ON BECOMING ONE OF THOSE “MATH PEOPLE”

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Abstract:

So often in social circles, the topic of mathematics is met with vehement disdain. It seems that almost everyone has a story to share about the anxiety they have felt when it comes to mathematics. Regardless of how this happened, it is the mission of the two authors to do something about it. It is incumbent upon all of us to challenge this outdated mindset, and to model for students that each of us has the capacity to push our limits and to achieve our potential.

Keywords: mathematics; math anxiety; growth mindset; humility; well-being; equity

Body:

So often in social circles, the topic of mathematics is met with vehement disdain. Indeed, it has become commonplace to avoid mathematical responsibility by declaring oneself, in an act of self-deprecation, as “not a math person.” It seems that everyone has a horror story to share where their interactions with mathematics have invoked a sense of heightened anxiety. The authors recall, all to well, timed math tests and oral recitations of the times tables, where our thinking was completely shut down amidst a flood of fear. Why is it that so many people characterize themselves as “not a math person”? This fixed mindset has clearly contributed to normalizing math anxiety, and perpetuating generations of math-phobic learners. Regardless of how this happened, it is the mission of the two authors to do something about it. But, we would argue that it is incumbent upon all of us to challenge this outdated mindset, and to model for students that each of us has the capacity to push our limits and to achieve our potential.

We have both been there. If you had told either of us, ten years ago, that we would be at the forefront of championing mathematics education, we would have never believed you. But we were no longer willing to accept a fixed mindset that relegated us to a life of being “not math people.” We openly embraced a positive growth mindset, confident in the belief that when you take control of your own learning, you can change your destiny. Most importantly, we knew that in modelling a growth mindset for our students, we could contribute to the development of their own capacity to see the greatness of their potential.

Together, we took a collaborative approach to learning, where we began by getting informed on effective mathematics practices through our participation in Additional Qualification courses and online learning offered by cutting edge mathematics educators (i.e. Jo Boaler and Dan Meyer). We then dove right into the work. Rather than waiting to plan out every detail, we realized that,

in the spirit of an inquiry model, we needed to just get down to the work – craft problems, develop lessons in response to our observations, create games to reinforce ideas, and to build a community where accountable talk advanced the thinking. To ensure that we were on the right track, we committed ourselves to an ongoing cycle of debriefing, refining, reflecting and re-approaching. We valued mistakes as a means for pushing creativity, and deepening learning. While we would never call ourselves experts in the field of mathematics, we do pride ourselves on leading by example. And, in our work, we campaign for every teacher to rise to the challenge as well. Heck, if we can do it, then anyone can.

For the authors, we were no longer okay with the notion that perpetually struggling with math was simply normal for some. In fact, to admit this, would be to imply that the entire body of work of our profession was futile. Think about it. If we, as educators, are not capable of change, then is that not tantamount to saying that learners learn in spite of our teaching, not because of it? That was a fixed mindset message, to which we were simply not prepared to concede. You will never regret deepening your knowledge or broadening your range of skills.

We are well-aware of the anxiety that surrounds mathematics for so many people. It would be untruthful to say that we do not continue to feel a certain degree of anxiety. But, it is a healthy dose of anxiety that motivates us to challenge our thinking, to be willing to make mistakes in the service of learning, and to being comfortable with being uncomfortable. In order for learning to take place, there must be some degree of struggle involved. It is through the struggling with math that determination grows and risks are taken. Through taking risks, connections are made, and understanding emerges. The most surefire way to alleviate anxiety is to experience success. Success breeds further success, and resiliency is the by-product. We knew that if we wanted our students to experience success, then we needed to create the conditions within the school, and within the classroom, where students would have an equitable access to the learning, where learning was tailored purposefully for their needs, embraced their interests, and which was in alignment with the demands of real world. Students needed to see the relevancy of mathematics, not simply in the direct connections to the world around them, but also in embracing its sheer beauty and potential. By having the relevancy of mathematics made clear, we aimed to support students in appreciate not just how we use math, but, quite importantly, why. Improved mathematical understanding is connected with enhanced well-being, as it relates to a more resilient self, who is capable of transferring those skills across diverse contexts.

So, we took a risk. But, when we say risk, we mean risk. Too often the term risk-taking is used to refer to simply trying something new. But, following through on something new, in itself, is not really taking a risk; rather it can simply mean being compliant with a request. When we say risk, we mean, intentionally engaging in an informed action where we forge ahead, fully aware of the possibility of failure, but being prepared for that. Mistakes, if reflected upon thoughtfully, will drive new learning. So, our risk was to engage in an inquiry-based approach to mathematics

instruction that was aimed at developing students' critical thinking skills as they made sense of mathematics, and embraced its beauty.

One of the tactics that we have prided ourselves on, is the transparency in our co-teaching as principal and teacher. We model for students the thinking that is going on in our minds as we teach. When we are unsure that the impact of our instruction has been successful, we engage in an open conversation in front of the students, where we debrief our choices, and make on-the-spot decisions in response to our observations. Students see and hear that effective learners make ongoing decisions, and when faced with new evidence, alter the direction of their thinking, for the purpose of deeper learning. We continue to ask students to be open to redirection and to adjust approaches based on discovery and understanding, so it was important to us that our teaching not only modeled this, but clearly embraced it as an effective approach.

Enacting change requires a vision, embracing change requires dedication, and inspiring change requires taking risks for the greater good. Change is not always easy, but when leaders lead by example, they assist their colleagues by providing them with the agency they need to develop a growth mindset and to willingly engage in their own personal-professional learning journey.

To support change within the school, we set about to change attitudes and understandings through thoughtful and reflective planning, and with a significant amount of humility. We allowed our story, one of giving things a go, in the service of students, to open doorways for our colleagues. We never tried to be the sage on stage because we were quite content to be the guides on the side.

There is much more work to be done. But if we can leave anyone with a message of hope, for moving forward with the desire for meaningful change, we would want to share the following:

Be curious. Your sense of wonder, and the inquisitive minds of your students, will carve the path for mathematical thinking in your classroom, where understanding will take precedence over completion.

Be humble. Your story of struggle, your mistakes, and your own grappling with anxiety will inspire others whose anxieties have held them back.

Be willing. Your willingness to try things out, experiment with ideas and concepts, and to take risks demonstrates a positive growth mindset, which inspires new learning in both colleagues and students.

Be reflective. Your reflections on your decisions will continually refine your instruction, which will only have a positive impact on students.

Collectively, it should be our goal to create the first generation of learners who proudly proclaim themselves to be “math people.”