

Antidote to fear of maths



| *Bangladesh Sangbad Sangstha*

A CHILD sits at a desk, pencil poised over a notebook, staring at a maths problem that feels less like a question and more like a wall. Nearby, a parent watches, wanting to help but feeling the same familiar tug of uncertainty. It is a quiet, shared tension that plays out at kitchen tables in nearly every corner of the world. We have come to accept this struggle as a normal part of growing up — a ‘maths person’ or ‘not a maths person’ divide that is decided before a child even leaves primary school. But this moment of paralysis is not a reflection of a child’s potential; it is a symptom of how we have been taught to see numbers.

Bangladeshi Culture Course

Maths anxiety, that growing sense of dread that turns a simple textbook into a painful mental barrier, rarely has anything to do with actual intelligence or natural ability. Instead, it has everything to do with method — specifically, how the subject is first introduced in the early, formative years. The fear comes from whether numbers are treated as cold, lifeless symbols to be memorised through endless repetition, or as useful, empowering tools designed to help us understand the complex world around us. This deeply ingrained pattern of struggle is not permanent; it can be completely rewritten by shifting our focus towards clear understanding and a practical, everyday approach to learning.

Addressing this challenge requires more than just new textbooks; it requires an environment where students feel safe to explore. This is why we developed Math Buddy, an interactive ecosystem specifically designed to dismantle the fear that so often hinders a child's progress. When my co-founder Bharathy and I started Math Buddy in 2010, we were driven by one observation: mathematics is not inherently difficult, yet it remains one of the most feared subjects. Our vision was to create a curriculum where technology and hands-on activities work in tandem to simplify these complexities.

To facilitate this, we advocate for the Concrete-Pictorial-Abstract (CPA) approach. The CPA approach is rooted in the work of American psychologist Jerome Bruner, who proposed in 1966 that learners construct knowledge through three distinct 'modes of representation.' Bruner argued that for students to truly master a concept, they must progress through these stages to bridge the gap between their physical experiences and abstract thinking. This framework gained international prominence through its integration into the Singapore Math curriculum in the 1980s, helping students consistently achieve top rankings in global mathematics assessments.

Under this framework, a child does not begin with a formula; they start with 'concrete' physical objects to grasp how different concepts work. They then move to the 'pictorial' stage, where concepts are represented using images or diagrams. Finally, the 'abstract' stage is reached when students begin using numbers, symbols and formulas. Consider a simple concept like fractions. Instead of beginning with numbers on a page, a child might first divide a real object — a piece of fruit or a paper circle — into equal parts. They can see and touch what 'half' or 'one-fourth' means. In the next stage, those physical objects are replaced with drawings — circles shaded in parts, visualising the same idea. Only after this foundation is built do numbers enter the picture: $1/2$, $1/4$, $3/4$.

By the time a student reaches the abstract stage, the symbols are no longer intimidating — they are simply a shorthand for something already understood.

While CPA is one of our key instructional techniques, we also encourage gamified learning, where maths problems no longer remain ‘problems’ but become puzzles to solve with rewards and challenges. This encourages students to confront maths in a familiar environment without the added pressure of having to get the right answer immediately. Furthermore, providing students with step-by-step problem-solving ensures that the activity is understood thoroughly, with no gaps left unexplored. Maths as a concept can be generally harrowing for a young mind, as children naturally like to explore all possibilities before deciding — which is a fundamentally human thing to do. This is why we use visual learning tools to facilitate understanding, breaking maths down from an unknowable concept into something tangible. This encourages active learning, a result that usually cannot be obtained from simply reading books, especially by individuals with roving minds.

Math Buddy’s interactive ecosystem is designed specifically for today’s digital-native students. Math Buddy’s online platform not only offers lesson plans for students, but integrated AI creates a personalised learning path for them. The AI adjusts task difficulties based on student performance, where students needing foundational support get simpler reinforcements and advanced students receive more challenging tasks. The platform also offers interactive quizzes with immediate correction and feedback. This reinforces learning in real time, unlike traditional classrooms where quiz results might be delayed for a few days while they are graded.

While Math Buddy's AI adapts to the student in real-time, true educational growth also requires visibility. Math Buddy transforms data into a tangible learning journey through its comprehensive progress tracking. At the centre of this is an intuitive performance dashboard that monitors essential metrics such as accuracy rates, completed topics and time spent on tasks. Rather than simply presenting numbers, the platform utilises skill mastery mapping to visually categorise concepts into those that are mastered, currently in progress or needing reinforcement.

This is further supported by deep learning analytics that identify nuanced patterns, flagging frequent mistakes or areas with slow response times before they compound into larger learning gaps. To keep motivation high, students are encouraged to set personal milestones — tracking daily and weekly targets and earning achievement badges that make progress feel rewarding. Ultimately, this transparent data generates detailed reports for both parents and teachers, bridging the gap between school and home to ensure the child is supported from all sides.

Math Buddy has already reached over 300 schools in India, fostering deeper student engagement across the curriculum. In Bangladesh, Math Buddy has been adopted by Glenrich International School, where the interactive Math Lab is powered by our system. By implementing these tools for students up to Grade 8, we provide a cloud-based environment where teachers monitor progress in real-time and parents stay involved through transparent tracking.

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In Bangladesh, where academic success is often closely tied to high-stakes examinations, mathematics can become a source of intense pressure from an early age. Many students rely heavily on private tutoring, sometimes at the expense of genuine understanding. This creates a cycle where memorisation is prioritised over comprehension, and confidence remains fragile.

This collaboration represents more than just a technological upgrade but a shift in the educational culture. By introducing interactive and concept-driven approaches within schools, there is an opportunity to shift this dynamic — reducing dependency on external coaching while making learning more meaningful within the classroom itself. Our goal is to ensure that when a child sits down with a notebook, the pencil no longer freezes in mid-air. Instead, it moves with the confidence of a mind that does not just know how to calculate, but how to think. We are not just teaching children to solve for x ; we are empowering them to solve the challenges of tomorrow.

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