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August, 1, 2010

Action Research Plan

- **What are the needs of my low performing math students?**
- **Is the child showing growth as a result of the implemented interventions?**
- **Will providing struggling students with an individualized remediation plan improve their math confidence?**

Introduction

Math is one of my passions and an area in which I excel. My long term career goal is to teach middle school math or take on a math intervention position. Therefore, I wanted to further develop my knowledge of mathematics. Last year, our county adopted a new math text book series called *Math Expressions*. One of the major components to the program is "Math Talk" where the students explain their methods to the class while other students ask questions. While observing my students participate in Math Talk, I realized several students have low math confidence. I feel that a primary factor in having a low confidence level is due to low past performances. Some of these students are significantly below grade level. I am struggling to meet their needs since I have a very limited amount of math intervention resources available. Therefore, this is the area that I want to develop and improve my practices in order to better meet the needs of my low performing math students.

I will assess these students' instructional levels and then find appropriate interventions. Once I determine the appropriate interventions, I will set the proper goals and monitor the progress of these focal students. I feel it is more important to assess for mastery rather than getting a set number of problems answered correctly in a specified time. However, if our goal is to increase that student's fluency of math facts, than a timed test would be necessary. In conclusion, since there is not research stating that timed or un-timed tests have proven to be more beneficial, I will base this decision on the child and the goal we have set for him or her.

Providing these children with positive and successful experiences will therefore help improve their math confidence. As a result, my focus questions for my action research are: What are the needs of my low performing math students? Is the child showing growth as a result of the implemented interventions? Will providing struggling students with an individualized remediation plan improve their math confidence?

I know this is a researchable, context and intervention based project since last year I conducted progress monitoring for a student performing well below grade level in reading. This was a much easier process since the literacy department had the instructional levels determined, many interventions available, a set of reading passages at each level, and predetermined goals. I will be following a similar process, but focusing on math. To make this project manageable, I will begin this progress monitoring process with just one student.

Observations of students being well below grade level and having low confidence:
- Students do not do their homework (due to not knowing how to do it)
- Students appear bored or not engaged during the lecture (over their head)
- Students to not participate in math class- draw, play with pens/pencils
- Students are discouraged and frustrated
- Students repeatedly fail math assessments

Possible barriers:
- Feel intimidated/uncomfortable to ask questions
- Do not have the skills to participate
- Are embarrassed
- Have trouble understanding vocabulary
- Low self esteem/motivation
- Lack of a cultural support system

Action Plan:
1. Observe students in class and look at assessment data
2. Identify students who are struggling academically and have low confidence
3. Choose one student with whom to conduct interventions
4. Ask student questions in the form of a survey or interview to identify feelings and attitudes toward math
5. Assess the student to find his/her instructional level
6. Set proper goals
   a. Choose appropriate intervention
   b. Figure out number of days and time to spend on intervention
   c. Figure out baseline-where student's ability is currently at
   d. Set a goal for student to reach before moving on (either reaching goal within a time limit or showing mastery by getting a certain percentage of the questions correct)
   e. Decide when and what to progress monitor
7. Implement intervention
8. Progress monitor weekly
9. After 3 weeks, re-evaluate progress monitoring
   a. If the trend line is steeper than the goal line, the performance goal needs to be increased
   b. If the trend line is flatter than the goal line, the student's instructional program needs to be revised
   c. If the trend line and goal line are fairly equal, no change needs to be made
10. Continue process until student is where he/she needs to be
11. Analyze and interpret data by looking at progress monitoring data, test scores, class work, observations of student, and performing another survey or interview to identify feelings and attitude toward math

I am planning to work on this action research project independently. However, I would love to collaborate with other teachers at my school if they were interested. I know many of them feel the same way about the limited amount of math intervention resources available. I believe there are many benefits to collaboration in that one can develop a greater variety of interventions and methods. It would also be helpful to compare data and results.

Literature Review

Progress monitoring is a scientifically-based practice that can be implemented with an entire class or individual students to assess the students' academic performance and to determine the effectiveness of instruction. Teachers use progress monitoring so "they are better able to identify students in need of additional or different forms of instruction, they design stronger instructional programs, and their students achieve better" (Fuchs & Fuchs, 1). In a case study of a third grade math student, progress monitoring consisted "of teacher observation and teacher-generated prompts" (2006, 28). There are three Tiers of students. Tier 1 students meet proficiency from general instruction, Tier 2 students need additional small group instruction, and Tier 3 students need more individualized interventions. The main purpose of progress monitoring Tier 2 and Tier 3 students "is to determine whether the intervention is successful in helping the student learn at an appropriate rate" (2006, 4).

Curriculum-Based Measurement (CBM) is one type of Curriculum-Bases Assessment (CBA). CBM has a prescribed method for creating, administering, scoring, and interpreting the tests.   "Each CBM test assesses all the different skills covered in the annual curriculum" (Fuchs & Fuchs, 1), and it is thus a helpful tool for educators to chart and record student progress with skills over the year. On the other hand, CBA requires teachers to create their own assessment procedures in which the tests often focus on one skill. This is often referred to as "Mastery Measurement". Since these methods are designed by teachers, they are not as reliable and do not reflect maintenance of skills throughout the year. CMB materials and computer software programs need to be purchased. Therefore, schools may have rely on CBA in which the teachers would be designing the assessments.

The *Student Progress Monitoring in Mathematics* PowerPoint gave me valuable information for conducting Curriculum-Based Measurement (CBM). First of all, it provided instructions on how to determine the student's appropriate level of material for progress monitoring. It then went through the steps of how to administer and score the CBM math probes (tests). Next, you would plot the date and score of the test on a line graph. This presentation also explains how to set ambitious goals and how monitor these goals depending on the progress of the student. These steps are closely aligned with my action plan. In addition, the presentation provided a description of how to use the graph in order to evaluate student progress and formulate instructional decisions. The presentation stated that if the trend line is steeper than the goal line, the performance goal needs to be increased. If the trend line is flatter than the goal line, the student's instructional program needs to be revised. Lastly, if the trend line and goal line are fairly equal, no change needs to be made. (Stecker, 2007, 75)

If a school cannot purchase CMB materials, "The Number Knowledge Test" (or NKT) is another effective tool used to assess a student's academic performance. The Number Knowledge Test is an assessment of "students' procedural and conceptual knowledge related to whole numbers" (Gersten, Clarke & Jordan, 2007, 14). The purpose of the Number Knowledge Test is "to help teachers differentiate instruction and in some cases offer more intensive intervention to students who lack the foundational knowledge to understand and master the primary grade curriculum" (Gersten, Clarke & Jordan, 2007, 14). After implementing the NKT, the teacher would have a good idea of the student's instructional level and would be better able to design interventions and probes, in which progress monitoring could occur.

Providing low performing children with positive and successful experiences has been shown to improve their math confidence. According to Julia A. Sliva and Mary Fay-Zenk, "Success in solving mathematics problems is not based solely on one's knowledge of mathematics. It is also based on processes related to the use of mathematics strategies, the emotions an individual feels when doing a problem, and personal beliefs in one's mathematical abilities" (Sliva & Fay-Zenk, 2004). It is essential that the teacher has a thorough understanding of her students and their needs as it relates to the curriculum. Furthermore, teachers need to instill the belief in their students that can and will be successful in learning mathematics.

Data Collection Methods

Research Questions:
- **What are the needs of my low performing math students?**
- **Is the child showing growth as a result of the implemented interventions?**
- **Will providing struggling students with an individualized remediation plan improve their math confidence?**

Instrument	Description of the Instrument	Schedule for Collecting Data
Math Assessments	At the beginning of the year look at the previous year's EOG (End of Grade Test) scores and first and/or second unit math assessments to identify struggling math students *Recorded in grade book	-At the very beginning of the year
Number Knowledge Test	-Will assess the "student's procedural and conceptual knowledge related to whole numbers" (Gersten, Clarke, & Jordan, 2007, 14) -This will inform the teacher of any gaps in the student's knowledge and where to begin interventions	-Use this assessment prior or progress monitoring -Re-assess to check student's growth
Baseline	Give student 3 tests on the determined concept child will be working on. The median score will be the baseline or starting point. This is the student's current ability level for that concept. *Record on Progress Monitoring Record &Progress Monitoring Graph	-Determine a new baseline after the goal has been met
Observations	Observe the students during math class. Look for the following behaviors that may be a factor to having low confidence: • Students do not do their homework (due to not knowing how to do it) • Students appear bored or not engaged during the lecture (over their head) • Students to not participate in math class- draw, play with pens/pencils • Students are discouraged and frustrated • Students repeatedly fail math assessments *Record in teacher journal	-Homework is documented daily -Class observations: make notes weekly of trends observed or if something significant happened record that day -Math assessments-every few weeks when unit ends -Math quizzes- once a week or every couple days depending on the unit
Survey or Interview	Depending on the student's writing ability, I will either give a pre/post survey or interview to the student to identify their feelings and attitudes towards math	-One time before and after working with the child and progress monitoring him/her
Intervention	Will choose an appropriate intervention depending on the concept and need of the child. Will make observations on how the student is progressing during the intervention. *Record on Progress Monitoring Record	Typically: 10 min, 3 times per week (Depending how the child is progressing may increase or decrease)
Progress Monitor	Will formally assess the child on the specific concept. Achieving 80% accuracy will be mastery.	Once a week

	*Record on Progress Monitoring Record &Progress Monitoring Graph	
Progress Monitoring Graph	Will plot student's baseline score and goal score to create a goal line. Then each week the date will be recorded and the score will be plotted by a point on the graph. (Modified from BES Blackboard)	Graph results once a week
Re-evaluate Progress Monitoring	Monitoring the Progress Monitoring Graph: • If the trend line is steeper than the goal line, the performance goal needs to be increased • If the trend line is flatter than the goal line, the student's instructional program needs to be revised • If the trend line and goal line are fairly equal, no change needs to be made (Stecker, 2007, 75)	Every 3 weeks
Progress Monitoring Record	Includes: • Date- will be recorded • Intervention/Progress Monitor- will indicated which one is being completed • Description of Skill the Child is Working On • Observations of How the Child is Progressing- what they are doing well, what they are still struggling with, their confidence while working on the problems • My Response/What it Means for My Research- my own interpretations/understandings, decisions I make, what I will continue watching for, what we will continue working on (last two columns are similar to the double-entry journal as shown in Capobianco's article)	Fill out 3 times per week

Triangulation Matrix for Meeting the Needs of My Low Performing Math Students

Interview Questions	Data Source #1	Data Source #2	Data Source #3
What are the needs of my low performing math students?	Number Knowledge Pre/Post Test	Progress Monitoring Record	Progress Monitoring Graph
Is the child showing growth as a result of the implemented interventions?	Progress Monitoring Record	Progress Monitoring Graph	Number Knowledge Pre/Post Test
Will providing struggling students with an individualized remediation plan improve their math confidence?	Survey/Interview	Class Observations	Progress Monitoring Record

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Appendices

Interview/Survey Questions

1. How do you feel about math?

2. Do you enjoy math?

3. What are some positive experiences you have had with math?

4. What are some negative experiences you have had with math?

5. How do your parents feel about math?

6. What is difficult about math?

7. What is easy about math?

8. What did you like/dislike about your past math teachers?

9. Is there something your teacher could do differently to improve your learning?

10. Do you consistently complete your math homework? Why or why not?

11. Do you feel confident discussing math with your classmates?
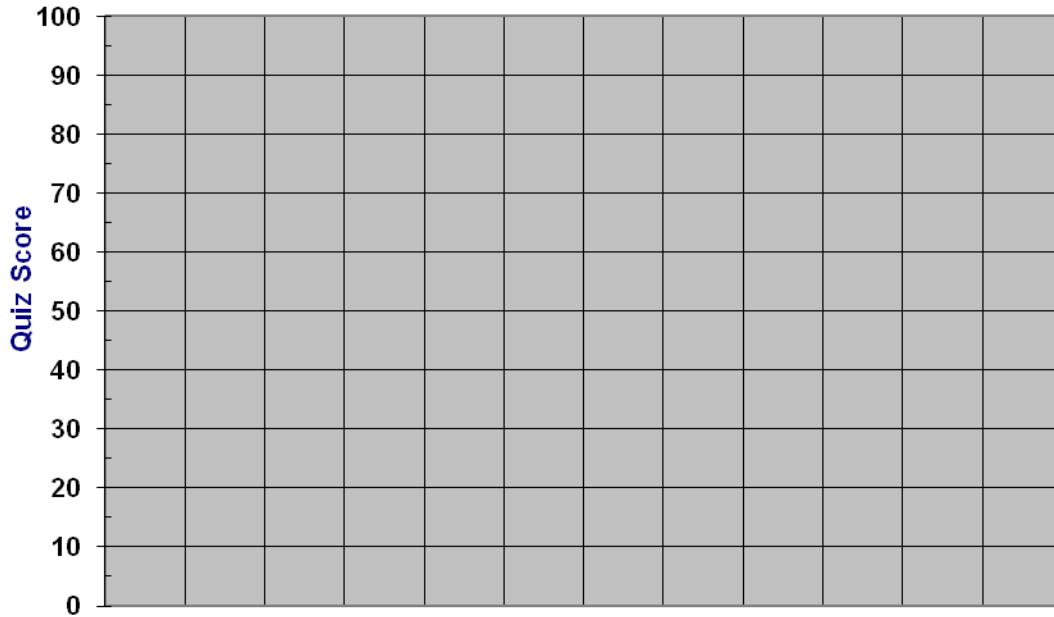
Progress Monitoring Record

Name:

Goal:

Baseline:

Intervention:

Progress Monitor:

Date	Intervention/ Progress Monitor	Description of Skill the Child is Working On	Observations of How the Child is Progressing	My Response/ What it Means for My Research

_____'s Progress Monitoring Chart
My Goal is 80%.

Quiz Score

100
90
80
70
60
50
40
30
20
10
0

Dates of PM Probes