




Case Study


Gates County Schools Leverage GEAR UP NC Grant and MATHia to Strengthen Math Skills, Boost Post-Secondary Enrollment


How a new math program helped one rural NC school district beat the odds

GATES COUNTY SCHOOL DISTRICT

 **Gatesville, North Carolina**

 **POPULATION:** 10,584

 **DEMOGRAPHICS:** Minority enrollment is **40%**. Over **28%** of students are economically disadvantaged.

 **TEST SCORES:** **42%** of middle school students tested at or above the proficient level for math.

For middle and high school students, few subjects are as challenging and, in some cases, frustrating, as math. Their instinct is to rush through assignments as quickly as possible, even with complex word problems that require some reading, like some questions on end-of-grade math tests.

Take Brayden Wolford, a student at Gates County High School in northeastern North Carolina. When working on online homework for Math 1 as a 9th-grader, he would skim the question, maybe hit the “hint” button for a clue, then quickly glance over the multiple choice options and pick the first one that sounded plausible. And he’d pick again and again until he landed on the right answer.

That strategy didn’t serve him well come test time, when there were no “hints” or second guesses to propel him across the finish line. And that was a problem, since Math 1 is considered a make-or-break class in terms of a child’s academic progress in high school.

Luckily for Brayden, his rural school district is one of three across the state taking part in a unique program to increase students’ math proficiency and enrollment in college or other post-secondary credentialing programs – all with the goal of helping them secure the high-tech, math-focused jobs of the future.

The Gaining Early Awareness and Readiness for Undergraduate Programs federal grant, commonly known as GEAR UP, promotes academic readiness in math and increases the number of students from disadvantaged communities who are prepared for a postsecondary education. In his 2024 [budget proposal](#), President Joe Biden recognized GEAR UP as one of the primary levers in supporting students’ access to college.

The North Carolina grant, administered by GEAR UP NC, pays for districts to use Carnegie Learning’s online math curricula, the AI-driven tutoring software MATHia. The platform provides a challenging curriculum that boosts student eligibility for college and reduces their need for remedial coursework once they get there.



"GEAR UP NC believes in the strength and engagement of its district partners and leadership. We recognize that successful implementation and outcomes such as Carnegie Learning and MATHia are only as strong as the school leadership and teachers that believe in its success. It is truly a collaborative effort. As we have adjusted to the unique needs of our students and teachers during and after the pandemic, collaboration is our strength. GEAR UP NC, Carnegie, and our schools have worked together to assess gaps, student needs, and pivot to best support students. Together, we put our students and their learning first to maximize their future opportunities."



Patti B. Harris, MEd.,
Director of GEAR UP NC

“We chose Carnegie because of the rigor,” says Dr. Deborah (D.J.) Jones, a 48-year veteran educator who served as a teacher, assistant principal and principal in the Guilford County School System for 27 years, and spent three years as a school improvement turnaround team leader at the N.C. Department of Public Instruction.

Students in Gates, Harnett and Montgomery counties are using a cohort-and-priority model to serve low-income and other traditionally underrepresented students. Unlike traditional grant-funded programs, this one follows students from grade to grade — beginning as sixth-graders and continuing through high school and into their first year of college.

“Kids understand routine,” says Jones. “Instead of moving from one curriculum to another, by the time they’re in high school, they’re familiar with Carnegie, which makes it less of a transition.”

The grant also provides students with technology resources to use during class; comprehensive advising, outreach and supportive services; and information about financial aid for postsecondary credentialing programs.

The practical effect, however, is that students are gearing up to slow down. Brayden didn’t know that his teacher, Megan Hudson, could use MATHia to see exactly how many times he asked for hints or picked the wrong answer. Teachers like Hudson use that data to decide whether to pull kids into small groups for remediation — or in the case of Braden, encourage them to read each problem carefully.

“MATHia supports the teacher,” says Carnegie Learning’s Eric Doan. “It gives them actionable information on what to work on with each student. It’s like having a co-pilot in the classroom.”

Math 1: Success is Key to Employment

“Why do we have to learn algebra? We’re never going to use this in our lives.”

If Hudson has heard this once, she’s heard it a thousand times. Students, particularly those who are math-averse, routinely demand that she justify the time they spend learning about linear equations, exponential functions and polynomials.

In fact, she has heard the question so much that she has an answer at the ready: algebra is the branch of mathematics most applicable to real life. Say you’re hosting a party for about 40 people and need two cans of soda per guest. The skills you learn in Math 1 help you figure out how many six-packs of soda to buy “whether you’re sitting down and doing the formal process or not,” she tells them.

Researchers have found that students who [fail classes like Algebra I](#) have just a one in five chance of graduating high school. One [study](#) conducted by the American Institution for Research found that only 43 percent of kids who fail the course as ninth-graders recover the credit by their senior years.

That’s a significant barrier, since unlike North Carolina, some states require the course to graduate.

Math 1 also is a prerequisite for the higher-level math and science courses needed for careers in the growing fields of science, technology, engineering and math (STEM). In fact, the U.S. Department of Labor Statistics [predicts](#) that employment in math occupations will grow 29 percent by 2031.

BY THE NUMBERS

- The University of North Carolina System Office (UNC System Office) was awarded a **seven-year, \$25.7 million** Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) from the U.S. Department of Education.
- Entering the **fifth year of seven year grant**; 2019 - 2026
- Over **8,800 students** served across cohort and priority districts, and first-year in college
- Carnegie Learning provided **245 days of professional learning instruction** for teachers and school leaders
- Almost **90% of GEAR UP NC middle school students** believe it is important to do well in math. (* 2021-2022 Annual GEAR UP NC report data point from an annual assessment of student perceptions of GEAR UP NC services by external evaluators, Educational Policy Initiative at Carolina (EPIC.) <https://epic.unc.edu/>

But economists say that the basic skills needed for manufacturing, health care and other fields also will become increasingly more complex and tech-focused in the coming decade. Students who fail Math 1 won't have the basic math skills to perform these tasks, leaving low-wage, low-skill jobs as their only options.

That makes success in Math 1 even more critical – which is why GEAR UP targets schools in financially disadvantaged areas, particularly those with low post-secondary enrollment rates.

'Like a tutor you can use anywhere'

It's too soon for districts like Gates County Schools to quantify how GEAR UP NC and MATHia have impacted students' academic performance. The program kicked off during the 2019-20 school year, which was disrupted by COVID-19-related school shutdowns and remote instruction.

The 2022-23 school year was the first period of uninterrupted in-person learning since then, and the district doesn't have results of its end-of-year math tests. Once those results are in, district leaders and GEAR UP officials can compare the outcomes of students who used MATHia to those who didn't.

Since 2012, GEAR UP NC schools have:

- Experienced a 11 percentage point increase in four-year graduation rate during the seven-year program.
- Increased FAFSA applications by 19.5 percentage points to nearly 61 percent.
- Increased college enrollment rates 18 percentage points to 50 percent.
- Documented college persistence rates of 82 percent for two-year institutions and 94 percent for four-year colleges among members of the class of 2018.



There's also anecdotal information that the grant program is boosting math proficiency in districts like Gates County Schools.

As an eighth-grader at Gates County Middle School, fourteen-year-old Carter Buhler was one of two students in the district to finish the entire MATHia curriculum for the year – a feat borne both of ambition and practicality.

"I wanted to push myself to see if I could get it done," he says. "Plus it means there's less to do later."

At first, Carter didn't like the MATHia platform with its wordy questions. But the more he worked in the platform, the better his math skills became. That was especially noticeable on tests, when he would think back to MATHia when struggling to solve problems.

"It's kind of like a tutor, but you can use it anywhere," he says. "Before I took MATHia, I didn't realize passing math would be possible for me, but after taking MATHia, I started thinking, 'Wow, this is pretty easy – I can do this.' That proved to be true and my grade is way better than it was before MATHia."

"For someone who thinks it's a waste of time, put in the effort and then see if it helps you," Carter says. "Ask for a Carnegie lesson that can help you with what you're struggling with."