

The State of EdTech: Why Students Need Change Now

PRISMS REPORT



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We have failed our kids. Students are three to five years behind grade level in some subjects and are not catching up. Teachers’ jobs are at stake, school funding is at stake and more importantly, the future of our kids and our country is at stake.

But the reality is that declining interest and proficiency have plagued students in the U.S. for decades and the existing pedagogies fail to ignite a passion for learning, especially where science and math are concerned.

The problem is that simply inserting technology into education failed. When technology was introduced to education, the old methodology was simply applied to the technology. Instead of writing answers on paper, computers allowed you to type them out, but the concept was the same.

It didn’t work 30 years ago and it’s not working now.

We know that students’ ability to (i) reason spatially and (ii) create abstract representations of real world experiences and phenomena are critical predictors of success in technical careers, so why haven’t we built learning solutions that scale these best practice learning methods in the last 50 years?

Additionally, we know that math proficiency in PreK-12 is a good marker for whether a student is on track to graduate college. A concerning development given that adults with college degrees earn 84% higher annually than peers with lower levels of education. A gap that trends wider each year.

To better understand this problem, Prisms took a deeper look at students’ success in the U.S., both pre and post-pandemic. This report aims to address the substantive reasons technology integration has lagged behind expectations, provide an understanding of what’s at stake if we cannot course correct, and highlight why now is the time to address these issues.

Key Themes Identified:

Student Results	Investment	Resource Shortage
While the pandemic had dramatic results on our students’ education, scores and proficiency have been in decline since before the pandemic.	Despite a massive investment from both the U.S government and the private sector in education technology, learning outcomes have only continued to decline.	A shortage of educators, and resources to support teachers’ professional development, has delayed the rollout and efficacy of digital learning tools.

Defining the Challenge:

Education Technology has Failed Our Students

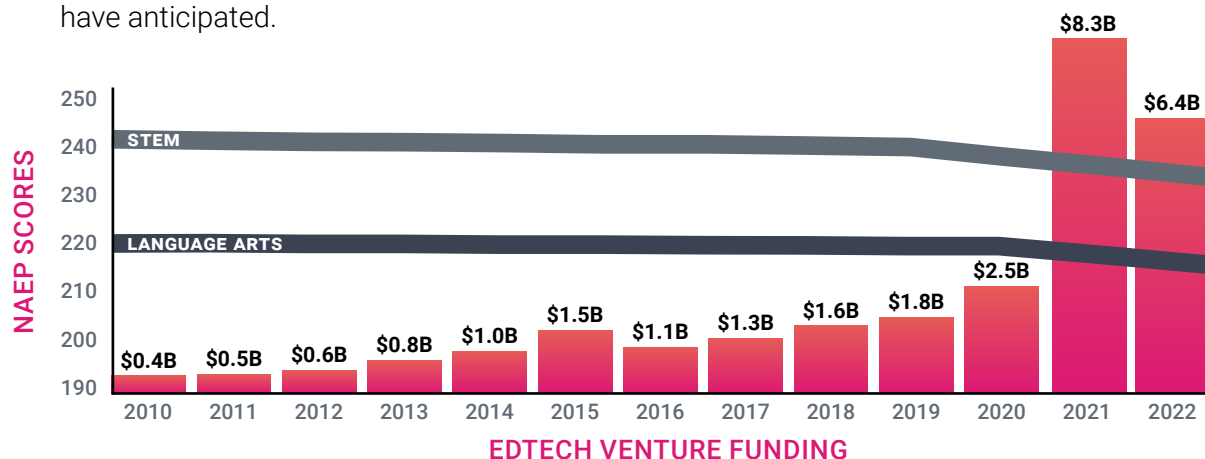
From failed tech initiatives like InBloom, math emporiums and Google Glass, the history of educational technology is littered with failure. The introduction of every new technology prompted dreams of transforming education. From radio and movies to television, computers and tablets, we were promised expanded access, reduced costs, and improved quality of teaching and learning.

These technologies were promised to be disruptive, transformational and revolutionary, but their impact on pedagogical practice and student performance fell short. A far cry from changing the paradigm, edtech innovations have only reinforced existing instructor-centered, lecture-driven pedagogies and rote memorization.

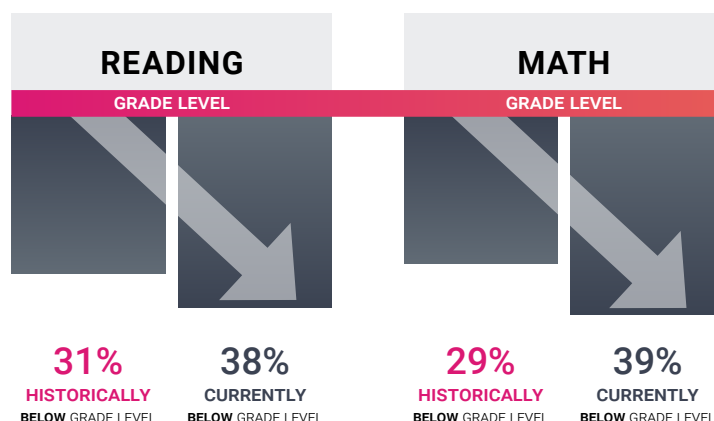
Five years after the shift to high-stakes testing under the No Child Left Behind Act, which was signed in 2002, a survey of a national sample of school districts found that nearly two-thirds of school districts had dramatically increased language-arts or math time while almost half had reduced time spent on social studies, science, art, music, physical education, lunch, or recess.

Yet, even before the pandemic, [nearly two-thirds of U.S. students](#) were unable to read at grade level. Scores have been getting worse for several years.

The pandemic thrust over 91% of the global student population out of the traditional classroom in 2020, increasing the role of educational technology in student learning. Two years later, NAEP scores revealed student progress reached the lowest levels recorded since the program began tracking student performance. Despite rapid adoption and significant investment, edtech has struggled to provide the transformational impact many have anticipated.



In fall 2021, [38% of third-graders](#) were below grade level in reading, compared with 31% historically. In math, 39% of students were below grade level, vs. 29% historically. ([i-Ready Research on Unfinished Learning](#))



Unrealistic models of mind: All learning technology has an explicit or implicit model of the mind. Current solutions tend to treat the mind as a computer. Responses to a program are neatly categorized whereas in reality student responses are often fuzzy, partial, and they learn through refining this rough draft thinking over time. This difference requires very different styles of interaction.



Learning and development often travel a non-linear path. Educational technology should leave room for – and foster – the types of learning that come naturally to students.



Technology shouldn't be used to implement, scale, or sustain ineffective in-person instructional strategies.



Declining NAEP scores over the years are the direct consequence/result of the learning models over the past 50+ years.

Understanding where the implementation of edtech solutions have faltered, and the resulting impact, are critical steps toward providing meaningful solutions moving forward.

The Impact of the Challenge:

Education is our foundation. It's the backbone on which our economy, politics and even public health rely - if you don't understand math you can't understand how a virus spreads. This decline in our education system is serving to deteriorate the U.S. position globally.

Economically:



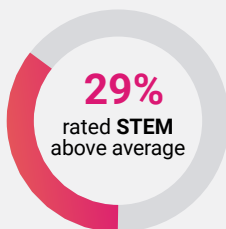
The largest setback from the pandemic will stem from the decline in student learning. Conservative estimates suggest many students experienced up to a year's worth of learning losses from the pandemic, which can result in 6% to 9% lower earnings over the lifetime of an average student, and significantly more for disadvantaged students. This setback is likely to impact the future workforce within the U.S and ultimately its GDP.

National Competitiveness/ Security:

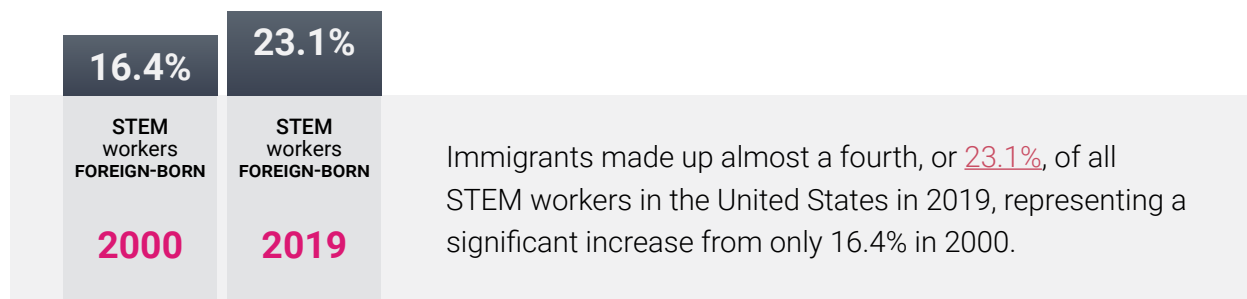


America's national security, which is closely tied to its economic competitiveness abroad, relies on strong capability across its STEM fields. However, the country is facing attrition as students increasingly decline to pursue subjects within STEM, and many experts warn of shortage in skilled STEM educators.

The U.S. is falling behind in STEM proficiency compared to other leading countries. [The 2019 Trends in International and Mathematics Science Study](#), which tests international students at the fourth and eighth grade-levels, ranked U.S. fourth grade students fifteenth among the sixty-four participating education systems in average mathematics score. For eighth grade students, the average mathematics score ranked eleventh among the forty-six participating education systems. The countries that ranked ahead of the U.S. included Singapore, China, South Korea, Japan, and Russia.



Additionally, the majority of Americans rate their STEM education system as below average. In a study conducted by the [Pew Research Center](#), just 29% of Americans rated the country's K-12 STEM education as above average.



Politically:



Our ability to participate as informed citizens in our democracy relies heavily on our ability to possess basic mathematical literacy to recognize when statistics and polls are being used solely for political gain.

Misleading statistics, sham metrics, cooked numbers, and erroneous alternative science herald a precipitous decline of rigorous thinking, starting with the erosion and weaponization of that rigor's foundation—mathematics.

Socially:

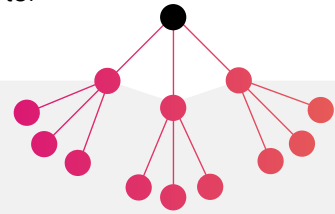


Bob Moses, civil rights leader and creator of the *Alegra Project*, argued that fluency in math and science was the springboard for people of color to gain access to prosperity over a decade after the civil rights movement. Unfortunately, a significant achievement gap in mathematics continues to impact opportunities for students of color today – a gap that has only widened since the pandemic. In math, Black students lost 13 points on the nation's most recent report card, compared with five points among white students, widening the gap between the two groups.

Additionally, math test scores strongly relate to neighborhood rates of imprisonment. Fifth grade standardized math tests are shown to have an inverse relationship with imprisonment rates: For every 10 points higher students averaged on the test in a given school zone, the imprisonment rate decreases by nearly 150 people per 100,000 in the same area.

Public Health:

Headlines over the past year have been wrought with people flouting public health guidelines despite thousands of deaths each day. It's become obvious that many lack the fundamental understanding — that yes, even just 20 people getting together at a party can lead to thousands of new Covid infections and deaths. In theory, this shouldn't be a mystery to anyone: everyone learned this concept, exponential growth, in high school Algebra. But in practice, too many were bored, confused, or indifferent, and were never sensitized to the importance of these fundamental math concepts.



Conclusion:

Now is the time to fix it

Educators have until the spring of 2023 before the next round of student assessments are conducted, and until September 2024 to indicate how they will utilize \$122 billion in federal relief to chart a new course for our students' education. The problem and the timeline within which we have to address this problem is clear. We have the resources. But designing a purposeful response to this challenge will require a paradigm shift in our approach to integrating technology into our classrooms — one that focuses on teaching to the correct modalities. Research validates that we all learn more fluidly and fluently when we interact with and experience via perceiving, touching, moving, and visualizing concepts within meaningful real-world settings. Our responsibility is to imagine the classroom of the future — one where students engage and interact with real-world concepts in an immersive and experiential environment that prioritizes and facilitates their learning at its core.



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