

Making the New Ohio Math Plan Work

A conversation with OCTM President Mike Lipnos on agency and leadership in mathematics.

By Tuto Lopez Gonzalez

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For nearly three decades, Mike Lipnos taught math the way most educators were trained to teach it: explaining how to solve problems, showing when to use certain methods, and guiding students toward correct answers. He was “the big answer key in the front of the room.” Then he made a promise: he would teach in a way that develops thinkers, not answer-seekers. That decision led him to learn an entirely different way of working with mathematics and with young people.

Now, as President of the Ohio Council of Teachers of Mathematics (OCTM), Lipnos is trying to transform an entire state’s approach to math education. Ohio just released a plan that, for the first time, dictates not just *what* students learn, but *how*: they should “behave mathematically”—think, problem-solve, persevere. Lipnos has watched reform efforts come and go since the 1960s, each abandoned too quickly. This time, he argues, has to be different. And the difference comes down to leadership.

“We’ve become the big answer key in the front of the room. I’m not interested in right answers. I’m interested in how you’re thinking.”

You insist on calling them “young people” rather than “students” or “kids.” Why does that matter?

Young people deserve to be treated like people and humans, not something less than the facilitator of learning in that space. We’re in a human business—we’re human beings facilitating the learning process

in young humans. But the whole structure of education dehumanizes the learning for everybody. It’s no longer learning; it’s just regurgitating a bunch of stuff someone told you.



Photo: OCTM/Mike Lipnos

When did you realize that traditional math teaching wasn’t working?

Since I started teaching about 27 or 28 years ago, I would come to class and directly instruct; tell people how to think, what to think, when to think it, and why to think it. That’s the way it works in our country, especially in math. But I started realizing that’s not human. We’re always dealing with this power struggle: “I’m the keeper of knowledge, I’m the gate-keeper, I’m gonna tell you when to use what and why this works.” It really dehumanizes the learning for everybody.

Then I was working in a curriculum office and got some training on cognitively guided instruction

(CGI). And I read that and I'm like, huh. I realized that I don't have to tell young people how to think. They can figure that out. And honestly, once I discovered that I didn't have to tell them everything, I made a promise: I'm never gonna tell a child how to do something again. It forced me to learn how to facilitate. It forced me to teach diagnostically. All the research is out there, you just have to go get it. And I'm still learning today.

We're trying to educate 21st-century young people with 19th-century methods. How did we get here?

We developed schools in an agrarian society where we didn't have access to information, so you had the village school teacher giving you this information. Those days are long gone. But we've trained young people to want us to tell them what to do. We've indoctrinated them into this system.

Sir Ken Robinson used to talk about how schools kill creativity. Just by the fact that we're grading something, young people take fewer risks. I don't think they really want that, because when they leave school, they log into the Xbox and play these challenging games that keep them striving towards something. But in school? "Tell me how to get the answer." We've become the big answer key in the front of the room.

So young people will persevere through hard video games but not through math problems?

In my heart, I want to say they really want challenges, they want real-life situations, they want authentic projects, they want to do thinking, they want to productively struggle. They like trying to figure things out as much as we all do. But we've trained them to be helpless, to always need us for something.

American textbooks do this beautifully. You don't even have to know mathematics to get through the textbook, because it'll carve an easy pathway for you to keep getting answers. You might learn some com-

putation along the way, but you're not really learning mathematics. You're not studying mathematics. I think we've taken it away from them. I really believe that.

"We've trained them to be helpless, to always need us for something."

Ohio just released a new math plan. What makes this time different from all the other failed reforms?

I think for the first time, our state has taken a stance and says, this is what we want to be happening in our math classrooms. We've always left the local decision on how to teach—here's the minimum they need to know. Now we're asking young people to do the standards for mathematical practice, to behave mathematically.

It's no different than when calculators were first invented, or when homework bots were doing the picture-with-your-phone thing. Generative AI is a lot more sophisticated, but how did we respond then? It was, "Well, it's not really about getting the answer, it's about getting young people to think, to be creative, to be problem solvers." I'm not interested in right answers. I'm interested in how you're thinking about getting an answer or solution. That's where we have to put our focus. And I think this is the first time our state has gone more so to say this—we need our young people to behave mathematically.

But what about high-stakes tests? Don't they reward right answers, speed, and memorization—everything you're fighting against?

To be honest, I'm not too against outside audits and high-stakes assessments. The standards are the tool or the vehicle that we use to get young people to behave mathematically. The math content is what I'm gonna use to get the math behaviors that I'm really teaching.



Photo: Ohio Department of Education

When young people sit down at these high-stakes tasks, there's no way they're gonna remember all the things. What they're really doing is thinking, "How do I solve this?" Because they have strong mathematics connections—they connect math to math—they do pretty well. I've worked with teachers in their classrooms for half a school year, doing nothing but building agency, getting students to believe they can problem-solve, that they're mathematical. And I've watched their math computation grow just because we put them into these high-leverage, high-impact mathematical experiences.

They're gonna learn and grow and make connections, even if they're not understanding it in the moment. In the long run, they come out way ahead. But nobody wants to be patient enough. Everybody wants the instant bump in scores. If you just stay the course, you're gonna be leading the way, but everybody abandons it so quickly.

How does making math more challenging create more access?

When you have young people who are struggling, what we typically do is teach them something lower level—master that before we can go on. We're always taking the high-level, high-leverage mathemat-

ics away and giving them things we think they can do because it's a little bit easier. But what we're really doing is shutting them out from the mathematics. It's an oxymoron.

When we continue to define success as getting correct answers all the way through, we're limiting our opportunities to be learners, to have productive struggle, to be truly what a mathematician's all about. Mathematics in the United States is defined as correct answers to this set of questions. That's not truly it. Everybody has unique gifts and talents. Everyone can think differently. We do it with the best of intentions, but we're shutting people out when we want to be bringing them in.

If the research is clear and we know what works, why aren't more teachers doing this?

There's a difference between a chef and a cook. A cook follows a recipe. Right now, our building administrators, our curriculum directors, our superintendents, and many of our Tier 1 instructors—we're following recipes. We're not cooking.

"There's a difference between a chef and a cook. Right now, we're following recipes. We're not cooking."

I think most of it is a lack of understanding. We get so bogged down in running schools and running districts that we're forgetting to lead them. We don't build collective efficacy. We try things, it doesn't work, we change it right away. We just keep bouncing around looking for something, when we know what works.

What about elementary teachers? They're juggling multiple subjects.

This year, just in the district I'm employed in, elementary teachers have a new math primary resource and new language arts resources. They have two and a half hours of language arts time, almost

80 minutes of math time—they're working their tails off. They don't have time to stop and do the things we're talking about.

This is why leadership is going to be so key for us. We first have to get districts and building leadership to believe: we call it mathematics, not computation, not arithmetic. But yet we're stuck in the days of computation and arithmetic. We have to continue to build that capacity.

So what's OCTM's plan? How do you actually reach teachers across the state?

Our big plan right now is we want to start with leadership. We've done this for so many years—people say, "Well, we've been doing this shift in math instruction, it hasn't worked, we need to switch gears." But we haven't got it there yet. People don't understand that. They think because we're talking about it, everyone's doing this. Well, I can tell you they're not. I walk into classrooms across our state, and it's still mostly content delivery, low student engagement—mimic what the teacher's doing and move on to the next lesson.

This is the first time our state has said we need to build capacity with our leadership teams. I've come to realize, if we don't approach it from leadership down, we can have no collective efficacy. They set the climate and the culture for what the school is. As teachers, we don't have that kind of power. But if district leadership doesn't believe it, they're gonna keep throwing stuff at it until they think they fix it, which they never will.

People say there's a knowing–doing gap—if you know better, you should do better. Is that true?

You can know it. But before you can do better, you gotta build some capacity to know *how* to do better. Just knowing something doesn't make it happen. I think we do a lot of telling, and I think we do a lot of talking about the problem, but we're just admiring it. We're not doing anything about the problem.

What's at stake if we don't get this right?

Think about the fact that we've got young people in our classrooms who are gonna have jobs that we have no idea what they are. So I'm not supposed to teach you about this specific thing—I need to teach you how to be a mathematician before I can teach you to do anything else. I need you to be a thinker, I need you to problem-solve. I need you to be okay with failure and struggle, because it's gonna happen a lot.

We know what young people deserve, we just gotta keep working towards it. I can't help but think—if we keep sticking with it, if we follow what we believe, I do think we're changing lives. Not all young people, not right away, but we have to keep working towards what we know is best for the young people that we serve.

About This Interview Series

This conversation is part of a bimonthly series highlighting diverse voices in Ohio mathematics education. We feature in-depth interviews with stakeholders across the educational landscape—teachers, students, parents, K-12 administrators, policymakers, and education leaders—each offering unique perspectives on the challenges and opportunities in mathematics teaching and learning.

About the Interviewer

Carlos A. Lopez Gonzalez is a data scientist and educator with a background in engineering and mathematics education. He designs innovative tools and learning experiences that personalize instruction. His recent research explores the cognitive intersections of mathematics and art. These interviews are published in partnership with the *Technology Educator Alliance*.