

**The evidence should not be ignored...**

## 2½ Year Lockdown Shows Print Superior to Screen

*This month's guest columnist Dr. John Richard Schrock analyzes lessons learned in the online classroom.*

Over the last two and a half years, evidence piled up indicating that for the vast majority of K–12 and university students, online learning with extensive screen time was a disaster.

Learning loss was great in math subjects where daily lessons are needed to build skills, but loss was even greater in the sciences where lab and field experiences are needed to make concepts meaningful.

### Learning Loss

Learning loss varied, with only a few students maintaining normal progress due to their intellectual nature and extra parental support.

The data as well as teacher testimonials showing a dramatic overall slowdown in learning filled the pages of both *Education Week* and *Chronicle of Higher Education*, the weekly newspapers of record for K–12 and higher education.

Nevertheless, those publications are filled with even more advertising with futuristic calls to utilize more computers in the classroom and messages such as “you can’t teach tomorrow’s students with today’s technology.”

### Educational-Technology Complex

In his last days in office, President Eisenhower warned of the dangers of the “military-industrial complex.” If he were alive today, he might very well add the “educational-technology complex.”

The educational-technology complex predicted handheld screens would end all need of printed books by 2015 and end brick-and-mortar schools long before now.

### Detailed Research

The dangers of replacing proven effective teaching and printed books with on-screen methodology have long been detailed by a series of academic

books summarizing the problems with digital screen formats: *Mind Over Machine: The Power of Human Intuition and Expertise in the Era of the Computer* by Hubert and Stuart Dreyfus (1986); *Failure to Connect: How Computers Affect Our Children’s Minds—and What We Can Do About it* by Jane Healy (1998); *Oversold and Underused: Computers in the Classroom* by Larry Cuban (2001); *The Flickering Mind: The False Promise of Technology in the Classroom and How Learning Can Be Saved* by Todd Oppenheimer (2003); *What the Internet Is Doing to Our Brains* by Nicholas Carr (2010); *Mindless: Why Smarter Machines are Making Dumber Humans* by Simon Head (2014) and many others.

### Meta-Analysis

Four decades of research has been conducted. A meta-analysis is an overall analysis of the many published research articles in a field, and a total of three meta-analyses have been conducted: *Reading on Paper and Digitally: What the Past Decades of Empirical Research Reveal* by Singer and Alexander, *The Journal of Experimental Education*, 85: 155-172 (2016); *Don’t Throw Away Your Printed Books: A Meta-Analysis on the Effects of Reading Media on Reading Comprehension* by Delgado et al., *Educational Research Review*, 25: 23-38 (2018); and *Reading from Paper Compared to Screens: A Systematic Review and Meta-Analysis* by Clinton in *Journal of Research in Reading*, 42(2): 288-324 (2019).

### Comprehension and Distraction

All found comprehension and distraction problems with screen reading that the industry has never addressed. Now these last years of lockdown have provided a massive field test confirming face-to-face teaching and reading printed books is superior for the majority of students.

### Profit Motive

At the university level many publishers have faced the fact that they only make money on a new printed textbook the first semester it is released.

The used book market provides students with the print they overwhelmingly prefer. One strategy was to publish new editions every few years despite such updates not being needed.

### Limited-Time Access

Many publishers offered the texts slightly cheaper but only online and with access suspended at the end of the semester. Students printed it off themselves to do “deep reading” on paper.

Now one publisher has speculated on using NFTs (non-fungible tokens) in order to claim some profit each time a book is sold, similar to a new trend for artwork.

### Threat To Libraries

We also face a most serious threat from libraries discarding printed books under the assumption that everything is now available in online archives, which is not true.

This danger was clearly documented back in 2003 in the journal *Science in Going, Going, Gone: Lost Internet References* by Dellavalle et al. and updated in *Dozens of Scientific Journals Have Vanished From the Internet, and No One Preserved Them* by Brainard in *Science* September 8, 2020.

### Paper Is Forever

Acid-free paper can last over 500 years. Digital archives—when they exist—must be migrated at least every decade.

Following the pandemic, other countries have moved back to face-to-face teaching and students using printed books. Many schools in the U.S. have chosen to ignore these lessons.



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The United States is a free country where every man can do as his wife pleases.



“Dad,” a young boy asked, “what has really great curves, gives you tingles in your stomach and makes you want to jump out of your chair and whistle?” “Easy,” replied the father. “It’s Gerrit



Cole’s pitching.” “Thanks, Dad,” the boy said as he skipped away happily. “I knew there was a reason mom said I’d better ask you.”



The most frustrating profession in the world? A Chinese dentist: 1.3 billion potential customers, all afraid to open their mouths.



Reporters interviewing a 104 year-old woman asked, “What do you think is the best thing about being 104?” She simply replied, “No peer pressure.”

One summer evening, during a violent thunderstorm, a mother was tucking her son into bed. She was about to turn off the light when he asked, with a tremor



in his voice, “Mommy, will you sleep with me tonight?” The mother smiled and gave him a reassuring hug. “I can’t dear,” she said. “I have to sleep in daddy’s room.” A long silence was broken at last by his shaky little voice: “The big sissy.”



Before she was married, my mom had three theories about raising children. Now she has three children—and no theories.



Underneath the hot-air dryer in the public bathroom, someone had written, “Press button for a message from your congressman.”



Experience: something you get right after you need it.

Wedding: A \$15,000 photo opportunity.



A bartender at a successful lounge began to cheat on his boss. For every \$2 drink he’d sell, he’d look around quietly, then slip one dollar into his pocket. After doing this for a few weeks, the crooked bartender began putting both dollars in his pocket. His boss, who had been monitoring this behavior all along finally said, “What’s the matter? Aren’t we partners anymore?”



Some of us learn from other people’s mistakes. The rest of us are the other people.



Advice: what you get when you’re not going to get anything else.



The hardest part about a diet is shutting up about it.



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