 & 8	24	4.2%
Region 7	33	3.0%
Region 9	22	0.0%
Region 10	12	0.0%
Region 11	246	0.8%
All regions	***397***	***1.5%***

Table 60. What kind of technical assistance have you sought (check all that apply)? *Assistance implementing new instructional strategies*

Region	n	Percent
Region 1 & 2	22	13.6%
Region 3	13	7.7%
Region 4	9	0.0%
Region 5	16	0.0%
Region 6 & 8	24	8.3%
Region 7	33	0.0%
Region 9	22	0.0%
Region 10	12	8.3%
Region 11	246	0.4%
All regions	***397***	***2.0%***

Table 61. What kind of technical assistance have you sought (check all that apply)? *On-site coaching*

Region	n	Percent
Region 1 & 2	22	13.6%
Region 3	13	7.7%
Region 4	9	0.0%
Region 5	16	0.0%
Region 6 & 8	24	8.3%
Region 7	33	0.0%
Region 9	22	0.0%
Region 10	12	0.0%
Region 11	246	0.0%
All regions	***397***	***1.5%***

Table 62. What kind of technical assistance have you sought (check all that apply)? *Providing support or a venue for conferencing*

Region	n	Percent
Region 1 & 2	22	4.5%
Region 3	13	0.0%
Region 4	9	0.0%
Region 5	16	0.0%
Region 6 & 8	24	0.0%
Region 7	33	0.0%
Region 9	22	0.0%
Region 10	12	0.0%
Region 11	246	0.0%
All regions	***397***	***0.3%***

Table 63. What kind of technical assistance have you sought (check all that apply)? *Analysis*

Region	n	Percent
Region 1 & 2	22	0.0%
Region 3	13	7.7%
Region 4	9	0.0%
Region 5	16	0.0%
Region 6 & 8	24	4.2%
Region 7	33	0.0%
Region 9	22	0.0%
Region 10	12	0.0%
Region 11	246	0.0%
All regions	***397***	***0.5%***

Table 64. What kind of technical assistance have you sought (check all that apply)? *Other*

Region	n	Percent
Region 1 & 2	22	0.0%
Region 3	13	7.7%
Region 4	9	0.0%
Region 5	16	0.0%
Region 6 & 8	24	0.0%
Region 7	33	3.0%
Region 9	22	0.0%
Region 10	12	0.0%
Region 11	246	0.4%
All regions	***397***	***0.8%***

Table 65. If other, please specify (n=3):

Response	Frequency	Percent
Requests for materials	1	33.3%
Assistance interpreting data	1	33.3%
Log-in help	1	33.3%

Table 66. On how many occasions have you requested MSTA assistance?

Region	n	1	2	3	4	5 or more
Region 1 & 2	4	0.0%	25.0%	50.0%	25.0%	0.0%
Region 3	2	0.0%	0.0%	100.0%	0.0%	0.0%
Region 5	1	100.0%	0.0%	0.0%	0.0%	0.0%
Region 6 & 8	2	0.0%	0.0%	0.0%	50.0%	50.0%
Region 7	5	0.0%	40.0%	20.0%	0.0%	40.0%
Region 10	1	100.0%	0.0%	0.0%	0.0%	0.0%
Region 11	6	66.7%	16.7%	0.0%	0.0%	16.7%
All regions	***21***	***28.6%***	***19.0%***	***23.8%***	***9.5%***	***19.0%***

Table 67. Per request, how much time on average was spent corresponding and receiving assistance?

Region	n	Less than 1 hour	1-3 hours	4-6 hours	7-9 hours	10 or more hours
Region 1 & 2	4	0.0%	75.0%	0.0%	25.0%	0.0%
Region 3	2	0.0%	100.0%	0.0%	0.0%	0.0%
Region 4	1	100.0%	0.0%	0.0%	0.0%	0.0%
Region 5	2	50.0%	50.0%	0.0%	0.0%	0.0%
Region 6 & 8	5	60.0%	40.0%	0.0%	0.0%	0.0%
Region 7	1	0.0%	0.0%	100.0%	0.0%	0.0%
Region 11	6	66.7%	16.7%	0.0%	0.0%	16.7%
All regions	***21***	***42.9%***	***42.9%***	***4.8%***	***4.8%***	***4.8%***

Table 68. Please describe the format of the assistance

Region	n	Onsite assistance	Remote assistance	It varied
Region 1 & 2	4	0.0%	0.0%	100.0%
Region 3	2	0.0%	50.0%	50.0%
Region 4	1	0.0%	0.0%	100.0%
Region 5	2	0.0%	0.0%	100.0%
Region 6 & 8	5	0.0%	40.0%	60.0%
Region 7	1	0.0%	0.0%	100.0%
Region 11	6	33.3%	66.7%	0.0%
All regions	***21***	***9.5%***	***33.3%***	***57.1%***

Table 69. Please describe the assistance received (n=17):

Response	Frequency	Percent
Questions concerning teaching or lesson plans were answered	9	52.9%
On-site visits or demonstrations	4	23.5%
Assistance was given obtaining materials	3	17.7%
Smartboard training	1	5.9%

Table 70. Please describe your satisfaction with the following components concerning the assistance you received: *Speed with which Teacher Center responded*.

Region	n	Very unsatisfied	Somewhat satisfied	Very satisfied
Region 1 & 2	4	25.0%	0.0%	75.0%
Region 3	2	0.0%	50.0%	50.0%
Region 4	1	0.0%	100.0%	0.0%
Region 5	2	0.0%	0.0%	100.0%
Region 6 & 8	5	0.0%	20.0%	80.0%
Region 7	1	100.0%	0.0%	0.0%
Region 11	6	16.7%	33.3%	50.0%
All regions	***21***	***14.3%***	***23.8%***	***61.9%***

Table 71. Please describe your satisfaction with the following components concerning the assistance you received: *Duration of assistance*.

Region	n	Very unsatisfied	Somewhat unsatisfied	Somewhat satisfied	Very satisfied
Region 1 & 2	4	25.0%	0.0%	25.0%	50.0%
Region 3	1	0.0%	0.0%	0.0%	100.0%
Region 4	1	0.0%	0.0%	100.0%	0.0%
Region 5	2	0.0%	0.0%	50.0%	50.0%
Region 6 & 8	5	0.0%	0.0%	40.0%	60.0%
Region 7	1	0.0%	100.0%	0.0%	0.0%
Region 11	5	20.0%	0.0%	40.0%	40.0%
All regions	***19***	***10.5%***	***5.3%***	***36.8%***	***47.4%***

Table 72. Please describe your satisfaction with the following components concerning the assistance you received: *Format of assistance*.

Region	n	Very unsatisfied	Somewhat unsatisfied	Somewhat satisfied	Very satisfied
Region 1 & 2	4	25.0%	0.0%	0.0%	75.0%
Region 3	2	0.0%	0.0%	50.0%	50.0%
Region 4	1	0.0%	0.0%	0.0%	100.0%
Region 5	2	0.0%	0.0%	50.0%	50.0%
Region 6 & 8	5	0.0%	0.0%	40.0%	60.0%
Region 7	1	0.0%	100.0%	0.0%	0.0%
Region 11	5	20.0%	0.0%	40.0%	40.0%
All regions	***20***	***10.0%***	***5.0%***	***30.0%***	***55.0%***

Table 73. Please describe your satisfaction with the following components concerning the assistance you received: *Clarity of assistance provided*.

Region	n	Very unsatisfied	Somewhat unsatisfied	Very satisfied
Region 1 & 2	4	25.0%	0.0%	75.0%
Region 3	2	0.0%	0.0%	50.0%
Region 4	1	0.0%	0.0%	0.0%
Region 5	2	0.0%	0.0%	50.0%
Region 6 & 8	5	0.0%	0.0%	60.0%
Region 7	1	0.0%	100.0%	0.0%
Region 11	5	20.0%	0.0%	40.0%
All regions	***20***	***10.0%***	***5.0%***	***50.0%***

Table 74. Please describe your satisfaction with the following components concerning the assistance you received: *Outcomes of assistance provided*.

Region	n	Very unsatisfied	Somewhat unsatisfied	Somewhat satisfied	Very satisfied
Region 1 & 2	4	25.0%	0.0%	0.0%	75.0%
Region 3	2	0.0%	0.0%	50.0%	50.0%
Region 4	1	0.0%	0.0%	100.0%	0.0%
Region 5	2	0.0%	0.0%	50.0%	50.0%
Region 6 & 8	5	0.0%	0.0%	20.0%	80.0%
Region 7	1	0.0%	100.0%	0.0%	0.0%
Region 11	5	40.0%	0.0%	20.0%	40.0%
All regions	***20***	***15.0%***	***5.0%***	***25.0%***	***55.0%***

Table 75. Please describe your satisfaction with the following components concerning the assistance you received: *Correspondence with Teacher Center*.

Region	n	Very unsatisfied	Somewhat unsatisfied	Somewhat satisfied	Very satisfied
Region 1& 2	4	25.0%	0.0%	0.0%	75.0%
Region 3	1	0.0%	0.0%	100.0%	0.0%
Region 4	1	0.0%	0.0%	100.0%	0.0%
Region 5	2	0.0%	0.0%	50.0%	50.0%
Region 6 & 8	5	0.0%	0.0%	20.0%	80.0%
Region 7	1	0.0%	100.0%	0.0%	0.0%
Region 11	5	20.0%	20.0%	20.0%	40.0%
All regions	***19***	***10.5%***	***10.5%***	***26.3%***	***52.6%***