

Future of Education in a Post-Pandemic Environment



People, Content, & Technology Considerations

Author Introduction

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The Covid-19 pandemic has caught many educational systems unprepared to deal with remote or virtual learning. UNESCO reports widespread school closures affecting 90 percent of all schoolchildren globally. With the pandemic situation appearing to stabilize, it could be tempting to revert to traditional schooling approaches. In this paper, we will explore the various forces impacting education and factors to consider to maximize education continuity, relevance, and education system resilience.

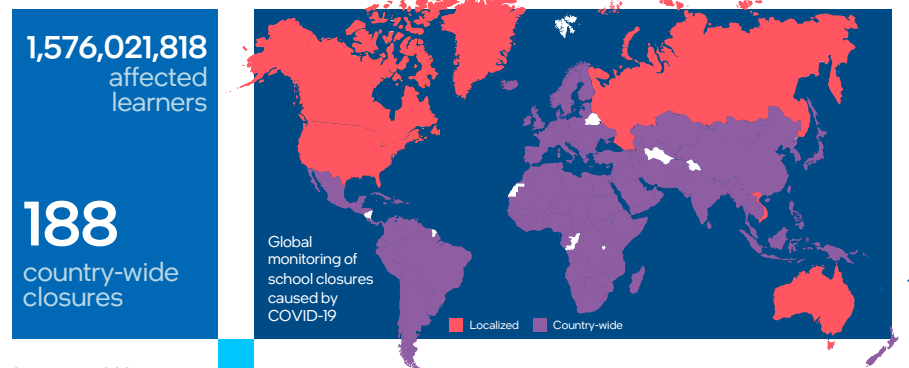


Figure 1. 2020: A challenging year.¹

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The New Normal

Widespread school closures, which forced the rapid shift to remote and virtual learning in many educational systems, are not expected to cease with this pandemic. Adverse climatic events (occurring more frequently, due to climate change), social unrest, or even another new pandemic may break out at any time. Education systems must always be ready for learning to take place anywhere.

The past decade has already seen considerable change in the way we work, due to rapid technological advances such as 5G connectivity, autonomous vehicles, and artificial intelligence, which many experts are collectively calling the Fourth Industrial Revolution or 4IR. The Covid-19 pandemic has only served to accelerate this transition.

In the Future of Jobs Report 2020², the World Economic Forum (WEF) estimates that by 2025, a shift in the division of labor between humans and machines will create 97 million new jobs and destroy 85 million traditional jobs. WEF further forecasts that analytical thinking and innovation will be the top skills in 2025, along with self-management and collaboration skills, otherwise known as social-emotional skills.



Figure 2. A net gain of jobs is forecast by 2025, with new roles emerging (left chart). These roles will require a combination of analytical, social-emotional, and technical skills (right chart).³

These changes are already afoot with companies beginning to bypass traditional school systems and offering alternative pathways for skills development and job access. For example, Google has introduced 6-month certificate courses that directly lead to jobs, potentially disrupting the 4-year college degree.⁴

The local and global restrictions on travel have also created a situation in which many companies have moved to remote working arrangements – some permanently. The increasing prevalence of remote work will mean that the competition for talent will truly become global, with students requiring the ability to self-manage and stay mentally resilient in an environment where they may never meet their colleagues in person.

Future-Proofing Education Systems

Traditional schooling is being challenged in more ways than one, and it is clear that even when the pandemic subsides, things will not simply go back to the way they were. As such, planning for the future, and not just a future pandemic, becomes crucial. But what would the future of schooling look like? The OECD, in September 2020, shared four possible scenarios for the future of schooling in the year 2040.⁵

While it is impossible to predict which specific scenario may occur, any useful strategic approach will need to ensure its relevance to all of the scenarios outlined. Two common elements that were identified in all of these scenarios were the integral role of technology in delivering learning and the adoption of new skills by all key stakeholders. As such, any future-proof strategic approach should include at its core a focus on new skills development and the ability to deliver learning in any circumstance.

Naturally, all stakeholders in the educational system will have a role to play in designing and implementing strategy. Decision makers will need to adopt, adapt, and promote a new vision for their education system. They will also need to manage the transition process for their educators and equip them with professional development resources. Educators, for their part, would need to shift towards using facilitation methods more frequently, rather than instructional methods, and use technology more effectively for skills development in their classrooms. Finally, students will need to make the shift from being content with being information consumers to becoming self-directed learners and creative problem solvers.

Four Future Scenarios for Schooling 2040

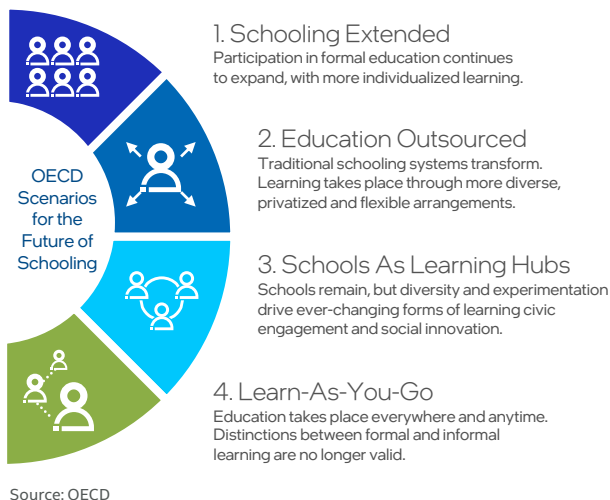


Figure 3. Schooling scenarios in 2040 all incorporate technology in an integral role.⁶

Shifting to Anywhere Learning

Many educational systems had their first taste of “anywhere learning” in the immediate aftermath of the initial pandemic outbreak, when they had to switch between different ways of education delivery to ensure continuity whether students were at school or at home. Due to the emergency nature of the transition, several problems quickly emerged among the many stakeholders in the education ecosystem.

Many education systems found themselves grossly unprepared as rapidly changing health policies meant having to deliver lessons both virtually and in person. In particular, it quickly became clear that instruction and pedagogical approaches that were originally designed for in person instruction were not well-suited to a virtual environment. Additionally, there were instances of malware attacks as students connected with their unsecured home-based devices to secure school networks.⁷ In the face of these and numerous other challenges, education system administrators faced difficulties in maintaining staff morale and health.⁸

On the flip side, education systems that did well had several characteristics in common. They had prioritized their at-risk students for interventions⁹ and had been regularly upgrading their technology infrastructure. In addition, they had invested continually in professional development courses¹⁰ that showed educators how to use technology to deliver high-quality learning experiences.

Educators, for their part, struggled with adapting the experiential and collaborative segments of their lesson plans in a virtual learning environment and with scaling traditional assessment methods in a way that maintained their integrity. The requirement for all educators, and not just those in STEM subjects, to use technology led to 87 percent of US K-12 educators¹¹ reporting that they spent more time on troubleshooting technology than previously.

Classroom management was also challenging with educators finding it difficult to develop the social-emotional skills of their students in a virtual learning context and trying to keep lessons engaging for younger learners in particular. Some educators successfully responded to these challenges by keeping their learning content bite-sized to suit the shorter attention span of students. Some used a facilitation-style approach, realizing that it encouraged students to exhibit more self-directed learning behaviors. Assessments shifted from being test or exam oriented to a flexible and continuous assessment approach. This removed the high stakes nature that tended to encourage cheating.

Last but not least, students and parents had to deal with the challenge of creating a conducive learning environment at home – a particularly daunting task for families with shared living spaces, limited access to devices, and caregivers who were essential workers. The mental and physical health of both students and parents was severely tested, and student engagement levels were generally seen to decline once the novelty of virtual learning wore off. How best to overcome this novelty effect and keep students motivated is the topic of recent research¹² and ongoing discussion among parents and educators.

While parental involvement has always been viewed as important in the educational development of a child, the pandemic brought the lack of attention paid to parental involvement into sharp relief. Students who were better supported tended to have caregivers who were able to play the role of “encourager” and create learning routines for students to bring some structure to the learning experience. Some education systems introduced daily mental¹³ and physical health¹⁴ activities as a way to check in on the emotional state of students. Educators worked to optimize the balance between fully online, virtual, and unplugged learning experiences to maintain the engagement of students.

Addressing the Top Challenges of Anywhere Learning

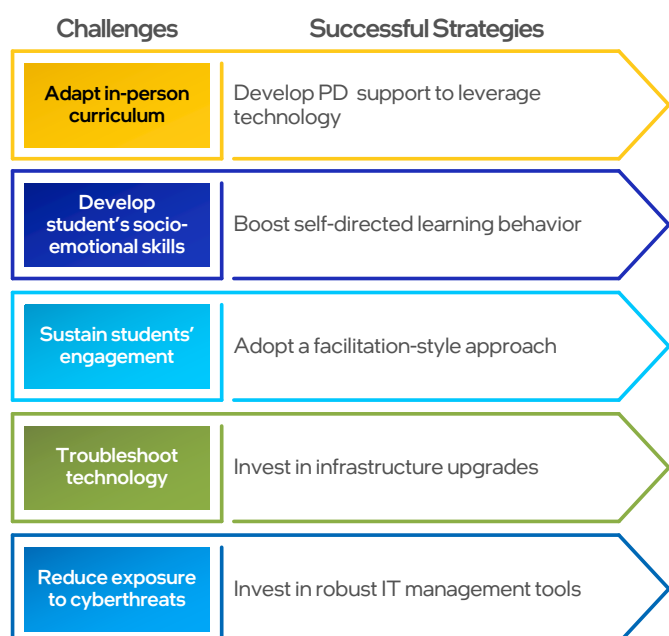


Figure 4. Some of the strategies educators are employing to address the challenges of Anywhere Learning.

87%
K-12 educators who saw mastery of tech skills improve due to the pandemic¹⁵

At Intel, we believe that the “anywhere learning” experience will evolve from the disjointed experience that it is today to a balanced and tightly integrated portfolio of learning and skill development experiences, accessible regardless of where the learner is. One of the key developments driving this evolution will be the accelerating effect that the Covid-19 pandemic has had on increasing the mastery of educational technologies, as reported by 87 percent of K–12 educators.¹⁶

Reimagining Technology for Education

Covid-19’s hastening of the transition to the Fourth Industrial Revolution has prompted education decision makers to realize that building the right skills for the future will require a combination of people, content, and technology.

How Learning Modality Will Evolve: The Rise of Anywhere Learning

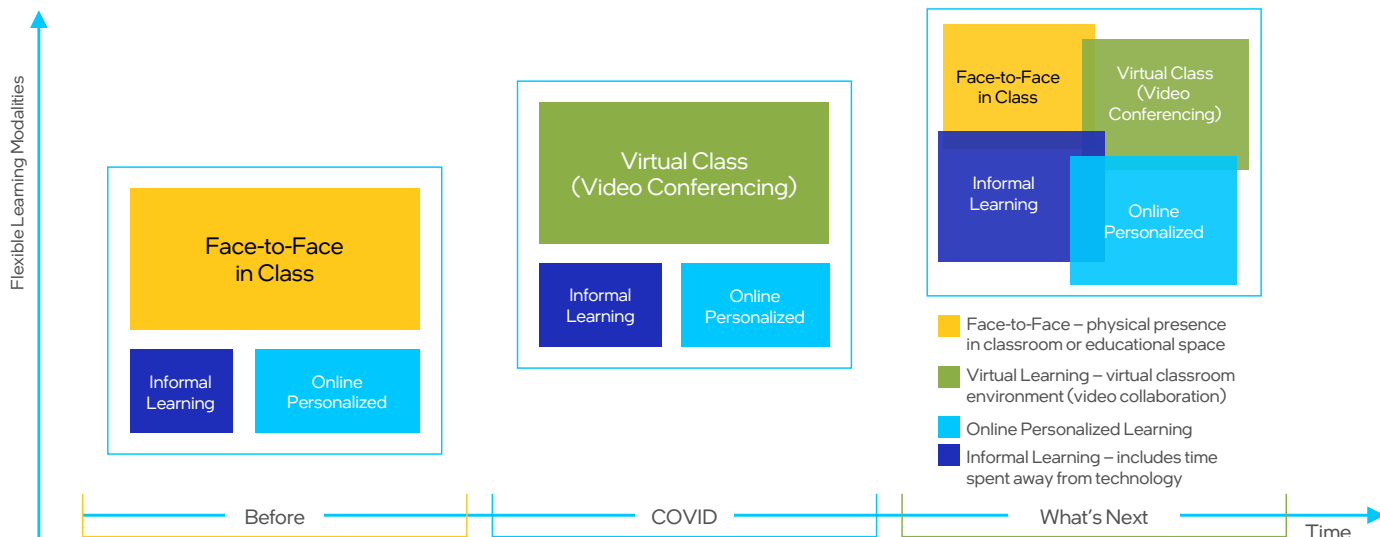


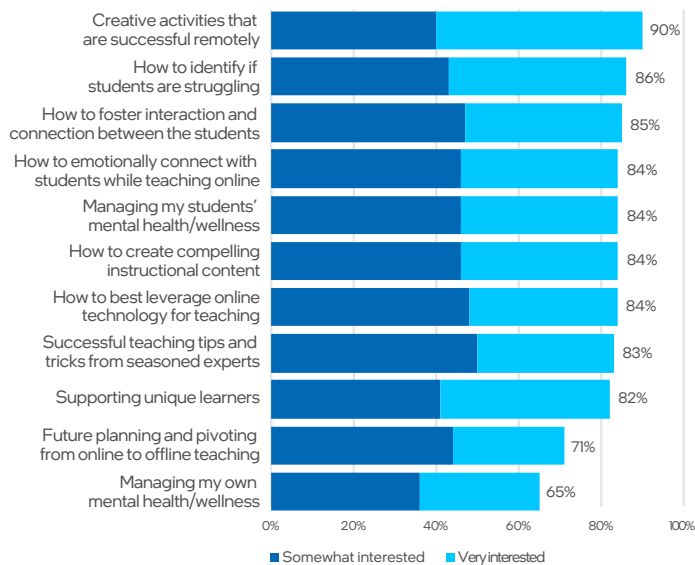
Figure 5. Learning modality will evolve to a model of Anywhere Learning.

Education systems have long viewed technology from the standpoint of providing access to content. However, the struggles of the pandemic have shown us that the use of technology must evolve to also provide for future skills development that can be delivered anywhere. Given the packed curriculum schedules many education systems are already faced with, it can seem daunting to add an emphasis on future skills development. The solution is to reimagine the use of technology for education. By thinking in an integrative fashion, we can look for opportunities to integrate skill-building technology activities into everyday teaching and learning.

Let us consider an example of an everyday teaching and learning activity in which students are learning about classifying animals. In a typical classroom environment, students may be asked to present their classifications of a series of animals on either paper or through a computer slide presentation. However, if we wanted to introduce technology-integrated skill building, we could approach the same lesson by having students create a virtual reality museum that showcases their identified animal groupings and inviting other students in their classroom and from around the world to visit and comment on their work. In this situation, students are not just exposed to the intended content knowledge, but they also learn the skill of building simulations along with the social-emotional competencies required for dealing with comments and criticism.

Such integrations are clearly not possible in every subject or learning activity. However, integrating skill-building activities into the existing curriculum, where possible, bridges content and pedagogy for anywhere learning and future skills development. It also saves educators from having to dedicate independent curriculum time. Today, the ability to conduct virtual chemistry experiments, prepare digital files for digital fabrication, develop business models through computer games, and program simulated hardware electrical components has vastly expanded the range of possibilities for educational systems and educators looking to reimagine technology for education.

What Do Educators Want Support In?



Q37: If you could take a series of quick classes to help you optimize your online teaching approach, how interested would you be in learning more about each of the following topics? (Shown among: Teachers n=1,001); Edelman Intelligence / April © 2020

Figure 6. Educators' interest in optimizing their online teaching approach.¹⁷

How Intel Can Help

Intel envisions a world in which students learn, from anywhere, the skills to be innovators as they prepare for, imagine, and create jobs of the future. In order to support the transformation journey of education systems, Intel has introduced the **Intel® Skills for Innovation** framework that focuses on the development of mindsets and skillsets.

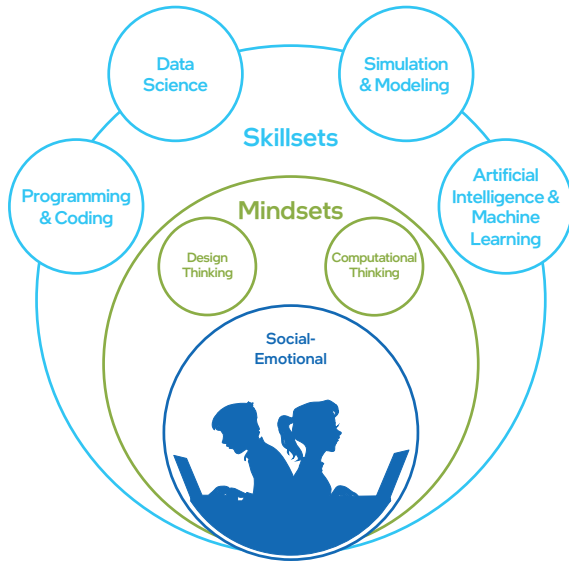


Figure 7. Intel® Skills for Innovation framework focuses on the development of mindsets and skillsets.

About Intel® Skills for Innovation Framework

Intel® Skills for Innovation Framework empowers today's students to become tomorrow's innovators. Using this framework, educators can integrate technology into their programs and plans to build skills of the future, and help students develop their cognitive, technical, and social-emotional skills.

The framework and its corresponding resource package include:

- A planning toolkit to help education decision makers understand new skill requirements, align stakeholders, and facilitate the creation of an action plan
- An activity starter pack that allows schools and educators to experience how technology can be used for curriculum-integrated skill-building activities along with resources to support the development of physical and virtual innovation spaces
- A series of professional development courses to develop educator competencies to facilitate higher-order skills development in their students.

Taken together, the **Intel Skills for Innovation** framework allows decision makers and educators to understand, experience, and implement the Skills for Innovation vision in their education system.



¹ Impact of COVID-19 on Education, UNESCO, Sept. 4, 2020, <https://en.unesco.org/covid19/educationresponse>

² Future of Jobs Survey 2020, World Economic Forum http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

³ Future of Jobs Survey 2020, World Economic Forum. http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

⁴ <https://www.inc.com/justin-bariso/google-plan-disrupt-college-degree-university-higher-education-certificate-project-management-data-analyst.html>

⁵ Back to the Future of Education: Four OECD Scenarios for Schooling, 15 September 2020, <https://www.oecd.org/education/back-to-the-future-s-of-education-178ef527-en.htm>

⁶ Back to the Future of Education: Four OECD Scenarios for Schooling, 15 September 2020, <https://www.oecd.org/education/back-to-the-future-s-of-education-178ef527-en.htm>

⁷ <https://losangeles.cbslocal.com/2020/08/24/malware-attack-forces-rialto-unified-to-suspend-online-learning/>

⁸ <https://www.psychologytoday.com/us/blog/multidimensional-aspects-adolescent-well-being/202009/how-covid-19-has-influenced-teachers-well>

⁹ <https://www.bbc.com/news/education-52550470>

¹⁰ <https://www.edweek.org/ew/articles/2020/04/22/how-districts-are-helping-teachers-get-better.html>

¹¹ <https://www.edweek.org/technology/how-covid-19-is-shaping-tech-use-what-that-means-when-schools-reopen/2020/06>

¹² Tsay CH-H, Kofinas AK, Trivedi SK, Yang Y. Overcoming the novelty effect in online gamified learning systems: An empirical evaluation of student engagement and performance. *J Comput Assist Learn.* 2020; 128–146. <https://doi.org/10.1111/jcal.12385>

¹³ <https://www.channelnewsasia.com/news/commentary/first-day-of-school-singapore-teachers-anxious-nervous-13855824>

¹⁴ <https://www.scmp.com/news/hong-kong/education/article/3075280/coronavirus-hong-kong-students-adapt-online-learning-amid>

¹⁵ <https://www.edweek.org/technology/how-covid-19-is-shaping-tech-use-what-that-means-when-schools-reopen/2020/06>

¹⁶ <https://www.edweek.org/technology/how-covid-19-is-shaping-tech-use-what-that-means-when-schools-reopen/2020/06>

¹⁷ University of Phoenix: Virtual Teaching Academy Research from University of Phoenix, <https://thejournal.com/articles/2020/06/02/survey-teachers-feeling-stressed-anxious-overwhelmed-and-capable.aspx>

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