

Breaking the Math Anxiety Barrier: Empowering Learners Through Supportive Strategies

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Mathematics remains one of the most challenging subjects for many students, not only because of its abstract nature but also due to the psychological barriers that accompany learning it. Early exposure to large amounts of information has shaped today's learners into a generation that demands engaging and real-world teaching strategies, particularly in traditional subject like mathematics (Calzada, 2024). These demands highlight the urgency of adapting teaching approaches to suit the needs of Generation Z learners, who experience education differently compared to previous cohorts.

Research has shown that the attention span of Gen Z learners averages only eight seconds, a considerable reduction from the Millennials who came before them (Ichsan et al., 2023). This reality underscores the difficulty of maintaining focus in traditional mathematics classrooms that rely heavily on lectures and text-based instruction. To address this challenge, Schwieger and Ladwig (2018) stress that instructors must undergo a shift in their instructional strategies, moving away from conventional models and toward more dynamic and participatory approaches.

One way to support learners effectively is by cultivating a collaborative learning environment. Theobald et al. (2020) emphasize that collaboration allows Gen Z students to construct deeper understanding in mathematics, as peer-to-peer learning builds both confidence and competence. Collaboration also reduces isolation, a feeling often amplified by anxiety in mathematics learning.

Instructional design must also consider the learning preferences of Gen Z students. Murro et al. (2023) report that more than 59% of Gen Z learners prefer visual platforms, such as videos, compared to text-heavy resources. For mathematics instruction, this indicates the importance of multimedia resources that use animations, simulations, and visual explanations to simplify abstract concepts. By aligning teaching strategies with student preferences, teachers can reduce disengagement and strengthen comprehension.

Another powerful approach is the integration of game-based learning strategies. Aker et al. (2018) point out that the introduction of competitive and motivational elements—such as leaderboards, rewards, and challenges—can significantly increase motivation and enjoyment in math classes. Gamification not only sustains attention but also transforms mathematics into an activity that fosters persistence, problem-solving, and excitement, rather than fear and avoidance.

Math anxiety, however, remains the most significant barrier to success. Kadonsi (2025) defines math anxiety as a psychological obstacle that directly affects a student's ability to engage with mathematical tasks. Dowker (2021) describe it as an experience marked by tension, apprehension, and fear when faced with mathematics, which often leads to avoidance behaviors, reduced self-confidence, and

underachievement. Left unaddressed, this cycle perpetuates negative attitudes toward mathematics and limits learners' potential to succeed.

Breaking the barrier of math anxiety requires a holistic approach that combines innovative instructional strategies with an environment of empathy and support. Teachers must act not only as facilitators of knowledge but also as motivators who recognize student fears and actively dismantle them through encouragement, collaboration, and creative pedagogical tools. When instruction is adapted to the learning styles of Gen Z, incorporates engaging digital tools, and addresses the psychological barriers of anxiety, mathematics can be transformed from a source of fear into a discipline of empowerment.

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ARTICLE DETAILS

EIR-0000047; Received: August 26, 2025; Accepted: August 29, 2025; Published: August 31, 2025

CITATION:

Espinosa, Cesar G. (2025). *Breaking the Math Anxiety Barrier: Empowering Learners Through Supportive Strategies*. Education and Industry Review: Essays and Critiques. DOI: 10.62596/eir.c97ee072

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