



2024 FEMALE STUDENTS AND STEM REPORT

Breaking the glass ceiling

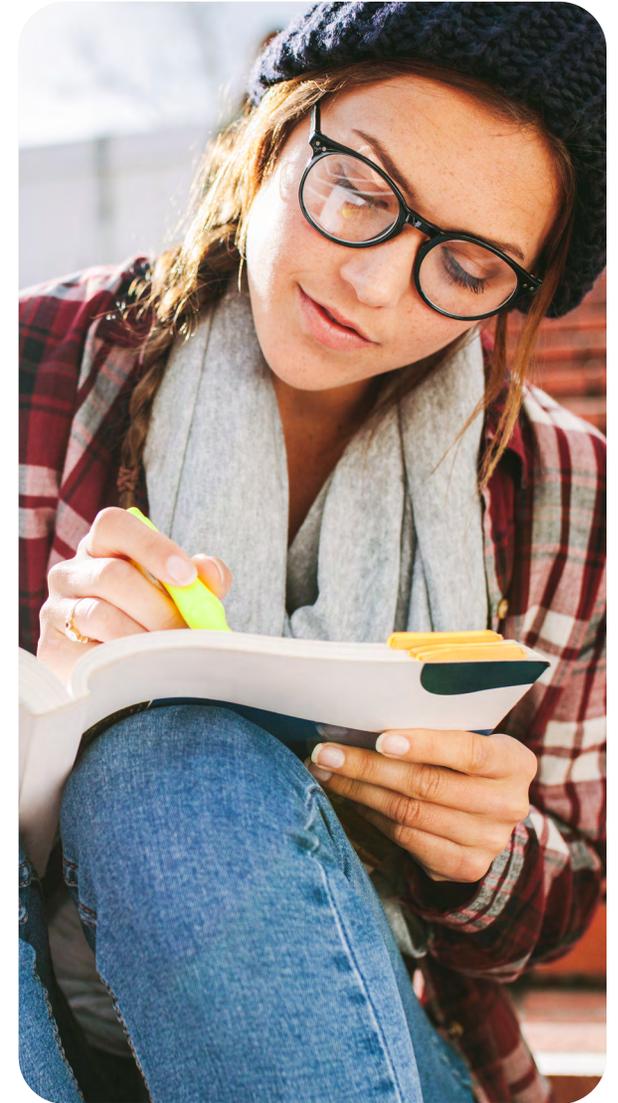
Increase female students' participation in STEM careers by supporting earlier interventions in K-12 education.





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About the report

This report analyzes anonymized data from 233,000 female middle and high school students in the U.S. from 2023. The data reveals top career cluster recommendations based on scientifically backed aptitudes and interest measurements.

The report, copublished by YouScience and Ford Next Generation Learning, analyzes data to highlight female student career exposure gaps for in-demand careers and provides examples of programs and curricula helping to close this gap.

YouScience is the leading technology provider dedicated to solving the skills and exposure gap crisis for students and employers.

Ford Next Generation Learning helps reshape education to better align with the demands of the modern workforce.

The following are key terms and definitions used throughout the report. These terms are important for understanding the report data and findings.

Aptitude

is defined as an individual's natural ability to learn or perform skills regardless of environment. Knowing aptitudes is one of the most powerful accelerators to help empower individuals to leverage their natural gifts and find success.¹ Aptitudes expand a student's understanding of what's possible beyond what they know and have been exposed to.

Interest

is self-reported activities someone wants to know or learn about. While interests are important for career guidance, they are limiting and have proven to reinforce biases and stereotypes because having an interest in a particular career relies heavily on a student's direct exposure to that particular career field.

STEM careers

include professions in science, technology, engineering, and mathematics. In this report, we examine career clusters in Health Science, Advanced Manufacturing, Engineering, Architecture & Construction, and Computers & Technology under the STEM umbrella.

Career exposure gap

is a measurement of the difference between a student's aptitudes and their interests—it identifies which careers a student hasn't been exposed to and which ones might be a good fit. Without addressing this gap, many students flounder in school as they try to figure out their path. They may also find it difficult to understand the value of postsecondary education, which can lead to changing majors, incurring additional debt, dropping out of school, and ultimately struggling to find fulfillment in their career as they miss out on in-demand opportunities where they could thrive.





Understanding the problem

The workforce of the future will require workers with advanced technical skills¹ to fill the high-growth pipeline of Science, Technology, Engineering, and Math (STEM) careers. In order to meet demand for these differentiated careers, the United States and other countries will require increased workforce participation and advanced skills.

Recent research show that women account for 28% of the STEM workforce.² This is a good start, but there is room for improvement. As we show in this report, female students have the aptitude for STEM-related careers but show low levels of interest.

This lack of interest in STEM-related careers typically starts during a student's K-12 educational journey. Although more women than men complete their post-secondary education,³ women remain a minority in critical fields like engineering and computer science.

Analysis from the American Association of University Women revealed three likely causes for underrepresentation of women in STEM:

1. The belief that men are superior at math and naturally more gifted in STEM fields
2. Lack of interest from female students in STEM
3. Bias and work-life balance concerns in the STEM workplace

While we celebrate the progress that has been made in recent years, more is needed. Specifically, interventions must happen much earlier to debunk misperceptions, encourage earlier exploration, and overcome barriers that unfairly hold many back.

Primary and secondary education provides the ideal sandbox for this discovery and engagement. Here, students can safely access resources that will help them understand their true aptitudes, plan and take STEM courses, and gain access to early career guidance. Without this, they may fall back on what are perceived to be traditional female careers that may not give them a competitive advantage in the workforce of today and tomorrow.





This report is organized around three insights:

1

Data suggests that many female students have the aptitude for STEM-related careers. They deserve the support and tools to discover, research, explore, and pursue these opportunities. More broadly, this fosters the development of a robust and inclusive workforce, yielding benefits for society at large.

Over the past two years, YouScience data shows very little change in the career exposure gap for STEM careers, and in fact, the gap between female students who have the aptitude for career fields such as Computers & Technology has increased.

2

Female aptitude for STEM careers does not necessarily translate into interest. This is likely due to the lack of representation and the troubling reality that female students are often not encouraged to pursue STEM. Ultimately, female students cannot be interested in careers that they are not exposed to. This career exposure gap for multiple key industries is highlighted throughout the report.

By adopting the recommendations outlined in this report with urgency, we can close the gap and increase the number of women working in STEM-related careers.

3

Educational and industry leaders must implement interventions earlier in order to ensure future STEM career participation. With the right tools, such as aptitude-enabled education, female students can overcome societal noise and stereotypes and pursue STEM-related coursework and careers.





A closer look at the career exposure gap by industry

Analysis shows a startling discrepancy between the interest in STEM-related careers versus the obvious aptitude for it—thereby widening the talent shortage and weakening the economy. A lack of interest in middle and high school tends to translate into low participation in STEM-related coursework, internships, mentoring, exposure, and counseling. As a result, more female students opt out of STEM opportunities as they pursue higher education and careers.

The failure to support and develop a diverse workforce in STEM careers from an early age perpetuates significant problems.

- 1. Innovation deficits:** without diversity in STEM, the development of new innovations, research, and technologies may not fully address or even recognize the needs of diverse populations, leading to biased outcomes and inequitable solutions.
- 2. Earnings disparities:** as employers in all industries place an increasingly higher economic value on individuals with STEM training, those underrepresented in STEM fields will experience even greater educational and economic inequalities, restricting access to high-paying, in-demand jobs, and limiting social mobility.

- 3. Economic disruptions:** STEM workers are critical for businesses to compete—failing to engage a broader segment of the population in STEM careers dramatically slows economic development and innovation, threatening the country’s ability to compete globally.

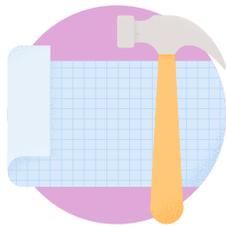
“The solutions outlined in this report must be applied promptly. We can no longer overlook young women who have the aptitude but have not been exposed to these opportunities. We are now equipped with the knowledge to do better, so we must.”

—Cheryl Carrier, Executive Director, Ford Next Generation Learning

STEM CAREER FIELDS



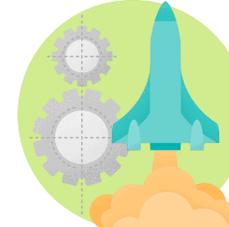
Advanced Manufacturing



Architecture & Construction



Computers & Technology



Engineering



Health Science



Advanced Manufacturing

While some traditional manufacturing jobs remain, the majority of opportunities lie in Advanced Manufacturing roles where advanced STEM-related degrees are required. There are 12.1 million people working in manufacturing⁴, of which only 30% are women.⁵ With more exposure and aptitude-enabled education for women, the gap can be closed.

Example careers:

Industrial engineers, electrical engineers, mechatronics engineers, machinists, manufacturing technicians

58,631

Student aptitude

7,214

Student interest

87%
exposure gap

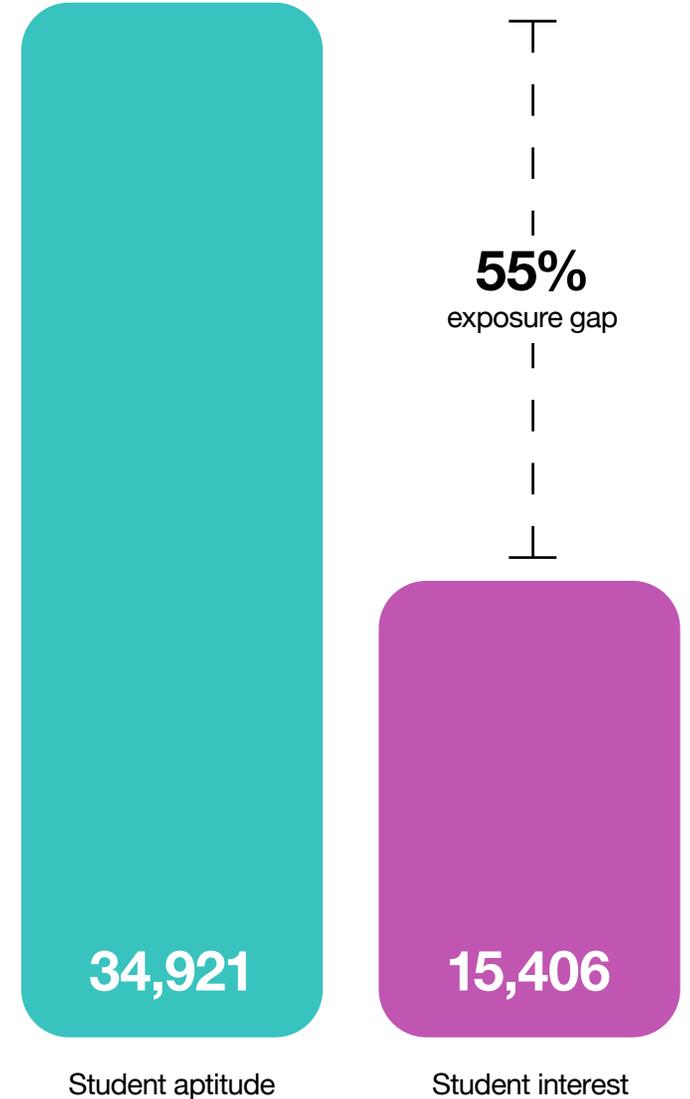


Architecture & Construction

Progress is being made toward gender equity in the field of Architecture & Construction. Two out of five new architects are women, and in fact, women earn their licenses nearly a year faster than men.⁶ In construction, the percentage of women working in construction reached record highs in recent years, and Washington, D.C., Arizona, and Florida lead all states in the share of women working construction jobs.⁷ This is a good sign for the U.S. economy, as the housing shortage is reaching crisis levels and the construction industry is expected to increase by 32% between 2020 and 2030 from \$580 billion to \$2.4 trillion.⁸

Example careers:

Architects, construction managers, electricians, facility managers, plumbers and pipefitters, cost estimators, interior designers



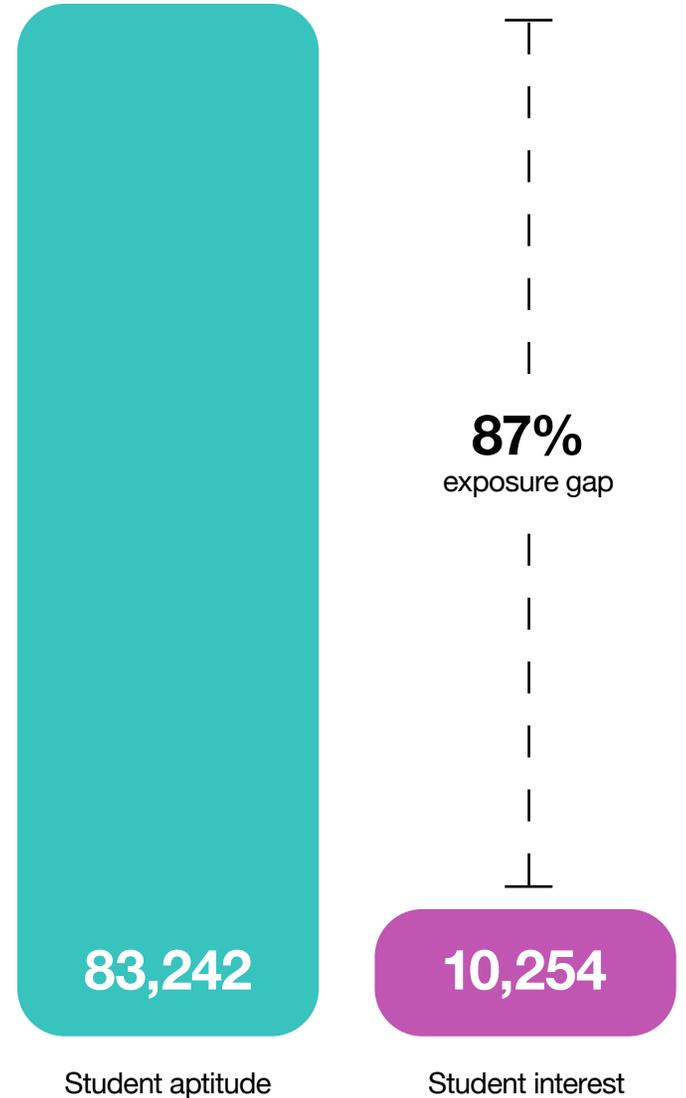


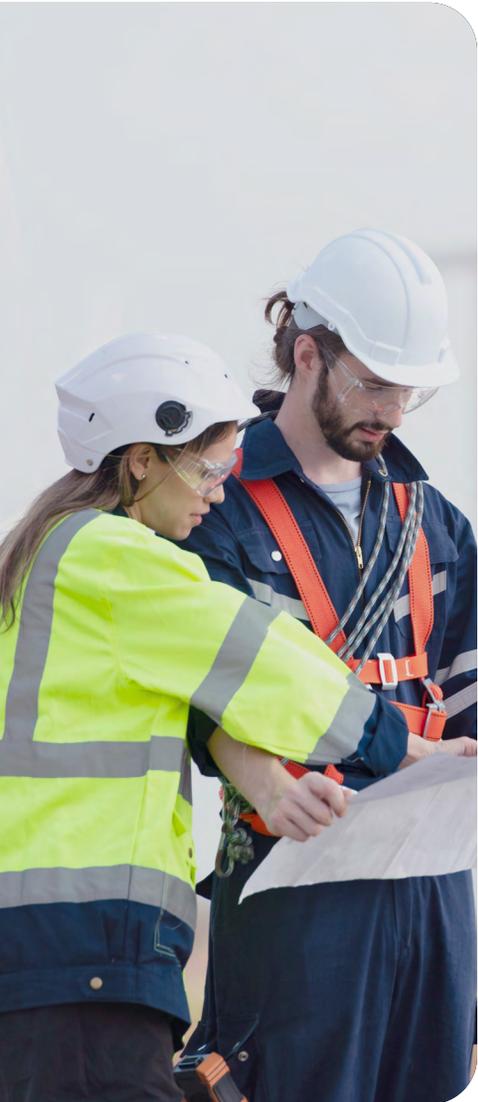
Computers & Technology

Women make up a quarter of all tech-related jobs,⁹ but that percentage is not representative of the number of women in the workforce. More work needs to be done to expose female students to these opportunities. Computers & Technology careers are typically high-paying and in-demand with approximately 377,500 openings projected each year, on average.¹⁰

Example careers:

Computer programmers, software developers, information systems engineers, cyber security analysts



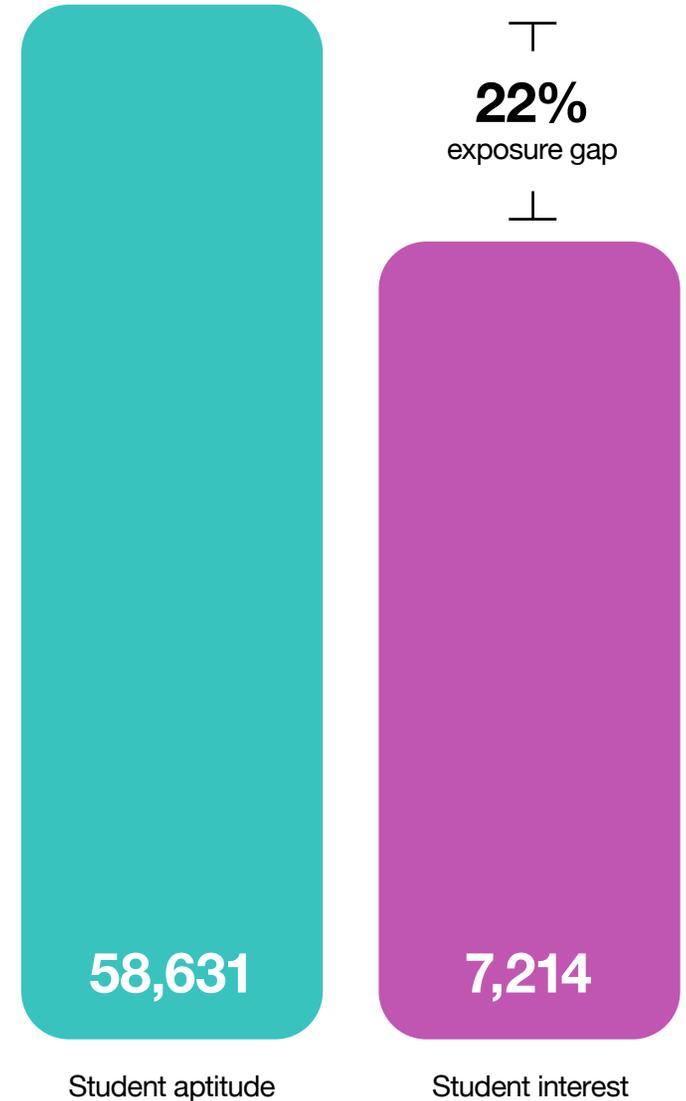


Engineering

Engineering “is the application of science and mathematics to solve problems.”¹¹ From deep space to the depths of the ocean, engineers are in high demand and can work in numerous fields that fit their interests. High-paying Engineering careers continue to be male-dominated, and of the STEM-related occupations, engineering has the lowest representation of women at 16.7%.¹² There is good news though, an increasing number of female students are being exposed to, and therefore expressing interest in, engineering career fields.

Example careers:

Aerospace engineer, chemical engineer, drafter, nuclear engineer, surveyor





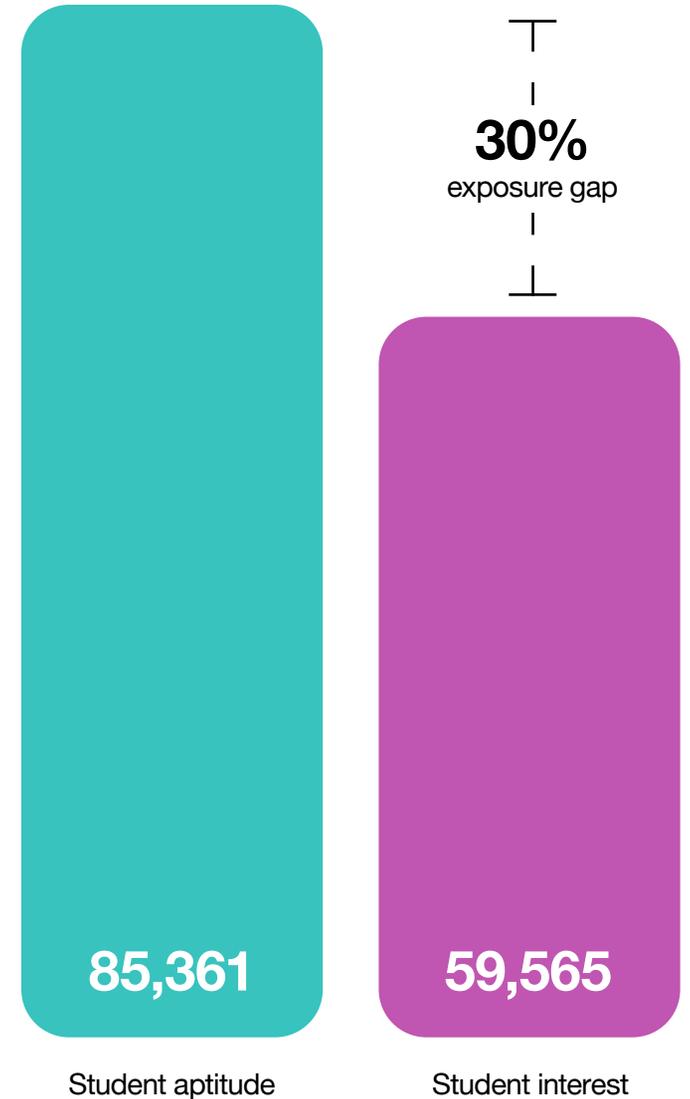
Health Science

Health Science careers are projected to grow faster than the average for all occupations from 2022 to 2032 with 1.8 million openings expected each year.¹³ Our data revealed that there is a lot of interest in Health Science, but aptitude continues to outpace interest with a 30% exposure gap.

It is vital that these careers don't go unfilled. There is a national nursing shortage and the rapid retirement rate of the Baby Boomer generation is accelerating the need for skilled Health Science workers.

Example careers:

Physicians, pharmacists, laboratory technicians, nurses, dentists, nutritionists

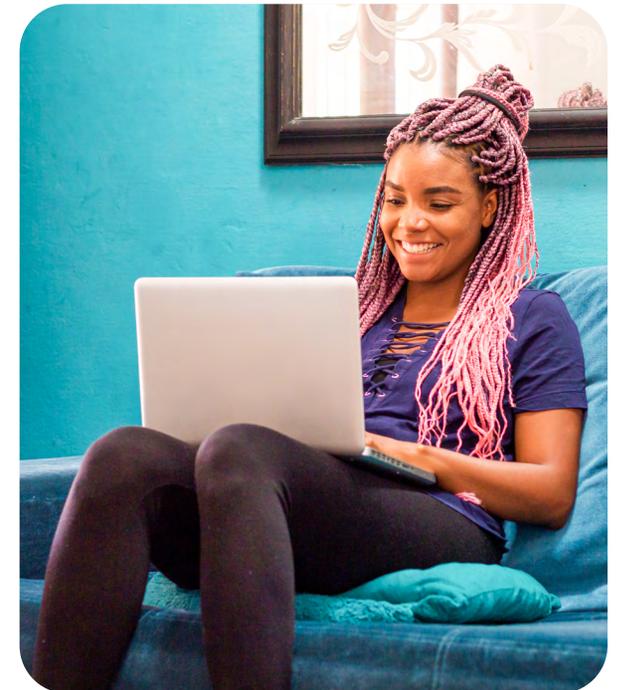




Identifying solutions to improve STEM

YouScience and Ford Next Generation Learning, along with many other industry and educational organizations, are developing innovative solutions to these very real problems. These solutions include:

- 1. Aptitude measures** are the foundational tool to help students discover their best fit postsecondary education and career pathways. This is one of the most critical steps to close the exposure gap for students and increase their spectrum of career exposure.
- 2. Career academies** are the creation of high school programs focused on specific career fields like: health sciences, engineering, and IT. They allow students to align their education with career aspirations.
- 3. Collaborative planning** between family, educators, and counselors to help students navigate their educational and career journeys, including: course planning, CTE participating, and obtaining industry-recognized certifications.
- 4. Interdisciplinary education** where schools and districts work together to create personalized pathways and integrated programs through the lens of relevant career clusters.
- 5. Career-connected learning** to help students connect education to the real world. Programmatic approaches should be implemented on both the state and local level.
- 6. Education-to-career planning tools** aid counselors and teachers in helping students create personalized plans for postsecondary education and training based on each student's unique aptitudes and interests.
- 7. Industry-recognized certifications** quantify student knowledge and skills that directly connect the classroom to employers. Emphasis needs to be placed on stackable certifications—which support outcome-based education efforts and provide students with meaningful credentials as they graduate.
- 8. Work-based learning**, internships, and apprenticeships connect students with business and industry partners to gain real-world work experiences while they are in school.
- 9. Community connections** strengthen ties between schools and the community to address local workforce needs, support economic development, and enhance education through community resources.





Student spotlight

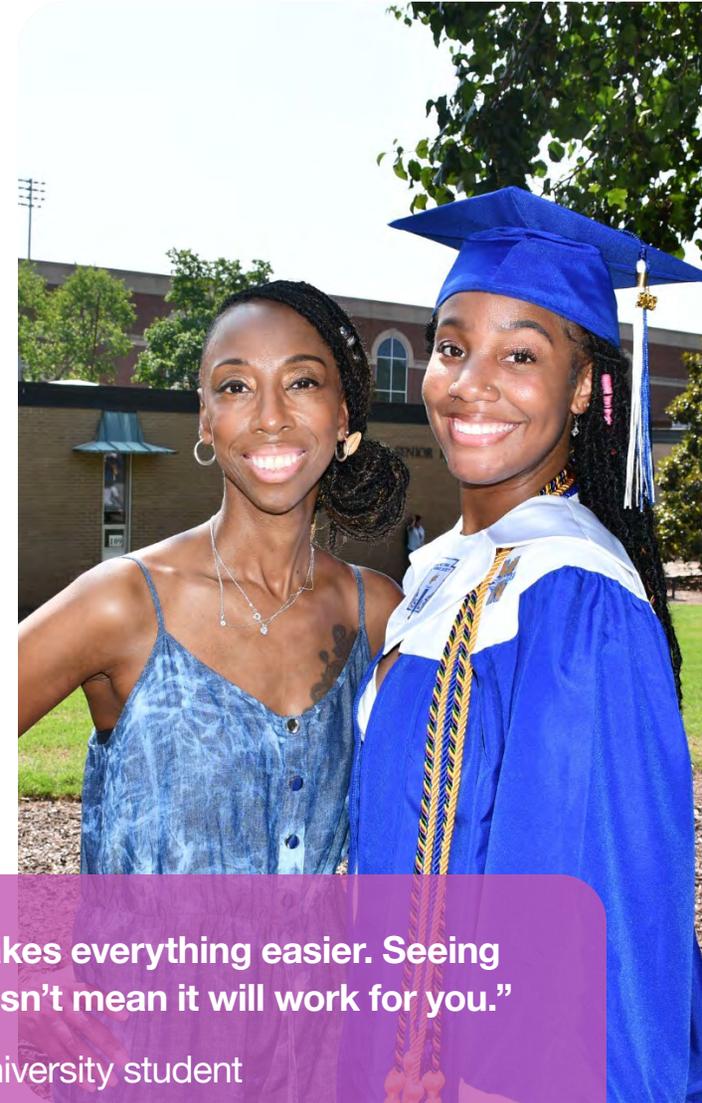
As a high school student in Georgia, Maylyn Mann thought she wanted to become a lawyer. When she took YouScience Aptitude & Career Discovery, she discovered new career paths she hadn't previously considered.

When Maylyn examined her results, she was surprised to learn that law did not appear as a best-fit career. Instead she found that she had a high aptitude for STEM-related careers. After closer inspection, she decided that a career in STEM was what she wanted to pursue.

Using her YouScience results and guidance from her mother, Dawn Mann, Maylyn was able to plan her high school course load with more confidence and successfully prepare for her postsecondary education and eventual career.

During her senior year of high school, Maylyn identified several scholarship opportunities to help pay for her college education. In nearly every scholarship application, she was asked to answer, 'Why should we choose you?', 'What great skills do you have?' and 'What are your weaknesses?' Dawn suggested that her daughter use her YouScience results, which detailed her aptitudes and provided a list of her interests, strengths, and weaknesses, to answer these questions. Maylyn did just that, and at the end of the process, she was awarded more than \$200,000 in scholarship funds.

Maylyn is currently studying at Tennessee State University and majoring in public health with a minor in computer science. It's not where she thought she would be at the beginning of her high school career, but thanks to YouScience and her mother's guidance, she knows she's pursuing a career that she will enjoy and succeed in.



“I think knowing what’s for you makes everything easier. Seeing what works for someone else doesn’t mean it will work for you.”

— Maylyn Mann, Tennessee State University student

About us



YouScience® is the leading technology provider dedicated to solving the skills and exposure gap crisis for students and employers. Its end-to-end platform, YouScience® Brightpath, connects education with career applications designed to help students unlock their potential for future pathways. YouScience leverages proven research, artificial intelligence, and industry input to help individuals identify their aptitudes, validate their skills and knowledge, and get matched with real-world educational and career pathways in high-demand occupations. YouScience is the preferred choice of individuals, parents, educators, and counselors to guide and support educational and career pathways, currently serving more than 9,200 educational institutions and millions of users nationwide.

To learn more about Brightpath, visit www.youscience.com/brightpath.



Ford Next Generation Learning (Ford NGL) is a community-connected transformation model dedicated to reshaping K-12 education to better align with the demands of the modern workforce. By mobilizing educators, employers, and community leaders, Ford NGL is preparing a generation of diverse young people who are ready for college, careers, and life. Students, as a result, are equipped to apply their passion and skills to contribute and improve their communities. Committed to empowering all students to thrive in an ever-evolving world, Ford NGL is making a significant impact on advancing student, community and workforce success.

To learn more about Ford NGL, visit www.fordngl.com



¹ <https://www.bls.gov/emp/tables/stem-employment.htm>

² <https://www.forbes.com/sites/taliamilgromelcott/2023/10/11/workplaces-do-it-so-can-schools-real-world-relevance-keeps-girls-in-stem/?sh=6228c3241127>

³ <https://www.pewresearch.org/science/2021/04/01/stem-jobs-see-uneven-progress-in-increasing-gender-racial-and-ethnic-diversity/>

⁴ <https://www.forbes.com/sites/lisacaldwell/2023/04/12/women-in-manufacturing-the-ball-is-rolling-now-it-must-go-faster/?sh=2734b4043c51>

⁵ <https://www.commerce.gov/news/blog/2021/03/making-place-women-manufacturing>

⁶ <https://www.ncarb.org/nbtn2023/demographics>

⁷ <https://www.washingtonpost.com/business/2022/11/11/hispanic-women-construction-trades/>

⁸ <https://www.oxfordeconomics.com/resource/future-of-construction/>

⁹ <https://www.forbes.com/sites/shereatcheson/2023/03/07/powerful-tech-stats-for-international-womens-day/>

¹⁰ <https://www.bls.gov/ooh/computer-and-information-technology/home.htm>

¹¹ <https://www.livescience.com/47499-what-is-engineering.html>

¹² <https://swe.org/research/2024/employment/>

¹³ <https://www.bls.gov/ooh/healthcare/home.htm>