



Math Solutions Professional Development for MITs Session Reflections

November 14-16, 2007

Newport, KY

Respondents

Math Intervention Teachers	54
Administrator/Other	5
Total	59

Description

Math Solutions is a professional development program intended to help mathematics teachers focus on and guide students in building the foundational understandings they need to be successful. This particular session was designed to help teachers: 1) build knowledge of the development of student understanding in the areas of number, operations, and quantitative reasoning 2) use knowledge of how children learn to facilitate lessons that support student success 3) assess student understanding and use that information to guide instruction 4) build expertise in the use of questions to probe and support student understanding 5) use instructional strategies that scaffold and pace the learning, make connections explicit, build vocabulary, and provide practice.

Respondents and Instrumentation

This session was primarily attended by Kentucky Mathematics Intervention Teachers currently implementing the Number Worlds program. Additionally, a small number of administrative personnel attended the session. Data from this session was collected from 59 attendees using the Math Solutions session reflection survey. This instrument is a five question, open-response survey designed to measure opinions and attitudes regarding specific aspects of the professional development.

Data Analysis and Reporting

Respondents typically used rich, descriptive language to produce complex responses featuring multiple ideas. Responses to survey questions were coded and grouped according to emergent themes. Given the inevitable variance

produced by an open-response format, themes are identified as *major* when more than 10% of the responses (≥ 6) typified a particular topic. Description of minor themes is also provided to demonstrate response variance. Lastly, sample responses are presented to illustrate significant themes.

Results

1. From your perspective, what were the important ideas presented today?

Respondents identified six major themes related to this question. 28 respondents listed questioning and listening strategies as important. 21 respondents identified ideas relating to student exploration, problem-solving, and conjecture as important. 18 respondents acknowledged student discourse and communication (i.e. verbalization, writing) related to mathematics as important. The internalization of number sense, emphasis on multiple solutions, and learner-driven instruction were identified as important by 12, 11, and 9 respondents respectively.

Additional minor themes included manipulative use, student collaboration, and material related to presented articles and videos.

Sample Responses:

Questioning and listening strategies

- “The value and importance of using questioning strategies to allow students to guide the instruction.”
- “My role is to facilitate student learning by questioning and letting students discover their answers, not teaching on ‘right’ method.”

Student exploration, problem-solving, and conjecture

- “Allow your students to explore and discover.”
- “Allow students to explore in order to make sense of learning.”
- “Students need to be given the opportunity to explore, make observations, and come to understanding on their own.”

Student discourse and communication

- “Allowing students to talk about their reasoning.”
- “Providing opportunity for math talk.”
- “How to lead communication between students.”

Number sense

- “Number sense and how to present it in a small group environment.”
- “Giving students the opportunity to develop number sense through flexible thinking in order to create depth of understanding.”
- “Children need to understand and internalize number sense.”

Multiple solutions

- “Students should be exposed to multiple ways of solving problems through discussion with their peers.”
- “There can be more than one way to solve a problem.”

Learner-driven instruction

- “Math instruction must be geared to the way students learn. . .It must be about questioning, listening, and delving deeper into students’ true understanding.”

Minor Themes

- “I really enjoyed the article *Never Say Anything a Kid Can Say*.”
 - “Important ideas to me were the emphasis on using manipulatives.”
 - “Group work is valuable.”
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2. What one thing made the greatest impact on you?

Respondents identified three major themes related to this question. 21 respondents listed the *fids & glots* simulation of child experiences and frustrations with unfamiliar mathematical content as highly influential. This input consisted of exposing participants to procedurally oriented classroom instruction surrounding a relatively unusual ternary (base-3) numeral system. Activity related to questioning and listening strategies as well as student discourse and communication were cited as impactful by eight and six respondents respectively.

Additional minor themes included inputs related to: specific teaching tactics, roles of the student and teacher, promotion of sustained hard thinking among students, and articles/videos. Presenter professionalism was also identified as a minor theme regarding impact.

Sample Responses:

Fids & Glots simulation

- “(*Fids & Glots*) activity was great for seeing how students become confused because of things we do as teachers.”
- “The simulation of being a student and learning a new concept.”
- “The (*Fids & Glots*) activity really opened my eyes to my method of teaching and how my students feel. It really put me in their shoes.”
- “This lesson took me way out of my comfort zone and forced me to feel like my pupils.”
- “(*Fids & Glots*) was an excellent way for me to see through the eyes of a struggling student.”

Questioning and listening strategies

- “I enjoyed the focus on effective questioning and the different levels of math questions.”
- “Understanding the importance of questioning; not only the questions posed by the teacher, but allowing more time for student questioning as well.”

Student discourse and communication

- “Having students openly talk about how they solved a math problem is so important. Verbal communication helps students begin to fully understand math and not see math as numbers.”
- “Students need to be able to communicate and describe what they are doing not just arrive at a right answer.”
- “The importance of stepping back and letting kids do the talking.”

Minor Themes

- “I really enjoyed the article *Never Say Anything a Kid Can Say*.”
 - “The professionalism of the presenters.”
 - “I need to allow my students to struggle and place the responsibility for learning directly on their shoulders.”
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3. What do you think you will try in the classroom as a result of this session?

Four major themes emerged from responses to this question. 29 respondents stated an intention to modify their questioning and listening strategies as a result of this development. 13 respondents identified student discourse and communication related to mathematics as something they hope to feature more prominently in their classroom. Nine respondents stated an intention to use games and materials presented at the development in their classrooms, and six respondents indicated that they plan to offer students increased opportunities for exploration, conjecture, and problem solving.

Additional minor themes included intentions related to specific teaching tactics (i.e. increased wait time, limiting teacher paraphrasing or restating), modification of arithmetic task presentation, manipulative use, and learner-centered instruction.

Sample Responses:

Questioning and listening strategies

- “I will definitely make use of the questioning strategies.”
- “Letting students question one another.”
- “I plan on trying to question more and be a better listener.”
- “I hope to become a better questioner to evoke student thought.”

Student discourse and communication

- “Allowing students to talk about their reasoning.”
- “More open-ended discussions.”
- “Allowing students to talk and write about math in their own way.”
- “Allowing students to talk about how they solved a problem.”

Games and Materials

- “Activities to develop number sense: 101 and out, 2-dice sum game, 0-99 & 0-100 chart.”
- “I will definitely play the games.”

Student exploration, problem-solving, and conjecture

- “Helping students become better learners by letting them explore.”
- “Allow students more opportunities to discover the answers.”
- “Much more problem-solving situations.”
- “Allow students more exploration.”

Minor Themes

- “Not try to paraphrase everything my kids say.”
- “To check understanding more with manipulatives.”
- “Group work is valuable.”

4. What changes (general or specific) would you recommend to improve this session?

Two significant themes emerged from responses to this question. 17 respondents indicated that they would make no changes to the professional development session while six respondents stated a preference for shorter days.

Additional minor themes identified a need for more frequent breaks, reduction in the length of activities, and the provision of additional materials.

Lastly, a significant number of individuals did not provide a response to this question.

Sample Responses:

No changes

- “None! I liked the mix of activities, videos, and theory.”
- “None. I really enjoyed the 3 days and feel like it was very worthwhile.”

Shorter days

- “The days were a little long for these old bones.”
- “8:30-4:30 is a long day.”

Minor Themes

- “The sessions were a little long.”
- “I do think more frequent breaks would be a good idea.”
- “More copies. If you put it on the overhead, chances are I will want a copy.”

5. Additional Comments

Although no major themes emerged from this question, the general response tone was overwhelmingly affirmative regarding the nature of the training. Indeed, 40 respondents commended the training and/or trainers.

Sample Responses:

- “Best training I have attended! Ever! Very, very helpful and things that can be put to use in the classroom.”
- “Excellent 3 days. I appreciate all of the information, articles, activities presented. Thank you for sharing instructional strategies and research based materials.”