Math Science Partnership (MSP) Program: Title II, Part B

FLOYD COUNTY: COLLABORATIVE SYMPOSIUM FOR MATH IMPROVEMENT IN FLOYD COUNTY SCHOOLS

ANNUAL EVALUATION REPORT: YEAR TWO

Report Prepared by: Tiffany Davis, M.A.

Center for Education Integrating Science, Mathematics and Computing (CEISMC) Evaluation Team, Georgia Institute of Technology

Key Findings

Retention: Although some teachers left the MASTERs program at the beginning of Year 2, 9 new participants were added, resulting in a 73% retention rate.

Professional Development: Teachers consistently ranked the MSP program's professional development offered as "very good".

Math Teacher Content Knowledge: Teachers in both the middle and high school math cohorts significantly increased their content knowledge between Years 1 and 2 of the program.

Student Achievement: 6^{th}, 7^{th}, and 8^{th} grade students from 15 of the 20 math classes outperformed their district on the CRCT.

Students in 18 of these same 20 classes performed better than all students in the state of Georgia.

8 of the 20 participating middle school math teachers had 100% of their students meet or exceed expectations on the CRCT.

EXECUTIVE SUMMARY

This evaluation report presents findings for the 2009 to 2011 Floyd County Public Schools MSP program. The goal of this evaluation is to determine the effectiveness of professional development for mathematics teachers. The purpose of this analysis is to identify whether there is any significant increase in teacher content knowledge or not, to assess teacher satisfaction with the professional development they received through the program, and to determine what impact the teacher's professional development had on student achievement. The detailed results of the evaluation can be found in the "Findings" section.

The following are some highlights of the report findings:

95% of all teachers surveyed strongly agreed or agreed that the 2009 to 2011 MSP program further developed their content knowledge.

For all areas tested, including Numbers and Operations, Algebra, Geometry, and High School Mathematics, the middle and high school teachers made significant gains during Years 1 and 2.

Several students of participating MSP teachers in the middle and high school math cohorts scored higher than the district and state averages on the CRCT.

Table of Contents

FIGURES

TABLES

APPENDICES

Introduction

This report provides an evaluation of the second year of implementation for the Collaborative Symposium for Math Improvement in Floyd County Schools. This program is a Math Science Partnership (MSP) Grant Program, based on a partnership between the Floyd County Board of Education and Shorter College. The evaluation team from CEISMC served as the external evaluator for the overall grant program. The partnerships help create quality and sustained professional development and support for 6-9 grade level mathematics teachers in Floyd County to effectively implement the GPS in mathematics. The ultimate goal of the program is to increase student achievement in grades 6-12. The program specifically targets the curriculum in Math I, Math II, Math III, and Math IV through comprehensive teacher development and classroom support.

The long-term goals of this program are:

- To provide 6-8 grade-level mathematics teachers in Floyd County with professional development and support to enable them to effectively implement the Georgia Performance Standards in mathematics.
- To prepare students in Floyd County for the mathematics curriculum for Math I, Math II, Math III, and Math IV through comprehensive teacher preparation and classroom support.

During Year 1, implementation of the grant focused on content refreshers, learning new pedagogical skills and implementing and integrating these skills effectively in the classroom at the point of instruction. Although the program is based on the cohort model,

not all participating teachers have attended or completed the same instructional sessions or activities. Participants have completed an average of 86 hours of instruction, but were allowed to select the sessions that are the most meaningful to their own personal development. Both middle school and high school teachers participated in the MSP program. This approach has allowed participants to 1) customize the training they receive for their individual needs and 2) focus on the topics and grade levels pertinent to their individual teaching assignment.

The Participants

Although the grant proposal projected serving 48 teachers, the initial enrollment at the beginning of implementation was 35 teachers. At the end of Year 1, 33 participants remained. Nine teachers joined during Year 2, resulting in a final total of 42. Some teachers discontinued their participation due to changes in teaching assignments and other professional commitments that interfered with their participation in the program. Therefore, Year 2 of the MSP program resulted in a 73% retention rate of existing cohort members.

Evaluation Methods

The evaluation plan utilizes a mixed-method design, which provides both formative and summative information. It emphasizes quantitative and qualitative data collection methods. The key evaluation question is: "*To what extent has the program improved teacher content knowledge and increased the number of students meeting and exceeding expectations on the CRCT and the EOCT in Math and Science?*" Several key points serve as the focus for this evaluation:

- Evidence that a consistent cohort of teachers is being retained in the program
- Evidence that quality professional development, materials, and support is being provided to cohort members
- Evidence of participants' satisfaction with the program
- Evidence of improved teacher content knowledge
- Evidence that the professional development is impacting classroom instruction through improved student achievement

In order to address these points, the following data sources were used, including:

Attendance Sign-in Sheets

The Floyd County grant administrator created and maintained sign-in sheets at each professional development session to track attendance throughout the grant's duration. Sign-in sheets were not only utilized to track attendance, but also to track stipends earned and perfect attendance bonuses. Completed sign-in sheets were provided to the evaluation team at the conclusion of each professional development session.

Demographic Data Information Forms

New participants to the program were asked to provide demographic data information, including their names, schools, and the grade levels they were teaching. Administrators collected information about the number of years of teaching experience each participant had, as well as the participants' levels of education, their job classifications (i.e. Special Education, Regular Education, Title I, ELL, AP/IB, non-

teaching coach, or paraprofessional), and an estimate of the number of students each teacher taught during the year. Teachers were given several opportunities to complete the demographic data forms and to verify that their information was correctly recorded. In spite of these efforts, data were not collected from all participating teachers.

Professional Development Feedback Forms

Similar to Year 1 of the grant, professional development feedback forms were given to participants at the conclusion of each training session in Year 2. Minimal changes were made to the feedback forms used in Year 2 (see Appendix A). Feedback forms were compiled and analyzed by the CEISMC evaluation team, and an evaluation report was provided to the program directors and instructors to serve as formative feedback through Year 2. Grant administrators and instructors utilized this feedback to make adjustments in the professional development to better meet the needs of the participants.

Teacher Pre & Post-tests

Each cohort was given a pre-test, a mid-point test, and a post-test based on content area and grade level, per instructions from the Georgia Department of Education. The test scores were used to measure changes in participants' mathematics content knowledge. Table 1 outlines the teacher assessments given to each cohort in the program. The Learning Mathematics for Teachers (LMT) project assessments were used as the pre-test, mid-point test, and post-test. There are currently no high school LMT assessments. As a result, the Georgia Department of Education commissioned the creation of an assessment developed specifically for use with the MSP grants in the State of Georgia.

Table 1. Cohort Teacher Assessments

Cohort	Pre, Mid-Point, & Post-Test
Middle School Mathematics	LMT Middle School Numbers & Operations LMT Middle School Geometry LMT Middle School Algebra Georgia DOE High School Mathematics Assessment
High School Mathematics	LMT Middle School Numbers & Operations LMT Middle School Geometry LMT Middle School Algebra Georgia DOE High School Mathematics Assessment

For the LMT and GA DOE tests, completed Scantron answer sheets were mailed to the GaDOE, and the results were analyzed and reported to the evaluator by email. All used test materials were properly destroyed and test results were maintained in a secure location.

Student Achievement Data (CRCT & EOCT data)

The grant administrator provided the evaluation team with student scores on the Criterion-Referenced Competency Test (CRCT) for the middle school mathematics teachers and End-of-Course (EOCT) Math I and Math II test scores for the high school teachers participating in the program.

Findings: Teacher Impact

Quality Professional Development

Participant satisfaction with the professional development received in the MSP was assessed in two ways: by ranking numerous items on a Likert Scale (from 1 "not at all" to 4 "to a great extent") and responses to several open-ended questions. The comments, which provide additional insight into the participants' thoughts and reactions to the overall professional development experience, help further inform the quality of professional development being delivered.

The following comments represent a sample of the positive and negative feedback received about the professional development sessions.[1] In general, teachers enjoyed collaborating with other participants, identifying new resources or new ways to use existing resources, and experiencing hands-on activities.

Participants were asked to respond to the following open-ended questions:

Looking back at the course, what part has been most valuable to you?

March 15, 2010 High School Mathematics Workshop

- The material presented was made available to me so I could review it at a later time and share with my colleagues.
- Actually creating an activity and doing it!!

June 3, 2010 Workshop

- The KUTA software that we previewed today seemed wonderful. This software would greatly help me prepare effective material for all students as well as quickly create wonderful practice work for students to individually meet their specific needs.
- The KUTA software offers the ability to individual practice and assessment for their students. It would be a great asset.

[1] These comments have been sparingly edited, only to correct egregious grammatical or spelling errors.

June 4, 2010 Workshop

- Great workshop.
- The math tools add-ons were very student friendly and may be used to enhance student participation in class.

June 10, 2010 Workshop

- The collaboration with other professionals and the time to work on lessons has been invaluable!

Final Survey 2011

A final survey was administered at the conclusion of the 2009 to 2011 MSP. Of 37 teachers surveyed, only two teachers felt that the program did not meet their expectations. According to one teacher, "*I expected more meetings in the spring concerning technology in the classroom"* while the other teacher said "*yes and no; the only workshops I attended were last summer and during the school year. Those we had were effective but I felt the small group was not*". Although two teachers did not feel the program met their expectations, 100% of teachers would recommend the MSP program to a colleague.

When asked, "*What aspects of the MSP Program need improvement? (i.e. administration, organization, schedule, quality, content, etc.) Please feel free to provide recommendations,"* teachers answered:

- No real suggestions – I think you all do a great job!
- I've been impressed with how well it is planned and how practical and useful the activities are.
- Professional learning communities could be school-based; therefore alleviating the time to travel somewhere. I could not participate because of late hours.
- I would like to see more time for us to work specifically on the content of new course as they are implemented. Maybe the PLC would be a good place for this.
- Meeting schedules during the school year.

If you participated in the Professional Learning Communities, did you find the experience valuable? Please explain.

- Yes, especially if we had pre-determined what we planned to do. Working with others teaching the same courses is very helpful.
- They were valuable in that we had time to plan together. However, the Shorter professor was not a math instructor and was really not beneficial to us.
- When every member was available to meet and bring resources, this experience was very valuable. However, we oftentimes find it difficult to arrange a meeting day, time and place that worked for everyone in the group. At meetings, I was able to discuss issues in my classroom, share and collect resources, and develop assessments. These things were very helpful.
- No, we only had a few willing to show up and work.
- No, makes for too long of a day and they usually turned into a gossip/vent session.

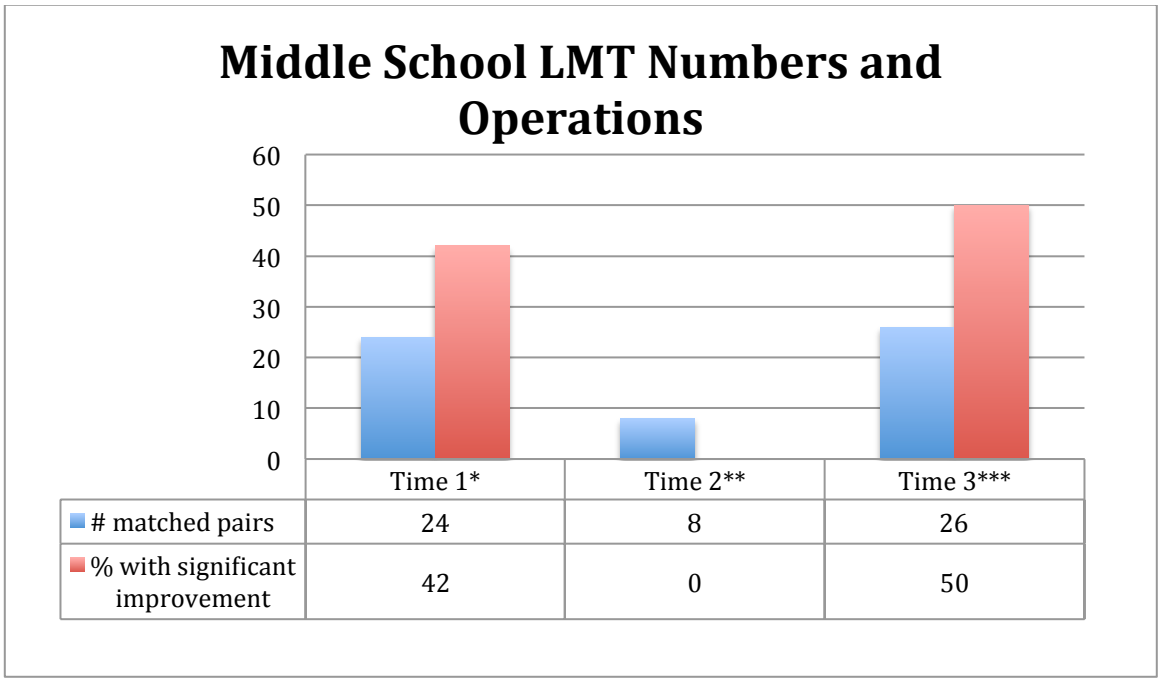
Math Teacher Content Knowledge

Participating math teachers were given a pre-test in the summer of 2009, a mid-point test in spring of 2010, and a post-test in the spring of 2011. These tests were based on their content area and grade level. It should be noted that for all figures below, Time 1 represents a comparison between pre-test and mid-point test data, Time 2 represents a comparison between mid-point and post-test data, and Time 3 represents a comparison between pre-test and post-test data. The number of matched pairs for each test is displayed in the graph, and represents the number of teachers with data from both testing periods.

Middle School Mathematics

As Figure 1 shows, there were significant increases during Time 3 on the Middle School Numbers and Operations assessment. 50% of teachers increased their score during Time 3.

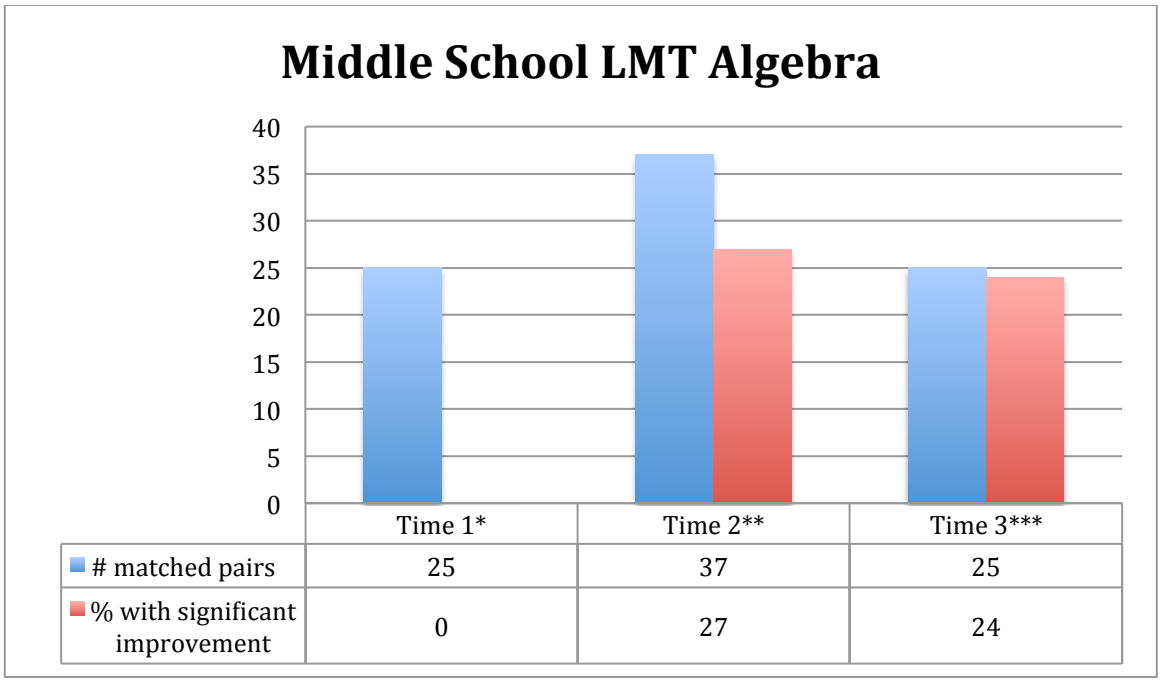
Figure 1. Years 1-2 Middle School LMT Numbers and Operations Teacher Gains in Content Knowledge



* pre-test and mid-point test
**mid-point and post-test
***pre-test and post-test

Teachers showed less significant improvement on the Middle School LMT Algebra assessment than they did on the Numbers and Operations assessment. Although performance improved during Time 3, the percent of teachers who improved their scores was lower. Figure 2 shows that only 24% improved their scores during Time 3.

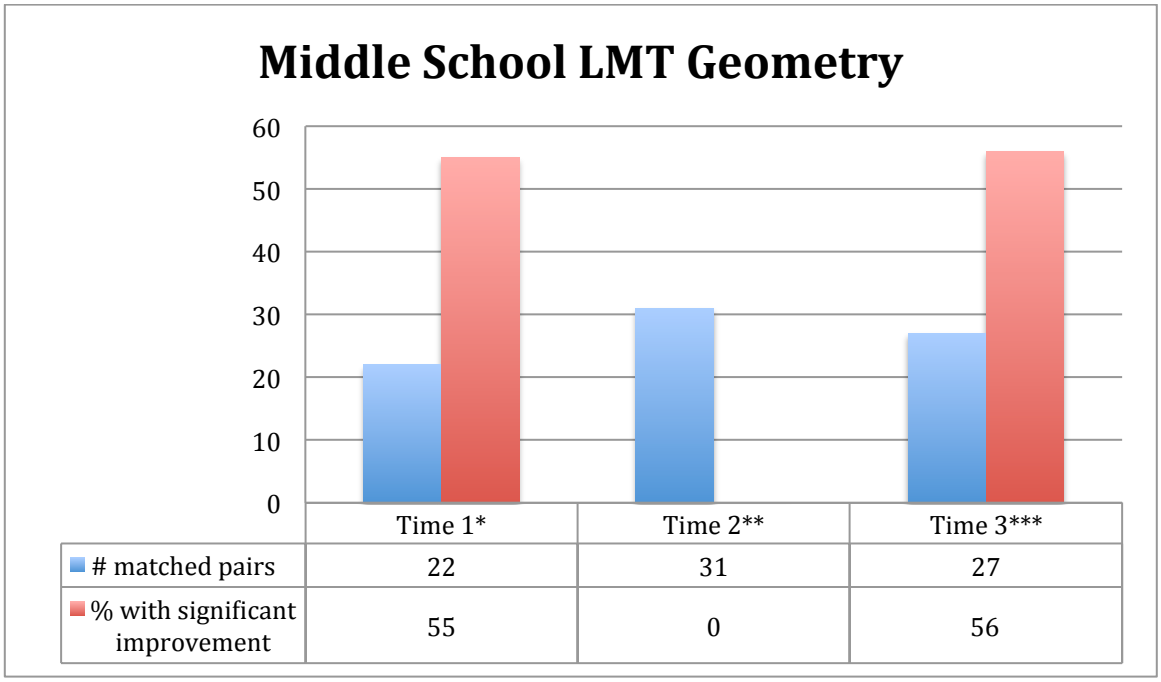
Figure 2. Years 1-2 Middle School LMT Algebra Teacher Gains in Content Knowledge



* pre-test and mid-point test
**mid-point and post-test
***pre-test and post-test

Similar to their performance on the Number and Operations assessment, math teachers significantly increased their scores on the Geometry assessment during Time 3. 56% of teachers significantly improved their scores during Time 3, between the pre-test and the post-test (see Figure 3).

Figure 3. Years 1-2 Middle School LMT Geometry Teacher Gains in Content Knowledge

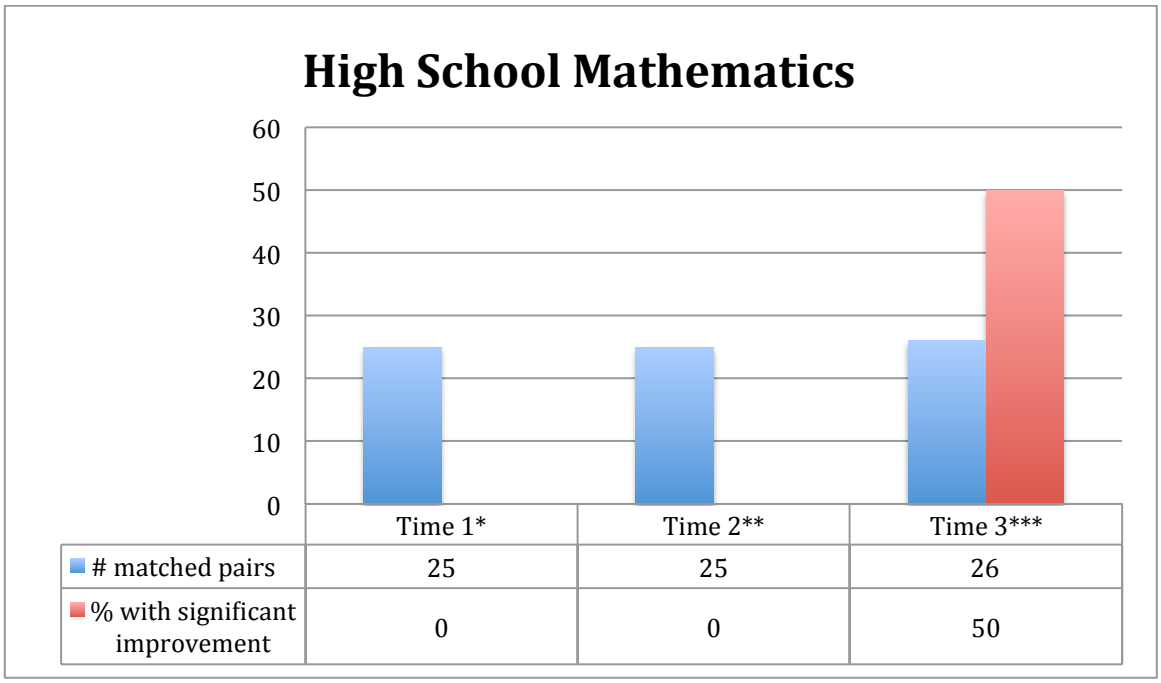


* pre-test and mid-point test
**mid-point and post-test
***pre-test and post-test

High School Mathematics

The only time period during which math teachers exhibited significant increases in their content knowledge was Time 3 (see Figure 4). Of the teachers with matching pre- and post-test data, 50% significantly increased their scores.

Figure 4. Years 1-2 HS Mathematics Teacher Gains in Content Knowledge



* pre-test and mid-point test
**mid-point and post-test
***pre-test and post-test

Findings: Classroom Impact

Student Achievement

CRCT and EOCT student achievement data were gathered from FCPS and provided to the evaluation team. Teacher names were replaced with numbers to ensure anonymity. These data are organized by grade level. As a comparison, the pass rate for each teacher's students was correlated to the district pass rate for the same subject area and grade level. Table 2 displays the CRCT mathematics scores for the participating teachers. Each teacher's individual mathematics scores are compared to the mathematics

scores for the entire district. They are also compared to the state averages as reported by the Georgia Department of Education.

Teachers participating in the professional development workshops during Year 2 impacted 1,957 students. The total number of math students impacted decreased from 2,547 students in Year 1. Looking solely at student performance by participating teacher, students from 15 of the 20 (or 75%) Middle School Math teachers with reported CRCT data had higher pass rates than their respective school district (see Table 2). Eight of these teachers had every student either meet or exceed expectations on the CRCT. Compared to the state level data, 18 out of 20 (90%) participating MSP teachers had higher pass rates. Students from 8 of the 14 high school math classes outperformed students at the district level, and 8 of the 14 classes outperformed students in the state of Georgia. Data for teachers whose students outperformed either the district and/or the state are highlighted in the tables below.

Table 2. Middle School Math 2011 CRCT Data

Teacher ID	District	Grade Level	Teacher % students who Met or Exceeded 2011	District % students who Met or Exceeded 2011	State of GA % students who Met or Exceeded 2011
1	**Floyd**	**6**	**79%**	**85%**	**76%**
2	**Floyd**	**6**	**100%**	**85%**	**76%**
3	**Floyd**	**6**	**87%**	**85%**	**76%**
4	**Floyd**	**6**	**100%**	**85%**	**76%**
5	**Floyd**	**6**	**93%**	**85%**	**76%**
6	**Floyd**	**6**	**94%**	**85%**	**76%**
7	**Floyd**	**7**	**100%**	**95%**	**89%**
8	**Floyd**	**7**	**100%**	**95%**	**89%**
9	**Floyd**	**7**	**100%**	**95%**	**89%**
10	**Floyd**	**7**	**59%**	**95%**	**89%**
11	**Floyd**	**7**	**93%**	**95%**	**89%**
12	**Floyd**	**7**	**91%**	**95%**	**89%**
13	**Floyd**	**7**	**99%**	**95%**	**89%**
14	**Floyd**	**7**	**100%**	**95%**	**89%**
15	**Floyd**	**7**	**92%**	**95%**	**89%**
16	**Floyd**	**8**	**100%**	**84%**	**78%**
17	**Floyd**	**8**	**92%**	**84%**	**78%**
18	**Floyd**	**8**	**100%**	**84%**	**78%**
19	**Floyd**	**8**	**97%**	**84%**	**78%**
20	**Floyd**	**8**	**93%**	**84%**	**78%**

Table 3. High School Math 2011 EOCT Data

Teacher ID	District	Grade Level	Teacher % students who Met or Exceeded 2011	District % students who Met or Exceeded 2011	State of GA % students who Met or Exceeded 2011*
1	**Floyd**	**Math 1**	**96%**	**44%**	**59%**
2	**Floyd**	**Math 1**	**100%**	**44%**	**59%**
3	**Floyd**	**Math 1**	**18%**	**44%**	**59%**
4	**Floyd**	**Math 1**	**90%**	**44%**	**59%**
5	**Floyd**	**Math 1**	**50%**	**44%**	**59%**
6	**Floyd**	**Math 1**	**68%**	**44%**	**59%**
7	**Floyd**	**Math 1**	**100%**	**44%**	**59%**
8	**Floyd**	**Math 1**	**62%**	**44%**	**59%**
9	**Floyd**	**Math 2**	**29%**	**85%**	**66%**
10	**Floyd**	**Math 2**	**63%**	**85%**	**66%**
11	**Floyd**	**Math 2**	**40%**	**85%**	**66%**
12	**Floyd**	**Math 2**	**89%**	**85%**	**66%**
13	**Floyd**	**Math 2**	**38%**	**85%**	**66%**
14	**Floyd**	**Math 2**	**80%**	**85%**	**66%**

Conclusion

The Floyd County MSP program successfully recruited and maintained a consistent cohort of teachers throughout Years 1 and 2. Through professional development workshops, the teachers received training on mathematics content and pedagogy. Results from workshop evaluations show consistent positive ratings from participating teachers. In evaluating the entire two-year experience, many teachers expressed the value of collaborative planning and training they received on new

technology. Participants were generally satisfied with the experiences and knowledge they gained from the professional learning communities.

Using test results as an indicator of content knowledge, several of the teachers significantly increased their mathematics content knowledge. Among the math teachers with matching pre- and post-test data, 45% significantly increased their content knowledge. Although results from self-reported data show that almost all of participating teachers strongly agree that they increased their content knowledge through the program, this is not reflected in the test results.

Student achievement data were also considered in the evaluation. Data show that, depending on the cohort, most classes of MSP participants outperformed their respective districts and the state of Georgia.

In conclusion, results from the evaluation of the 2009-2011 Floyd County Public Schools MSP program are generally positive. Most indicators show positive impacts on teacher content knowledge and student achievement.

Appendix A Evaluation Instruments

Professional Development Feedback Forms

CEISMC

2011 FLOYD COUNTY MSP

Date: _____
School District: _____
Grade Level: _____
Instructor's Name: _____

Answer Selection: Correct = ● Incorrect = ☒ ☑ ⊖

TO WHAT EXTENT, IF ANY, WAS THIS WORKSHOP SUCCESSFUL IN EACH OF THE FOLLOWING WAYS?	Not at all	Small Extent	Moderate Extent	Great Extent
1. It was appropriate to my knowledge, skills, and interests.	1	2	3	4
2. It increased my content knowledge.	1	2	3	4
3. It stimulated me to think about ways I could improve my instructional practices.	1	2	3	4
4. It provided me with strategies to transfer what I learned into classroom practice.	1	2	3	4
5. It increased my ability to teach the Georgia Performance Standards.	1	2	3	4
6. It increased my ability to see and explore ways to integrate math, science and technology.	1	2	3	4
7. It provided methods to better identify and meet the needs of my students.	1	2	3	4
8. It provided me with an opportunity to become a member of a professional learning community.	1	2	3	4
9. It provided knowledgeable facilitators and staff genuinely interested in helping me improve.	1	2	3	4
10. It provided me with learning activities that were effective and useful.	1	2	3	4

WHAT PART OF THIS WORKSHOP HAS BEEN MOST VALUABLE TO YOU?