Math education needs high expectations and love

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THE other night, I was skating at our local outdoor rink with my children. On one end of the rink, there was a cacophony of activity with what looked like a Jack Rabbits hockey practice. It was amazing and joyful to bear witness to shrieks of joy coming from those five-year-olds.

The coaches were incredible. Somehow, in -20 temperatures, they had captured the attention of all the kids by introducing them to critical skills so that they could eventually play a junior version of the game of hockey. Kids were challenged, engaged, learning, and having fun.

In the *Winnipeg Free Press* recently, both Anna Stokke and Neil Dempsey have weighed in on how we might address the dire fact that many learners are not learning maths, don't see themselves as mathematicians, and subsequently lose confidence in themselves.

There is considerable research which suggests that mathematics is a massive predictor of later school and life success. So maths education needs to be at the forefront of our minds.

I have deep respect for both Anna and Neil — they both adore kids and want every child in Manitoba to feel that euphoric tingling when everything in maths seems to make sense. You know the feeling — flow.

In education, we create false dichotomies that take our (the adults) energy away from the task at hand: ensuring that every child in Manitoba has the means to a decent life. My first question to principals is: what is your portrait of a graduate of your school? What should they know? What should they be able to do? And how should they be in the world?

Maths always factors into this equation. Pun intended.

But if you were like me in school, maths did not come easily. It was really hard and the more I struggled, the less confident I became in school itself. I didn't see myself as a scholar.

When I became a teacher and taught maths between Grades 5 and 11, I quickly realized that learning and teaching maths is like learning and teaching a musical instrument, a sport, or chess. We don't just give kids an oboe, a hockey stick, or all the chess pieces and say "go explore or problem solve." But we also don't just drill kids or employ vertical surfaces and hope for the best.

Good maths instruction weaves together direct instruction, powerful formative feedback, opportunities for practice, and the ability for kids to see the whole game at a junior level. "I do, we do (and we do and we do and we do), and then you do."

That's what T-ball is. Basic skills coupled with a scaffolded chance for kids to apply what they know and witness the whole game from a junior level. Wrapped in powerful feedback.

In history education, we always argue that kids can't think about nothing. You can't inquire about something if you don't have enough knowledge or skill to actually think about something. The same is true for maths, soccer, or the cello. If we introduce the whole game, or too many concepts, kids will become overwhelmed and give up.

My friend John Mighton, the creator of JUMP Math, speaks eloquently to this in his book *All Things Being Equal*.

On the other hand, if we don't let learners see the whole picture, they'll tune out. This is the very art of teaching. Finding that magic spot between knowledge, skills, and real-world application so that kids see themselves within mathematics. That they begin to understand how thinking mathematically can help them understand what it means to be human in the universe — the very purpose of public education.

And yes, poverty plays a major role in school interruption, absenteeism, and maths confidence. But let's not blame kids for being poor.

Schools can't do everything, but they can do something, and some things, very well. The onus is on teachers to have the highest expectations for kids and make school sticky. The onus is on teachers to become masters of teaching maths. To ensure that if we're serious about maths instruction, that our daily schedule and professional learning reflects this.

Schools become sticky when the learner knows they have multiple adults who tell them that they will be successful, where learners see themselves reflected in the school community, and where they develop confidence in an environment of high expectations and love.

Good maths education is central to this foundation of powerful schools. Instead of heading down the path of false dichotomies, let's take a page from those Jack Rabbit coaches where good instruction is founded on intentionally designed experiences that leverage the pre-existing knowledge of the child, focus on content and skill acquisition, and allow learners to see the whole game at a junior level.

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