Math Task Force Report
Community Information Meeting
Small Group Discussion Questions

1. Identify the three most important recommendations in the report from your perspective. Rank order your selections from 1 – 3, using 1 to identify the most important recommendation. Discuss the reasons for your choices.

2. The Math Task Force recommended that MMSD give serious consideration to selecting a single textbook for each grade level or course, and to require a common course sequence in all high schools (recommendation #6). What are the benefits and/or drawbacks of selecting a consistent district-wide curriculum vs. allowing individual teachers or buildings the choice of the curricular materials they use with students?

3. The Math Task Force recommended that parents be provided opportunities to learn about MMSD's mathematics instruction so that parents are able to assist and reinforce student learning at home (recommendation #10). What are the best ways to reach parents with information about their student's math program? What are good ways to provide suggestions to parents for helping their children at home?

4. The Math Task Force recommended that the MMSD align district goals, policies, and resources in ways that result in a math teacher workforce that has in depth knowledge of math content and instruction, especially in grades 5 – 8 (recommendation #1). Hiring math "specialists" may require middle schools to move away from the current middle school model which keeps students with fewer teachers who teach multiple subjects. What do you think about the benefits for students of improved math instruction from a teacher who is able to specialize in the subject vs. the benefits of the middle school model?

5. Join table #5 if you would like to make general comments about the Math Task Force findings and recommendations or talk about some other aspect of the report in more detail.

Introduction

Charge of Board of Education to Task Force.

At a meeting of the MMSD Board of Education on November 16, 2006, the Board approved a motion to initiate and complete a comprehensive, independent, and neutral review and assessment of the district's K-12 mathematics curriculum and related issues. With Board approval, the Superintendent was to appoint a task force to undertake the review and assessment.

Composition of the Task Force and introductory remarks.

Superintendent Rainwater appointed a 10-person Task Force and arranged for district and SCALE[1] personnel to provide staff support for the Task Force. While most Task Force members (a parent, a teacher, and six UW-Madison faculty and researchers with a range of expertise) were drawn from the Madison community, co-chairs were selected from outside the Madison community in an effort to ensure that the review was independent and neutral. Jim Lewis, Professor and former chair of the Mathematics Department at the University of Nebraska-Lincoln, and Merle Price, former Los Angeles Unified School District Deputy Superintendent of Instruction, and now a faculty member in the Department of Educational Leadership at California State University, Northridge, and Graduate School of Education and Information Studies Liaison at UCLA, were appointed as Task Force co-chairs. They were introduced to the Board of Education and the Board approved their appointments at a meeting on April 16, 2007.[2]

The Task Force functioned as a learning community that met and communicated over a 12-month period. This is an important point, since the mathematical, cognitive, educational, cultural, political, financial, and psychological issues raised by the Board of Education charge to the Task Force constitute a complex landscape. Research and experience can shed some light on this landscape, but there is still much that is not understood. With that caveat, the Task Force offers this report to fulfill its charge from the Board of Education.[3]

The remainder of this document consists of the following: a section that highlights the Task Force's major findings and recommendations; a section that maps the original charge of the Board of Education to the research and conclusions in this report; and five additional sections – Learning from Curricula; Instruction and Teacher Preparation; Analysis of Student Achievement; Surveys of Teachers, Parents, and Students; and the MMSD Mathematics Task Force Meeting Minutes.

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[1] See Acknowledgements
[2] See Appendix A
[3] See Appendix B for more background on the Task Force and the BOE charge

Findings

The first two findings represent a synthesis from across all of the research sections and the experience and professional opinions of the Task Force members. The remaining findings highlight selected results from the research sections. Additional findings can be found in the individual research sections. This section provides greater elaboration for the first two findings, because these findings are overarching syntheses of the research findings and the Task Force's deliberations and are not specific to a particular research section.

Finding 1: The single most important step that the MMSD Board of Education can take in support of improved student achievement in mathematics is to align district goals, policies, and resources in ways that result in a mathematics teacher workforce well prepared in the content of mathematics and in the techniques of teaching mathematics. This issue is especially critical in grades 5 to 8.

In 1998, the Learning First Alliance, a consortium of 15 education organizations that include the Council of Chief State School Officers, the Education Commission of the States, the National Association of State School Boards of Education, the National School Boards Association, the American Association of School Administrators, and the National Education Association, published its report, *Every Child Mathematically Proficient*[4]. In it, the Learning First Alliance set forth two important recommendations that are relevant to the MMSD Board's request for "a discussion of how to improve MMSD student achievement":

- Virtually all students starting school this fall [1998] will complete a challenging, coherent, and focused K-12 mathematics curriculum that includes core concepts of algebra and geometry early enough and with progressively increasing depth so that the content covered in current algebra I and geometry courses is mastered by the end of grade 9.

- All students of mathematics should be taught by teachers who have been well prepared in the content of mathematics and techniques of teaching mathematics. In particular, all mathematics teachers grades 5 through 9 will be mathematics specialists, educated to meet the mathematical needs of students studying a challenging curriculum that includes algebra and geometry.

As discussed in the sections on instruction, the students who started school in the fall of 1998 have just completed the ninth grade. In 2008, MMSD Board of Education policy is to have all students complete Algebra I by the end of grade nine; full implementation of this policy is still in the future. Moreover, the district's middle-level mathematics teacher workforce is overwhelmingly elementary certified with mathematics preparation far below that of a mathematics specialist[5].

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[4] Learning First Alliance (2007), Washington, D.C.
[5] See below for a discussion of *mathematics specialist*

It is perhaps obvious that the district is faced with two types of challenges: those it cannot affect and those that it can affect. The changing demographics of the student population is an example of a challenge in the first category. A challenge in the second category is the cumulative effect of state policy and teacher preparation programs on the mathematics preparation of teachers who provide middle school mathematics instruction. These policies and programs include Wisconsin Department of Public Instruction (DPI) regulations; the state's teacher preparation programs, especially that of the University of Wisconsin, which understandably aligns teacher preparation requirements with state requirements; and the district's own goals and priorities as established by previous Boards. The section on Instruction and Teacher Preparation discusses the need for additional mathematics content-based pre-service instruction and in-service professional development for MMSD mathematics teachers.

The adequacy of teacher preparation is a significant problem that cannot be solved without a substantial investment in mathematics content-based professional development and a change in hiring priorities at the district level. In addition, other district and school-level practices must be brought into alignment to take advantage of professional development that is provided. For example, re-assigning a middle school mathematics teacher who has had extensive content-based professional development in mathematics to social studies instruction is not an optimal use of district resources, even if it solves a school-level staffing challenge. The Task Force also recognizes that significant change will be difficult without a corresponding change in state regulations and teacher preparation programs at University of Wisconsin member campuses and other Wisconsin colleges and universities. Still, the Task Force notes that the current situation would be quite different if in 1998 the MMSD Board of Education had made it official policy to implement the two Learning First Alliance recommendations within a decade and had secured and provided resources necessary to provide mathematics professional development on a level sufficient to achieve that policy.

The Task Force also emphasizes that the issue is not as simple as suggesting that teachers should know more mathematics. *The Mathematical Education of Teachers*[6], published in 2001 by the Conference Board of the Mathematical Sciences (CBMS), stresses (a) the intellectual substance in school mathematics and (b) the special nature of the mathematical knowledge needed for teaching. The publication goes on to offer recommendations for the preparation of mathematics teachers and joins with the Learning First Alliance in recommending that mathematics in middle grades (grades 5-8) should be taught by mathematics specialists. This "special nature of the mathematical knowledge needed for teaching" has been the focus of the work of many education scholars and is discussed further in the Instruction and Teacher Preparation section. For a measure of the mathematical knowledge needed by a mathematics specialist, the Task Force suggests that a reasonable expectation could be the CBMS recommendation for grade 5-8 teachers: "at least 21 semester-hours of mathematics, that includes at least 12 semester-hours on fundamental ideas of school mathematics appropriate for middle grades teachers."

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[6] Edited by Cathy Kessel, Judith Epstein & Michael Keynes (2001). CBMS Issues in Mathematics Education, Vol. 11. American Mathematical Society and Mathematical Association of America.

Finding 2: The MMSD Board of Education must resolve the conflict between the value offered by site-based management and the value offered by a more coherent K-12 mathematics curriculum.

The Task Force recognizes the appeal of making curricula decisions at the school level. At the same time, the net effect is to have multiple district mathematics curricula that, taken as a whole, lack coherence – a fact that was recognized by many MMSD mathematics teachers who responded to the Task Force survey, especially in the elementary schools and high schools. Many education professionals, including the members of our Task Force, are concerned that this results in a special challenge to highly mobile students, who are disproportionately from low-income households. Thus, the policy of permitting different schools to have different mathematics programs and use different textbooks has its greatest negative impact on a population that is already hardest for the district to reach. At the high school level, we are also concerned that the instruction available may be dependent on the high school attended. In particular, concern was expressed among the Task Force members that two of the high schools require two credits of math between Geometry and Calculus AB, whereas the other two have a one year option for students. This disparity has caused stress on students, teachers and parents as early as elementary school in select schools across the district.
In addition, the Integrated Math course option is only offered at two of the district's high schools, which can create problems for students who transfer schools after taking Integrated Mathematics I.

The Task Force is aware, as is the Board, that some parents strongly disapprove of one or more textbooks used by the district. However, when considered as a whole, the published, peer-reviewed research literature reviewed by the Task Force does not offer evidence that a particular choice was a mistake. Moreover, our surveys did not receive significant student, parent, or teacher feedback indicating concern with any specific textbook that is currently used within the district. At the same time, teachers did not in significant numbers praise the textbooks they use (with the exception of the *Connected Mathematics Project* series)[7].

The district policy supporting the middle school curriculum of the *Connected Mathematics Project* (CMP) is laudable because (a) the curriculum has been adopted district wide; (b) the national research available, though woefully incomplete, suggests that CMP is as good or better than other choices for students overall; (c) CMP has strong support from teachers, as reflected in the teacher survey data; and (d) the district-wide Web site has provided an outlet for teachers using CMP to organize and share accommodations for struggling and advanced students, common assessments, and grading practices.

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[7] Lappan, F., Fitzgerald, S., Friel, P. (2004). *Connected Mathematics*. Upper Saddle River, NJ: Prentice Hall.

Finding 3: Research on the effectiveness of mathematics curricula is limited, but the available research indicates that many curricula choices are at least acceptable, and that when one controls for other factors that influence student achievement, the effect of choosing one textbook over another is small.

Three reviews (meta-analyses) of the published research on the effectiveness of mathematics curricula on student learning were reviewed. Each employed different criteria for inclusion of studies. (Although few studies of any curriculum materials, including those used in the MMSD, were considered of sufficient quality to meet the highest methodological standards, this lack probably reflects deficits in the applied research realm rather than criticisms of the curricula themselves.) Overall, the available research literature suggests that the effects of curricula on learning are small, once the effects of student factors (e.g., socio-economic status, educational level of parents), teacher factors (level of teacher preparation, quality of implementation), and school factors (available scholastic resources) are controlled for. (See Section 1: Learning from Curricula for more information on reform curricula, research, and this finding.)

Finding 4: Taken together, the available research literature supports the thesis that the district has made reasonable curricular choices that support MMSD teachers' efforts to offer courses and curricula that address MMSD and DPI mathematics standards. A few published peer-reviewed studies would suggest that reform curricula, like those used in the district, show promise in serving low-performing students, and there is some evidence that both reform and traditional curricula are less successful at improving achievement of high-performing students.

The available published research literature suggests that NSF-sponsored reform-based curricula that emphasize a constructivist philosophy, with a strong emphasis on individual and collaborative problem solving, use of manipulatives, and concept development, are as good or better than traditional curricula overall, and have particular promise for historically underserved and minority populations and low-achieving students. Districts should, however, pay special attention to the performance of high-achieving students, providing supplemental materials as needed to ensure their success in mathematics. (See Section 1: Learning from Curricula for more information on this finding.)

Finding 5: The district's curriculum should simultaneously develop conceptual understanding, computational fluency, and problem-solving skills. Debates regarding the relative importance of these aspects of mathematical knowledge are generally misguided.

This finding duplicates a finding of the National Mathematics Panel. It is important to note that this point of view is consistent with district philosophy regarding mathematics instruction, particularly in the elementary and middle school grades. Research shows that conceptual knowledge and procedural knowledge in mathematics develop in an integrated, iterative fashion. Because a few studies have found that students using reform curricula perform less well on computation and algebraic manipulation than do control

groups, the district should monitor performance in these areas to ensure that adequate attention is given to the development of basic skills without sacrificing the development of conceptual understanding. (See Section 1: Learning from Curricula for a careful discussion of this and other issues.)

Finding 6: The surveys indicate that most teachers, parents, and students offer a positive assessment of the mathematics instruction provided by the district.

In general, teachers approve of the district curricula options, especially at the middle school level. Overall, students approve of and feel challenged by their mathematics instruction. Likewise, parents generally approve of the mathematics instruction and think it is appropriately challenging for their children. (See Section 4: Survey of Teachers, Parents, and Students for more in-depth analysis.)

Finding 7: The surveys uncovered concern with the coherence of the curriculum, the opportunities afforded teachers to collaborate, and communication between teachers and parents.

Especially at the elementary and high school levels, parents and teachers expressed concern about the lack of coherence both within and across schools. A significant percentage of teachers feel that they do not have enough time to collaborate with other teachers concerning mathematics instruction. A significant number of parents were concerned about their ability to communicate with their children's teachers concerning mathematics instruction and expectations. (See Section 4: Survey of Teachers, Parents, and Students for a more in-depth analysis.)

Finding 8: Overall, the student achievement data confirm known district strengths, such as ACT performance, and known problems, such as the gap in achievement by demographic and ethnic categories.

Madison has experienced significant demographic changes. Academic performance is different within different demographic groups; this phenomenon is often referred to as the "achievement gap." If student performance is analyzed by group using some of the traditional demographic categories (ethnicity, socioeconomic status), mathematics scale scores within each group have varied from year to year from the 1999-2000 to the 2006-07 school years. The scale scores varied the most for Hispanic students (range in variation from 26 to 30 scale points for grades 4, 8, and 10) and least for White students (ranged from 7 to 17 scale points for grades 4, 8, and 10). Mathematics scale scores of students at each of grades 4, 8, and 10 have generally declined from the 1999-2000 to the 2006-07 school years. The one exception is for grade 8 African American students. This group had their highest WKCE mean scale score (677) in 2006-2007.

The average ACT math score remained about 24.6 over this period with an increase to 25.0 in 2006-07, the highest average score in five years. The MMSD average score of 25.0 with 58% of students taking the test is high compared to other states and Wisconsin districts. The average score for the state of Wisconsin is 22.2, which is the second highest

of any state in which more than 20% of students take the test. Of the 11 districts in Wisconsin that have 10,000 or more students, the second best average score is 22.9 (for Green Bay, with 48.8% of students taking the test). Within Dane County, two smaller, less demographically diverse districts, McFarland and Middleton-Cross Plains, each have an ACT average score of 24.7 (still below 25) and a percent of students taking the test of just above 70%.

An increasing number of MMSD students have received credit for Algebra I by grade 10 and geometry by grade 11 over the past five years, from 2003-04 through 2007-08—an increase from 65% to 77% for Algebra I and an increase from 60% to 67% for geometry. (See Section 3: Analysis of Student Achievement for a careful discussion of these and other issues.)

Recommendations

This section contains the recommendations relevant to the two overarching findings and a listing of some of the recommendations that occur in the four research sections of the report.

To significantly improve the mathematical knowledge for teaching of the MMSD mathematics teacher workforce, the district should:

1. Establish the goal of moving to the full use of mathematics specialists in grades 5 through 8 within six years;

2. Focus hiring of grade 5-8 mathematics teachers on candidates who are mathematics specialists or who commit to meeting the district's criteria for a mathematics specialist within three years;

As discussed in our Findings section, the challenge of implementing Recommendations 1 and 2 is made all the more difficult because of current DPI certification requirements and available teacher education programs in Wisconsin which are aligned with those requirements. As a consequence, it may be necessary for the District to seek to implement Recommendations 1 and 2 in stages, first focusing on middle school mathematics teachers (grades 6-8), while advocating for changes in DPI policies and collegiate teacher education programs. At the same time, the Task Force hopes that MMSD will experiment with ways to strengthen the mathematical knowledge of 5th grade teachers, in order to learn more about the benefits to student achievement if the District is eventually able to extend mathematics specialists to grade 5.

3. Make a much larger commitment to mathematics professional development than has been possible in recent years;

4. Extend the partnership with the University of Wisconsin and also other colleges and universities, especially with faculty in mathematics and mathematics education, to provide coherent programs that lead to a mathematics specialist certification; and

5. Advocate to both the University of Wisconsin and the DPI for a new middle school-level mathematics certification.

To significantly improve the district coherence of the mathematics curricula, the district should:

6. Give serious consideration to selecting a single textbook for each grade level or course and to requiring a common core sequence across all high schools.

Additional recommendations are the following:

7. In making improvements and investing resources, the district should consider how best to reduce the large achievement gaps among subgroups of students.

8. A value-added type of analysis of Wisconsin Knowledge and Concepts Examination (WKCE) scores by district, school, and grade level should be made a standard part of district reporting. Value-added analysis gives a more accurate picture of district performance and trends in student achievement, especially in a district like the MMSD with a diverse student population and changing demographics. (See Section 3: Analysis of Student Achievement.)

9. More time should be provided for teacher collaboration for teachers to learn from each other, analyze achievement data, meet needs of diverse learners, plan for instruction, and ensure both horizontal and vertical alignment of the curriculum. (See Section 4: Survey of Teachers, Parents, and Students.)

10. Parents should be provided opportunities to learn about district mathematics instruction to be able to assist and reinforce student learning at home. (See Section 4: Survey of Teachers, Parents, and Students.)

11. Instruction at all grade levels should focus on the integration of conceptual and procedural knowledge; in particular, laying conceptual foundations for procedural and symbolic manipulation skills. (See Section 1: Learning from Curricula.)

12. Although the increase in the number of students taking and passing algebra is encouraging, the large number of failing grades is a serious concern. The district should investigate causes of the problem and identify and implement research-based remedies.

13. The district should pursue a challenging, coherent, and focused K-12 mathematics curriculum that includes core concepts of algebra and geometry early enough and with progressively increasing depth so that the content covered in Integrated Math I and II or in traditional Algebra I and geometry courses is mastered by the end of grade 9.

This last recommendation enables the Board to focus on a key student outcome that the Task Force believes is consistent with the Madison community's goals for MMSD and the students that it educates. To implement this recommendation, the MMSD Board of Education will need to make a major commitment to the professional development needs of its middle level mathematics teachers (see Recommendation 3).

Summary Response to Board Charge

The Task Force was charged with preparing and presenting to the Board a preliminary outline of the review and assessment to be undertaken. The Board directed that the outline include: (a) an analysis of mathematics achievement data for MMSD K-12 students, including an analysis of all mathematics sub-tests scores disaggregated by student characteristics and schools; (b) an analysis of performance expectations for MMSD K-12 students; (c) an overview of mathematics curricula, including the MMSD's mathematics curriculum; (d) a discussion of how to improve student achievement; and (e) recommendations on measures to evaluate the effectiveness of the MMSD's mathematics curriculum. The Task Force's outline was provided to the Board on March 24, 2008.

In this report, the Task Force has addressed its charge in the following ways:

(1) An analysis of math achievement data for MMSD K-12 students, including an analysis of all mathematics sub-tests scores disaggregated by student characteristics and schools

The Analysis of Student Achievement section includes analyses of WKCE and ACT scores disaggregated by student characteristics with trends over the last several years. The results are reported by grade level. Because of time and resource constraints, the section does not include an analysis disaggregated by school.

Madison has experienced significant demographic changes. Academic performance is different within different demographic groups; this phenomenon is often referred to as the "achievement gap." If student performance is analyzed by group using some of the traditional demographic categories (ethnicity, socioeconomic status), mathematics scale scores within each group have varied from year to year from the 1999-2000 to the 2006-07 school years. The scale scores varied the most for Hispanic students (range in variation from 26 to 30 scale points for grades 4, 8, and 10) and least for White students (ranged from 7 to 17 scale points for grades 4, 8, and 10). Mathematics scale scores of students at each of grades 4, 8, and 10 have generally declined from the 1999-2000 to the 2006-07 school years. The one exception is for grade 8 African American students. This group had their highest WKCE mean scale score (677) in 2006-2007.

The average ACT math score remained about 24.6 over this period with an increase to 25.0 in 2006-07, the highest average score in five years. This performance is remarkable in light of the averages seen state-wide and in other states. An increasing number of MMSD students have received credit for Algebra I by grade 10 and geometry by grade 11 over the past five years, from 2003-04 through 2007-08—an increase from 65% to 77% for Algebra I and an increase from 60% to 67% for geometry. (See Section 3: Analysis of Student Achievement.)

(2) An analysis of performance expectations for MMSD K-12 students

The findings and recommendations address current expectations that students will complete algebra by grade 9 and geometry by grade 10. While these expectations for all students provide some focus, the district should reconsider these goals so that they are in alignment with recommendations from the Learning First Alliance, for example, by including more focus on providing a "challenging, coherent, and focused K-12 math curriculum that includes core concepts of algebra and geometry early enough and with progressively increasing depth so that the content covered in current algebra I and geometry courses is mastered by the end of grade nine."

It should be noted that in the surveys of teachers, parents, and students, 71% of teacher respondents strongly agreed or somewhat agreed that the mathematics program results in students receiving a high-quality mathematics education, and 75% of the parent respondents strongly agreed or somewhat agreed that their child's mathematics teacher meets their child's learning needs. While these results suggest that there is a significant level of confidence in the district's performance expectations, the Task Force believes that these expectations can be more ambitious.

(3) An overview of mathematics curricula, including MMSD's mathematics curriculum

The Learning from Curricula section includes an overview of MMSD's mathematics curriculum at each level.

The recommendations include giving serious consideration to selecting a single textbook for each grade level or course and requiring a common curriculum across each district high school. (See recommendation 6.)

(4) A discussion of how to improve student achievement

The Task Force believes that the issues identified in the Findings and Recommendations parts of the report that are most pertinent to improved student achievement are those pertaining to teacher preparation for grade 5-8 teachers and to a focused K-12 mathematics curriculum that includes core concepts of algebra and geometry early enough, and with progressively increasing depth, so that the content covered in current algebra and geometry courses is mastered by the end of grade 9. The recommendation for a common textbook at each grade level is also directed at improving student achievement. Other areas for consideration in the report that bear directly on student achievement are commitments to professional development and teacher collaboration time, parent opportunities for learning how to help their students with mathematics at home, and expanded opportunities for students to complete algebra in grade 8. In addition, the Task Force recommends that instruction at all grade levels should focus on the integration of conceptual and procedural knowledge; in particular, laying conceptual foundations for procedural and symbolic manipulation skills. (See Section 1: Learning from Curricula.)

(5) Recommendations on measures to evaluate the effectiveness of the MMSD's math curriculum

The Task Force feels that interpretations about the impact of a particular curriculum, teacher pedagogy, and effects of school level decisions would be better evaluated if value-added analyses of the WKCE were available. Value-added analysis gives a more accurate picture of district performance and trends in student achievement, especially in a district like the MMSD with a diverse student population and changing demographics. (See recommendation 7.)

Appendix A: MMSD Mathematics Task Force Membership

Jim Lewis, Co-chair, Professor (and former Chair), Department of Mathematics, University of Nebraska-Lincoln
Merle Price, Co-chair, former Los Angeles Unified School District Deputy Superintendent for Instruction, Lecturer, Educational Leadership and Policy Studies, California State University, Northridge and Graduate School of Education and Information Studies Liaison at UCLA
Martha Alibali, Professor, Departments of Psychology and Educational Psychology, UW-Madison
Charles Chapin, Science Teacher, La Follette High School
David Griffeath, Professor (and former Chair), Department of Mathematics, UW-Madison
Jill Jokela, MMSD Parent
Eric Knuth, Associate Professor, Department of Curriculum and Instruction, UW-Madison
Mitchell Nathan, Professor, Departments of Educational Psychology and Curriculum and Instruction, UW-Madison
Norman Webb, Senior Scientist, Wisconsin Center for Education Research, UW-Madison
Kenneth Zeichner, Associate Dean and Professor, School of Education, UW-Madison

Staff to MMSD Mathematics Task Force:

William H. Clune, Voss-Bascom Professor of Law, UW-Madison Law School and Researcher, Wisconsin Center for Education Research, UW-Madison
Mathew Felton, Graduate Research Assistant, Mathematics Education, UW-Madison
Angela Hoistion, Project Manager, Wisconsin Center for Education Research, UW-Madison
Steve Kosciuk, Researcher, School of Education, UW-Madison
Sarah Mason, Researcher, Wisconsin Center for Education Research, UW-Madison
Terry Millar, Professor of Mathematics, Graduate School Associate Dean for the Physical Sciences, and Director, System-wide Change for All Learners and Educators, Wisconsin Center for Education Research, UW-Madison
Paula A. White, Researcher, Wisconsin Center for Education Research, UW-Madison

Appendix B: MMSD Mathematics Task Force History

The Board of Education set the 2006-07 goals for the Superintendent at the Board meeting of November 13, 2006. The first goal was:

> Initiate and complete a comprehensive, independent and neutral review and assessment of the District's K-12 mathematics curriculum.
>
> - The review and assessment shall be undertaken by a Task Force whose members are appointed by the Superintendent and approved by the BOE. Members of the Task Force shall have mathematics and mathematics education expertise and represent a variety of perspectives regarding mathematics education.
>
> - The Task Force shall prepare and present to the Board of Education a preliminary outline of the review and assessment to be undertaken by the task force. The outline shall, at a minimum, include: (a) analysis of mathematics achievement data for MMSD K-12 students, including analysis of all mathematics sub-tests scores disaggregated by student characteristics and schools; (b) analysis of performance expectations for MMSD K-12 students; (c) an overview of mathematics curricula, including the MMSD's mathematics curriculum; (d) a discussion of how to improve MMSD student achievement; and (e) recommendations on measures to evaluate the effectiveness of the MMSD's mathematics curriculum. The Task Force is to present the preliminary outline and a timeline to the BOE for comment and approval.
>
> - The Task Force is to prepare a written draft of the review and assessment, consistent with the approved preliminary outline. The draft is to be presented to the Board of Education for review and comment.
>
> - The Task Force is to prepare the final report on the review and assessment.

At the special Board of Education meeting on April 16, 2007, where the Co-chairs of the Task Force were introduced, the Board was able to articulate a number of concerns and questions related to the choice of curricula, the success of sub-groups, as well as high school issues such as the impact and results of mandating algebra, the success of students after high school, the use of instructional time and other miscellaneous issues. Board minutes include a list of the more than 30 questions and issues discussed by Board members with the Co-chairs at the meeting. The Co-chairs used these questions to help further frame the objectives of the Task Force.

The first Task Force meetings on June 12-13, 2007 served to acquaint the members of the Task Force with the MMSD, the Board's charge, and the expertise and backgrounds of members. At meetings on June 12-13, 2007, the MMSD Math instructional staff gave presentations on the instructional system in mathematics and some of the curricular and

instructional issues. The agenda for these meetings included open discussions of how to proceed, possible timelines, and additional background materials. Further meetings on July 31 and August 1, 2007 were convened to organize teams to engage in research tasks in the areas of (a) data analysis and student achievement; (b) surveys and focus groups of teachers, parents, and students; (c) research synthesis on teacher preparation; (d) research synthesis on the effectiveness of curricula; and (e) interviews and policy analysis of how districts similar to Madison have approached ensuring performance of all students.

Resources and revised focus. Resources for the work of the MMSD Mathematics Task Force were addressed by an application to the NSF from the UW's Wisconsin Center for Educational Research (WCER) for a District Mathematics Instructional System Evaluation and Case Study. In August 2007, the WCER was informed that the NSF did not fund the proposal. Nevertheless, Superintendent Rainwater and UW leadership pursued other means of funding a scaled-back version of the anticipated research studies and reports. In September, UW Mathematics Professor Terry Millar and Superintendent Rainwater were able to identify some resources that allowed for a more limited set of studies. An award of $40,000 from the UW Baldwin endowment, $16,000 from MMSD and some SCALE[8] research funding were identified as resources for a more modest study. The Task Force was on a forced hiatus until new resources could be identified, and therefore the meeting schedule was pushed back until October 2007.

After Task Force reactivation in October 2007, the meeting of October 19, 2007 refocused on the key tasks, tentative working groups of Task Force members and WCER staff who would propose plans for addressing the Board of Education charge within available resources. Four working groups were established: Analysis of Student Achievement, Curriculum Review and Research Findings, Instruction and Teacher Preparation, and Survey of Teachers, Parents, and Students. A chair was appointed for each working group who was asked to convene meetings of working group members and WCER staff to identify work plans within each domain that would help address the Board of Education charge and related questions.

Meetings in November and December 2007 were used primarily to review the proposed scope of work and research that could be accomplished within each working group area of responsibility. Finally, at the March 7, 2008 meeting, a plan was approved by the Task Force for each of the working groups.

Open Meetings Law and reports by individuals. To meet the requirements of Wisconsin's Open Meetings Law, Task Force working group meetings were posted and open to members of the general public. The inability of the work groups to schedule smaller subgroup meetings and the limited ability of members to communicate other than at meetings was a constraint in pursuing work plans. To proceed more expeditiously, work groups were eliminated once they had provided guidelines to complete the research in the areas assigned to them. The agreed upon tasks and reports were assigned by the Co-chairs to individuals on the Task Force or in the WCER so that they could proceed more efficiently to engage others in analysis and preparation of draft reports.

[8] See Acknowledgements

The individuals assigned the task of completing the four sections were as follows:

1. Learning from Curricula (Dr. Mitchell Nathan)
2. Instruction and Teacher Preparation (Dr. Eric Knuth)
3. Analysis of Student Achievement (Dr. Norman Webb)
4. Surveys of Teachers, Parents, and Students (Dr. Paula White)

These sections were submitted to and reviewed by the full Task Force at their scheduled meetings of June 6, 19 and 20, 2007. Minutes for all Task Force meetings are included in Section 5, at the end of the report.