

# STATE OF STEM EDUCATION STAKEHOLDER REPORT

TWENTY-TWO YEARS OF MEASURING  
STUDENTS AND TEACHERS PERCEPTIONS  
ABOUT STEM

JUNE 7, 2024



“Let’s help them see themselves as greater so that they can see the world as they are and always have a future to look forward to.”

**-Reagan Flowers, PhD,  
founder of C-STEM Teacher and Student Support  
Services and the State of STEM Education  
Stakeholder Report**

## Acknowledgments

The 22nd C-STEM report could not happen without the teachers and students who participate in the organization's PreK-20 programs, which consist of teacher training, PreK-12 supplemental learning, and the college/university internship program. These individuals share their perceptions, attitudes, confidence, and experiences regarding STEM teaching, learning, programming, participation, performance, and interests. This report is because of their willingness to share with us.

June 7, 2024

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# BACKGROUND

C-STEM Teacher and Student Support Services, Inc. is thrilled to continue to share our story with you! Since 2002, C-STEM has been an innovative community resource from cradle to career. Our outreach efforts have spanned 42 countries. C-STEM is a smart social investment for communities across the U.S. as it is research-based and meets rigorous and results-driven design principles. The three critical education problems C-STEM addresses in the United States relate to:

- Increasing the interest and academic capacity of minorities and females to pursue STEM opportunities
- Exposing minorities and females to high-quality STEM learning in communities where they live and learn
- Increasing participation of minorities and females in the growing STEM economy.

The mission of C-STEM is to inspire the next generation of innovators and thought leaders by engaging them in exciting hands-on projects, solving real-world problems to encourage entry into the talent pipeline, bolster self-confidence, and foster a well-rounded mastery of the areas of Communication, Science, Technology, Engineering, and Mathematics.

C-STEM's work is not just about education, it's about transformation. By increasing the exposure to quality STEM educational programming, we are not only impacting the student but also the entire family. The benefits are even more profound when students decide on a STEM career. Choosing a path in STEM significantly increases the chances of accessing high-paying jobs (Grünberg, 2022), offering the potential to radically alter the trajectory of their family and community.





# INTRODUCTION

## Who we are and the work we do

For more than two decades, C-STEM has engaged with businesses that are leading the way in STEM to remain apprised of what industries are working on, the type of talent they seek, the skills that are needed to respond to demand, and the economic implications. In doing so, C-STEM has continued to develop training, curriculum, and programs that are relevant and real-world. The theme for the 2023-2024 academic year focused on, "A Sustainable Horizon - Empowering Collective Action for Carbon Neutrality,". This theme was selected in response to the United Nations 17 Sustainable Development Goals (SDG) that have been shared with the world with benchmarks to reach by 2030 and 2050 (THE 17 GOALS | Sustainable Development, n.d.). C-STEM helps schools remain up to date by providing access to training, curriculum, toolkits, and resources that are relevant and connect with current and projected workforce trends to supplement classroom instruction.

Throughout the 2023-2024 academic year, C-STEM teachers and students explored practices that reduce greenhouse gases in the atmosphere and how collective societal response can reshape how we interact with systems to provide us energy to achieve what's known as net-zero emissions, where any greenhouse gases still entering the atmosphere are balanced by those being removed.



C-STEM was able to take challenges we are currently facing in the world with rising sea levels and burning of forests, as one of our planet's defining challenges of our time and indicators of climate change to teach students and teachers how to think about our planet and be good environmental stewards. While the impact of global warming escalates, so does a growing number of initiatives aimed at mitigating carbon emissions and holding contributors of greenhouse gases accountable for their impact on the environment. There is often much debate about the most effective way to face the climate crisis and who is most responsible for taking on the challenge. Ultimately, overcoming the climate crisis will require the collective effort of governments, businesses, and individuals, so C-STEM found it critically important to create a learning opportunity for students on this topic.

The journey to discovering how to affect climate change began by enhancing teachers' and students' understanding of the science behind why the globe is warming and understanding what types of human activities have the most significant impact on Earth's temperature and weather patterns.

C-STEM successfully engaged teachers and students in activities that got them thinking about and creating solutions on how we can achieve net-zero emissions or reduce greenhouse gas emissions to as close to zero as possible, as a crucial step in combating climate change.

At C-STEM, we know that all students can achieve and that no STEM problem is too big for them to solve!

# THE STAKES

## C-STEM's place in the community and in kids' lives

Despite the national priority to enhance STEM education, the current landscape reveals a concerning scenario. Achievement levels in STEM indicate that the U.S. is not adequately preparing minority populations for a STEM knowledge-based economy. There must be a sufficient talent pipeline of scientists, mathematicians, and engineers to meet domestic demand. According to Education Week, 95% of teachers feel they are responsible for getting students ready for the future workforce, yet nearly 40% believe this is not happening at school (Langreo, 2023).

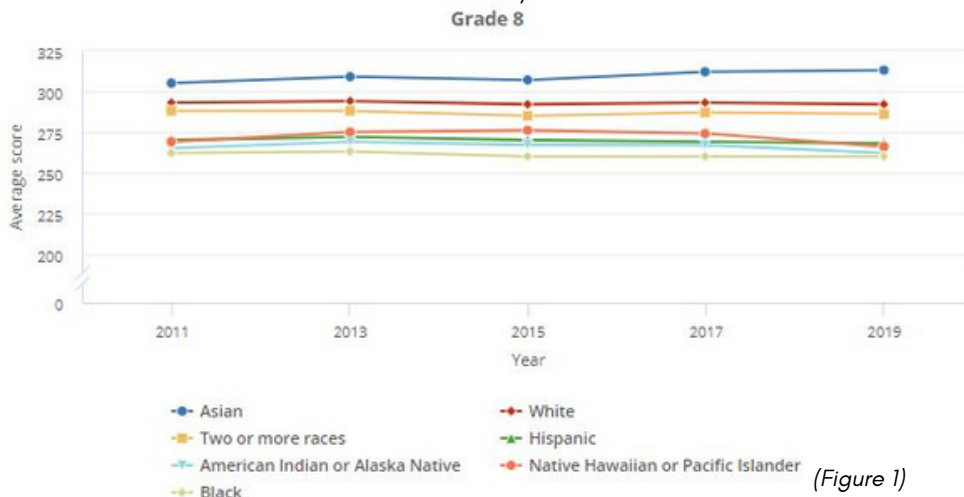
The NAEP 2019 mathematics test data show that U.S. minority (non-Asian) eighth graders were lower than their White and Asian peers (Burke, n.d.) (Figure 1). In 2022, Elementary and Secondary STEM Education reported that middle school math teachers in schools with more than 75% minority enrollment have 14% fewer teachers with in-field degrees (Gillespie, 2023).

Furthermore, many students entering high school with learning deficiencies come from low socio-economic backgrounds and primarily are children of color and rural Americans (Bertley & Bertley, 2024).

Their proficiency in reading and math skills is as much as 26% below that of their counterparts from families with substantial incomes (Bertley & Bertley, 2024). This is only exacerbated in the aftermath of the COVID-19 pandemic, as students in the U.S. and worldwide continue to catch up from so much time spent away from in-person classroom learning (Bertley & Bertley, 2024).

The knock-on effect is that struggling students will likely become increasingly frustrated with their progress and low performance. As a result, many will go on to have low self-confidence, which might discourage them from pursuing education further or cause them to distance themselves from others. Further, according to a 2020 Youth Truth survey students reported that their teachers are more disconnected from them than ever, with less than 22% of middle and high school students saying that their teachers try to understand their lives outside of school (Langreo, 2023).

Average scores of students in grades 8 on the NAEP mathematics assessment, by race or ethnicity: 2011-19



(Figure 1)



# THE STAKES (CONTINUED)

## C-STEM's place in the community and in kids' lives

Another aspect of STEM education being explored is students' sense of belonging in the learning environment. The Teacher Education department at Rider University began combatting the shortage of teachers in STEM pathways with their 100Kin10 initiative that focused on training 100,000 new STEM teachers to enter the workforce over ten years. After hitting their goal, Rider is now expanding the program with their Beyond100K initiative, which aims to increase the capacity for inclusive teaching models and end the STEM teacher shortage by 2043 (Rider Receives Grant to Support Inclusive Excellence in STEM Teaching and Learning | Rider University, 2024). Bowen (2021) found that with these types of programs, teacher preparation departments hope to train teachers, so they are better equipped to embrace student differences in hopes that children feel socially connected, supported, and respected. He also found that by fostering a sense of belonging, educators hope students will feel empowered to ask for what they need.

Additionally in the article it is mentioned that teachers and peers are regarded with a sense of trust, and they attend school with a sense of achievement, excitement, and belonging. Environments that are set up to encourage STEM education create confidence, and these students are seen as people of value (Bowen, 2021).

When students who are exposed to STEM have the right people, environments, and educational support in their corner, the greater the odds the ripple effect of their STEM education will be felt in a myriad ways and for years to come. We cannot let supporting STEM be a missed opportunity—in our community or elsewhere. Given how much education is changing, it is necessary to be aligned with all stakeholders on what needs to happen to support all students and most importantly those most vulnerable and underserved. And although we can work together toward a brighter future, there are still a few obstacles to consider as we forge our path forward.



# CONFLICTS

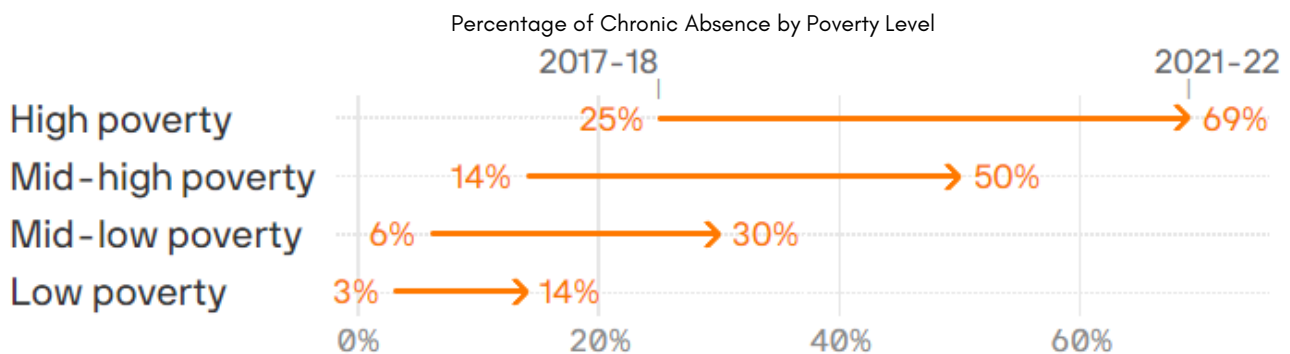
## The difficult “realities” of STEM education that the world is facing and how C-STEM is providing solutions to those challenges.

Let’s look deeper at the challenges and opportunities that lie ahead at C-STEM and in PreK-12 STEM education. Although we are seeing improvement in some areas, other challenges are more daunting and will take longer to show improvement. We are sharing information gathered through our formal surveys completed by students and teachers, conversations with fellow educators teaching in public and charter schools, and data from trends happening on a national scale.

### Chronic Absenteeism

Chronic absenteeism rates have surged in recent years, with students missing at least 10% of school days. In many states and districts, these rates doubled between the 2018-19 and 2021-22 school years. These numbers reach nearly 70% of students (Rubin, 2023) in schools with the highest poverty levels (see figure 2). The combination of school missed during the pandemic and post-pandemic absenteeism rates makes it difficult for students to keep pace and meet grade-level expectations. Gabenski (2024) in his write up for the National Association of Elementary School Principals (NAESP) speaks about how students who battle with chronic absence struggle to obtain the necessary foundational skills to be successful in school. They further say that when students with chronic absences matriculate to high school, it impacts their grades and ability to pass courses and increases the chance of dropping out.

However, some states have begun to see improvement. Of the 31 states that have reported data from the 2022-23 school year, 26 saw slight declines in chronic absenteeism from the previous school year, according to Bdimarco (2024) in FutureEd. It is essential that schools diligently track absenteeism and find ways to get to the root of the problem. According to Attendance Works, there are four root causes of chronic absence: barriers, aversion, disengagement, and misconceptions. Barriers speak to challenges such as illness, transportation, and community violence (Root Causes - Attendance Works, 2023)(C-STEM, 2023).



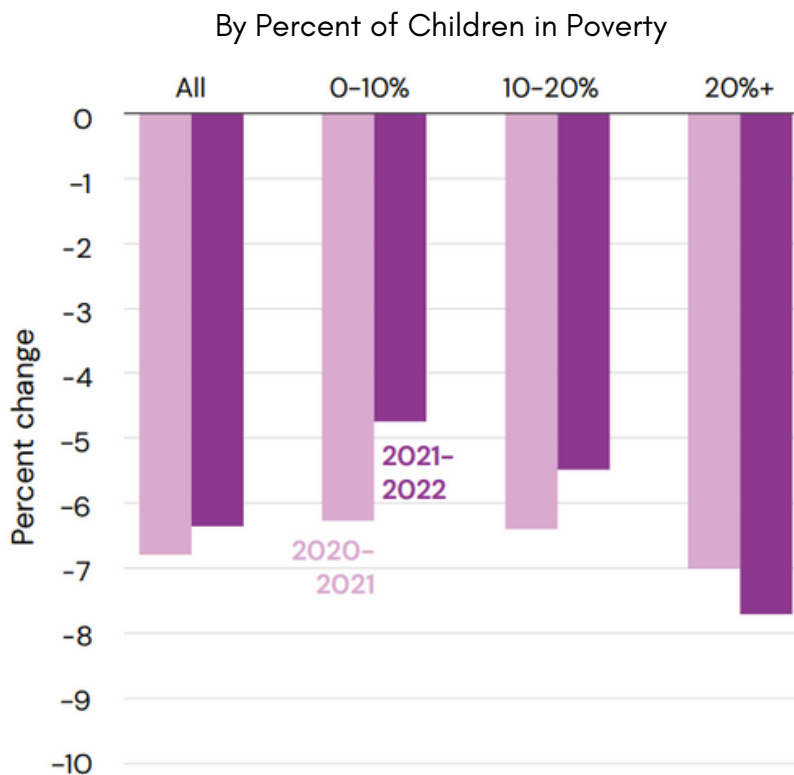
(Figure 2)



# CONFLICTS (CONTINUED)

## The difficult “realities” of STEM education that the world is facing and how C-STEM is providing solutions to those challenges.

There are also barriers C-STEM has observed that students face, such as not having a clean uniform to wear to school, which results in not attending school. Aversion speaks to factors such as academic and behavioral struggles, support systems with negative experiences, and anxiety. Disengagement highlights challenges with cultural responsiveness, lack of enrichment opportunities, and working to fulfill household financial obligations. Some misconceptions include the belief that attendance only matters in the higher grades and that suspensions don't count as absences. The identified challenges above are all impacting factors that students in low socioeconomic neighborhoods face daily throughout their educational trajectory. According to Burtis and Goulas (2023), schools in high-poverty and urban areas saw the steepest enrollment declines (see Figure 3). However, improvement is possible when educators and school leadership identify the most significant problem areas. In an article written for K12 Dive, Arundel (2024) highlights two school administrative teams for their efforts to reduce chronic absenteeism. In this article, the two schools say that they make an intentional effort to address students' individual needs with the attendance barriers, and in doing so, one of the schools reduced their percentage from 15% to 9%. At the same time, the other campus moved from 30.9% to 21.6% of students with chronic absenteeism. Additionally, Aberdeen Academy and Bristol Central High School emphasize "making sure every kid feels connected and safe."



(Figure 3)

# CONFLICTS (CONTINUED)

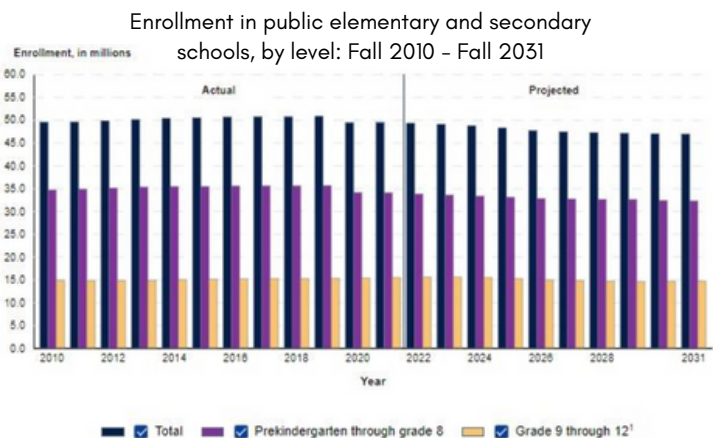
**The difficult “realities” of STEM education that the world is facing and how C-STEM is providing solutions to those challenges.**

## Funding

Congress allocated an unprecedented surge of \$190 billion in one-time funding to schools and districts during the COVID-19 pandemic, and this funding will soon run out. This funding is not a permanent solution to the problem with the funding model. School districts must carefully reevaluate their budgets to account for the loss of funding once the pandemic allocations have subsided. Although grants and private funding have a significant impact, they can be inconsistent in appropriation. Unless there are dramatic shifts in allocation, we will see specific programs scaled back or cut, and personnel will be eliminated. A known fact is that the distribution of money and time highlights the priority. James W. Frick, former vice president for public relations at the University of Notre Dame, once said “Don’t tell me where your priorities are. Show me where you spend your money and I’ll tell you what they are.”, this powerful statement is a true testament to understanding that where we spend our money shows what we value. Currently, in the U.S., the average spend for each inmate is \$31,286 per year in the prison system, while we spend an average of \$12,756 per student in the public education system. When we look at these astonishing numbers it should inspire more significant investments in our future leaders, innovators and change-makers coming of age through public education.

## Declining Enrollment

Declining enrollment will also affect district budgets and result in tough decision-making about staffing, schools' upkeep, programs' elimination, and even school closures. While public school enrollment gradually increased by 3% between 2010 and 2019, it dropped 3% in the first year of the pandemic, with steeper declines in earlier grades (COE - Public School Enrollment, n.d.)(see Figure 4). While less enrollment could mean smaller class sizes and more individual student attention, it also means fewer instructional resources. Additionally, students not enrolled in school experience a loss of instructional time, widening their learning gaps. According to an article written by Cohodes et al. (2022), students fall further below grade level every month when they are not enrolled or attending face-to-face schooling



(Figure 4)



# OPPORTUNITIES

Amidst the challenges, there's a silver lining—a growing emphasis on social-emotional learning (SEL). Schools are adopting frameworks that not only focus on SEL but also equip students with real-world applicable technical skills. These efforts are not just about academic progress, but about empowering students to navigate the world of STEM education with confidence and resilience.

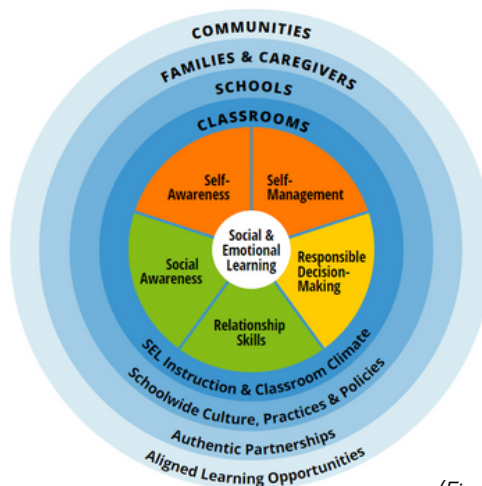
## Social-Emotional Learning

Low-income students and students of color deal with additional stressors every day. These could include financial worries, housing instability, food insecurity, prejudice, racial stereotyping, and more. Building social-emotional resources that acknowledge students' struggles and help them find social mobility is crucial. The whole-child approach understands that for students to reach their full potential, institutions must understand how to make learners feel safe and welcomed in STEM learning environment (Whole Child Education, n.d.)(see Figure 5). Popular among SEL models is the CASEL framework, which has five main pillars: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (Frye et al, 2022)(see Figure 6). Intentional focus on these areas aids the effort to build a more inclusive and student-focused environment for all learners. With the high rigor of STEM education, institutions must create a community supporting learners throughout their programming experience. The Centers for Disease Control reports that 42% of high school students in 2021 felt sad or hopeless for at least two consecutive weeks in the past year and stopped engaging in their usual activities, an increase of 26% over 2009 (Centers for Disease Control and Prevention, 2021).

Guiding Principles for Equitable Whole Child Design



(Figure 5)



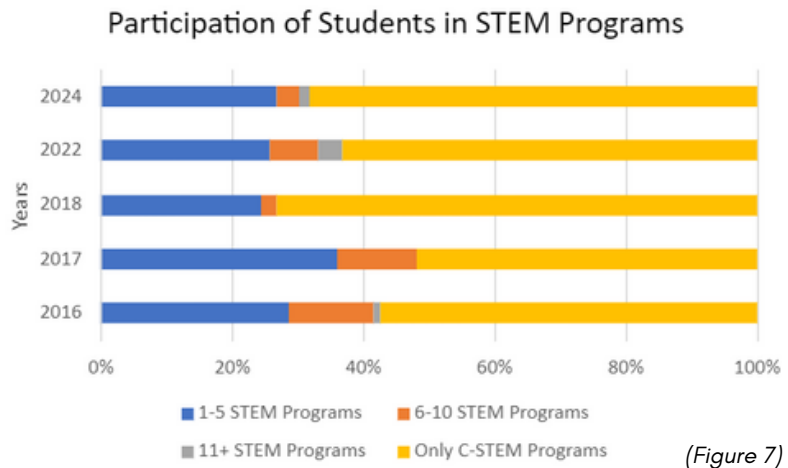
(Figure 6)

# OPPORTUNITIES (CONTINUED)

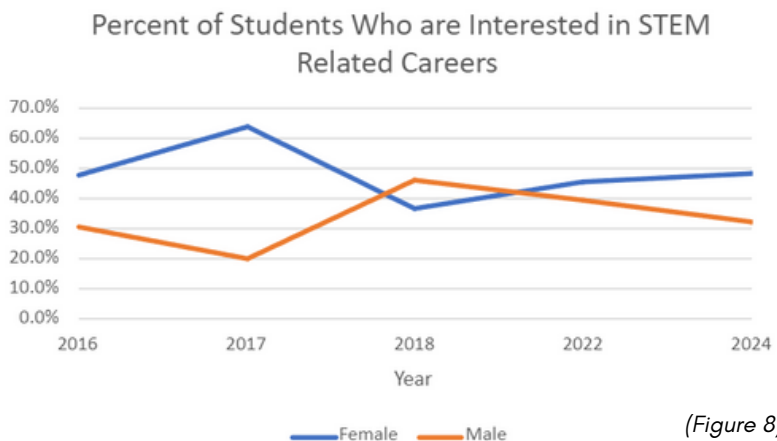
## Career and Technical Education

Increased focus and investment in preparing students for career paths is needed to combat the economic challenges we face as a nation. In a recent article from U.S. News & World Report published in 2023, Kerr and Wood (2023) write the cost of colleges and universities continues to rise, which creates a challenge for underrepresented groups to gain access to higher education due to a large portion of this group holding the title of low socioeconomic status. The U.S. Census published in 2020 that Black Americans made up 23.8% and Hispanics made up 28.1% of the poverty population (U.S. Census Bureau, 2021). According to Wilburn (2024) of the Texas Tribune, community colleges are on the rise, with enrollment of over 600K students in Texas alone and with more affordable and quality post-secondary educational options. The Stay Informed Report published by the National Student Clearinghouse highlights that students are taking advantage of the more economical choice of community college, which makes up nearly 60% of the overall institutional growth (Blog, 2024). Additionally, the Clearinghouse data shows that minority students accounted for most of the undergraduate growth in Fall 2023 (Blog, 2024).

Over the years C-STEM has collected data from students participating in the C-STEM challenge that fall under the labels of underrepresented low socioeconomic minority groups. The data collected over the years shows that 50% or more have not participated in STEM programs prior to their experience with C-STEM programming (see Figure 7). Additionally C-STEM has collected data about the interest of students in STEM careers. While females remain as an underrepresented group, over the years C-STEM has seen positive growth in the interest of STEM careers amongst female participants (see Figure 8).



(Figure 7)



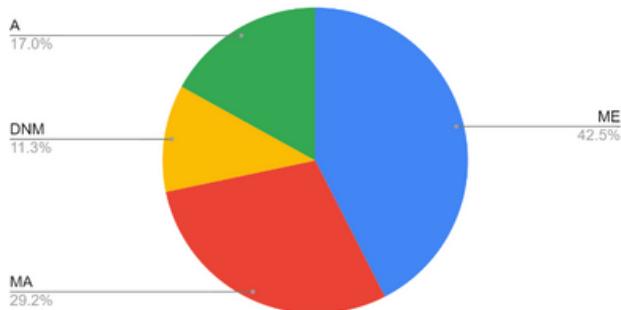
(Figure 8)

# IMPACT FACTORS

## Title I Participation in STEM

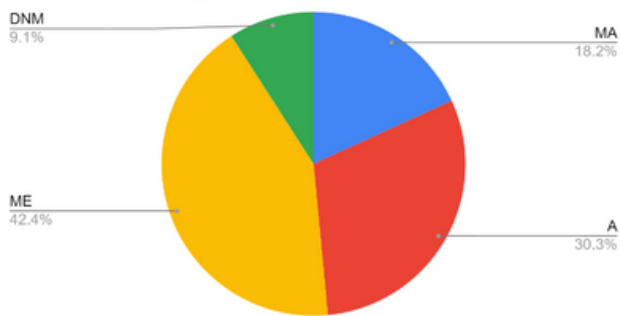
For six years, C-STEM has partnered with Sheldon Independent School District (ISD), a Title I District. This distinction indicates that the schools in the district fall under Title I, with over 40% of the students qualifying for free or reduced lunch based on socioeconomic status. Historically, schools with low socioeconomic status have low performance ratings on standardized tests. In 2023 it was reported that 33% of elementary and secondary Texas low-income students met or exceeded grade level expectations on the Math STAAR, while 60% of students not considered low-income met or exceeded grade level expectations (Lopez, 2024). Sheldon ISD C-STEM student data suggests that individuals coming from low-income households can achieve high-performance levels in mathematics on state mandated standardized test if given adequate support, including access to high-quality STEM education (see Figures 9, 10, & 11).

Elementary: STAAR Math (Masters- MA, Meets-ME, Approaches- A, Did Not Meet- DNM)



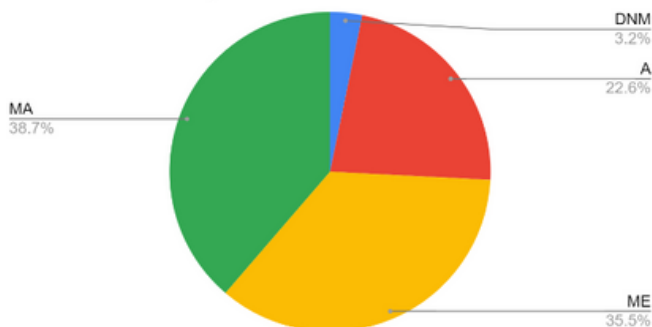
(Figure 9)

Middle: STAAR Math (Masters- MA, Meets-ME, Approaches- A, Did Not Meet- DNM)



(Figure 10)

High: STAAR Math (Masters- MA, Meets-ME, Approaches- A, Did Not Meet- DNM)



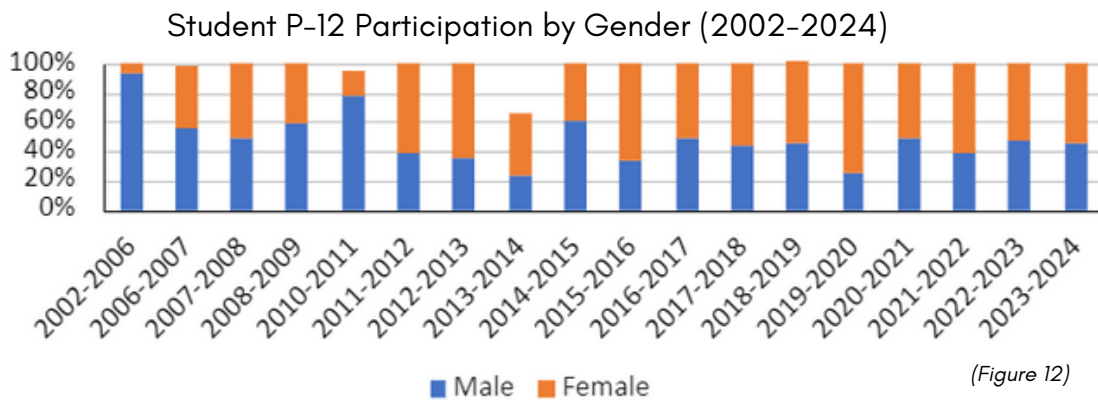
(Figure 11)



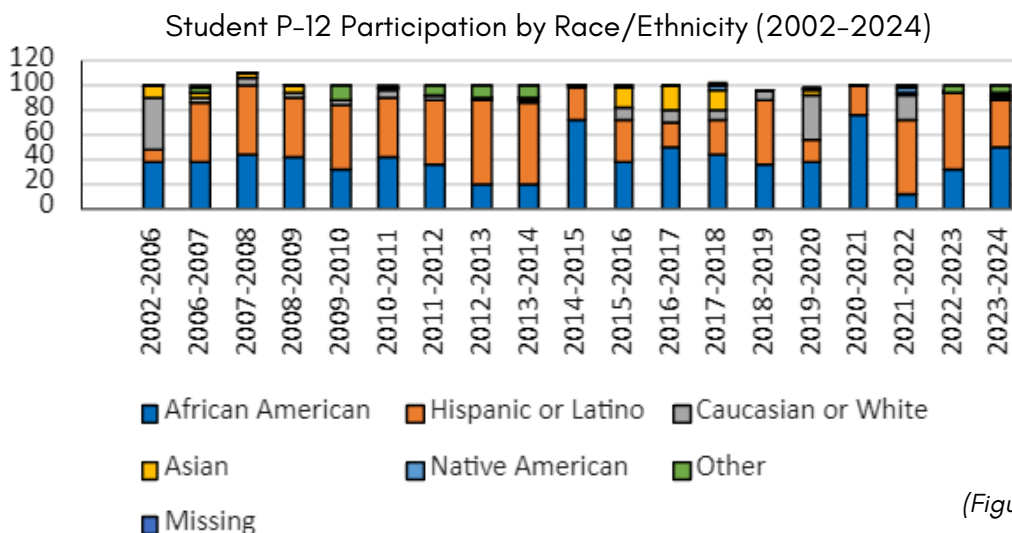
# IMPACT FACTORS (CONTINUED)

## Underrepresented Groups

Since 2002, C-STEM has been leading the way in engaging teachers, parents, corporate partners, and community stakeholders in efforts to close the learning gaps that underserved and underrepresented students far too often experience in STEM. The support services C-STEM provides target girls, PreK-12 students of color, college and university students, those who are economically disadvantaged, as well as students who are disabled, have English as a second language (ESL) or face other challenges that may affect learning. C-STEM responds to historical and current STEM academic and workforce data, trends, and projections. According to the National Science Foundation (NSF), in 2021, Hispanics made up 15% (5.1 million), and Black Americans made up 9% (3.0 million) of the total STEM workforce (Deitz, n.d.). This data represents an alarming imbalance due to the population numbers captured in the 2020 census report, where Hispanics made up 18.7% (roughly 62 million) and Black Americans made up 12.1% (approximately 47 million) of the U.S. population (U.S. Census Bureau, 2023). Over the last two decades, C-STEM community impact efforts have focused on closing the achievement gap by providing training, programming, and internships to underserved and underrepresented groups in the STEM workforce (see Figures 12 & 13).



(Figure 12)



(Figure 13)

# IMPACT FACTORS (CONTINUED)

## Workforce Opportunities: Environmental and Sustainability

According to the National Registry of Environmental Professionals (NREP), in 2023 the most in-demand green jobs consisted of (Environmental Careers: 11 Most In-Demand “Green” Jobs in 2023 | NREP, n.d.);

- Air Quality Engineer
- Chief Sustainability Officer
- Conservation Scientists
- Energy Analyst
- Environmental Consultant
- Geoscientist
- Renewable Energy Consultant
- Farm and Fishery Manager
- Safety Technician
- Compliance Manager
- Natural Resources Specialist

With the environmental challenges we face today as a society, we must take notice of the careers that can aid in preserving our planet. In looking at the list above, it is clear that for humans to advance in their contribution there must be an intentional focus on understanding the impacts that society has on the environment, how we as humans can innovate and invent new environmentally friendly technologies, and how we regulate the systems so that we keep a culture of compliance. Careers focusing on the analysis and research of environmental factors help us understand. Those in engineering and technical roles are directly working towards new innovative technologies. At the same time, those in managerial roles are working to keep companies and organizations in compliance with the rules and regulations that govern the industry.

## Global Sustainability

Cambridge University defines global sustainability as "the conditions under which humans and nature, societies and the biosphere, the world, and the Earth can co-exist in ways that enable productive harmony, stability and resilience to support present and future generations" (About Global Sustainability, n.d.). In 2023 the United Nations Educational, Scientific and Cultural Organization (UNESCO) spoke to the importance of education's involvement in creating a sustainable future. In this article, they make the argument that education for sustainable development empowers society to make knowledgeable choices regarding personal and communal conduct to shift culture and call attention to the earth.

## Path to Environmental and Sustainability Careers

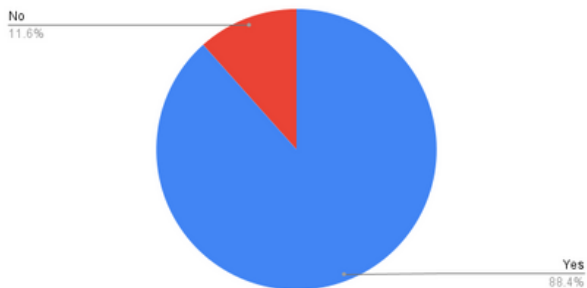
According to Harvard Business Review in their 2022 article, the Green General index highlights four skills appealing to green occupations: engineering and technical skills, science-based skills, operational management skills, and monitoring skills (Orduña, 2024). New products and solutions require a unique skill set of creative engineering and technical expertise. With rising emphasis on challenges such as energy efficiency companies need individuals with advanced knowledge in various fields of science, including physics, chemistry, and biology. Along with technicians and innovators, the industry needs organizational managers. With equal importance, businesses require in-depth monitoring to produce reports and remain compliant. Honing skills within the four pillars will benefit students looking to advance in sustainability.

# STAKEHOLDERS IMPACTED

## Families

Careers in STEM fields like science and engineering are among the fastest growing occupations in which individuals can become involved to build the capacity for financial stability and mobility. According to the National Science Foundation (NSF), men working in STEM occupations earned an average of \$17,000 more than non-STEM workers, while women in STEM earned up to about \$24,000 more in wages compared to those in non-STEM careers (Deitz, n.d.) (see Figure 14). The U.S. Bureau of Labor Statistics (BLS) reports that the median annual wage for STEM occupations was \$86,980 in 2019, significantly higher than the median wage of \$39,810 for all occupations (Employment in STEM Occupations: U.S. Bureau of Labor Statistics, 2024). Families have always played a pivotal role in influencing children's perspectives on educational opportunities, and recently, we have seen a rise in scholars conducting studies focused on parental involvement in STEM education (Gülhan, 2023). C-STEM has been intentional over the years to track how parents and families impact STEM education with their students (see Figure 15). With studies on the rise that take a deeper look into the involvement of families, we are in a great position as a society to understand the lasting effects better.

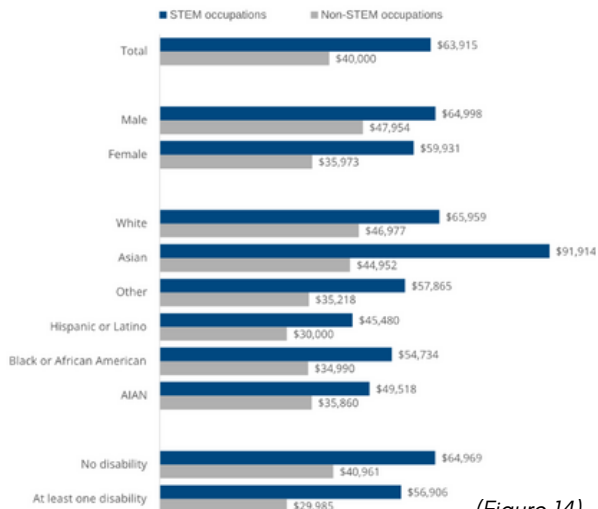
My parent(s) are involved with supporting my participation in STEM



(Figure 15)



Median wage and salary earnings of the workforce ages 18-74 in STEM and non-STEM occupations, by sex, ethnicity, race, and disability status: 2020



(Figure 14)

## Post Secondary Pathways

Ghazzawi et al. (2021) writes about the data from the National Center for Education Statistics (NCES) indicates that underrepresented minorities earned only 15% of STEM bachelor's degrees in 2018, despite making up 30% of the US population. This data is consistent with the National Science Foundation (NSF) and Bureau for Labor and Statistics (BLS) statistics on underrepresented groups regarding underrepresentation in the STEM workforce. C-STEM's community impact work directs students to post-secondary pathways by providing entry points and consistent touch points for students to engage in STEM education. C-STEM is helping students from underrepresented backgrounds build an identity in STEM. According to a study conducted by scholars at Purdue University, one of the main factors influencing students to elect a STEM pathway is their math/science identity (Main et al., 2023). Ma and Xiao define identity, as told by many researchers, as the sense that math and science are 'right' for an individual and vice versa.



# STAKEHOLDERS IMPACTED

(CONTINUED)

## Companies

Companies: Many industries we depend on, from the auto industry to construction, healthcare, and more, require increasing aptitude in math and science. NPR reported that in March 2024, the construction industry added over 300,000 jobs, more than the expected increase (Horsley, 2024). Data shows that jobs within the manufacturing sector of automobiles are on the rise, reaching nearly 1 million workers in 2022 (Statista, 2023). Indicators such as these labor statistics show that we must be vigilant in preparing the future STEM workforce. According to the U.S. Bureau of Labor Statistics (BLS), employment in STEM occupations is projected to grow by 8% from 2019 to 2029, compared to 3.7% for all occupations (Employment in STEM Occupations: U.S. Bureau of Labor Statistics, 2024)(Figure 16). Investing in STEM education is essential to meet the demands of a rapidly expanding job market and to ensure economic competitiveness. A report by the National Academies of Sciences, Engineering, and Medicine (2023) highlights a significant shortage of skilled workers in STEM fields, which creates risk with the growing economy, leading technological initiatives, and national security.

It is important that companies continue to invest in the future through educational initiatives and programs. In 2022, U.S. companies collectively invested around \$350 billion in education, with a significant focus on STEM (Science, Technology, Engineering, and Mathematics) education (Why STEM Education Is the New #1 Corporate Investment, n.d.; Digital Learning Can Help Us Close the Global Education Gap. This Is How, 2021). This massive investment highlights the prioritization of preparing a workforce skilled in STEM fields, which are critical for the 21st-century economy. This investment is part of a broader trend where corporations are increasingly viewing education, particularly STEM education, as essential for their corporate citizenship initiatives (Digital Learning Can Help Us Close the Global Education Gap. This Is How, 2021; Why STEM Education Is the New #1 Corporate Investment, n.d.).



Employment in STEM Occupations

Occupation category	Employment, 2022	Employment, 2032	Employment change, numeric, 2022–32	Employment change, percent, 2022–32	Median annual wage, dollars, 2023 <sup>[1]</sup>
Total, all occupations	164,482.6	169,148.1	4,665.5	2.8	48,060
STEM Occupations <sup>[2]</sup>	10,365.0	11,487.4	1,122.4	10.8	101,650
Non-STEM occupations	154,117.6	157,660.7	3,543.1	2.3	46,680

(Figure 16)

# DEFINE THE PATH

## Conclusion

C-STEM's longitudinal data and comprehensive understanding of the need for increased collaborations to drive the future of STEM education suggest that we can bridge the gaps and increase the participation of underserved and underrepresented groups in STEM, includes:

- Collaborative efforts to improve access to high-quality math and science education, particularly in schools serving underprivileged communities. Providing access involves investing in resources, teacher training, curriculum development, and after-school programs that foster STEM learning.
- Bridging the digital divide by providing all students access to broadband internet and modern technology tools. Initiatives focused on providing technology resources, such as computers, internet connectivity, and software, provide the tools that empower underrepresented communities to engage in self-directed digital learning and exploration while keeping pace with academic expectations.
- Create inclusive and supportive learning environments to foster interest and confidence in STEM subjects. This involves promoting diversity among educators, implementing culturally responsive teaching practices, and encouraging collaborative learning and hands-on experiences.
- Provide mentorship programs and increase the presence of diverse role models in STEM fields in classroom learning and field trips to inspire and provide direction to guide students, particularly the most underserved and underrepresented. Encouraging professionals from diverse backgrounds to engage as mentors and offering opportunities for students to interact with successful individuals in STEM can help broaden their horizons and build a sense of belonging.
- Leverage the best-in-class solutions being provided by colleges/universities, community organizations, industry, and city/state/government to create collaborative, comprehensive, and sustainable solutions to address STEM education disparities. These partnerships can pool resources, share best practices, and coordinate efforts to provide holistic support for underrepresented groups in STEM.





# DEFINE THE PATH (CONTINUED)

## Looking Ahead: The Future

C-STEM is working toward a future where minority, female, and economically disadvantaged students have high-quality communication and STEM experiences that catapult them into transformative spaces and create economic and social mobility opportunities.

The future of STEM education holds immense potential, and the need for it is pressing. By harnessing the power of collaboration and innovation, and by securing the most effective resources, we can unlock a future filled with endless possibilities for the students who need it most. The following STEM projections highlight significant growth and essential initiatives. As previously stated, the U.S. Bureau of Labor Statistics forecasts an 8% increase in STEM jobs by 2029. The World Economic Forum anticipates 97 million new jobs in AI and automation by 2025 (The Future of Jobs Report, 2020). Global efforts like UNESCO's STEM and Gender Advancement (SAGA) aim to improve gender diversity in STEM (UNESCO SAGA Team & Advisory Committee and partners, 2016). Industry partnerships with companies like Google and Microsoft are aligning STEM education with market needs. Investing in STEM education is crucial for innovation and addressing workforce demands.





# REFERENCES

- About global sustainability. (n.d.). Cambridge Core. <https://www.cambridge.org/core/journals/global-sustainability/about>
- Arundel, K. (2024, March 1). How 2 schools are tackling chronic absenteeism. K-12 Dive. <https://www.k12dive.com/news/2-schools-tackle-chronic-absenteeism/708993/>
- Bdimarco. (2024, May 2). Tracking State Trends in Chronic Absenteeism - FutureEd. FutureEd. <https://www.future-ed.org/tracking-state-trends-in-chronic-absenteeism/>
- Blog, N. (2024, February 24). Stay Informed Report: Undergraduate enrollment grows for the first time Post-Pandemic, despite freshmen. Clearinghouse Today Blog. <https://www.studentclearinghouse.org/nscblog/stay-informed-report-undergraduate-enrollment-grows-for-the-first-time-post-pandemic-despite-freshmen-declines/>
- Bowen, J. (2021, October 21). Why is it Important for Students to Feel a Sense of Belonging at School? 'Students Choose to be in Environments That Make Them Feel a Sense of Fit,' Says Associate Professor DeLeon Gray. College of Education News. <https://ced.ncsu.edu/news/2021/10/21/why-is-it-important-for-students-to-feel-a-sense-of-belonging-at-school-students-choose-to-be-in-environments-that-make-them-feel-a-sense-of-fit-says-associate-professor-deleon-gra/>
- Burke, S. R. a. A. (n.d.). *Elementary and Secondary STEM Education | NSF - National Science Foundation*. <https://nces.nsf.gov/pubs/nsb2021/student-learning-in-mathematics-and-science>
- Burtis, E., & Goulas, S. (2023, October 12). Declining school enrollment since the pandemic. *Brookings*. <https://www.brookings.edu/articles/declining-school-enrollment-since-the-pandemic/>
- Centers for Disease Control and Prevention. (2021). *YOUTH RISK BEHAVIOR SURVEY DATA SUMMARY & TRENDS REPORT 2011-2021*. [https://www.cdc.gov/healthyyouth/data/yrbs/pdf/YRBS\\_Data-Summary-Trends\\_Report2023\\_508.pdf](https://www.cdc.gov/healthyyouth/data/yrbs/pdf/YRBS_Data-Summary-Trends_Report2023_508.pdf)
- COE - Public school enrollment. (n.d.). <https://nces.ed.gov/programs/coe/indicator/cga/public-school-enrollment>
- Cohodes, S., Goldhaber, D., Hill, P., Ho, A., Kogan, V., Polikoff, M., Sampson, C., & West, M. (2022). Student achievement gaps and the pandemic: A new review of evidence from 2021-2022. In *Center on Reinventing Public Education*. <https://files.eric.ed.gov/fulltext/ED622905.pdf>
- C-STEM. (2023, May 31). Students Feel Less Connected to Their Teachers Than Ever - C-STEM Teacher & Student Support Services. C-STEM Teacher & Student Support Services. <https://www.cstem.org/2023/05/31/teacherconnections/>

# REFERENCES

CTE data story: insights into how CTE can improve students' income after they graduate. (n.d.). <https://www2.ed.gov/datastory/cte/index.html#WHOGRADUATESFINDSAJOB>

Deitz, E. G. a. S. (n.d.). Diversity and STEM: Women, Minorities, and Persons with Disabilities 2023 | NSF - National Science Foundation. <https://nces.nsf.gov/pubs/nsf23315/report>

Digital learning can help us close the global education gap. This is how. (2021, January 26). World Economic Forum. <https://www.weforum.org/agenda/2021/01/think-education-is-a-matter-for-governments-alone-think-again/>

Employment in STEM occupations: U.S. Bureau of Labor Statistics. (2024, April 17). Bureau of Labor Statistics. <https://www.bls.gov/emp/tables/stem-employment.htm>

Environmental Careers: 11 most In-Demand "Green" jobs in 2023 | NREP. (n.d.). <https://www.nrep.org/blog/in-demand-green-jobs>

Frye, K. E., Boss, D. L., Anthony, C. J., Du, H., & Xing, W. (2022). Content analysis of the CASEL framework using K-12 state SEL standards. *School Psychology Review*, 1-15.

Gabenski, K. (2024, February 28). Breaking Down Barriers to Student Attendance - NAESP. NAESP. <https://www.naesp.org/resource/breaking-down-barriers-to-student-attendance/>

Ghazzawi, D., Pattison, D., & Horn, C. (2021). Persistence of underrepresented minorities in STEM fields: Are Summer Bridge programs sufficient? *Frontiers in Education*, 6. <https://doi.org/10.3389/feduc.2021.630529>

*Gillespie, A. (2023, November 3). What do the data say about the current state of K-12 STEM education in the US? NSF - National Science Foundation. <https://new.nsf.gov/science-matters/what-do-data-say-about-current-state-k-12-stem>*

Grünberg, J. (2022, June 30). Improving our STEM education is a national priority - ORT. ORT. <https://ort.org/en/improving-our-stem-education-is-a-national-priority/>

Gülhan, F. (2023). Parental Involvement in STEM Education: A Systematic Literature review. *European Journal of STEM Education*, 8(1), 05. <https://doi.org/10.20897/ejsteme/13506>

Horsley, S. (2024, April 5). Construction boom helps fuel job gains in March. NPR. <https://www.npr.org/2024/04/05/1243019330/construction-jobs-unemployment-federal-reserve>

# REFERENCES

Kerr, E., & Wood, S. (2023, September 20). See the Average College Tuition in 2023-2024. US News & World Report. <https://www.usnews.com/education/best-colleges/paying-for-college/articles/paying-for-college-infographic>

Langreo, L. (2023, July 21). Students want STEM careers, but think schools are doing a 'Poor job' preparing them. Education Week. <https://www.edweek.org/technology/students-want-stem-careers-but-think-schools-are-doing-a-poor-job-preparing-them/2023/07>

Lopez, B. (2024, February 6). STAAR results show Texas students still struggling with math and reading. The Texas Tribune. <https://www.texastribune.org/2023/08/16/texas-staar-scores-math-reading/>

Main, Joyce., Dang, Tram., Johnson, Beata., Shi, Qian., Guariniello, Cesare., Delaurentis, Daniel., (2023) Why Students Choose STEM: A study of high school factors that influence College STEM Major choice American Society for Engineering Education. <https://nemo.asee.org/public/conferences/327/papers/40243/view>

National Academies of Sciences, Engineering, and Medicine. (2023). In ASSESSING AND ADDRESSING THE LABOR MARKET GAP FACING THE U.S. SEMICONDUCTOR INDUSTRY. [https://www.semiconductors.org/wp-content/uploads/2023/07/SIA\\_July2023\\_ChippingAway\\_website.pdf](https://www.semiconductors.org/wp-content/uploads/2023/07/SIA_July2023_ChippingAway_website.pdf)

Orduña, N. (2024, April 11). How to build a career in sustainability. Harvard Business Review. <https://hbr.org/2022/02/how-to-build-a-career-in-sustainability>

Perna, M. C. (2023, October 18). Why Gen Z can solve the skilled labor shortage crisis. Forbes. <https://www.forbes.com/sites/markcperna/2023/10/17/why-gen-z-can-solve-the-skilled-labor-shortage-crisis/?sh=4bd06bfe3ac6>

Rider receives grant to support inclusive excellence in STEM teaching and learning | Rider University. (2024, April 9). Rider University. <https://www.rider.edu/about/news/rider-receives-grant-support-inclusive-excellence-stem-teaching-and-learning>

Root causes - attendance works. (2023, August 4). Attendance Works. <https://www.attendanceworks.org/chronic-absence/addressing-chronic-absence/3-tiers-of-intervention/root-causes/>

Rubin, A. (2023, November 21). 15 million students chronically miss school in post-COVID spike. Axios. <https://www.axios.com/2023/11/21/student-chronic-absenteeism-covid-recovery>



# REFERENCES

States increase funding for secondary career technical education by average of \$182 million over last decade - Advance CTE. (2024, January 18). Advance CTE. <https://careertech.org/news/states-increase-funding-for-secondary-career-technical-education-by-average-of-182-million-over-last-decade/>

Statista. (2023, December 19). Number of employees in U.S. automotive industry by sector 2010-2022. <https://www.statista.com/statistics/276474/automotive-industry-employees-in-the-united-states-by-sector/>

*THE 17 GOALS | Sustainable Development.* (n.d.). <https://sdgs.un.org/goals>

The Future of Jobs Report. (2020). World Economic Forum. [https://www3.weforum.org/docs/WEF\\_Future\\_of\\_Jobs\\_2020.pdf](https://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf)

UNESCO SAGA Team & Advisory Committee and partners. (2016). MEASURING GENDER EQUALITY IN SCIENCE AND ENGINEERING: Working Paper 1 THE SAGA SCIENCE, TECHNOLOGY AND INNOVATION STEM and Gender Advancement (SAGA) GENDER OBJECTIVES LIST (STI GOL) (By E. Fernandez Polcuch, M. Schaaper, L. A. Brooks, A. Bello, & K. Deslandes; Revised edition) [Working Paper]. United Nations Educational, Scientific and Cultural Organization. <https://uis.unesco.org/sites/default/files/documents/saga-sti-objectives-list-wp1-2016-en.pdf>

U.S. Census Bureau. (2021, December 9). Inequalities persist despite decline in poverty for all major race and Hispanic origin groups. Census.gov. <https://www.census.gov/library/stories/2020/09/poverty-rates-for-blacks-and-hispanics-reached-historic-lows-in-2019.html>

U.S. Census Bureau. (2023, October 11). The chance that two people chosen at random are of different race or ethnicity groups has increased since 2010. Census.gov. <https://www.census.gov/library/stories/2021/08/2020-united-states-population-more-racially-ethnically-diverse-than-2010.html>

What you need to know about education for sustainable development. (2023, November 17). UNESCO. <https://www.unesco.org/en/education-sustainable-development/need-know>

Whole child education. (n.d.). Learning Policy Institute. <https://learningpolicyinstitute.org/topic/whole-child-education>

*Why STEM Education is the New #1 Corporate Investment.* (n.d.). <https://www.stemvillage.com/blog/why-stem-education-is-the-new-1-corporate-investment>

Wilburn, C. (2024, February 6). Texas community college enrollment sees biggest post-pandemic increase. *The Texas Tribune*. <https://www.texastribune.org/2023/11/10/texas-community-colleges-enrollment-pandemic/>



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