

MATH BEYOND NUMBERS: HOLISTIC APPROACH TO UNFINISHED LEARNING WITH GROWTH MINDSET AND SOCIAL EMOTIONAL SUPPORT

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WHAT IS UL?

COVID-19 brought a lot of major concerns and disruptions in the world of education, with long term impacts still present across K-12 classrooms everywhere. **Unfinished Learning** is a term used to describe the gaps in students' academic progress due to staying virtually at home during the pandemic.

Researchers said that by the end of 2020-2021 school year, students were, on average, five months behind in mathematics and four months behind in literacy, with the majority of students coming from low-income and students of colors who had major setbacks even before the pandemic.

TPEP CRITERION 3

Recognizing individual student learning needs and developing strategies to address those needs.

RATIONALE

As a long-time math instructor and tutor, I have observed firsthand how students' emotions and self perception dramatically impact their mathematical performance and willingness to engage with challenging material. Post-COVID observations reveal students returning to face-to-face instruction with:

- Diminished confidence in mathematical abilities
- Increased math anxiety and stress
- Visible gaps in learning fundamentals

Reluctance to attempt difficult problems, I frequently hear statements like 1. "I hate this!", 2. "I can't do this", 3. "I quit because I am not a math person".

These fixed mindsets limit growth and learning potential. This research explores strategies to understand and address these challenges, fostering mathematical confidence in a post-pandemic classroom.

THEORIES

SELF-DETERMINATION: which explains the fulfillment of basic psychological needs—*autonomy*, *competence*, and *relatedness*—and by use of this theory, it helps promote motivation and improve overall well-being of individuals.

GROWTH MINDSET: A growth mindset was then developed to emphasize the ability that helps improve students' learning through effort and by using effective instruction strategies such as positive encouragement, and productive struggles.

SOCIAL COGNITIVE: students' self-efficacy—their belief in their ability to succeed in specific tasks and or concepts—plays an important role in achievement and performance. Research has shown that to improve learning, students' self-efficacy is one of the strongest predictors to be successful in school. It is closely tied to students' perceptions of support from peers, teachers, and families.

INQUIRY QUESTIONS

What evidence-based strategies can be employed to help educator such as myself to foster growth and confidence in my students' ability to study and learn math?

ROOT CAUSES

- Reduced real-time instruction and immediate feedback
- Social isolation from peers and teachers
- Cognitive overload during virtual learning
- Trauma from pandemic-related stressors
- Limited opportunities for hands-on learning

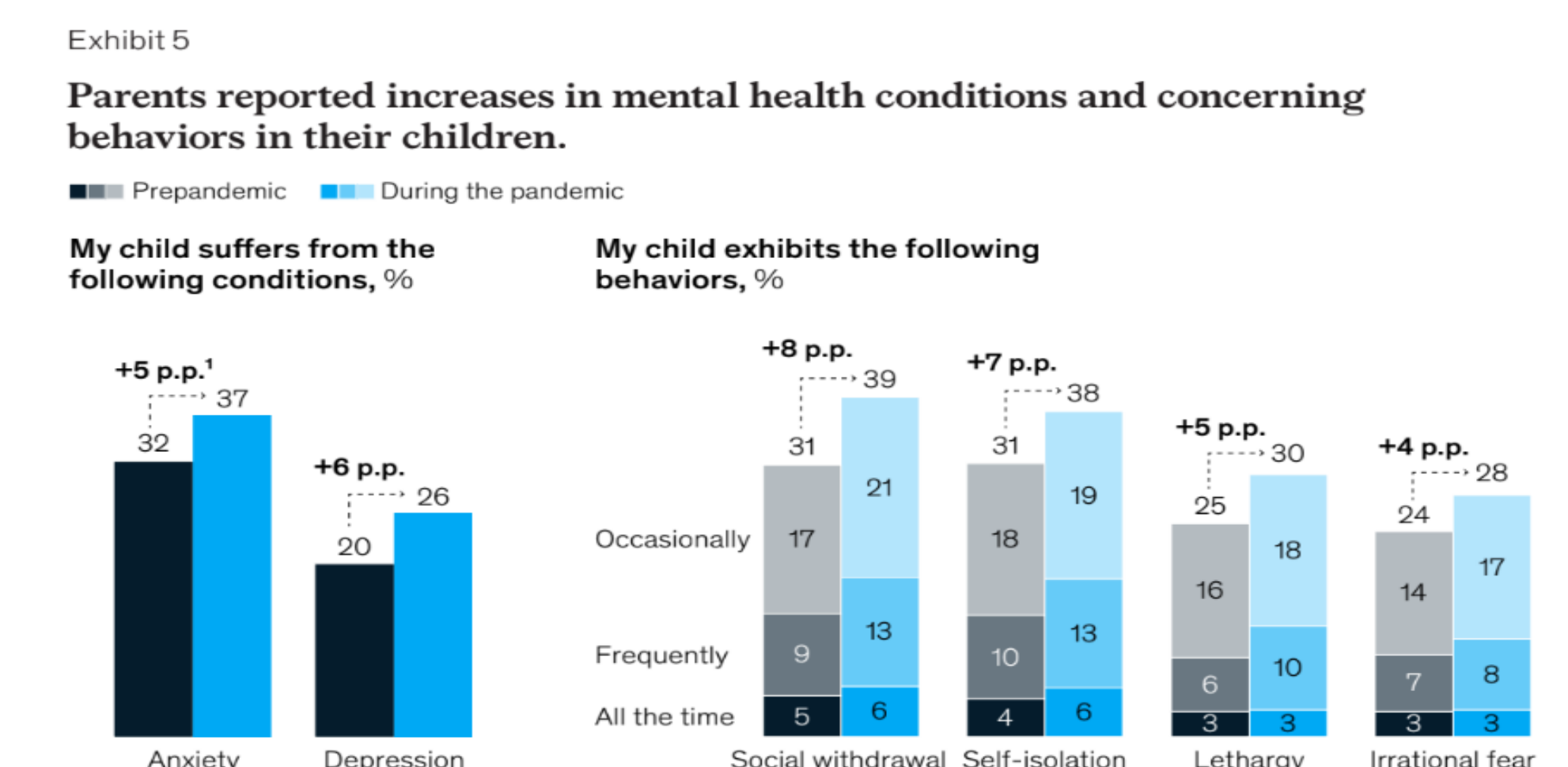
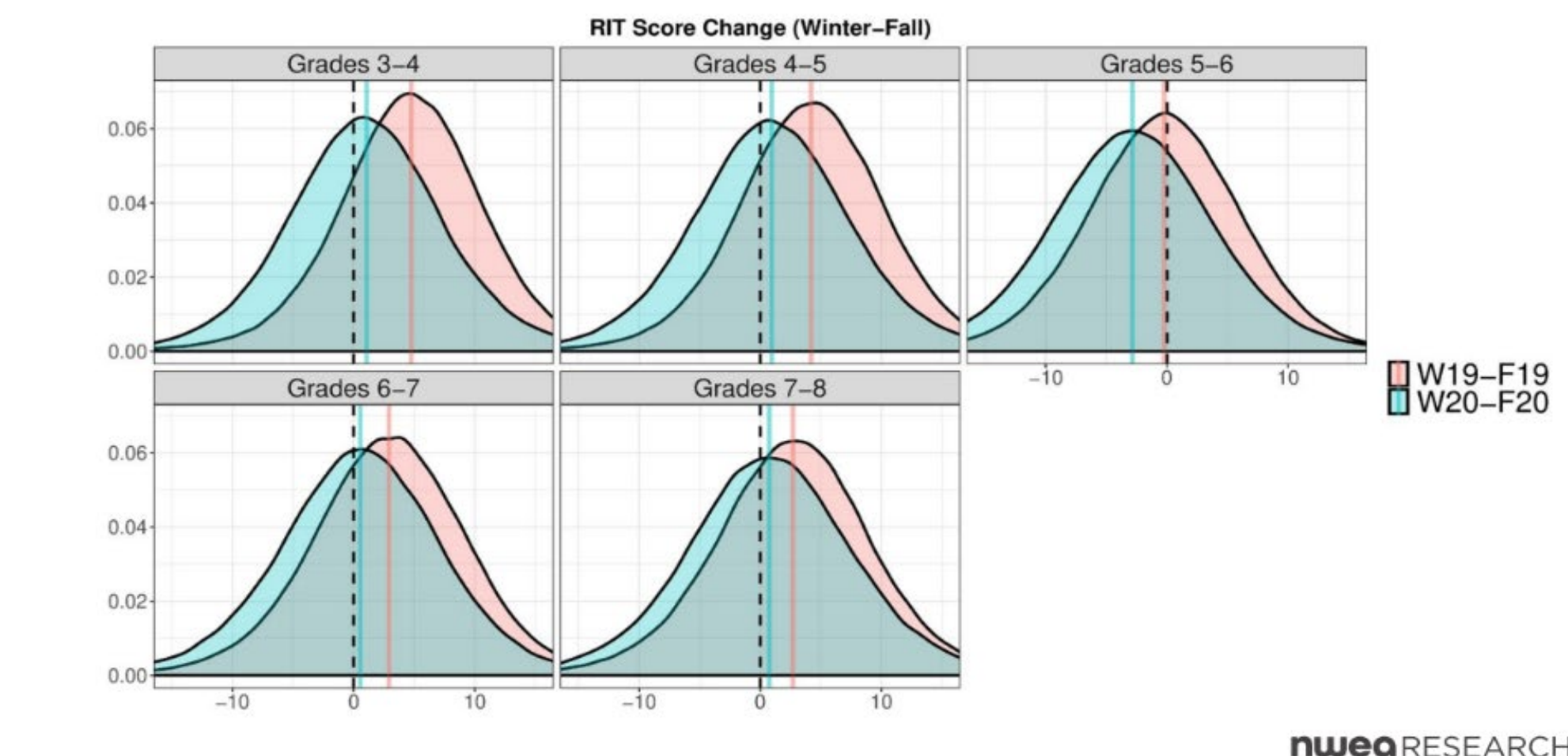
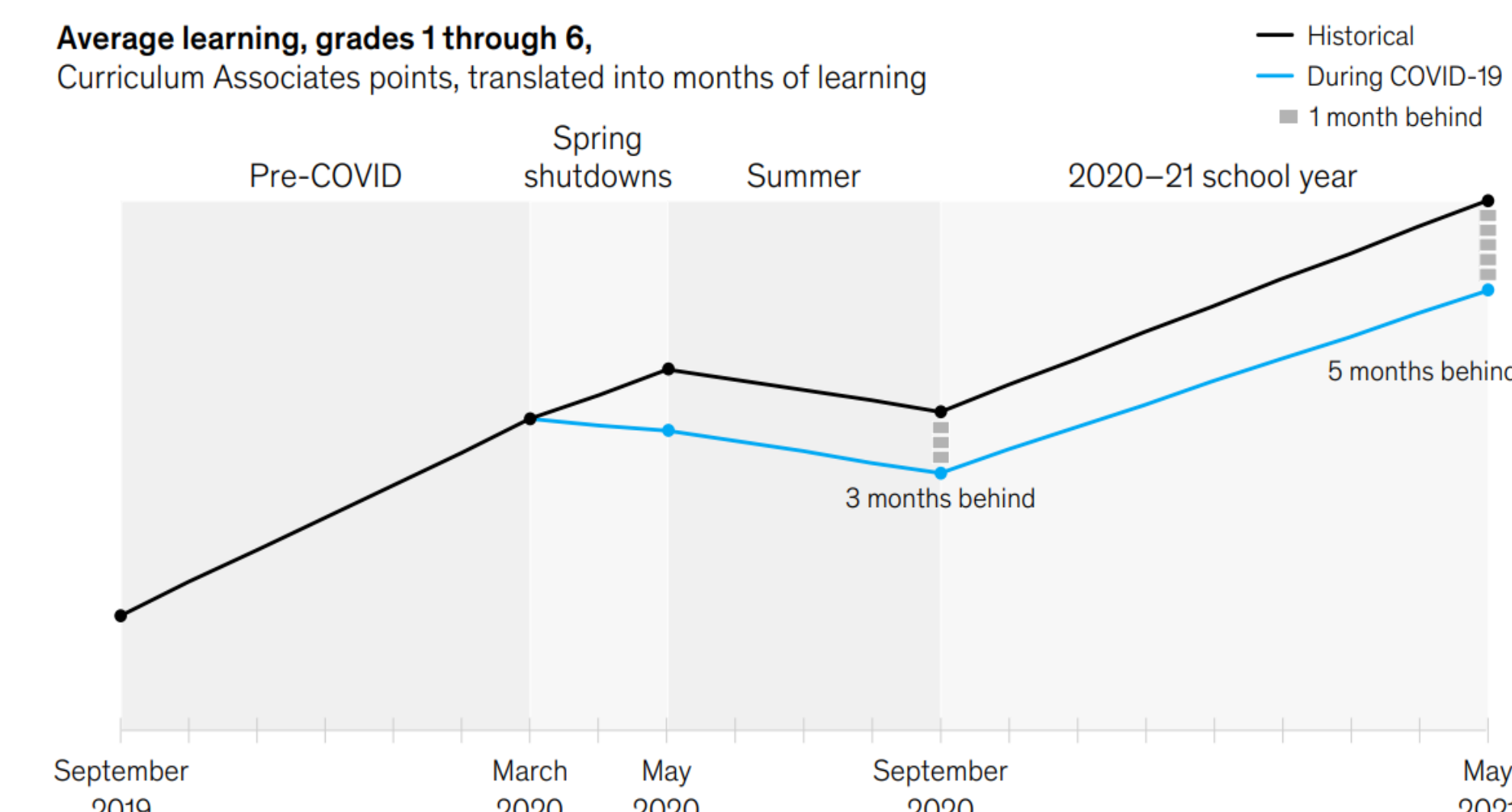
ACADEMIC IMPACTS

- Students averaged 5 months behind in math, 4 months behind in literacy (McKinsey & Company, 2021)
- Low-income students and students of color experienced deeper losses
- **42% of students** avoided daily school attendance due to fear of judgment
- Math gains were **5-10 percentile points lower** than previous years (NWEA data)

SOCIAL-EMOTIONAL IMPACTS

- Increased **math anxiety** and reduced self-efficacy
- **35% of parents** expressed extreme concern about children's mental health
- Students developed symptoms of depression, lethargy, and social withdrawal
- Mathematics self-efficacy accounts for **35% variation** in student achievement

How social-emotional factors, particularly math anxiety and self-efficacy; influence students' mathematical learning post-COVID?



ACTIONS

1. Collaborative Support

- **Team Approach:** Collaborating with administrators, families, fellow educators, and intervention teams to identify and support students' needs.
- **Focused Support for High-Needs Students:** Extra attention to students with IEPs, 504 plans, or emotional/behavioral needs.

4. Classroom Design & Environment

- **Welcoming & Inclusive Space:** Create a welcoming space where all students are welcome and all voices can be heard
- **Flexible Seating & Grouping:** Allows for peer support and collaborative learning.
- **Safe & Growth-Oriented Environment:** Encourages risk-taking and learning from mistakes without fear of judgment.

2. Social-Emotional Support

- **Daily Check-Ins:** Builds emotional awareness and lets students feel seen and supported.
- **Relationship-Building:** Prioritized before instruction to create trust and engagement.
- **Safe Emotional Climate:** Addresses anxiety, stress, and self-doubt as barriers to learning.

5. Challenges & Solutions

- **Student Engagement Variability:** Addressed through inclusive practices, collaboration, and SEL support.
- **Group Work Resistance:** Mitigated by building a culture of safety and empathy.
- **School Pressure & Anxiety:** Countered by making learning engaging, low-stress, and relevant.

3. Instructional Strategies

- **UDL Implementation:** Differentiated content, process, and assessments tailored to varied student needs.
- **Goal-Setting & Reflection:** Exit tickets and personal goal check-ins to foster **student agency** and self-monitoring.
- **Alternative Assessments:** Project-Based Learning, Portfolios

TOOLS

1. High-Dosage Tutoring
Provides targeted, frequent, and individualized support. Enhances student engagement and math outcomes.

3. Digital Learning Platforms
Interactive & Differentiated Tools: Desmos, Geogebra, IXL – for visual, hands-on problem-solving. Adaptive Learning Platforms (especially for students with math anxiety): DreamBox Learning, Freckle – personalized pacing and practice to reduce stress.

5. Universal Design for Learning (UDL) Tools
Choice boards, Text-to-Speech, manipulatives provide multiple means of representation, engagement, and expression, especially beneficial for students with IEPs, 504 plans, and multilingual learners.

2. Motivational Tools & Engagement Strategies
Incentives/Rewards: Snacks, stuffed animals, sports cards.

Student-Centered Projects: Aligning activities with students' interests (e.g., irrigation system for plants).
Board Games & Group Activities: Promote social connection, review math skills, and encourage motivation.

4. Social-Emotional Learning (SEL) Tools
CASEL-aligned activities, reflection journals, Calm Classroom – support emotional regulation and well-being.

6. Communication & Classroom Management Tools
Google Classroom – keeps students and families informed, builds consistency, and fosters trust and care in the learning environment.



REFERENCES