

Preparing Students Effectively for Their Future



The economic landscape is changing quickly, and today's students must learn to become creative and collaborative problem solvers if they want to be well-positioned for success. To foster these critical skills among students, here's what teaching and learning should look like.

The pace of change is accelerating, and this development has important implications for the future of instruction.

According to the World Economic Forum, nearly two-thirds of the children entering grade school today will end up working in jobs that haven't even been invented yet.¹ Global management consulting firm McKinsey & Co. estimates that by the year 2030, as many as one-third of the jobs of today will be performed by machines.²

Amid such rapidly changing workplace needs, how can educators prepare students effectively for the jobs of the future? Experts agree that skills such as creative and collaborative problem solving will be in high demand—and developing these skills requires a new approach to instruction.

This white paper examines the skills that today's students should be graduating with, the factors that are driving this shift—and how teaching and learning must change as a result. It also looks at the ideal classroom environments that are needed to support this new kind of instruction.

How the Job Market Is Changing

Automation and artificial intelligence (AI) are changing the nature of work. Over the next 10 to 15 years, the adoption of these technologies will transform the workplace as people interact with ever-smarter machines.

At least 30 percent of the work activities performed within 60 percent of today's occupations can be automated, McKinsey says. The consulting firm believes that by the year 2030, 75 million to 375 million workers (or 3 to 14 percent of the global workforce) will need to switch jobs as a result of this transformation.



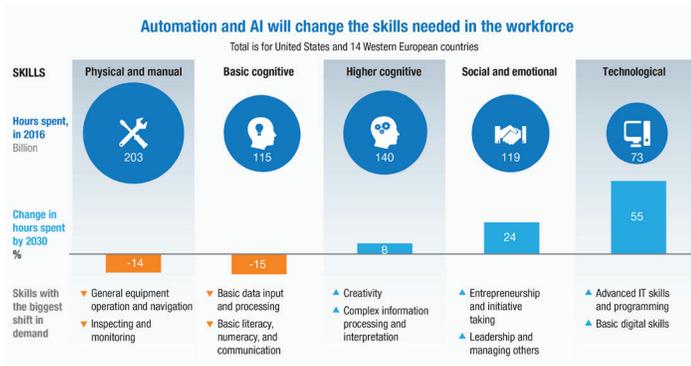
What's more, all workers will need to adapt as their jobs evolve alongside increasingly capable machines. Some workers will need to go back to school to attain a college education, while others will need to spend more time on activities that require social and emotional skills, creativity, high-level cognitive capabilities, and other skills that are difficult to automate.

Although automation will displace many workers, it will also create new jobs that don't exist today, just as many prior technologies have done. For instance, McKinsey expects that 50 million new technology jobs will be created by 2030.

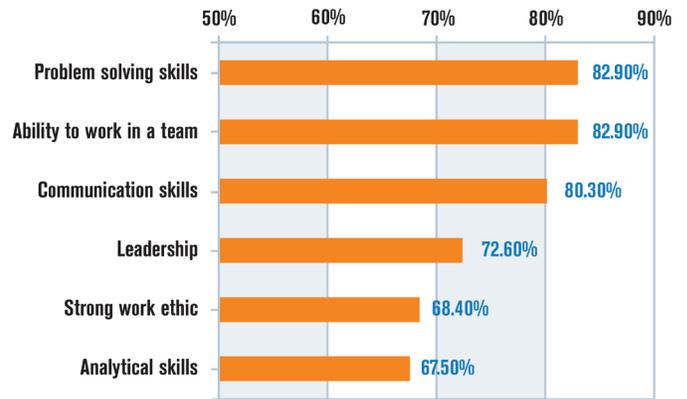
Automation and AI are changing the skills required of employees in profound ways. McKinsey's research finds that the strongest growth in demand will be for technological skills, which will rise 55 percent by 2030. This includes basic digital skills as well as advanced technological skills such as programming. Demand for social and emotional skills, such as leadership and managing others, will rise by 24 percent. Demand for higher cognitive skills will grow moderately overall (8 percent) but will rise sharply for some of these skills, McKinsey says—especially creativity.

In contrast, some skills will be less in demand. Basic cognitive skills, including data input and processing, will decline by 15 percent. Demand for physical and manual skills will drop by 14 percent but will remain the largest category of workforce skills in many countries.

In general, “competition for high-skill workers will increase, while displacement will be concentrated mainly on low-skill workers,” McKinsey says.³



Attributes That Employers Seek from Job Candidates



The Skills Needed for Success

What do these changes mean for students? In their publication *Dancing with Robots: Human Skills for Computerized Work*, researchers Frank Levy from MIT and Richard Murnane from Harvard argue that while computers are very good at certain tasks, there are some types of tasks they still struggle with—including solving unstructured problems and working with new information.⁴

Therefore, the best chance of preparing students for gainful employment in the years to come is equipping them with the skills they’ll need to achieve these complex tasks.

“We have to educate young people for the high-wage jobs that computers can’t do,” says Tom Daccord, co-founder and CEO of education training and consulting firm EdTechTeacher. “Computers rely on information to make decisions. They are really good at analyzing lots of data to determine historical trends. But they can’t adapt well to new situations. And this is where humans can excel. The ability to adapt and solve problems creatively when confronted with new circumstances ... is paramount.”

This problem solving is often done in a collaborative environment, Daccord says—and so the ability to work well with others is critical as well. “Strong collaboration skills are essential to tackling the problems we face in this rapidly shifting workplace environment,” he notes.

Employer surveys confirm that skills such as creative and collaborative problem solving are highly coveted. For instance, the National Association of Colleges and Employers asks hiring managers each year which attributes they most value in job candidates, beyond a strong GPA and the technical skills required for the role they are hiring for—and problem solving and the ability to work well in a team were the top responses this year⁵:

Skills such as problem solving, creativity, critical thinking, and collaboration used to be referred to as “soft skills.” But this mentality is changing.

“Businesses no longer consider these as ‘soft’ skills. More and more, they are referring to these as ‘essential’ skills,” Daccord says. “Companies need employees who are creative and collaborative problem solvers. These aren’t skills that are somehow secondary. They are fundamental, core skills that young people need to bring to the labor force.”

What High-Quality Learning Looks Like

What does this mean for classroom instruction? While there is still a place for direct instruction from the teacher to the class as a whole, learning environments must shift to become more student-centered and collaborative in nature—and learning tasks must focus on developing creativity and problem-solving capabilities—if schools are to prepare students effectively for the future.

Instruction should simulate the kinds of challenges that students are likely to face when they graduate, Daccord says, with teachers embracing a problem-based approach to instruction that allows for student creativity and collaboration.

“In order to tackle problems effectively, students have to learn how to take innovative approaches to problem solving,” he observes. “One way schools are approaching this is through project-based learning.”



As classrooms evolve to support multiple learning modalities, many schools are supplementing the large screen that is often located at the front of the room with smaller, interactive displays that can be used for collaborative group projects.

For instance, in a science classroom, students might be given an environmental problem to tackle—such as figuring out how to grow crops in a way that is environmentally sustainable. The teacher might have students research the issue and understand the science behind it, then develop their own approach to solving that challenge. In the course of the project, students are typically working together in small groups to develop their solutions.

"Often, what happens is that students develop very innovative approaches to solving these problems," he says. "When we put students in environments where they have some autonomy and end up directing their own learning, they often rise to the challenge and will come up with creative solutions that adults might never have thought of."

While project-based learning does not have to be supported by technology, technology plays a valuable role in enhancing students' experience. With a tech-infused classroom that offers devices for every student and interactive screens to collaborate on, students have the opportunity to perform sophisticated research and can work together easily on note taking, brainstorming, and other shared tasks.



"One of the fundamental advantages of technology is that students can work in many different modalities," Daccord says. "Students can be working in traditional prose, or they can be watching videos or listening to podcasts of scientists. They can be viewing, creating, and editing graphs and charts. They can be working collaboratively on developing a spreadsheet as they are collecting data. They can access information, work together, and demonstrate their knowledge in ways that wouldn't be possible without technology."

In short, he says, "there is a tremendous amount of flexibility, and many more opportunities to foster creative problem solving, that come from tech-infused learning."

Classroom Environments That Support High-Quality Learning

What should a well-equipped classroom look like to support project-based learning effectively? As classrooms evolve to support multiple learning modalities, many schools are supplementing the large screen that is often located at the front of the room with smaller, interactive displays that can be used for collaborative group projects.

Flat-panel displays that are 40 to 60 inches in size are perfect for giving students who are working in small groups an interactive, collaborative workspace. For instance, a group of three to six students can be gathered around the display to share their device's screen with other group members. They can interact with shared content directly on the display itself using a touch-screen overlay—and they can easily capture, save, and distribute their work to all team members or send it to the teacher.

If a classroom contains a fixed space intended for small group collaboration, these displays can be mounted on a stand that is attached to each group workspace, which is often called a "huddle space." If movable furniture is used to create temporary collaboration spaces in a classroom, the displays can be moved around the room on mobile media carts as needed.

Many schools are also creating collaborative workspaces for students in their libraries and other common areas, complete with interactive touch screens for students to work on shared documents and problems. Of course, schools will also need software to facilitate collaborative group work on a shared display.

NEC Display Solutions offers the latest technology to create more dynamic and interactive learning spaces, including large-format displays, interactive projectors, CB Series collaboration boards and software that can be used to drive collaborative problem solving. Solutions are available in a wide range of sizes (up to 96 inches); with resolution up to 4K UHD—and optional touch overlays can turn any large format display into an interactive tool for teaching, research, and collaboration.

In addition, NEC offers Mosaic software that allows users to present, share, and collaborate with several partners across multiple devices. Mosaic allows students to share content with each other in a group and interact with this content in creative and convenient ways. The software works across a range of platforms, including Windows, Mac, Android, and iOS devices.

About NEC Display Solutions of America, Inc.

NEC Display Solutions of America, Inc., a leading designer and provider of innovative displays, offers the widest range of products on the market, such as commercial- and professional-grade large-screen LCD displays, desktop LCD monitors, direct view LED displays, a diverse line of multimedia and digital cinema projectors, and integrated display solutions. Benefitting from the technologies of NEC Corporation and its own Research and Development, NEC produces leading-edge visual technology and customer-focused solutions for a wide variety of markets, including education, retail, transportation, broadcast, enterprise, healthcare, houses of worship, and many more. NEC is orchestrating a brighter world with the quality and reliability of its products and outstanding customer service. For additional information about NEC Display Solutions of America products, call (866) NEC-MORE, or visit the website at www.necdisplay.com. Follow us on our social media channels: Facebook, YouTube, Google+, Twitter and LinkedIn.

To learn more about NEC solutions that foster creative and collaborative problem solving in schools, go to <https://www.necdisplay.com/solutions/education-k-12/11>.



¹ World Economic Forum (2016). The Future of Jobs: Employment, Skills, and Workforce Strategy for the Fourth Industrial Revolution. Retrieved from http://www3.weforum.org/docs/WEF_Future_of_Jobs.pdf.

² McKinsey & Co. (2017). Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation. Retrieved from <https://www.mckinsey.com/mgi/overview/2017-in-review/automation-and-the-future-of-work/jobs-lost-jobs-gained/workforce-transitions-in-a-time-of-automation>.

³ McKinsey & Co. (2018). Skill Shift: Automation and the Future of the Workforce. Retrieved from <https://www.mckinsey.com/featured-insights/future-of-work/skill-shift-automation-and-the-future-of-the-workforce>.

⁴ Levy, F., and Murnane, R. (2013). Dancing with Robots: Human Skills for Computerized Work. Retrieved from <http://content.thirdway.org/publications/714/Dancing-With-Robots.pdf>.

⁵ National Association of Colleges and Employers (2018). "The Key Attributes Employers Seek on Students' Resumes." Retrieved from <http://www.nacweb.org/about-us/press/2017/the-key-attributes-employers-seek-on-students-resumes/>.