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THE RESEARCH IS IN**The 10 Most Significant Education Studies of 2020**

We reviewed hundreds of educational studies in 2020 and then highlighted 10 of the most significant—covering topics from virtual learning to the reading wars and the decline of standardized tests.

By *Youki Terada, Stephen Merrill*

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Calling 2020 a turbulent year would be an understatement. As the pandemic disrupted life across the entire globe, teachers scrambled to transform their physical classrooms into virtual—or even hybrid—ones, and researchers slowly began to collect insights into what works, and what doesn't, in online learning environments around the world.

Meanwhile, neuroscientists made a convincing case for keeping handwriting in schools, and after the closure of several coal-fired power plants in Chicago, researchers reported a drop in pediatric emergency room visits and fewer absences in schools, reminding us that questions of educational equity do not begin and end at the schoolhouse door.

1. TO TEACH VOCABULARY, LET KIDS BE THESPIANS

When students are learning a new language, ask them to act out vocabulary words. It's fun to unleash a child's inner thespian, of course, but a *2020 study* (<https://doi.org/10.1007/s10648-020-09527-z>) concluded that it also nearly doubles their ability to remember the words months later.

Researchers asked 8-year-old students to listen to words in another language and then use their hands and bodies to mimic the words—spreading their arms and pretending to fly, for example, when learning the German word *flugzeug*, which means “airplane.” After two months, these young actors were a remarkable 73 percent more likely to remember the new words than students who had listened without accompanying gestures. Researchers discovered similar, if slightly less dramatic, results when students looked at pictures while listening to the corresponding vocabulary.

It's a simple reminder that if you want students to remember something, encourage them to learn it in a variety of ways—by *drawing it* (</video/powerful-effects-drawing-learning>), acting it out, or pairing it with *relevant images* (</blog/ell-engagment-using-photos>), for example.

2. NEUROSCIENTISTS DEFEND THE VALUE OF TEACHING HANDWRITING—AGAIN

For most kids, typing just doesn't cut it. In 2012, *brain scans of preliterate children* (<https://dx.doi.org/10.1016%2Fj.tine.2012.08.001>) revealed crucial reading circuitry flickering to life when kids hand-printed letters and then tried to read them. The effect largely disappeared when the letters were typed or traced.

More recently, in 2020, a *team of researchers* (<https://doi.org/10.3389/fpsyg.2020.01810>) studied older children—seventh graders—while they handwrote, drew, and typed words, and concluded that handwriting and drawing produced telltale neural tracings indicative of deeper learning.

“Whenever self-generated movements are included as a learning strategy, more of the brain gets stimulated,” the researchers explain, before echoing the 2012 study: “It also appears that the movements related to keyboard typing do not activate these networks the same way that drawing and handwriting do.”

It would be a mistake to replace typing with handwriting, though. All kids need to develop digital skills, and there's *evidence* (<http://dyslexia.yale.edu/resources/technology/>) that technology helps children with dyslexia to overcome obstacles like note taking or illegible handwriting, ultimately freeing them to “use their time for all the things in which they are gifted,” says the Yale Center for Dyslexia and Creativity.

3. THE ACT TEST JUST GOT A NEGATIVE SCORE (FACE PALM)

A *2020 study* (<https://doi.org/10.3102%2F0013189X20902110>) found that ACT test scores, which are often a key factor in college admissions, showed a weak—or even *negative*—relationship when it came to predicting how successful students would be in college. “There is little evidence that students will have more college success if they work to improve their ACT score,” the researchers explain, and students with very high ACT scores—but indifferent high school grades—often flamed out in college, overmatched by the rigors of a university's academic schedule.

Just last year, the SAT—cousin to the ACT—had a similarly dubious public showing. In a major *2019 study* (<https://doi.org/10.3102%2F0002831219843292>) of nearly 50,000 students led by researcher Brian Galla, and including Angela Duckworth, researchers found that high school grades were stronger predictors of four-year-college graduation than SAT scores.

The reason? Four-year high school grades, the researchers asserted, are a better indicator of crucial skills like perseverance, time management, and the ability to avoid distractions. It's most likely those skills, in the end, that keep kids in college.

4. A RUBRIC REDUCES RACIAL GRADING BIAS

A simple step might help undercut the pernicious effect of grading bias, a *new study*

(<https://doi.org/10.3102%2F0162373720932188>) found: Articulate your standards clearly before you begin grading, and refer to the standards regularly during the assessment process.

In 2020, more than 1,500 teachers were recruited and asked to grade a writing sample from a fictional second-grade student. All of the sample stories were identical—but in one set, the student mentions a family member named Dashawn, while the other set references a sibling named Connor.

Teachers were 13 percent more likely to give the Connor papers a passing grade, revealing the invisible advantages that many students unknowingly benefit from. When grading criteria are vague, implicit stereotypes can insidiously “fill in the blanks,” explains the study’s author. But when teachers have an explicit set of criteria to evaluate the writing—asking whether the student “provides a well-elaborated recount of an event,” for example—the difference in grades is nearly eliminated.

5. WHAT DO COAL-FIRED POWER PLANTS HAVE TO DO WITH LEARNING? PLENTY

When three coal-fired plants closed in the Chicago area, student absences in nearby schools dropped by 7 percent, a change largely driven by fewer emergency room visits for asthma-related problems. The stunning finding, published in a *2020 study* (<https://doi.org/10.26300/nym5-q596>) from Duke and Penn State, underscores the role that often-overlooked environmental factors—like air quality, neighborhood crime, and noise pollution—have in keeping our children healthy and ready to learn.

At scale, the opportunity cost is staggering: About 2.3 million children in the United States still attend a public elementary or middle school located within 10 kilometers of a coal-fired plant.

The study builds on a growing body of research that reminds us that questions of educational equity do not begin and end at the schoolhouse door. What we call an achievement gap is often an equity gap, one that “takes root in the earliest years of children’s lives,” according to a *2017 study*

(<https://www.epi.org/publication/education-inequalities-at-the-school-starting-gate/>). We won’t have equal opportunity in our schools, the researchers admonish, until we are diligent about confronting inequality in our cities, our neighborhoods—and ultimately our own backyards.

6. STUDENTS WHO GENERATE GOOD QUESTIONS ARE BETTER LEARNERS

Some of the most popular study strategies—highlighting passages, rereading notes, and underlining key sentences—are also among the least effective. A *2020 study* (<https://doi.org/10.1002/acp.3639>) highlighted a powerful alternative: Get students to generate questions about their learning, and gradually press them to ask more probing questions.

In the study, students who studied a topic and then generated their own questions scored an average of 14 percentage points higher on a test than students who used passive strategies like studying their notes and rereading classroom material. Creating questions, the researchers found, not only encouraged students to think more deeply about the topic but also strengthened their ability to remember what they were studying.

There are many *engaging ways to have students create highly productive questions*

([/article/using-student-generated-questions-promote-deeper-thinking](#)): When creating a test, you can ask students to submit their own questions, or you can use the *Jeopardy!* game as a platform for student-created questions.

7. DID A 2020 STUDY JUST END THE ‘READING WARS’?

One of the most widely used—and notorious—reading programs was dealt a severe blow when a panel of reading experts concluded that it “would be unlikely to lead to literacy success for all of America’s public schoolchildren.”

In the *2020 study*

(<https://achievethecore.org/page/3240/comparing-reading-research-to-program-design-an-examination-of-teachers-college-units-of-study>), the experts found that the controversial program—called “Units of Study” and developed over the course of four decades by Lucy Calkins at the Teachers College Reading and Writing Project—failed to explicitly and systematically teach young readers how to decode and encode written words, and was thus “in direct opposition to an enormous body of settled research.”

The study sounded the death knell for practices that de-emphasize phonics in favor of having children use multiple sources of information—like story events or illustrations—to predict the meaning of unfamiliar words, an approach often associated with “balanced literacy.” In an *internal memo*

(<https://www.apmreports.org/story/2020/10/16/influential-literacy-expert-lucy-calkins-is-changing-her-views>) obtained by publisher APM, Calkins seemed to concede the point, writing that “aspects of balanced literacy need some ‘rebalancing.’”

8. A SECRET TO HIGH-PERFORMING VIRTUAL CLASSROOMS

In 2020, a team at Georgia State University compiled *a report* (<https://gpi.gsu.edu/publications/virtual-instruction-k-12/>) on virtual learning best practices. While evidence in the field is “sparse” and “inconsistent,” the report noted that logistical issues like accessing materials—and not content-specific problems like failures of comprehension—were often among the most significant obstacles to online learning. It wasn’t that students didn’t understand photosynthesis in a virtual setting, in other words—it was that they didn’t find (or simply didn’t access) the lesson on photosynthesis at all.

That basic insight echoed a *2019 study* (<http://dx.doi.org/10.24059/olj.v23i4.2077>) that highlighted the crucial need to organize virtual classrooms even more intentionally than physical ones. Remote teachers should use a single, dedicated hub for important documents like assignments; simplify communications and reminders by using one channel like email or text; and reduce visual clutter like hard-to-read fonts and unnecessary decorations throughout their virtual spaces.

Because the tools are new to everyone, regular feedback on topics like accessibility and ease of use is crucial. Teachers should post *simple surveys* ([/article/reading-virtual-classroom-hard-it-can-be-done](#)) asking questions like “Have you encountered any technical issues?” and “Can you easily locate your assignments?” to ensure that students experience a smooth-running virtual learning space.

9. LOVE TO LEARN LANGUAGES? SURPRISINGLY, CODING MAY BE RIGHT FOR YOU

Learning how to code more closely resembles learning a language such as Chinese or Spanish than learning math, a *2020 study* (<https://doi.org/10.1038/s41598-020-60661-8>) found—upending the conventional wisdom about what makes a good programmer.

In the study, young adults with no programming experience were asked to learn Python, a popular programming language; they then took a series of tests assessing their problem-solving, math, and language skills. The researchers discovered that mathematical skill accounted for only 2 percent of a person's ability to learn how to code, while language skills were almost nine times more predictive, accounting for 17 percent of learning ability.

That's an important insight because all too often, programming classes require that students pass advanced math courses—a hurdle that needlessly excludes students with untapped promise, the researchers claim.

10. RESEARCHERS CAST DOUBT ON READING TASKS LIKE 'FINDING THE MAIN IDEA'

"Content *is* comprehension," declared a *2020 Fordham Institute study*

(<https://fordhaminstitute.org/national/resources/social-studies-instruction-and-reading-comprehension>), sounding a note of defiance as it staked out a position in the ongoing debate over the teaching of intrinsic reading skills versus the teaching of content knowledge.

While elementary students spend an enormous amount of time working on skills like "finding the main idea" and "summarizing"—tasks born of the belief that reading is a discrete and trainable ability that transfers seamlessly across content areas—these young readers aren't experiencing "the additional reading gains that well-intentioned educators hoped for," the study concluded.

So what works? The researchers looked at data from more than 18,000 K–5 students, focusing on the time spent in subject areas like math, social studies, and ELA, and found that "social studies is the only subject with a clear, positive, and statistically significant effect on reading improvement." In effect, exposing kids to rich content in civics, history, and law appeared to teach reading more effectively than our current methods of teaching reading.

Perhaps defiance is no longer needed: Fordham's conclusions are rapidly becoming conventional wisdom—and they extend beyond the limited claim of reading social studies texts. According to Natalie Wexler, the author of the well-received 2019 book *The Knowledge Gap* (<https://nataliewexler.com/the-knowledge-gap/>), content knowledge and reading are intertwined. "Students with more [background] knowledge have a better chance of understanding whatever text they encounter. They're able to retrieve more information about the topic from long-term memory, leaving more space in working memory for comprehension," she recently *told Edutopia*

([/article/it-time-drop-finding-main-idea-and-teach-reading-new-way](#)).

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