

# Student Voices: Student Stakeholder Sessions



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**NCTM Innov8 Conference**  
**St. Louis, Missouri**  
**November 18, 2016**

- During these sessions, a panel of elementary and middle grades students will share their stories of struggle in mathematics and their perspectives on how students can and should be supported. Learn how the teachers of these students helped them find success in mathematics. – Well, sorta...

# Establishing a Foundation



## Beliefs about access and equity in mathematics

Beliefs about teaching and learning mathematics	
Unproductive beliefs	Productive beliefs
Mathematics learning should focus on practicing procedures and memorizing basic number combinations.	Mathematics learning should focus on developing understanding of concepts and procedures through problem solving, reasoning, and discourse.
Students need only to learn and use the same standard computational algorithms and the same prescribed methods to solve algebraic problems.	All students need to have a range of strategies and approaches from which to choose in solving problems, including, but not limited to, general methods, standard algorithms, and procedures.
Students can learn to apply mathematics only after they have mastered the basic skills.	Students can learn mathematics through exploring and solving contextual and mathematical problems.
The role of the teacher is to tell students exactly what definitions, formulas, and rules they should know and demonstrate how to use this information to solve mathematics problems.	The role of the teacher is to engage students in tasks that promote reasoning and problem solving and facilitate discourse that moves students toward shared understanding of mathematics.
The role of the student is to memorize information that is presented and then use it to solve routine problems on homework, quizzes, and tests.	The role of the student is to be actively involved in making sense of mathematics tasks by using varied strategies and representations, justifying solutions, making connections to prior knowledge or familiar contexts and experiences, and considering the reasoning of others.
An effective teacher makes the mathematics easy for students by guiding them step by step through problem solving to ensure that they are not frustrated or confused.	An effective teacher provides students with appropriate challenge, encourages perseverance in solving problems, and supports productive struggle in learning mathematics.

(NCTM, 2014)

<http://www.nctm.org/PtA>



Oh my...

<https://www.youtube.com/watch?v=jrmiJlyDyBM>



**And more...**

<https://www.youtube.com/watch?v=PgvIUkxhVfM>

# What happens?

- A number of studies have indicated that many children begin schooling with positive ATM; these attitudes, however, tend to become less positive as children grow up, and frequently become negative at the high school level (Ma & Kishor, 1997).
- Pressure exercised on students to cope with highly demanding tasks, often at a pace beyond their ambition, together with unimaginative instruction and non-positive teacher attitudes, have destructive impact on their ATM (Philippou & Christou, 1998).

# PISA – Teacher/Student Survey Results

- Only 38% of the students responded that they study math because they enjoy it. On average, 43% of the students believe they are not good at math. 65% of the girls are concerned that they will have difficulty in math as compared with 54% of the boys.
- Students exposed to contextual problems in mathematics tend to be more positive.
- When computers are used in mathematics lessons, students reported greater motivation for learning mathematics.

# Using Student Voice to Make Instructional Decisions

# Think about...

- Admittedly tricky at the elementary school level, in particular, BUT...
- In what ways are your students' voices influencing improvement of mathematics classroom instruction in your school or district?
- **Got it?**

# Using Student Voice to Make Instructional Decisions

Consider the following questions:

1. To be good in math, you need to \_\_\_\_\_ because \_\_\_\_\_.
2. Math is hard when....
3. Math is easy when....
4. The best thing about math is...
5. If you have trouble solving a problem in math, what do you do?
6. I learn math when....
7. I am happy in math when...
8. I am unhappy in math when...
9. One thing I wish we would do in our math class...
10. My teachers believe ....

Whitin, 2007; and others

# What do you notice about the responses?

- Themes
- Trends
- Struggling Learner Perspective

# Your turn...

Discuss (table time):

1. Where and when do your students struggle in mathematics? (topic-wise, grade-level wise, anything is fair game here!)
2. How can your students (all of them) be supported? **Share** what you ARE doing and what you would LIKE to do – support-wise.



**And, of course...**

Well, I was never really good in  
math...

# PISA – Teacher/Student Survey Results

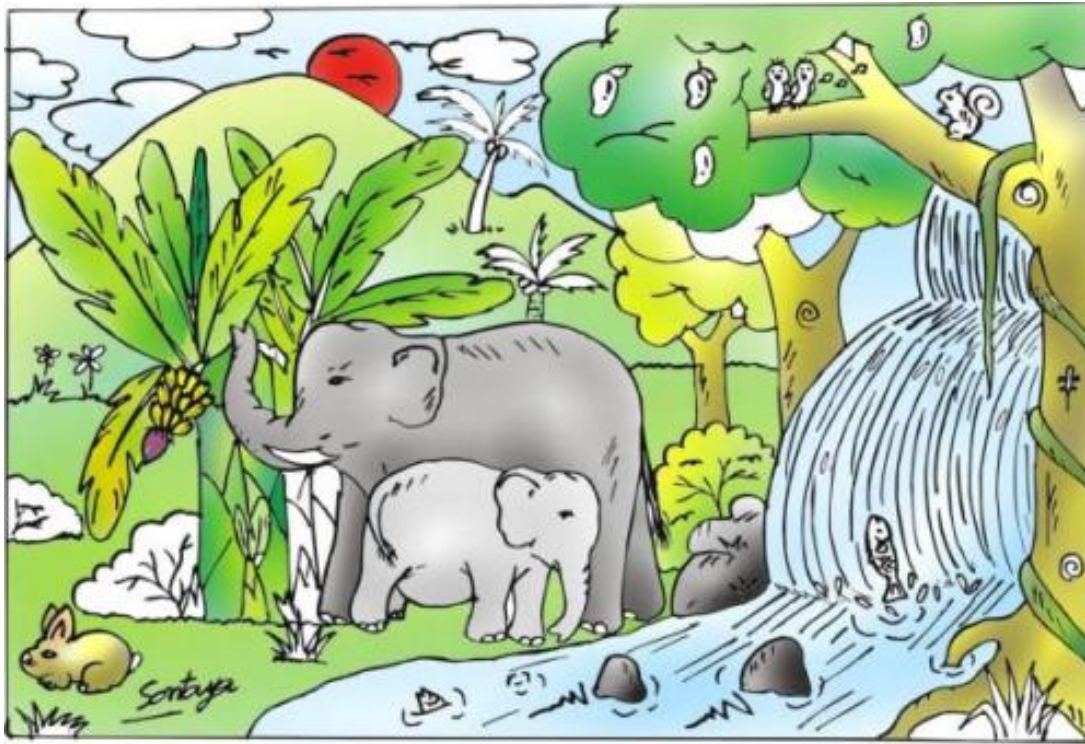
- Classroom climate is key – positive school environment, including support for teachers and good classroom management. Finding: there is a link between how teachers teach and relationships they have with their students.
- Note: Weaker students are less confident; don't do as well on more challenging problems. Student socio economic status influences student attitude toward the subject and their self-confidence.
- Consideration: Make students aware of math in their life and potential careers – bring in guests (architects, landscape, trees, rugs, tiling, sports data, etc.)

**How might struggling learners  
respond to the following?**

**Learning Math** is like learning a new cooking recipe. The teacher or book gives you step-by-step instructions. You just do what they say.



Math is like a jungle. The ideas are all jumbled up.



**Learning math** is like building a wall. You have to lay the bricks in order. You have to learn math in a certain order.



You don't need to understand how math works, you just need to practice doing it.



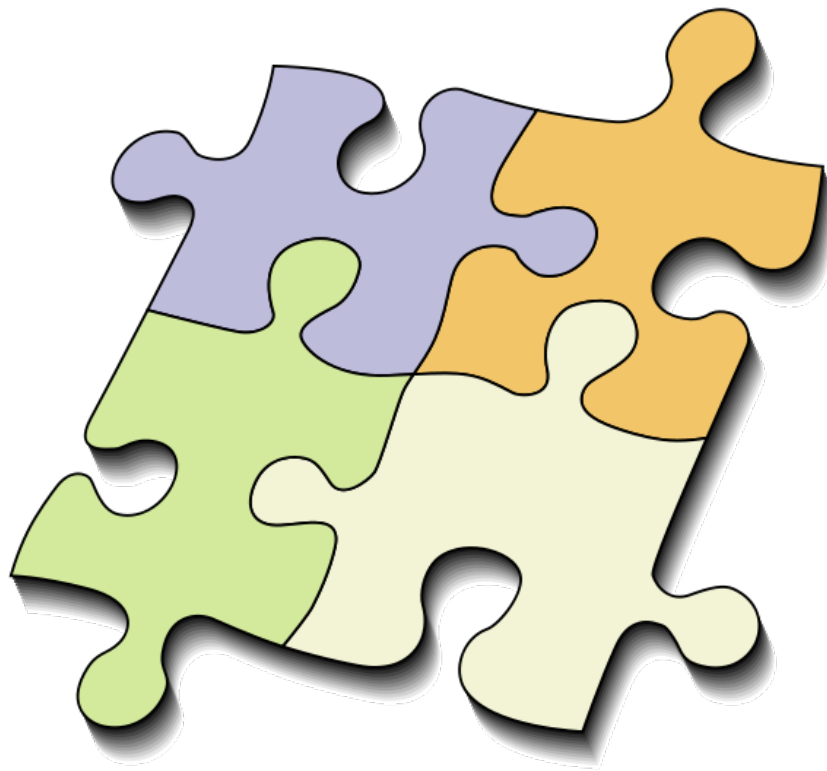


Learning math is like exploring an unknown country. You make lots of choices, where to go, what to do.

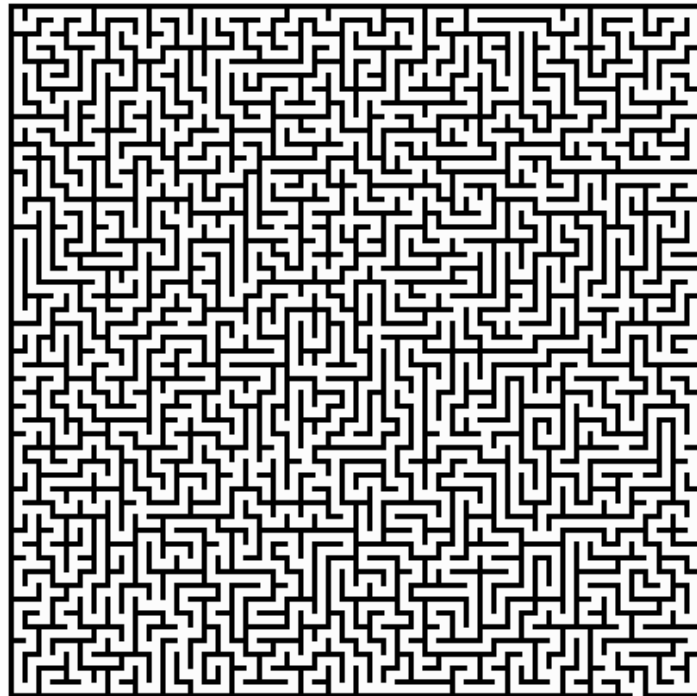




Math is like a jigsaw. The ideas fit neatly and beautifully together.



Doing a math problem is like finding your way through a maze. There are lots of possible pathways to go down.



**Consider the following student responses.**

# I am happy in Math when...

① One time I was happy while learning math was when my old teacher was teaching it to the class and we all would be doing it together we didn't have to do it all by ourself.

# I am unhappy in math when...

2. I feel unhappy when I am forced to use methods I don't like.

# My teachers believe...

5. I think that some of my teachers believe that I just can't do it and sometimes they think that I will succeed.

# My teachers believe...

5. My teachers believe that if I'm not doing good in a subject that I could try harder.

Students “need to be interested in and see the value of the tasks in which they are asked to engage.

For example, David said that “when you complete something important, then that’s pretty cool I did that,” which supported the concept that reluctant learners will engage in school if they see the value in the task.

Instead of trying to “get praise from somebody above you”

the students wanted to find activities that “relate” because “it’s interesting then” (Daniels & Araposthathis, 2005).



Trends Implied by the Surveys	Positive Attitudes, Dispositions, Beliefs	Instructional Plans for Change
<p>Mathematics is a solitary, silent endeavor.</p>	<p>Collaboration and communication contribute to mathematical understanding.</p>	
<p>The teacher is in charge of imparting knowledge. The rewards for developing mathematical expertise are external and are often postponed until the future.</p>	<p>Mathematics involves learners in constructing meaning for themselves. The rewards for developing expertise are intrinsic.</p>	
<p>Problems are solved in a swift, prescribed manner.</p>	<p>Problems are solved through flexible use of multiple strategies.</p>	
<p>Mathematics is unrelated to other subjects</p>	<p>Mathematics has real-life application across the curriculum and contexts outside school.</p>	<p>Emphasizing content-related</p>

Trends Implied by the Surveys	Positive Attitudes, Dispositions, Beliefs	Instructional Plans for Change
Mathematics is a solitary, silent endeavor.	Collaboration and communication contribute to mathematical understanding.	Structure group tasks; make children's strategies public; encourage children to note others' contributions to their learning.
The teacher is in charge of imparting knowledge. The rewards for developing mathematical expertise are external and are often postponed until the future.	Mathematics involves learners in constructing meaning for themselves. The rewards for developing expertise are intrinsic.	Encourage interaction, revisiting, extending (Schwartz, 1996); involve students through student-authored problems, mathematics journals.
Problems are solved in a swift, prescribed manner.	Problems are solved through flexible use of multiple strategies.	Encourage strategy sharing, problem posing investigations, extended explorations, mathematics journals (Whitin & Whitin 2000)
Mathematics is unrelated to other subjects	Mathematics has real-life application across the curriculum and contexts outside school.	Emphasize content related problems.

# Notice My Strengths – please!

In many cases, students will gravitate toward activities in which they show the most aptitude, and the success they experience will increase their desire and confidence to take risks in other academic areas (Daniels & Araposthathis, 2005).

# What do you BELIEVE about me?

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An effective teacher makes the mathematics easy for students by guiding them step by step through problem solving to ensure that they are not frustrated or confused.	An effective teacher provides students with appropriate challenge, encourages perseverance in solving problems, and supports productive struggle in learning mathematics.

# What do students believe about their teachers?

The teachers are the biggest thing . . . when the teachers pay attention to you like you're a student; like you're a person not a grade."

When the students felt that their teacher was their ally and advocate as opposed to their enemy and opponent, they also believed that the teacher's ultimate goal was student success, not failure. It is important to build communities where the students trust in the authority (Daniels & Araposthathis, 2005).

# How Important is Student Participation (Really)?

- Student participation positively predicted student achievement. The more actively students participated, by explaining their own thinking and engaging with the ideas of other students, the higher were their achievement scores.
- The more frequently teachers supported students' participation, the higher were students' levels of participation.

(Ing, Webb, Franke, Turrou, Wong, Shin, & Fernandez, 2015)

Wouldn't this be nice - everyday!

[https://www.youtube.com/watch?v=Z\\_RH2qcpxaM](https://www.youtube.com/watch?v=Z_RH2qcpxaM)

**What are your next steps as  
you support your students –  
all of them?**



# Questions?

[www.mathspecialists.org](http://www.mathspecialists.org)

 **ems&tl**

*Elementary Mathematics Specialists  
& Teacher Leaders Project*