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Oakland Schools Math RTI Screening and Early Intervention Action Research Project
Based on the Delta Math RTI State Project
Executive Summary
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Introduction and Purpose

Oakland Schools Special Education Department sponsored a 2-year Math RTI Project for Grades K through 3. The purpose of the project was to improve math achievement for all students by implementing a RTI for Math framework which provided the infrastructure and the tools for evaluating the strengths and weaknesses of the current math instructional program and identifies areas in need of instructional improvement. Within this framework all students in Grades 1-3 were screened on essential math standards and the big ideas of math content. Areas in need of improvement were identified and instructional adjustments were implemented across 3 Tiers of instruction depending on the frequency of occurrence and severity of the problems identified.

Program Overview

Oakland Schools Special Education Department supported 4 elementary school teams from 2 districts: Independence Elementary and Clarkston Elementary in Clarkston, and Simonds Elementary and Edmonson Elementary in Lamphere, in making a 2-year commitment to implementing the Delta Math RTI Program in grade levels K through 3.

- Year 1 followed the process outlined below using a pencil and paper version of the Delta Math RTI Screening Assessments.
- In Year 2 some schools utilized an online version of the Screening Assessments. Building Teams then had access to the automatic scoring and report menu that are available with the web-based system.

The Delta Math RTI program includes 4 essential components of RTI systems:

1. Universal math screening (based on Common Core Standards) in the Fall and Winter.
2. Grade level meetings occur post screening in the Fall and Winter to evaluate screening data and prioritize interventions for at-risk students.
   - Grade Level Meetings: cross grade-level teacher teams including current and previous grade level teachers (K–1) (1–2) (2–3) problem-solving in a PLC format.
   - The teams develop intervention plans and identify resources to implement targeted whole class re-teaching or supplemental instruction for identified groups of students.
   - Intervention Folders are constructed to hold these plans and to serve as a resource for other teachers and future groups of students.
3. Interventions are focused on the standards that students are struggling to meet.
4. Progress monitoring of students in need of intervention (using assessments aligned with the Delta Math Grade Level Screeners) is done at regular intervals to assure that interventions have been successful in helping students to meet essential standards.

Evaluation Questions

Our evaluation of the Pilot Project utilized multiple data sources in an attempt to assess the efficacy of implementing a RTI framework for Math. Our analysis of the data focused on answering 4 questions the team considered critical in evaluating the RTI for Math process.

1. To what degree was the Delta Math RTI process implemented with fidelity?
2. How effective and efficient was the Delta Math screener in identifying students for the RTI process in math?
3. How effective was the use of the Delta Math RTI process at improving math achievement? (See page 20 for specific Common Core Standards assessed at each grade level.)
4. In what ways did the implementation of a Math RTI process and collection of Delta Math RTI Screening Data shift classroom instructional practice in the delivery of math instruction?

Participating Districts
Site selection began with the premise that we wanted buildings experienced in the RTI process in Reading. We also were looking for districts that had resources such as math coaches that were excited about embracing this work. We recruited 2 districts, Clarkston and Lamphere, which selected 2 elementary buildings each. For a complete description of the participating districts and schools see pages 13 to 15.

Summary of Key Findings

1. A key principle of all RTI systems is the focus on early identification and intervention with the purpose of preventing long-term academic problems. Identifying and addressing critical instructional needs as early as possible is essential to this prevention effort. It is for this reason that our Math RTI Pilot Project focused on implementing in grades K through 3.
2. Implementation of a RTI process for Math stimulated a much needed dialogue between teachers, math consultants, and district leadership regarding math curriculum, instruction, and student achievement in math. This ongoing dialogue was the first step toward changing math instructional practice and improving math achievement in the participating districts. Here are some examples of actions taken by the districts to improve Tier 1 math instruction:
    a. Both districts began to research new textbooks and curriculum resources to better support core instruction. In fact, both districts sent teams to participate in an OS Math Department Initiative that provided a systematic process to evaluate new potential math textbooks aligned with the new high standards of Common Core.
    b. In response to early numeracy needs identified by the screening data, the Lamphere Math Consultant implemented a new numeracy instructional resource, *Number Talks,* with a group of early elementary teachers. Meanwhile, Clarkston District Leadership initiated professional development focused on Number Sense with all of its K – 3 teachers during year 2 of the project.
    c. Another area of need identified by the universal screening data was fractions instruction. Lamphere district sent a team to an OS Summer Institute on Fractions the summer following year 2 of the project.
3. Evaluation and improvement of Tier 1 instruction is an essential first step in improving math achievement for all students. When large numbers of students (30% or more in the Delta Math RTI model) are not proficient on specific pre-requisite skills, Tier 1 interventions (whole class) are required. Of course, the Tier 1 intervention may be supplemented with Tier 2 interventions for more at-risk students requiring more time or intensive intervention. The process of collecting universal screening data helped schools to identify Tier 1 (Core Instruction) concerns needing to be addressed. Post data (progress monitoring) and year-to-year comparison data provided a data-based feedback loop for staff to evaluate in collaborative dialogues with their colleagues. These dialogues focused staff in answering questions about math curriculum and instruction such as: *"How are we doing with Core Math instruction? Are our action plans effective in "closing the gap" and improving math achievement deficits? Are we more effective at preparing students to meet grade level standards than before?"*
    a. Pre-post data from all schools and grade levels showed significant improvement in student achievement in areas of need identified by the screening data. For example, Subtraction within 5 (beginning 1st grade), subtraction within 10 (beginning 2nd grade) and subtraction within 20 (beginning 3rd grade) were identified as areas of need in all

buildings. The post-test data showed significant improvement in these skills following a semester of Tier1 and Tier 2 interventions. The high percentages of students having problems in these areas pointed to areas of math curriculum and instruction weakness which were subsequently addressed vis a vis interventions, curriculum resource reviews, and professional development leading to higher quality math instruction for all students in Tier 1 (Core Instruction). As stated by John Van de Walle, “One way to teach for equity, supported by extensive research, is guaranteeing that students have a highly qualified teacher with strong knowledge of and experience teaching mathematics.”

   b. Our third grade case study data demonstrates that remediating deficits can be done while continuing to work on grade level standards and objectives which lead to year-to-year math achievement gains for all students. The year-to-year comparison data from all schools from the Fall of 2013, showed 24 examples of grade level standards on which 30% or more of students failed to make criteria, but when looking at the readiness data for the 2014 school year this number was reduced to only 9 standards on which 30% or more failed to meet criteria. Although additional improvement is still needed, this data is a significant step forward in “closing the gap” and important first step in the process of continuous math improvement for all students. (See pages 24 – 26 for complete discussion of the data.)

4. The Delta Math Screener is unlike other traditional math screening tools. The assessments were developed specifically to align with the Common Core Math Standards at each grade level that were considered to provide an essential foundation for continued success in math at subsequent grade levels. The standards chosen are based on the work of Dr. William McCallum, one of the lead writers of the CCSS math standards who developed a list of "Required Fluencies in K-6" that he believes is necessary for all students to engage in the mathematical practices that include problem solving.
5. Initially, leadership (including that of Oakland Schools) believed that RTI reading experience would transfer directly into the new math initiative. In fact, it appeared that implementation of RTI for Reading actually competed with RTI for Math in terms of competing for limited access to infrastructure, resources, and time allocated to the different initiatives. It was difficult for buildings to implement both reading and math initiatives in the limited time and space allocated, particularly if attempting to implement with fidelity at all levels (Tiers 1, 2 and 3) of the system simultaneously.
6. A corollary to Finding #5 is the importance of allocating adequate time for Consensus and Infrastructure Building during the pre-implementation and early implementation phases of any RTI for Math initiative. It is essential that all staff participating in the project develop an understanding of the principles of RTI and the purpose or compelling need for implementing an RTI framework in their district. Building the required infrastructure for RTI, for example, setting aside time for teachers to talk to grade level and cross-grade level colleagues about math curriculum, instruction and student achievement in math, is an essential component for successful implementation of any RTI project. It is the Building Leadership Team’s responsibility to assure that this takes place.
7. An important missing piece in the implementation picture was the absence of cross grade level meetings. In the Delta model the data discussed in cross grade level meetings provide essential feedback to the teachers as to whether their exiting students have met standards essential for success at the next level. These meetings provide an opportunity for teachers

to identify gaps in their curriculum and instruction which may then be corrected in order to **prevent** future failure. It is also important that a Math Coach or Math Instructional Specialist be part of these discussions. Because the Delta Math RTI model does not call for universal screening of kindergarten students, the K -1 cross grade level meetings provide the only opportunity for kindergarten teachers to participate in a data-based discussion of math curriculum and instruction. Thus, our Pilot districts missed an important opportunity to implement needed preventative and corrective actions adjusting kindergarten curriculum and instruction.

8. Strong evidence from research validates the efficacy of the use of universal screening assessments. In addition, our own study documents the predictive validity of the Delta Math Screening Total Score and the Addition Fluency (within 20) subtest score at predicting general math outcomes on MEAP and NWEA. Despite this evidence, participating staff (including administrators) remain concerned and perhaps confused about the purpose of screening assessments and the specific role they play as part of a comprehensive math assessment regime, which includes: outcome assessments, diagnostic assessments and other formative assessments, working in concert with universal screening and progress monitoring assessments. The importance of having universal screening and progress monitoring assessments in place that provide regular feedback to teachers enabling them to plan and evaluate the effectiveness of their instruction cannot be overstated. Mandated annual outcome assessments like MEAP cannot provide the immediate and frequent feedback teachers need to make these data-based instructional decisions and evaluate the results. It should be reassuring that the screening and progress monitoring tools employed in our Pilot study also correlate highly with the state mandated math assessment and the NWEA Math assessment which is becoming more widely used. (See pages 17 and 18.)
9. Building on items 7 and 8, it is particularly important to note that in the context of our Pilot study, the fluency assessments related to addition and subtraction within 5 (Kindergarten Standard), within 10 (Grade 1 Standard) and within 20 (Grade 2 Standard) were often misinterpreted as representing procedural deficits in addition and subtraction. It is the opinion of this team that this is a misreading of the data. Poor performance on these very simple math operations represents instead significant deficits in Number Sense rather than procedural deficits. The data first identified such deficits in students exiting kindergarten, and the deficits persist throughout the elementary grades. These deficits in Number Sense appear to be caused by a lack of instructional focus and regular allocation of academic time to routines which incorporate activities involving the composing and decomposing of numbers within 5, 10 and 20, and the use of tools that would facilitate the internalization of number sense such as regular use of the number line, the 5-frame, 10-frame, and double 10-frame that provide a concrete or visual representation of the persistent patterns that exist in working in the base 10 system.

   The incorporation of the regular use of multiple representations of math content (working from the concrete to the visual to the symbolic) into Tier 1 math instruction is a desired change in practice for Core math instruction. The importance of developing a solid foundation in Number Sense and its relationship to later math achievement is a conclusion shared both by this Team and the research on math instruction and achievement.

Conclusions

The desired outcome of implementing any RTI initiative is to engage staff in a process that leads to data-based teacher reflection, improved Core instruction in Tier 1, and improved achievement for all students. This is how primary prevention works. The most common misconception about RTI is that we screen all students to identify who needs and receives intervention and potentially who is eligible for Title One and Special Education support. At the heart of the RTI model is a sense of shared responsibility to evaluate the quality of instruction being delivered; engage in a process of systemic continuous improvement, and begin a shift in instructional practices that leads to improved teaching and, consequently, improved learning for all students.

RTI is a long term systemic change initiative usually requiring 3 to 5 years to achieve fidelity of implementation. In our Delta Math RTI Pilot Project our participating districts and schools began a process of implementing RTI for Math that we studied for a period of 1.5 to 2 years. This was not near long enough to achieve high levels of fidelity of implementation of the RTI framework. During that time period, however, all 4 schools saw evidence of improved math achievement, and we would expect that improvement to continue as districts sustained their efforts and worked toward full implementation of RTI for Math with fidelity.

Another important principle of RTI is the focus on early identification and prevention of academic problems. This is the reason that our RTI for Math Pilot Project had a K – 3 focus. Universal screening data collected during the Pilot clearly showed that deficits in number sense can be identified as early as Kindergarten, and these difficulties often persisted into grades 1, 2, 3 and beyond unless specifically addressed. The absence of purposeful Kindergarten Teacher participation in our systemic math improvement initiative was an important missing piece in prevention efforts. It is the recommendation of the Oakland Schools Team that in the future Kindergarten Teachers be systematically included in cross-grade level meetings with their Grade 1 colleagues, and that universal screening of kindergarten students on essential Common Core Math standards (such as the Delta Math Grade 1 Readiness Standards) begin during the second semester of kindergarten. The importance of analyzing and improving Tier 1 Core Math instruction at the kindergarten level cannot be overstated. The foundations of conceptual understanding of numbers and base 10, the foundations of which are established in kindergarten, affect all future math learnings as students move through subsequent grade levels of math curriculum.

Finally, teacher reflection, collaboration, and instructional problem-solving for math, (based on data from standards-based common assessments) are the essential ingredients in a continuous improvement process for math. It is this data-driven collaboration which enables teachers to identify strengths and weaknesses in math curriculum, instruction, and student learning which must be addressed. Data-based instructional problem-solving is also the key to identifying the need for strategic professional development for teachers which will improve their math content and pedagogical knowledge and lead to improved math achievement for all students. Such teacher collaboration is dependent upon the systematic use of a set of standards-based, common math assessments that will drive and focus the discussion. That being said, we leave you with this question, “If not Delta Math, then what set of standards-based common math assessments will be used to drive this continuous improvement process?”