

**The Post-COVID Classroom:**

*How early childhood education and development has evolved since the  
Pandemic.*

By:

Alyssia Weiss

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Sponsor: Professor Ross Daly

Second Reader: Professor Andrew Salomon

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**Introduction:**

A visit to Linette Garcia's Bronx kindergarten classroom today reveals a completely different picture compared to 2019. In the fall of 2019, children would be learning to hold a pencil and write their names, counting with building blocks, and learning to draw pictures. While this does still exist, much of this traditional style of learning has begun to find its way onto the back burner in early education.

Walking into the classroom today, one will be engulfed by a sea of smart devices in front of each 5-year-old. They will be able to watch as these children are able to skillfully navigate their way around an iPad, laptop, or other smart device. However, asking one of these children to turn off the device, and pick up a pencil to write their name or a sentence, will likely prompt conflict.

“My students can figure out how to get to anything on these iPads. It's really impressive,” said Garcia, kindergarten teacher at Senator John D. Calandra Public School 14 (P.S.14) in the Bronx, New York. “They've only been on this earth for five years and I swear they could be running a tech support hotline or something,” she said.

Garcia has been teaching for more than 30 years, but she has never experienced anything like what has happened to the education system since 2020. Children have begun learning both fine and gross motor skills at a much slower rate due to how much time they've spent on devices

since the COVID-19 pandemic hit in 2020. The kindergarteners of the 2023-24 school year were just a year old when the world went into lockdown. The pandemic forced people to stay in their homes for an extended period of time, which means that these children, along with those born after them, did not experience the same childhood beginnings as the generations before. The lack of human interaction among this age group has also forced a delay in early childhood development and the ability to interact with other children.

“They hardly even talk to each other; they’re glued to the screens when we have the iPad cart in here,” said Kristen Turner, a kindergarten and first grade special education teacher and coworker of Garcia’s at P.S.14. “My students are special needs. There’s a lot of areas where they need extra help and guidance, but using an iPad is certainly not one of them,” she said.

While early elementary school children have often struggled with cognitive development, motor skills, and human interaction throughout history, those born during the pandemic and post-pandemic struggle even further. Many children less than 2-years-old know how to hit a skip button on a youtube video, but are showing more signs of developmental delays than ever before.

The teachers are also struggling to navigate a world of technology that has been incorporated into regular, everyday learning. Garcia is 56-years-old. She has more than 30 years of teaching experience under her belt, and yet nothing could have prepared her for when she feels as though she is gasping for air as she slowly drowns in a pool of online learning programs, poorly timed iOS updates, and iffy school WiFi.

“I feel like I need to go back to Grad school and re-learn how to teach in this techy world,” said Garcia. “This isn’t what I signed up for. A little cartoon robot on a computer screen is teaching them more than I am at this point,” she said.

Garcia finds herself spending many of her prep periods trying to figure out how to incorporate tablet time into her lesson plans. She is forced to have her students learn math through a program on smart devices for one class period a day. And while they swiftly tap on the screen, navigating their way through the modules like they were born with an iPhone in their hands, Garcia feels as though she is being left behind by a group of 5-year-olds.

“It’s embarrassing, but sometimes I need to call my daughter to ask her how to work the program,” she said with a laugh. “Then I get confused with FaceTime too, which is a whole other thing. she always makes fun of me but I really do want to learn how to use it. I have at least two years before I can retire, so I’m really just trying to push through.”

### **Background:**

In March of 2020, people all over the world was forced to go into lockdown due to the COVID-19 pandemic. This meant that everyone other than doctors, nurses, and other essential workers were forced to work from home remotely on computers, iPads, and other forms of technology. This included schools. At the drop of a hat, schools were forced to develop a plan to switch gears into a completely remote learning setting. Teachers and students alike struggled

greatly from this sudden change, spending the rest of that school year remote, then kicking off the 2020-21 school year either fully remote or in some form of hybrid learning.

Lockdowns began to ease in the latter months of 2021 leading into 2022. Bars and restaurants reopen indoor dining. Many people returned to work in offices. Mask mandates lifted. But many factors of remote school stuck around. When students did begin to find their ways back into the classroom, the devices followed them, and not on a temporary basis. Now more than ever, smart devices are prominent in early education classrooms, causing problems for learning on pace and development of physical and social skills.

According to *PubMed Central's* article, "Indirect Effects of the COVID-19 pandemic on Children Relate to the Child's age and Experience,"<sup>1</sup>, pre-pandemic, pediatricians were adamant about limiting screen time among young children, as overexposure to screens often causes developmental problems, and it is important for young children to learn from peers and social interactions. However, the onset of the pandemic forced children to stay inside with busy parents who needed to balance their own remote jobs with figuring out how to help their children navigate remote school. At only 5 years old, children across the globe were forced to begin the foundation of their schooling through a screen even educators were unsure how to use.

The *PubMed* article states that due to the pandemic, pediatricians were not able to push limiting screen time, and it was inevitable that use would spike among young children. This had a huge impact on the development of these children.

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<sup>1</sup> Sarah B. Mulkey, Cynthia F. Bearer, and Eleanor J. Molloy. "Indirect Effects of COVID-19 Pandemic on Children Relate to the Child's Age and Experience," June 6, 2023.

“There has been an increase in children with developmental delays, learning disabilities, and behavioral disorders that may be a sequela of multiple changed experiences during the early years of the COVID-19 Pandemic for a child who may have already had some underlying risk.” (*PubMed Central*) The increased screen time also caused problems with fine motor skills, such as handwriting. Many children now, two years out of fully remote learning, cannot hold a pencil properly, and struggle to write their names, shared by Garcia. However, they are able to figure out how to get around a tablet or computer with a simple click or tap on the screen.

It is easy to argue that education was going to shift toward an expanded use of technology in the classrooms regardless of whether the pandemic hit or not. However, the pandemic accelerated this process to an extent that nobody could have predicted, and did not allow for traditional and technological learning to be gradually intertwined.

Still, there are studies to show that the use of educational apps are having a more positive effect on children in the classrooms than may be expected.

An overview of 36 studies found that the overall effect of the apps is a positive one.<sup>2</sup> Children are found to be more engaged with the programs, likely due to the fact that they have been raised on technology, so it catches their interest better than reading a workbook or using a pencil. However, teachers say that this should not replace physical learning all together. While teachers like Garcia and Turner continue to try and incorporate both traditional and technological learning into their lesson plans, it is obvious that even after two years post being fully remote,

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<sup>2</sup> Rick Hess, “Do Educational Apps Actually Help Kids Learn?” Oct. 23, 2023

the technology has left its permanent mark on education. Today's children will never return to fully traditional learning. They have been raised on smart devices since they were born, and have grown far too accustomed to using technology to navigate everything.

### **The Rise of Tech:**

The use of tech was on the rise in classrooms across the globe before the pandemic even began. Students in upper grades began using laptops in class to work on papers years before COVID-19. Computer usage among the younger grades, other than weekly trips to the computer lab, was rare.

"No, we never brought laptops into the classroom," said Turner. "We only used to bring them to the computer lab once a week where I think they were just learning basic typing skills for the most part."

The only technology typically present in the classroom was a Promethean board. A Promethean board or "smart board," is a white board that comes with a stylus pen that allows for it to be interactive. It can be connected to a computer which allows anything on the computer screen to be projected onto the board. It also comes with its own programs, such as a drawing program where the stylus can be used to draw and write. Teachers find these boards to be superior to a typical white board with dry erase markers or a chalkboard because of the unlimited



space they provide, the ability to save work, and of course the access to projecting websites and videos from the teacher's computer.<sup>3</sup>

These boards were introduced in classrooms across the country beginning around 2010. That was an evolution of technology in schools on its own, breaking down a brick wall for interactive learning through the use of technology long before the pandemic. This was a new and convenient use of technology to further student learning.

"I used to and still do use the promethean board in my classroom to teach math or for discussions where I write down my students' ideas," said Russell Minnerly, New York City public school teacher who teaches Kindergarten. "I've been teaching since before they introduced those things, and I have to say they are extremely convenient. I was able to go back to things I wrote days ago to refresh mine and my students' memory, and I was able to show powerpoints or videos if I needed. It was a real game changer when they brought them in," he continued.

The use of technology in classrooms pre-pandemic was limited, but definitely present in classrooms. However, it was at a very different level from where it is now.

"It was never a one to one ratio of students to devices. That is something totally new and a result of COVID," said Minnerly. "There is the likelihood that it would've gotten to that point regardless of whether the pandemic hit or not, but I don't think that would've been a reality until

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<sup>3</sup> Kathleen Stevens, Derek Hughes, "Promethean Board | Overview & Software," Nov. 21, 2023

long after I retired. I mean, I'm 46 years old. I don't think this would've happened for at least another 10 years," he said.

As Minnerly explained, students in kindergarten never had personal devices before the pandemic. Students would typically write in a notebook or on paper while the teacher would write information on the promethean board during lessons. Motor skills would be exercised and advanced in school much more, because children would be expected to write with a pencil in their work books. Even when students would be called up to interact with the technology, it would be with the promethean stylus used to circle something on the board, or to write a word.

"I think the more gradual route we were originally taking towards a technology driven education system was a lot better. We incorporated the use of computers here and there. They learned typing skills once a week, and got to interact with the promethean, which they'd get so excited about," said Minnerly. "But the harsh left turn we took towards it in 2020 was just far too much for me and my students. I really feel like children are getting robbed of their foundational year of education with how much technology has been incorporated into classrooms since then," he said.

### **Early Intervention & Early Development:**

Children born during the peak of the pandemic and soon after have shown to be developing, on average, at a slower rate than those born pre-pandemic. Children ages 0-3 qualify for early intervention services when they are not reaching expected milestones at the proper age,

and have a confirmed disability or established developmental delay. According to the Department of Health, this includes delays in physical, cognitive, communication, social-emotional, and/or adaptive development. Pre-pandemic, children were expected to be babbling and using gestures by 12 months of age, saying single words by 16 months of age, and be using two-word phrases by 24 months of age.

“Before the pandemic, the children I worked with typically had delays ranging from two to three months,” said Krystal Rivera, an applied behavior analyst and sensory integration therapist. “Now, post-pandemic, I am seeing delays from six months to a full year,” she said.

Rivera explained the process of becoming eligible for her services. Her clients in particular must have an autism spectrum disorder diagnosis prior to beginning early intervention services. Families will then be able to receive a family plan form in order to track the progress of their child over the course of services. Rivera spends typically one to two hours with each case per day, five days a week. She performs activities that encourage growth in fine motor skills, such as using Mr. Potatohead toys, or toddler puzzles. She also encourages relationship building among children when she has cases with children in daycare, through helping the child engage in group activities.

“Usually if there is an art activity that the rest of the children are doing I sort of guide my child’s hands to color with the crayon, or pour the glitter, or whatever else they’re expected to do,” said Rivera. “A lot of times it results in my child having a meltdown, but there are times

where they end up enjoying it and even begin attempting to do it on their own, which is very rewarding.”

Rivera shared that there has been an increase in autism diagnoses and developmental delays since the pandemic. She believes there is a clear culprit that has caused such an increase in the number and the severity of the delays.

“It definitely has to do with the increase in use of technology during the pandemic,” she said. “Babies born during the pandemic were often handed phones to play with and watch videos on, while parents worked on their computers, to keep them quiet.”

Babies born during the pandemic have begun scoring lower on developmental screening tests, even those who do not qualify for early intervention. Many of these developmental delays include particularly low motor skills. Pre-pandemic, by six months old, a baby was expected to be able to roll over from their backs onto their stomachs, as well as to be able to reach for and grasp objects. Post-pandemic babies aren’t exhibiting this behavior at the same rate.<sup>4</sup>

”Children learn through interactive play, and I notice that they don’t play with each other the way they used to before the pandemic,” said Christine Duffy, a New York City Public School teacher who teaches 3-K, a program in some public schools for 3-year-olds. “The main thing I teach is life skills, and most of them today come in knowing a lot less than before the pandemic.

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<sup>4</sup> Education Resources INC., “COVID’s Impact on Birth to 3-Year-Old Development.”

They don't learn from each other the way they did before because I see much more parallel play than ever before," she said.

"Parents aren't nearly as involved raising their children as they were before the pandemic," Rivera said. "A lot of babies are being raised on the phones and in front of TVs. When I was doing early intervention over Zoom it was already such a struggle. Then, a lot of the parents weren't even all that involved in the meeting. They often just left their children in front of the screen to basically watch me talk to them. These children were all under three years old. It's still crazy to me that they would just do that."

Rivera's experience with remote early intervention shows how technology use by even the youngest age groups increased over the pandemic. This increase has been linked to problems in cognitive and social and emotional development. Excessive screen time is proven to impact one's attention and memory. It is also known to increase chances of a child suffering from anxiety and depression.<sup>5</sup> However, the effect of technology on early development and education isn't entirely negative. Autistic children who are non-verbal benefit greatly from devices.

"Non-verbal children use technology to make requests and communicate their daily wants and needs," Rivera said. "I still work with them to find other ways to communicate, because even though assistive technology is available, it isn't always there. I work with these children to teach them how to communicate using words and body language. I aim to help them learn how to verbalize and communicate on their own."

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<sup>5</sup> Brody Woodell, "The Role of Technology in Childhood Development: Pros and Cons," May 24, 2023

### **Kindergarten Today:**

A day in a kindergarten classroom in a typical New York City public school consists of at least one class period of tablet use. Students still use work books and paper for some English comprehension and math, but not to the extent as in the past. Some students who particularly struggle with writing may be allowed to use the tablet more throughout the day to not miss out on instruction. Many exams are given to students verbally or through the online programs used in class, and rarely on paper anymore.

One program commonly used in schools is *Zearn*, an online math platform for students in kindergarten through eighth grade. It is used by one in every four elementary school students and by over one million middle schoolers across the country. iPads are distributed to each student in the classroom, and they are given one full class period a day dedicated to math instruction through Zearn. It is typically video lessons, where students navigate the tablet to interact with the program<sup>6</sup>

“It feels kind of weird even a few years into it. We walk around watching the kids watch the teachers on the screen teach math lessons, offering help when needed,” said Natasha Gonel, a New York City public school teacher who teaches Kindergarten. “Watching them use these iPads and tap through the lessons, click and drag number cubes on the screen, and tap correct answers feels so surreal, I’m pretty early in my career and this is definitely not how I expected it to go,” she said.

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<sup>6</sup> Information page, [about.zeam.org](http://about.zeam.org)

The use of devices in classrooms and at home has greatly impacted the development of motor skills among young children. Post-pandemic, children entering kindergarten are performing lower on Kindergarten Readiness Assessments.<sup>7</sup> Due to the overuse of devices, young children often struggle now to learn fundamental motor skills such as gripping a pencil, or building with blocks.<sup>8</sup>

“Many of my students struggle to write or draw with a pencil, it absolutely has to be because of the iPads, they’re addicted and nobody limits their screen time,” said Minnerly. “I have a hard time teaching them how to write these days, even literacy time is on the iPads once a week with our other program, *iReady*,” he said.

*iReady* is a program similar to *Zearn* that offers both mathematics and literacy lessons for Kindergarten through eighth grade. Students spend time with interactive characters that teach the lessons. It is meant to be entertaining for children while also providing data-driven instruction.<sup>9</sup>

“There has been an increase in the need for occupational therapy since the pandemic because of the overuse of screens at an early age,” said Ana Mislant, an occupational therapist. She travels between numerous schools throughout the Bronx to give occupational therapy to

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<sup>7</sup> Dr. Liji Thomas, MD, “COVID-19’s impact on Early Education: Retrospective Study Shows Decrease in Kindergarten Readiness,” Feb. 6, 2024

<sup>8</sup> Shu-Yu Cheng, Hsia-Ling Tai, Tsung-Teng Wang, Wojciech Kolanowski, “Impact of COVID-19 Pandemic on Children’s Fundamental Motor Skills: A Study for the Taiwanese Preschoolers Teachers,” Sept. 15, 2023

<sup>9</sup> *iReady* About Page, curriculumassociates.com

elementary school students. “The overuse of the screens takes away from time that could be spent working on fine motor skills that are necessary for success,” she said.

The overuse of technology in early childhood has caused an increase in developmental delays that continue through early intervention into school age<sup>10</sup>. That is where Mislant and New York City elementary public school speech teacher Stephanie Frey come in.

”The use of screens has severely impacted children’s development of speech,” said Frey. “They spend so much time on screens outside of school and before they even started kindergarten that they tend to really struggle with communication and face-to-face interaction. Five year olds today are a shell of what they used to be socially.”

### **Pandemic Kindergarteners Today:**

Children who were in kindergarten when the pandemic and spent the 2020-2021 school year engaging in hybrid learning are currently in third and fourth grade. It can be seen that these children were hit the hardest by the pandemic, as they are still facing many harsh challenges in their education that were not seen before.

Across the country, children entering third and fourth grade are on lower reading and math levels than those entering these grades pre-pandemic. They suffered deep learning setbacks due to the remote learning setting, and most children have not recovered. After numerous years of pandemic recovery, it is seen that the average student would need an additional Four months

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<sup>10</sup> Loyola Medicine, “Childhood Development: The Impact of COVID-19 on a Generation of Children,” Aug. 23, 2022



of learning on their current grade level to be caught up with pre-pandemic levels. This would result in a child being required to spend 13 months in their current grade.<sup>11</sup>

“I have definitely noticed that students have gaps in their learning. My students are showing to be several reading levels behind, lacking foundational skills in math to be on grade level, and are insufficient in penmanship, vocabulary, and spelling,” said George Ramos, a New York City public school teacher who teaches fourth grade, and has spent the bulk of his career at Ballet Tech, the Public School for Dance. “I also see very low stamina across all disciplines and a lack of social and emotional maturity for their age. I think the pandemic really hurt this generation of children.”

Ramos continued to explain a typical day of remote learning during the pandemic for his fourth graders. He said he had a small class, and he noticed that children who were scared to participate in the physical classroom shined when they moved to the remote setting because the computer screen was less intimidating. Now, with the children who spent that first year of school behind the screen entering his in person class, he notices he has more and more of those children who struggle socially.

“So many of my students struggle to speak in my class; they hardly ever communicate with each other. The social and emotional relationships among my students is severely lacking,” he said. “I don’t think they even do playdates anymore. It’s all about XBox live or whatever else

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<sup>11</sup> Heather Hollingsworth, “Children hit Hardest by the endemic are now the Big Kids at School. Many Still Need Reading Help,” Sept. 2nd, 2023

these kids are into. It all has to do with the internet. There's no traditional play anymore," he said with a laugh.

In the spring of 2024, New York State testing is transitioning into a remote format, Computer-Based Testing.<sup>12</sup> This is to give children a format of test taking that they may find more natural for them, because many of the students in third grade and above have grown accustomed to remote education, between the pandemic and the incorporation of systems such as *Zearn* and *iReady*. As Ramos stated, penmanship and vocabulary levels have plummeted since the pandemic, so this is expected to give students a better chance to perform well on the exams.

"I have found that students are now more hesitant to do actual paper and pencil work as well as hesitant to read with an actual book in their hands. They have grown used to online libraries and don't find motivation to use their fine motor skills to annotate a book or write down their thoughts," said Maria Scarpinato, a New York City Special Ed public school teacher who has experience working in a District 75 school, a type of school for severely disabled students. "I think the state test moving to online this year is going to be beneficial for students and I believe we are going to see an increase in scores," She said.

"At the end of the day, this is what kids are used to now," added Sofia Bradshaw, Scarpinato's fellow Special Ed teacher in the New York City Department of Education. "They are going to benefit from using what they know best. Children before the pandemic and those 10 to 15 years

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<sup>12</sup> New York State Education Department, "Computer-Based Testing (CBT)," [nysed.gov](https://nysed.gov)

ago performed well on paper because it was introduced to them early. These days it's the iPads that they learn before pencil holding," she said.

Many children in elementary school began to suffer from social anxiety and depression after the pandemic. This is mainly due to the use of technology increasing, being unable to see friends and family in person, and being quarantined alone for a long period of time.<sup>13</sup> Despite being multiple years out of this era, these feelings stuck around and continue to get stronger among some children.

"The school hired me after the pandemic to help children who felt traumatized by the situation and still haven't recovered. I primarily work with those children in third and fourth grade that had this all happening to them as they were entering the school structure," said Cynthia Martinez, a social worker and school psychologist at P.S.14. "It is necessary to provide children with my services to give them somebody to talk to and help with breaking out of their comfort zone. It's difficult for them to talk to other children because they didn't get the chance to learn social skills when they were five years old, cooped up in the house on Zoom meetings," she said.

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<sup>13</sup> Alisa Bowman, "Children's Socialization and Returning to Social Norms Post COVID," June 29, 2023

### **How a School Functions Post-Pandemic:**

Even years out from the pandemic, schools continue to function as contact-free as possible. Ira Schulman and Teresa Gerstner, principal and assistant principal of P.S.14, shared what has changed in their school from the perspective of the administration.

“We still do virtual open house meetings at the beginning of the school year, phone call parent/teacher conferences, and don’t really allow for parents to enter the building,” said Schulman. “We find it necessary to limit parents in the building to avoid anything spreading. It still is a danger and many students still come to school in masks,” Gerstner added.

In 2019, parents would typically be invited to come into their children’s classrooms at the beginning of the school year and meet their teachers face-to-face before the semester kicked into high gear. They would be able to see where their child would be learning for the year, and be able to make a personal connection with the teachers before conferencing later on.

“Of course it was beneficial for parents to meet teachers, but we find that this virtual style of introducing themselves works better and is much safer,” said Gerstner. “They’re able to share a powerpoint and answer all parent questions before they are even asked when on Zoom, and it avoids the spread of illness,” she continued.

Parent/teacher conferences are now held over phone calls instead of face-to face. Parents are given a time slot where their child's teacher will call them to conduct a five minute conversation about their child's level in skills.

Schulman also shared what budgets look like this school year.

"Most of our funding goes towards our online programs and substitute teachers. Our school still allows five days of recovery time for teachers who test positive for COVID," he said. "We hardly do any outside of school events because of where we have to put money this year and most likely years to come. Even the few events we do have are always outdoors," he continued.

Schulman and Gerstner said that the enrollment in their school is down, with many classes only having 18-20 children compared to 25 before the pandemic. Students were often forced to be rezoned to other schools because their classes were all at full capacity.

"Even my IEP (Individualized Education Program) meetings are performed remotely. I have to talk to parents on the phone about their child's status in my class. It's very difficult but there's no going back to in person meetings," said Turner.

"I do wish we still had that face-to-face connection between teachers and parents, but this way of running meetings and events is simply more convenient and overall safer for everyone," Gerstner said.

As with the parent meetings, change is inevitable in other aspects of education. Some of these changes were forced by the pandemic, others only accelerated. But along with real gains, have come losses.

“We are at the point of no return. While technology is a beautiful thing and is our friend in many instances, we have been able to see that too much is a terrible thing,” said Ramos, the fourth grade teacher. “My heart breaks for these kids. It really does. They will never be able to learn the way we once did, and unfortunately will most likely struggle with fine motor skills for the entirety of their lives.”