

Inspire the next generation of American innovation through STEM education



While the educational landscape continues to evolve, the standard remains the same: Equip our young people with the foundational skills they need to pursue fulfilling careers that contribute to the greater good of our communities. What's changed, however, is which skills we consider foundational. Specifically, we need to provide every student with a well-rounded STEM education – in addition to standard liberal arts and humanities.

All signs point toward a continued job explosion within the Fourth Industrial Revolution in roles related to artificial intelligence (AI), machine learning (ML), virtual reality (VR), and data science. And since we're still discovering and applying potential use cases and career tracks for these disciplines, it's critical to develop a knowledgeable student body and workforce that understands both the theoretical concepts and practical applications of STEM.

Just as importantly, we must provide these young people with the tools and resources they need to capitalize on the opportunities in front of them and inspire the next generation of American innovation.



What's the STEM education landscape?

Most of today's job growth is occurring in STEM fields, and the Bureau of Labor Statistics projects we'll see 8.8 percent growth from 2019 to 2029.¹ But many schools – especially in underserved communities – aren't putting enough resources toward STEM disciplines to keep up with this growth. We're seeing major gaps along ethnic, gender, and socioeconomic lines, leaving a lot of room for improvement.

"As part of the national discussion around diversity, equity, and inclusion, we have to have an honest discussion about where our gaps exist," explains Mike Belcher, Director of EdTech Innovation for HP.

All students need access to critical STEM education, but many students are not properly introduced to STEM concepts until high school. That's often too late to foster an interest in these topics and provide students the foundations they need to succeed in STEM.

This lack of science and technology preparation will not only negatively impact students, but could also significantly hurt our economy and our communities. Failing to properly educate young people could lead to dramatic underemployment or unemployment, as the skills of our students may not match the jobs available. Additionally, declining innovation and output across STEM-related fields could have significant economic consequences on a national and even international scale.

For all these reasons, it's important for the education sector to invest in STEM education for their students from a young age – something that's achievable if schools start taking steps now.



How can we improve STEM education?

First, school systems need to assess their curriculum, especially for younger students. To make STEM the foundational part of education that it needs to be, schools must build it into the learning environment from the get-go – even as early as kindergarten. They also must find ways to merge STEM activities with traditional core curriculum subjects.

Educators can help develop STEM skills from a very young age using technologies like virtual reality that enable immersive learning and can transcend the obstacles of logistics and location – something especially important during this era of hybrid learning. These technologies serve to democratize science and technology education and simplify what might otherwise be challenging hands-on activities. If you ever had the experience of dissecting a frog or pig in biology class, just imagine how much easier that lesson could be with virtual reality.

Second, schools must think about education for teachers. In many cases, teachers don't get a chance to experience the private sector and consequently may not understand the changing needs of this workforce. According to Belcher, "If we don't educate our educators to grasp and understand our changing world and how this impacts our young people, we're not going to set them up for success over the long term."

Faculty and administrators need to acknowledge what they don't know about STEM education and career development, find solutions for today's students, and be ready to adapt as things continue to change. This will require acting fast and investing in evolving technologies like virtual reality (VR) and augmented reality (AR), as well as high-performance laptops and other devices.

And third, schools will also need to develop a new approach to career education to help keep up with the changing needs of our economy. Today, only 20% of U.S. high school graduates are prepared for college-level coursework in STEM majors,² a number that is far too low.

The workforce will continue to shift from industrial to technological, and we'll increasingly need to put skilled labor in charge of developing and executing automation. To prepare students for the jobs of the future, schools will need to establish training programs appropriate for their communities and the students who live in them, taking into account local and regional economic needs and career opportunities. These programs will also need to provide basic skills in areas like data science and artificial intelligence, even for students who may not plan to pursue careers specifically in STEM disciplines.



Positive outcomes for students and communities

The importance of STEM experiences and skill development can't be overstated. According to Belcher, "The ability to put our students into immersive learning situations is incredibly important because it allows us to replicate real-life situations that they will encounter throughout their careers." And these experiences can give them a leg up in the workplace and beyond.

If school systems begin investing more significantly in STEM education and technologies, we will likely begin to see some big benefits:

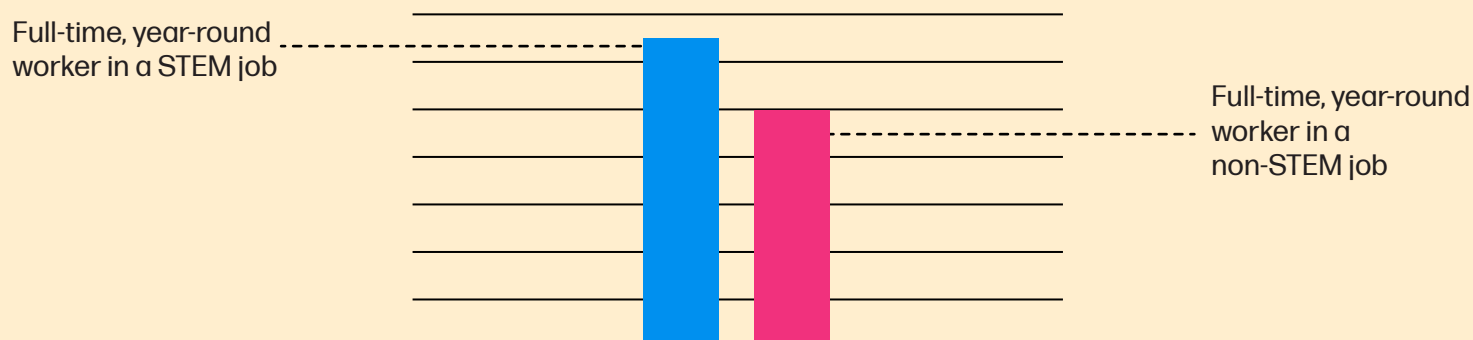
- Immersive classroom experiences will grow student interest in STEM disciplines and career tracks
- Students will further develop their critical thinking, problem-solving, and creative skills, which can help them well beyond the classroom and the workplace
- Students will receive more real-world educational training that prepares them with the skills they need to succeed in the workplace of the future
- STEM skills will enable this next generation of students to seek out new solutions to problems and foster innovation

Plus, STEM knowledge can help students in almost any career path. In fields like engineering or manufacturing, knowledge of artificial intelligence, machine learning, or 3D printing could have real practical applications on a daily basis and help enable innovation. Workers in construction or the skilled trades could benefit from an understanding of new technologies so they can prepare for possible automation. And even fields like marketing, advertising, and writing can benefit from an understanding of data science, which can offer insights into what's effective for communicating with a given audience.

For those students who do go into STEM fields, their skills and career choices can have a big financial impact too.

In 2019, the median salary for a full-time, year-round worker in a STEM job was approximately \$77,400, while for non-STEM occupations, it was \$46,900.³

Providing students with the skills they need to pursue a STEM job can help them make a career decision that fits their long-term financial needs.



Start growing STEM education in K-12

No one doubts the importance of STEM education, but it's also clear there's a huge opportunity to expand these learning experiences to reach more students, add them into curriculums for younger students, and really take advantage of today's latest technologies to provide young people with the skills they will need to succeed in our evolving economy.

To get started, school systems will need to educate teachers about the skills needed for STEM careers, invest in technologies like VR, workstations, and high-performing student devices, and provide course work in data science, artificial intelligence, and other STEM disciplines whose skills will be increasingly in demand in the workforce.

At HP, we're dedicated to helping you successfully prepare the next generation of students for careers in our evolving world. Learn more about how we're reinventing learning, or explore HP Education Solutions, including AR, VR, 3D printing, laptops, and workstations, at <https://www.hp.com/us-en/solutions/education/overview.html>.

Sources:

1 US Bureau of Labor Statistics. "Why computer occupations are behind strong STEM employment growth in the 2019-29 decade." <https://www.bls.gov/opub/btn/volume-10/why-computer-occupations-are-behind-strong-stem-employment-growth.htm>

2 American Affairs. "America's STEM Crisis Threatens Our National Security." <https://americanaffairsjournal.org/2019/02/americas-stem-crisis-threatens-our-national-security/>

3 Pew Research Center. "6 facts about America's STEM workforce and those training for it." <https://www.pewresearch.org/fact-tank/2021/04/14/6-facts-about-americas-stem-workforce-and-those-training-for-it/>