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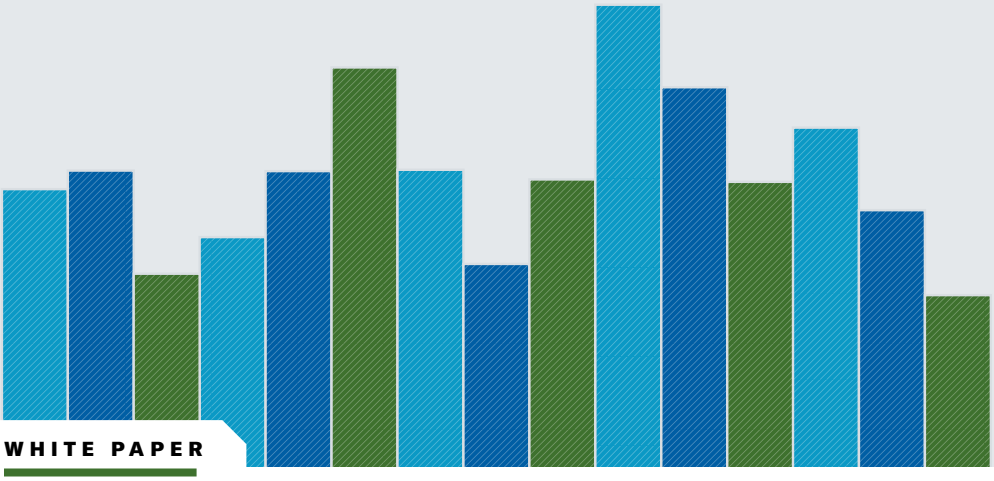
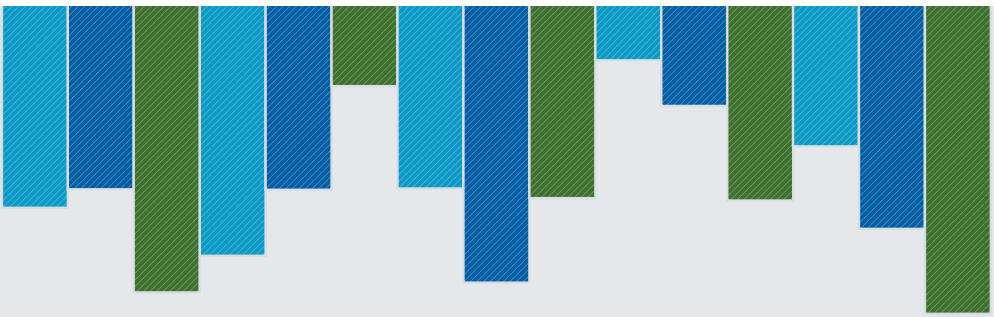


WHITE PAPER

The Class of Covid-19

Lessons of Today and Learning for Tomorrow



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In early 2020, Covid-19 disrupted the learning journey of more than 1.6 billion students worldwide. Education systems responded rapidly, and years of transition happened in just weeks and months as digital technologies were integrated into both in-person and remote classrooms. When the 2020–21 school year started, educators continued the process of reimagining education for the long term, bringing the best of in-person and remote learning together into hybrid models.

The effects of the unprecedented change, complexity, and ambiguity of 2020 will be felt for many years. Understanding more about its impact on children and adolescents is key to supporting their well-being and provides opportunities for educators to evolve education for the good of future generations. A recent survey revealed that to effectively support their students through this time of change, teachers need to know more about what complexities students face, their emotional state, and what motivates them.[1]

Microsoft Education partnered with Harvard Business Review Analytic Services to gather the unique perspectives of sociologists, psychologists, molecular biologists, and other experts to explore the short- and long-term impact of Covid-19 and the stressors that it brought on the development and well-being of children and adolescents.

The study shows that though the pandemic has had negative impacts on students' emotional, physical, and psychological well-being, science teaches us that the human brain is capable of "rebooting" and rewiring itself as children and adolescents acclimate to a new normal. Despite the many challenges caused by the disruption, it provides an opportunity to further evolve learning models to stimulate positive changes in students' brains and rethink how we support our teachers.

Sincere thanks to the many contributors who shaped this study, not only for sharing your knowledge, but also for your work to enhance student well-being and guide future pedagogy. I hope that the information presented helps educators around the world continue to reimagine education for a future where all students have the opportunity, the support, and the tools to be creative, confident, and optimistic learners, reaching their full potential.

Barbara Holzapfel
Vice President,
Microsoft Education

1 "Learning Forward," Teacher/Student survey commissioned by Microsoft and conducted by YouGov, December 2020, among 1,500 teachers and 1,500 students in the U.S., the U.K., and India.

The Class of Covid-19

Lessons of Today and Learning for Tomorrow

Social, political, and economic events have always influenced how children learn and experience the world. But Covid-19 has created "a perfect storm" of circumstances that threaten to "hobble child development," unless educators take the necessary precautionary measures and proactive steps, warns John Medina, a molecular biologist at the University of Washington School of Medicine. Unemployment, illness, and isolation are all contributing to greater stress and anxiety.

Neuroscience research teaches us that these stressors can unleash a cascade of chemicals in the brain, which can contribute to rising rates of emotional, behavioral, social, physical, and health issues. At the same time, insufficient social stimulation caused by lockdown restrictions and social distancing measures can affect reasoning and memory performance, hormone balance, and even resilience to physical disease.

However, as the short- and long-term impact of the pandemic on child development becomes clear, opportunities arise for educational leaders to help young people flourish during these tumultuous times, while paving a clear path forward for future generations of students and teachers.

In fact, there are already signs of resilience and indications of recovery as researchers move beyond forecasting the impact of Covid-19 to analyzing real-time data. For instance, using data from nearly 4.4 million students in grades 3 through 8 who completed reading and math assessments in the fall of 2020, researchers from the Brookings Institution found that these students performed similarly in reading to same-grade students in the previous year. Possible explanations are that students read more on their own, and remote learning provides them with greater access to other adults who can help support learning in reading.[1]

The key is to seize this unique moment in time to better understand the needs of children, adolescents, and their educators, and create strategies that

HIGHLIGHTS

As the short- and long-term impact of the pandemic on child development becomes clear, **opportunities arise for educational leaders to help young people flourish** during these tumultuous times.

There are highly effective ways for educational leaders to **help close gaps in academic performance, address psychological and emotional setbacks,** and help educators navigate the complexities of a post-pandemic world.

On a molecular level, **the anxiety and stress induced by Covid-19 can trigger maladaptive stress responses** in the brain, leading to feelings of anxiety and depression.

"Covid-19 is a major life stressor on a brain that's already fragile as a teenager," says John Medina, molecular biologist at the University of Washington School of Medicine.

will ensure students' ongoing success. Or as former U.K. Prime Minister Winston Churchill, put it, "Never let a good crisis go to waste." By working to counteract the negative effects of Covid-19, educators can promote brain plasticity, foster resilience, and reinvent traditional approaches to learning—strategies that can significantly shape the developing minds of children and teenagers and create a strong foundation for future learning, health, and behavior.

Short-Term Effects of Covid-19 on Students: Losses and Struggles

By April 15, 2020, 91.3% of children enrolled in formal schooling—1.5 billion children worldwide from 192 countries—were ordered to stay home.[2]

Less than a year later, widespread school closures are already having an adverse effect on children's ability to learn. "There's increasing evidence that children are learning less, and there remains a lot of uncertainty as to whether they'll be able to make up these learning losses in later years," says Emily Oster, an economics professor at Brown University.

Empty school gymnasiums and playgrounds are also having an immediate impact on children's social skills development. "Kids need one-on-one practice negotiating their peer relationships," says Medina. But that's not possible, he says, when "children spend most of their time around the same three or four people while quarantined at home."

On a molecular level, the anxiety and stress induced by Covid-19 can trigger maladaptive stress responses in the brain, leading to feelings of anxiety and depression. Humans have two sets of stress responses: the hypothalamic-pituitary-adrenocortical axis and the sympathetic-adrenal-medullary system. According to Medina, repeated activation of these systems due to stress can quickly lead to profound mood swings, poor impulse control, and clinical depression—factors that can compromise a student's academic performance and emotional well-being, particularly among teenagers. "Most mental health issues occur as disruptions in the normal puberty developmental cycle," says Medina. "Covid-19 is a major life stressor on a brain that's already fragile as a teenager."

Among other short-term losses: sleep. With anxiety levels on the increase, and without the daily routine of school, experts are reporting an uptick in sleep disorders among children[3] as they struggle to fall asleep at night and reset their circadian clocks—internal rhythms that manage the sleep-wake cycle and are critical to mental and physical health.

Understanding Covid-19's Long-Term Impact on Students

Although less is known about the long-term repercussions of Covid-19, if history is any indication, Medina predicts, "We're going to be paying for the pandemic for the next 10 years." He offers the example of the Great Depression, a worldwide economic meltdown precipitated by America's stock market crash in 1929, which devastated livelihoods. "The suicide rate was virtually unchanged in 1929," notes Medina. "However, by 1933, it was the highest it's ever been. That's the lesson—mental health issues can take a long time to develop."

Lost opportunities for on-the-job-training, cooperative education programs, internships, and professional networking also promise to impact the future career prospects and professional trajectories of young adolescents, forecasts Kristin Sharp, CEO at Education Quality Outcomes Standards (EQOS), a nonprofit organization that advises education providers. "Programs that provide internships and apprenticeships aren't readily available, so the ability to create a social network and access resources that students can draw on later simply isn't possible right now, which makes it harder to develop a career trajectory, find leads on jobs, and figure out what your next step is in life," she says.

Similarly, when it comes to future earning potential, Oster of Brown University says students and their families should expect a deepening of socioeconomic disparities. "A lot of kids who have been out of school this whole time are lower-income students of color in the U.S. That's already a group that is disadvantaged educationally, and that's only going to get worse. A big piece of the landscape is this increasing inequality that's going to result from these unequal school quarters."

In fact, the socioeconomic fallout of Covid-19 is reaching countries all around the world. According to a LocalCircles survey, 62% of parents in India, for instance, reported that they wouldn't be sending their children to school when doors reopened in September 2020.[4]

Even changes in children's physical activity can carry long-term implications, warn experts. For example, with

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many community centers closed and playgrounds cordoned off, sedentary habits can become permanently entrenched, increasing the risk of higher obesity rates and associated diseases, such as diabetes and cardiovascular disease, in their later years of life.[5]

An Opportunity to Reset

Despite these impediments to child and adolescent development, the pandemic presents unique opportunities for growth, learning, and self-discovery, beginning with the human brain.

With its 86 billion neurons and 85 billion nonneuronal cells, the brain is capable of rebooting, a growing body of research reveals. For example, researchers at the Picower Institute for Learning and Memory at MIT demonstrated how when one connection in the brain, called a synapse, strengthens, neighboring synapses weaken to produce plasticity. The more challenges children face in environments saturated with novelty, the more the brain rewires itself to acclimate to a new normal.[6] In fact, this synaptic plasticity is considered the underlying mechanism for cognitive functions such as learning and memory. Even more encouraging is that researchers indicate that individuals can continue to reap the rewards of brain plasticity well into old age.[7]

Covid-19 could also herald "a major disruption in the way we teach kids," forecasts Medina. Traditionally, education revolves around students sitting in a classroom and passively listening to information being delivered by a teacher. However, experts suggest that this method of study fails to encourage deeper learning and long-term retention of educational material. Case in point: the Learning Pyramid, originally created by the National Training Laboratories Institute, posits that most students only remember about 10% of what they read from textbooks, and a mere 5% from lectures. Most of what students learn comes from the act of teaching their peers. **FIGURE 1** "Ninety percent goes out the window," says Medina. "If that's a business, you're in bankruptcy. What other bucket of social experience in the world tolerates a 10% success rate? Education does."

Conversely, Medina says remote learning inherently encourages a more project-based, self-guided, exploratory approach to learning. Without direct access to classroom resources, students must think for themselves, solve problems, and demonstrate their knowledge in a virtual environment rather than simply reproduce it.

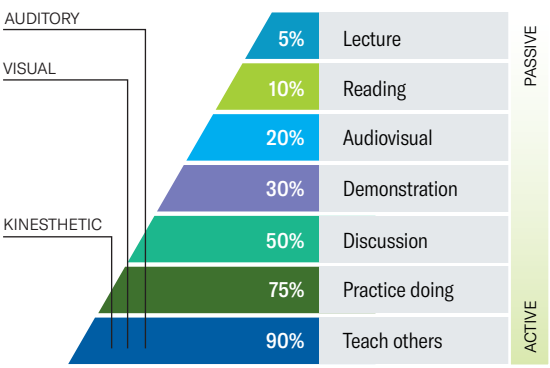
"Students move from the sage-on-the-stage to the guide-on-the-side model," says Medina, referring to a more active, cooperative learning format. Written about and promoted by Alison King, an associate professor of education at the College of Education at California State University in San Marcos,[8] the guide-on-the-side approach to teaching advocates for teachers to present material in a way that encourages students to actively analyze and interact with information, and leverage their existing knowledge as a base upon which to build new understanding and meaning. Sage-on-the-stage, alternatively, focuses on a professor or teacher—one with all the knowledge—who simply imparts or transmits this information to a passive listener, such as a student.

Another benefit of remote learning: enhanced digital literacy among children and young adolescents. These days, children of all ages are receiving hands-on training in everything from web-based videoconferencing to collaboration platforms and

FIGURE 1

Understanding the Learning Pyramid

Covid-19 could overturn the way students learn—and the way educators impart knowledge.



Source: Educationcorner.com, 2021

"Today's students are now fluent in how to operate technical systems and interact virtually, which wasn't the case before. Learning how to use these different kinds of technologies, adopted in a Covid-19 world, is a huge advantage," says Kristin Sharp, CEO at Education Quality Outcomes Standards.

messaging apps. "Today's students are now fluent in how to operate technical systems and interact virtually, which wasn't the case before," notes Sharp of EQOS. "Learning how to use these different kinds of technologies, adopted in a Covid-19 world, is a huge advantage."

Strategies to Prepare Students for Tomorrow

There are highly effective ways for educational leaders to help close gaps in academic performance, address psychological and emotional setbacks, and help educators navigate the complexities of a post-pandemic world.

For starters, school districts and the staff they support must proactively prepare for heightened levels of anxiety and depression in students. "We're going to see a lot more mental health issues, and that's something we need to be ready for," warns Oster.

On-site mental health counselors can help students manage feelings of anxiety and depression. In addition to these services, some educators are discovering the value in offering access to mindfulness meditation courses and cognitive behavioral therapy—practices that can reset students' neural pathways for long-lasting changes.

"There are meditation techniques that can work powerfully in pediatric populations," says Medina, citing the guided mindfulness meditation practices of Jon Kabat-Zinn, founder of the Center for Mindfulness in Medicine, Health Care, and Society at the University of Massachusetts Medical School. "It [meditation] is one of the few practices in all of neuroscience where all three buckets—behavioral, cellular, molecular—can be affected by a single behavioral change."

Similarly, Marc Brackett, a psychologist and founding director of the Yale Center for Emotional Intelligence, advocates developing emotional intelligence in children so that their emotions help, rather than hinder, their academic success and well-being.

One solution, says Brackett, is RULER—recognizing, understanding, labeling, expressing, regulating—an acronym for the skills of emotional intelligence and an evidence-based approach to social and emotional learning, developed at the Yale Center for Emotional Learning. The goal of RULER, which is used in nearly 3,000 schools worldwide, is to provide resources and strategies that strengthen the emotional intelligence skills of educators, students, and their families. The thinking is that by understanding the value of emotions, educators can create and maintain a more positive school environment for faculty and students alike.

A perfect example of a RULER strategy is "The Meta-Moment," a deep-breathing tool for regulating emotions in tense situations. Stressed and anxious, it's easy for students to react to a challenging situation—be it a classroom bully or an algebra test—in a way that they'll later regret. However, The Meta-Moment teaches students to pause and take one or several deep breaths before responding. Doing so, says Brackett, not only prevents an unfortunate exchange of words, but from a neurological perspective, it activates the parasympathetic nervous system, which reduces the release of cortisol, the stress hormone, and automatically lowers an individual's emotional temperature.

The next step of The Meta-Moment entails asking oneself questions such as "What would my best self do right now?" "By focusing on your best self, you are shifting the direction of your thinking back to your values, allowing yourself to regulate your emotions more effectively and respond in a more helpful way," says Brackett.

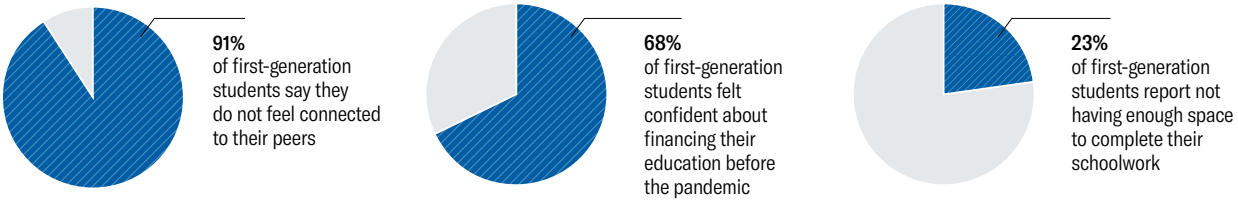
Better yet, by repeatedly practicing The Meta-Moment technique, Brackett says that educators and students can "reprogram their brains so that when they're triggered, the automatic tendency will be to take a breath, think about their best self, and respond in a more pro-social way."

Cassandra R. Davis says that in addition to addressing mental health and behavioral problems, educators should apply some of the lessons learned from the impact of natural disasters to their handling of Covid-19. A professor of public policy at the University of North Carolina, Davis has conducted extensive interviews and surveys in school districts recovering from Hurricane Matthew and Hurricane Harvey. Based on this research, Davis has created a series of policy recommendations that she says could be helpful to school districts recovering from the pandemic. One such recommendation is reconsidering what is required from students; for example, relaxing school dress codes, reducing homework loads, and overlooking absences can

FIGURE 2

Covid-19 and First-Generation College Students

The pandemic has dismantled home, social, and financial structures for some of today's most vulnerable students.



Source: Davis, Cassandra R. "Facing Covid-19 at Home," The University of North Carolina at Chapel Hill, 2020

help ease the burden on children while recognizing personal recovery efforts.

Other equally applicable recommendations include adopting a flexible leave policy to support overwhelmed and overworked staff and ensuring continual and consistent communication from schools and districts via social media channels to address evolving issues and reduce confusion. Some schools, such as Harvard and Cornell, are even waiving standardized testing requirements for 2021 applicants, while others are deploying test-optional pilot programs. Another strategy to set up future generations of students for success: recognize the unique impact Covid-19 is having on "low-income communities and communities of color," says Davis, citing research she recently conducted on first-generation college and university students. Findings include heightened anxiety over the likelihood of graduating, increased feelings of loneliness after campus closures, and an inability to feel connected to peers.[9] **FIGURE 2**

To ensure first-generation college and university students complete their education on time, Davis recommends educational institutions exercise greater flexibility with financial aid. For example, grant funds can supplement wages lost due to the pandemic and offset remote learning costs, from child care to home office supplies. Davis also encourages school districts to increase support for programs, such as the University of North Carolina's "Carolina Firsts," which offers mentorship and networking resources specifically targeted to first-generation students and their families.

"Unless educators specifically identify these disparities that are also emerging at the K–12 level, as well as at the college level, these socioeconomic gaps will widen," warns Davis. "We'll continue to see students not make it all the way to college—that's absolutely troubling."

Strategies to Prepare Educators for Tomorrow

While physical and mental health as well as financial support services that cater to students' unique needs can guide them to recovery, educators facing the same challenges are often left to address their personal and professional needs alone. Schools must prioritize the demands of teachers in ways that will ultimately benefit children by providing educators with the necessary resources, from personal protective equipment (PPE) to community partnerships.

"One of the first things the education system must do is make sure that teachers are okay," says Medina. "This is the classic, 'Put on your own damn oxygen mask before you put on someone else's' on an airplane."

Caring for teachers begins with implementing physical safety measures. "We need to make sure that teachers are physically safe so that they don't have to be emotionally preoccupied," advises Brackett. "We've got to set up classrooms and schools so that teachers feel like their physical safety is taken seriously." Increasing the availability of reading specialists and other types of in-class assistants can also ensure education systems are prepared to meet the increased needs of students. "When students return next fall, there will be a lot of kids who are really behind," predicts Oster. "We need to make sure there are enough education specialists in the classroom so that teachers aren't trying to fix these problems themselves."

One more strategy is to occasionally break from the school curriculum altogether and allow students to set their own educational agendas. In some instances, this approach may require teachers to abandon their tried-and-true lesson plans to engage children in issues they connect with on a more personal and emotional level, be it the latest Netflix series or Harry Potter subplot.

"It [meditation] is one of the few practices in all of neuroscience where all three buckets—behavioral, cellular, molecular—can be affected by a single behavioral change," says John Medina, molecular biologist at the University of Washington School of Medicine.

Similarly, educators should take advantage of children's enhanced technology skills in everything from web conferencing to instant messaging by encouraging them to apply such expertise to in-class projects, rather than simply return to the old way of doing things.

So, too, can seeking out external partners in today's increasingly complex educational ecosystem serve as a powerful strategy for repairing some of the damage done by the pandemic. Says Davis, "Covid-19 is a great opportunity for schools to build or enhance relationships with parents."

She recommends teaming up with neighboring districts to create a united front, especially when it comes to advocating for greater government support and resources during challenging times. "Our research has shown that school districts [that are] most successful in recovering from a disaster worked with other districts that were dealing with the same issues," says Davis. "It's easy during a disaster to become isolated in your community, in your own home, in your own room, especially during Covid times. But there must be space for collaboration." Together, educators, parents, and the communities they inhabit can effect greater change with sustainable results.

Conclusion

Mounting evidence shows that Covid-19 is poised to have both short- and long-term effects on the emotional and psychological development of children and teens. For some, the impact will be considerable; others will recover with a renewed sense of resilience and fresh learning skills.

In fact, Medina points to research that suggests humans are genetically programmed to react a certain way to negative life events. This body of research divides individuals into three main categories—tulips, dandelions, and orchids—based on their temperament and sensitivity to environmental stimuli. While orchids are "extraordinarily stress-sensitive," says Medina, "dandelions can grow anywhere—on the side of a volcano or in the middle of a windstorm." In other words, in many ways, children are who they are.

But educators can help them realize their greatest potential by providing innovative technologies and unfettered access to resources ranging from mental health support services to mindful breathing techniques. "There will be exceptional individuals where grit and circumstance come together," says Daniel Lende, professor of anthropology at the University of South Florida. But in the end, he adds, long-term academic success and continuous mental health will heavily depend on "the support systems that exist around any particular child."

That's a call to support students by fostering their emotional intelligence, providing programs that nurture their mental and physical well-being, and providing all students with equal access to potentially lifesaving services and resources.

By doing so, says Medina, "I'm hopeful [these measures] will be so disruptive that Winston Churchill's great quote will kick in and we won't have wasted this crisis."

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