Horvath, Jared Cooney. **The Digital Delusion: How Classroom Technology Harms Our Kids' Learning—and How To Help Them Thrive Again**. [n.p.] Jared Cooney Horvath, 2026.

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The world of education, particularly public education, has been buffeted by successive waves of innovations that promised to improve educational outcomes. Many of these proved to be educational dead-ends, introduced with great fanfare, but failing to achieve their promised goals. Others have been abject failures, of which whole language movement of reading instruction, in place of phonics, set reading instruction back decades and caused widespread functional illiteracy. Another "innovation" is now staring us in the face.

According to the latest OECD PIAAC* scale and data, an estimated 10 million (4%) of American adults read below a 3rd-grade level, 62 million (24%) read at a 4^{th}-5^{th} grade level, and 85 million (33%) read at a 6^{th}-8^{th} grade level. An additional 72 million (28%) read at grades 9-12 (high school) level, and only 29 million (11%) read at an upper-level college or graduate level. In other words, more than 62% of the 251 million adults in the United States are either functionally illiterate or close to it. These figures closely track the 2022 NAEP numbers of students who scored below proficiency, including 65% of 4^{th} graders, 64% of 8^{th} graders, and 63% of 12^{th} graders. Even more ominous, the most recent NAEP data indicate that about 40% of 4th graders scored below basic in reading in 2024, the highest share in two decades, and that corresponds to 155-160 million adults reading at less or equal to level 2. And of 4^{th} graders who score at basic or below basic, 70-80% will remain below proficient as adults.

If you think that the educational establishment would have learned its lesson after this century-long debacle, you would be wrong, terribly wrong. The latest failure, and one that explains much of the decline in learning over the past several decades, is the widespread embrace of digital devices in education, called EdTech. Dr. Jared Cooney Horvath, a neuroscientist and educator, in this exhaustively researched and thoroughly documented study, exposes the manifold dangers posed by the widespread adoption of Chromebooks and similar laptops, as well as cellphones, and artificial intelligence.

Even before the Covid-19 pandemic, which adopted remote learning as stop-gap, schools in the United States had largely shifted to a 1-to-1 program in which the vast majority of students were provided with a laptop or tablet. The latest data reveal that this is now true for 76% of students in K-2, 86% of those in grades 3-5, and about 90% of those in grades 6-12.Chromebooks have become the dominant device, purchased by schools with taxpayer dollars. The Chromebook is a line of laptops, desktops and tablets that run on ChromeOS, a proprietary operating system developed by Google. By 2018, Chromebooks constituted 60% of the computers purchased by schools in the United States, a figure than has grown to

93% by 2025. What began as a niche market has exploded into more than a $400 billion mega-industry.

The companies that have sold these devices, now integrated into every area of schooling, promised that students would learn twice as much in half the time. Consider the following: Over the course of the 20th century, the IQs of every generation of students rose about six points over those of their parents. That all began to change in the mid-1990s with the installation of desktop computer labs. This was followed by individual Chromebooks, introduced by Google in 2011, widely adopted in 2012-2013, and integrated with Google Classroom software. Revealingly, the massive adoption of these digital devices by 2016 and their rapid integration into educational instruction coincided with the decline in NAEP reading and math scores, the latest reports of which can only partially be attributed to the effects of Covid-19.In other words, the declines had already manifested themselves prior to the virus. Across the West, IQ scores began to fall even though students were spending more time in the classroom. Yet, in countries where traditional patterns of schooling were maintained, intelligence scores are still rising. In the author's view, this disparity can be attributed to "the meteoric rise of educational technology" that "**broke the link between schooling and cognitive development**."So how did this happen?

According to numerous studies and meta-analyses, more than half of students now use a computer for one to four hours a day and 25% of these are on screens for four hours of their seven-hour day. Unfortunately, these same studies reveal that less than half of this time is spent learning, with from 24 to 38 minutes of every hour spent off-task. Driving this surge in usage is a wave of intrusive tools that track personal data and assemble long-term behavioral profiles that are "deliberately engineered for addiction," with the intent of producing customer loyalty.

The MIT-based Poverty Research Center did a meta-analysis of 126 research studies that showed that "initiatives that expand access to computers… do not improve K-12 grades and test scores." And another study of 300,000 U.S. students revealed that even small amounts of daily use of digital devices in the classroom (30 minutes) are negatively correlated to scores on a reading comprehension test. These Chromebooks or tablets have encouraged multitasking and surfing the Internet, habits guaranteed to short-circuit focused concentration. This, combined with excessive cellphone usage, dealt a double body blow to student learning. The author concludes that, **instead of doubling learning in half the time, digital tools produce half the learning in double the time**. Results like these were confirmed by a 2019 International Mathematics and Science Study that found that, on average, students in 4th grade and 8th grade who use computers nearly every day in class scored about 41 points lower in math and 51 points lower in science on the TIMSS** assessment than students who rarely used them. For context, **these differentials represent roughly a year's worth of learning**.

According to Horvath, these digital tools look impressive and sound transformative, but when you strip away the slick marketing and persuasive language, you're "left with something woefully underwhelming—even harmful." He argues that EdTech's illusion by which they sold this technology is built on five myths or misconceptions: (1) education is broken; (2) multimedia enhances learning; (3) free choice leads to better learning; (4) kids learn best on their own; and (5) intelligent tutors make kids more intelligent. He then systematically demolishes each of these self-serving misconceptions. For example, he argues that schools may not be perfect, but they aren't broken. In fact, two disturbing trends that have emerged in education across the developed world since 2000—the decline in student mental health and academic performance—both of which track closely with the increased presence of digital technology in students' lives.

If schools are "broken" then it is the influx of digital tools that broke them. He also argues, based on the evidence, that multimedia handicaps learning, and free choice and personalized learning offer no more than "customized comfort," and a false sense of mastery that impedes real learning. The notion that kids learn best on their own, an outgrowth of the constructivist mindset that children can construct their own knowledge without the expert guidance of trained adults, is another falsehood. Without the intervention of trained adults, students flounder and struggle, showing little retention and even less understanding. Intelligent tutors can support learning, but only under the right conditions. According to MIT professor Justin Reich, "adaptive tutors have some application in learning to read, but very limited applications in reading to learn." They also lack the personal element and empathy that are essential, particularly for struggling students.

On the subject of creativity, Horvath attacks the widely touted notion that "students spend too much time in school memorizing facts and not enough time thinking freely," a falsehood even parroted by *Scientific American* that wrote "Maybe we should let smartphones call up facts as necessary and let students focus on developing analytical skills." To this, he correctly argues that "creativity isn't the opposite of knowledge—rather, it emerges from it." He cites the example of Singapore, that not only has the most academic rigor and scored highest on the international knowledge exam, but also scored highest on the creativity exam. His thinking is totally in sync with that of cognitive scientists generally who believe that "in order for students to think flexibly, they first need something to think with" and that such knowledge "must be stored in long-term memory." This also couples with the work of E.D. Hirsch who, for 40 years, has been promoting the necessity of acquiring Core Knowledge or Cultural Literacy to be a critical thinker. For without domain-specific factual knowledge, there can be little critical thinking because students won't have the necessary background knowledge stored in long-term memory to be critical about much of anything. The failure to acknowledge this has been one of the leading failures of the educational establishment since the progressive (i.e. regressive) era.

Interestingly, the disaster perpetrated by EdTech since the 1990s has a striking parallel in the first half of the 20th century. In 1930, Scott, Foresman & Company unveiled the insipid Elson-Gray basal readers featuring Dick and Jane. This whole

word, or look/say, reading strategy abandoned phonics and taught reading sight words as if they were Egyptian hieroglyphics or Chinese ideograms. With deft marketing, the publisher gained such a stranglehold over the teaching profession that the series became the most widely used in the United States in the 1930s through the 1960s. By the 1950s, 90% of the schools in the United States were using Dick and Jane to turn out functional illiterates. Samuel Blumenfeld, in **The New Illiterates**, calls it a "simple process of institutionalizing vested interests." Pushed by a united front, consisting of its authors, supportive education school professors, the International Reading Association (IRA), education journals, and the financial resources of the publisher, the Dick and Jane readers wormed their way into the educational establishment.

Those who questioned the validity of this deeply flawed method were intimidated and attacked and the advocates of phonics were shut out of the IRA's influential journals. Even the publishers' teachers' manuals were used to nail down this widespread acceptance by warning teachers about introducing letter sounds, as Blumenfeld has so scrupulously documented. Obviously, had they taught the sounds of letters, students would have soon learned the technique to read any word, and it would have undermined the entire whole word project and cost the authors enormous royalties and the publisher millions in profits.

Regular classroom teachers were as much the victims of this orchestrated scam as were students and their parents. Whole language was supposed to be "cutting edge" and scientifically based, although it had little or no science to back it up. Instead of learning the letter sound code to decipher any word, students were forced to memorize the appearance of a few hundred words every year by sight. These dynamics were repeated between 1980 to 2023 when Heinemann published Lucy Calkins "balanced literacy" texts and Fountas & Pinnell's 3-cueing systems, both flawed efforts to combine phonics and whole language, as related by education journalist, Emily Hanford, in her podcast "Sold a Story." Most analysts conclude that total sales of these programs by Heinemann alone amounted to billions of dollars over several decades, all the while causing untold educational damage to millions of children. But the naïve and widespread acceptance of these deeply flawed methods that propped up whole language and failed to embrace phonics speaks volumes about the initial gullibility of the educational establishment and their subsequent inability to recalibrate once their methods were demonstrably found to have failed. In fact, many school systems continued to use Balanced Literacy and 3-Cueing for as much as two decades after the Science of Reading was proclaimed by the National Reading Panel in the year 2000. In Connecticut, it took the General Assembly's "Right to Read" legislation in 2021 to force the issue and require the Science of Reading (phonics) in the schools. The formative years of tens of thousands of children were wasted due to this confusion and uncertainty by the educator class.

EdTech really began in the early 1980s when computer labs were introduced into public schools, triggered by the arrival of personal computers in the marketplace. By the late 1980s and early 1990s, computer labs were common in most U.S. schools, and most students had access to a computer lab by the late 1990s. The

shift away from the lab model began about 2011 when Chromebooks and laptops (1:1 devices) became widely available. Thereafter, EdTech became not just the devices for imparting generic computer skills and keyboarding, but the central focus of subject area instruction in most classrooms.

While wildly touted by tech evangelists as the panacea for past educational failures, it was at this point that EdTech began to exert a meaningfully negative effect on student learning and standardized test scores. It is now estimated that 95% of public schools now provide personal devices to students as standard practice. But like other educational innovations, enthusiasts have not reckoned with the manifold downsides of embracing this technology wholesale which should have been subjected to a "solid, independently verified base of effectiveness" that answers three questions: (1) Is it deliberate?; (2) Is it time-bound?; and (3) Is it justified? In other words, don't use a tool without a demonstrable purpose in supporting learning, set firm limits for screen use and stick to it, and is it better than other options?

EdTech clearly falls within this past history of education innovation, but with far more ominous implications for the future of learning due to its ubiquity, heavily financed manufacturer hype, widespread acceptance, and potential for harm. Researchers agree that meaningful gains in educational interventions begin somewhere between +0.40 and +0.50 on a statistical measure. In 2023, statistician John Hattie analyzed over 350,000 studies of learning generally. He found that 95% of all educational interventions show a positive effect size. EdTech came in at +0.29, but compared to what? To what baseline is it being compared? For example, direct teacher-led instruction has a +0.59 positive effect. In nearly every context, while EdTech doesn't come close to the minimum threshold for meaningful learning impact. The shortfall is particularly stark for 1-to-1 computing, distance education (think Covid), and digital support for disadvantaged students. Adaptive tools can support surface-level development only in narrow and well-defined domains.

Studies have shown that there is a screen inferiority effect when students read to learn, rather than for enjoyment. Reading from screens often triggers an unconscious shift from deep comprehension to shallow skimming. Also, taking notes by hand not only builds fine motor skills, but has a superior learning effect than typing notes on a computer. Using EdTech also has negative effects on attention, memory, accuracy, and loss of time. On a weekly basis, only 12 hours and 30 minutes are devoted to schoolwork and homework on digital devices, compared to over 30 hours playing videos and music, over 15 hours scrolling the Internet, and about 3 hours reading for pleasure. Multitasking is also a major problem. Studies show that the average student spends six minutes studying on a screen before drifting off to unrelated digital distractions. In class, students spend 24 to 38 minutes of every hour off-task. Even in tightly controlled laboratory experiments for which students are paid, 40% cannot resist the urge to multitask. Additional negatives include the loss of empathy from the teacher-student relationship and the fact that gains for long-term memory from a narrow context (the computer screen) are inferior to those in a variety of contexts.

The bottom line is that students spend thousands of hours training themselves to use digital devices in ways that undermine learning. By the time they have finished elementary school, they have already mastered screen-based multitasking and distraction. The author, who has had frequent contact with teachers, estimates that 10% of teachers genuinely love EdTech, 20% are indifferent, and 70% are quietly fed up with screens in schools. Simply put, the love teachers have for imparting knowledge to their students has been short-circuited by a digital divide that has them staring at the backs of digital devices all day and this dynamic is taking its toll. Horvath concludes that **digital devices will never be engines of deep learning**. We must return to the analog days of reading and doing homework on paper and use EdTech in narrowly defined ways if we are to promote student success and long-term learning.

The Digital Delusion arrives at a critical time when education in the United States is at a crossroads. Public schools, already suffering from the legacy of more than 70 years of whole language reading instruction and its equally deficient offshoots (Balanced Literacy and 3-Cueing), is now faced with the multiple negative impacts of digital devices, and the even greater looming threat of Artificial Intelligence. And all the while neglecting the acquisition of the kind of critical subject knowledge E.D. Hirsch has advocated for four decades. As Horvath warns, **"will we allow technology to hollow out the human practices that education has always rested upon without ever collectively considering what we are losing in this exchange**."

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