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# Which of These Is Not Like the Others: Followers, Likes, Views, and Education

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Add Sugata Mitra to the list of technology idealists who believe that the world is poised on the brink of an educational revolution because of the Internet. In 2013, Mitra delivered a TED talk explaining his vision of a “School in the Cloud,” in which students teach each other in small groups with a shared computer and nothing more than a moderator to “pose the right questions.”<sup>[i]</sup> In Mitra’s vision, there is nothing left of the school except a health and safety moderator—everything else is online. Nicholas Carr published a list of quotes from such idealists, each of whom believed he was putting the epitaph on the tombstone of classroom education as it has hitherto been known in the US.<sup>[ii]</sup> The list is headed by an 1885 prediction from Yale professor William Rainey Harper that students of correspondence courses would soon outstrip their classroom counterparts. Similar forecasts accompanied the emergence of the phonograph, the radio, the movies, television, personal computers, and the web. Today, the underwhelming effect of massive online open courses (MOOCs) goes politely unmentioned as we discuss the enormous potential of one-to-one technology programs revolutionizing education.

Modern society has endless optimism that technology can solve difficult medical, environmental, and socio-economic problems, and therefore many people assume we need only “find the cure” to radically transform education. The current race to saturate schools with wireless access and get tablet devices into student hands is only the latest manifestation of that optimism, and there is no shortage of studies and opinions on the benefits of such technology to justify that opinion. The Internet is awash with reports on how to improve access to education, close the achievement gap, increase student engagement, and attain better educational outcomes through technology. Any improvement in student test scores under these programs is cited as evidence, but technology idealism runs so deep that lack of improvement or even decline in academic performance is not typically considered a negative indicator.

In October of 2015 the Organization for Economic Cooperation and Development (OECD) released a comprehensive, international study on technology in the classroom across their 34 member and partner countries.<sup>[iii]</sup> The results of the study are almost universally disappointing with respect to achievement, showing declining performance in both reading and mathematics test scores as classroom technology use increases beyond a minimal amount. But OECD Education and Skills Director Andreas Schleicher remains undeterred. In his foreword to the study, he notes: “Still, the findings must not lead to despair. We need to get this right in order to provide educators with learning environments that support 21<sup>st</sup>-century pedagogies and provide children with the 21<sup>st</sup>-century skills they need to succeed in tomorrow’s world.”<sup>[iv]</sup>

Schleicher’s attitude is common among proponents of increased classroom technology, but it is awash with questionable assumptions. It assumes that 21<sup>st</sup>-century educational goals are distinct from those of earlier centuries. It presupposes that classroom technology will be able to deliver on those goals. It implies that these goals are so critical that it is either worth experimenting on yet another generation of

school children to “get this right,” or that failures will not be significant enough in these children’s lives to warrant holding off until we know more. As hard as it is to grant that any of these assumptions are plausible, the greatest misdirection is reducing the problem to one of implementation, as if other supposedly more difficult issues have already been overcome. In fact, poor implementation has been blamed for *every* type of failure in classroom technology, including inability to change school culture, insufficient logistical planning, lack of consistent pedagogy, poor professional development, lack of device security, and short supply. The term is applied so widely that one wonders whether the underlying assumptions have ever been addressed.

But the race is now on. As more schools adopt technology-assisted education, the pressure on neighboring schools to keep up increases every year. Schools turn to the private sector for help in selecting and implementing programs, but the clear conflict of interest in making enormous hardware and support sales can actually contribute to failure. The billion-dollar LA school system one-to-one iPad program that began in 2013 was plagued with implementation problems that generated a litany of complaints. The Hechinger Report published a post in September of 2013 that cited a lack of teacher professional training and poor planning as two critical failings reported by consultants who had worked on the implementation.<sup>[v]</sup> The program was eventually scrapped when investigators uncovered improprieties in the bidding process.

Despite this and other highly publicized failures, students and parents still appear to be motivated by the promise of technology in their educational program, even if they end up having to pay extra through taxes or tuition. Schools that issue devices or rely on classroom computers also need technology refresh contracts to keep their devices current, since students grow less impressed with school-issued equipment the more they acquire digital devices at home. A 600-school survey found that British secondary school students were becoming “indifferent” to tablet computers.<sup>[vi]</sup> With the average age of first internet use now well below the age of 9,<sup>[vii]</sup> that comes as no surprise, but it adds to the strain on teachers and funding.

College Park Academy (CPA) is a Maryland public charter school built around an all-online model that has high technology needs. Students still assemble in classrooms in a building, but every student sits at a computer and studies from Pearson Education’s Connections Learning online curriculum under the guidance of classroom teachers. Teachers hired for the program receive one week of professional development, which is much more than most schools offer. They also have broad flexibility in how they choose to manage the online curriculum and classroom activity. Pearson Education lists the program as a success story, citing higher test scores than other county public schools as proof of its effectiveness.<sup>[viii]</sup> However, as with many new programs the situation is more nuanced. The initial requirements for self-paced learning included time management skills and self-discipline that left some students struggling. Proponents of the school tend to categorize these as “growing pains,” but one parent revealed that the practical difficulties introduced by differences in these skills among students encouraged teachers to revert to a more synchronous classroom. Any new curriculum will take time to mature, but authentic growth indicates that it is continuing to perfect itself, not retreating from its ideals.

At the other end of the spectrum are schools that give very broad latitude to teachers on how much technology to use in the classroom. Students may be allowed or required to bring a device such as a laptop or tablet for note taking. DeMatha High School in Hyattsville, Maryland has chosen this approach, and also provides a “cart” of laptops that may be moved from room to room for periodic use. These can close access gaps for students who do not own a device, but students and teachers do not rely on them since they are not individually assigned. Most importantly, teachers are free to exclude

technology in their day to day lesson planning. Students at DeMatha have mixed responses to this policy, but don't see it as a barrier to learning. When asked, some students accused teachers who chose not to use technology of lacking sufficient skills, but one of the most technology proficient teachers at the school uses technology minimally and has argued against its widespread use.

Between these two extremes lie one-to-one technology programs in which every student receives a device, but the school does not commit to a single online curriculum. These programs tend to provide little or no professional development and preparation, but strongly encourage teachers to incorporate the technology into their lesson planning. St. John's College High School in Washington, D.C. is now in its second year of a one-to-one tablet program, after a successful pilot program with a subset of students under the direction of an educational technology consultant. Equivalent or slightly improved test results after the pilot encouraged school administrators to make the transition school wide.

At first, widespread tablet use was ironically a step backwards in productivity. The fastest and most accurate form of input for modern computers is the keyboard and mouse. Some impressive innovation has made incremental improvements on these two basic devices, but for pixel-perfect accuracy and to achieve faster-than-writing text entry, they are indispensable. Unless students supplement their tablets with a hardware keyboard and sit at a desk or table, data entry of any form becomes slower and more error prone than writing in a notebook. Nevertheless, one student reported that more than half the students using tablets to take notes in her class typed with their thumbs or index fingers using the on-screen keyboard. This habit continues into homework, where students often have the additional burden of having to switch between apps to refer to source material when writing essays. It is also typical to see them writing with an index finger to solve math problems or construct diagrams, even though other apps may be installed to make more accurate diagrams. While one might argue that students could switch to a computer to compose responses, set up a better study environment in which they use an external keyboard and mouse to do more accurate work, or use tools like stylus and straightedge designed for an iPad, ultimately these are only poor attempts to recreate the freedom students already have with pencil, paper, and ruler.

Reading on tablets and laptops can also cause a decline in performance. Electronic textbooks have become a staple in many one-to-one and online programs as a cost savings, a convenience, and a nod to technology. However, research on electronic reading has highlighted a decline in comprehension. In December of 2012, a study from the University of Norway found that "students who read texts digitally were more likely to receive lower scores on the reading comprehension tests compared to the students who read the texts on paper."<sup>[ix]</sup> A similar study published in March, 2015 at UCLA surveyed undergraduate reading preferences and discovered, "overwhelmingly that they prefer print over electronic formats for learning purposes," but numerous factors contribute to the way they actually read.<sup>[x]</sup> While the Internet-enabled device promises the world seen through a ten-inch window, the constant tapping, scrolling, and pinching is the reader's desperate attempt to patch together a field of view that approaches what a desk or table-top provides effortlessly.

The extreme portability of the tablet further encourages a "study anywhere" mentality, the practical result of which is that students do not sit at a desk or table with materials surrounding them in a dedicated study environment, but rather steal a bit of time here and there to do work. It is not a new phenomenon for students to try and get work done as quickly as possible, but mobile devices encourage multitasking in a much more invasive way. Whether in the classroom or while doing homework, screens deliver distractions designed to fit into the white space when students believe they do not need to devote their full attention to the content.

A Microsoft Advertising study published in the spring of 2015 cited Statistic Brain's claim that the average attention span has declined from 12 seconds in 2000 to 8 seconds in 2013.<sup>[xi]</sup> However, the "good news" reported by the study authors was that people are "becoming better at doing more with less via shorter bursts of high attention and more efficient encoding to memory."<sup>[xii]</sup> Without any further context for this statement, one is left to wonder whether this is the chicken or the egg. Perhaps online readers are better at assimilating information quickly because it is being shortened and simplified for digital consumption. The mentality that produced the acronym TL;DR (Too Long; Didn't Read) has become so ubiquitous that some authors are anticipating their readers and providing TL;DR summaries at the head of their articles, making the thoughtful consideration of their argument appear superfluous. There are inherent limitations to the compressibility of information; nuanced arguments cannot be well communicated in a series of 140-character quips. A consultant who assisted with the St. John's one-to-one program concurred. When asked what he thought was being lost by introducing devices, his response was the ability to conduct long-term sustained research, an activity that he surmised would be confined to a specialized few in the future. The average reader, he thought, would be satisfied with a Google search or a Wikipedia summary to get a rough, working understanding of most subjects. Unfortunately, questions that have deep impact on human life do not have answers that can be looked up in a search engine.

Major social media sites like Facebook and Twitter, as well as messaging apps of all forms, rely on declining attention spans and the sense of hopeful urgency created by notifications to build ever more irresistible distractions. The Microsoft study encouraged advertisers to take advantage of the moment when attention lapses to steal a user away from his current task. Of "multi-screen" users they note: "Since consumers turn to their secondary screens to fill in those in-between moments when they might otherwise drop off completely, they're more engaged overall and already primed for immersive experiences."<sup>[xiii]</sup> With modern operating systems, however, any tablet or laptop acts as if it were built of multiple screens by promoting notifications in the viewer's peripheral vision. "Multi-screening," notes the researchers, "trains consumers to be less effective at filtering out distractions—they are increasingly hungry for something new."<sup>[xiv]</sup> Unless a school takes measures to completely block all communication and notification apps—a Herculean task given the number and turnover of such programs—teachers and texts will be in constant competition with what students are discussing in their social apps.

Controls that limit access to messaging apps and diligent surveillance by teachers can minimize the disruption caused by devices, but the irony is that such measures are effective only insofar as they cripple the capabilities of the device. Better would be training in time management and study skills that encourage students to better focus, but although this was a stated goal of the St. John's program during its first year, no such specialized instruction has yet been implemented. Reportedly, additional technology controls are to be introduced in the future to limit non-academic use, but even if so, technology will once again be invoked to solve problems it amplified in the first place.

NYU professor Clay Shirky studies the effect of the Internet on society. He observes that, "There are some counter-moves in the industry right now—software that takes over your screen to hide distractions, software that prevents you from logging into certain sites or using the internet at all, phones with Do Not Disturb options—but at the moment these are rear-guard actions."<sup>[xv]</sup> With the entire industry focused on distracting, engaging, and immersing online readers, it is a losing battle to attempt at once to put the Internet at the service of classroom education and restrict the uses of devices to focused academic pursuits. At McMaster University, researcher Faria Sana and her colleagues studied the effect of laptop multitasking on lecture comprehension, and found that students who engaged in laptop multitasking performed 11% worse than their peers.<sup>[xvi]</sup>

The research on the illusion of multitasking is extensive and convincing: switching between tasks rapidly decreases performance and retention, but gives the multitasker a deceptive feeling of improved productivity. Like drivers who believe that intermittent texting does not impede their focus, students report that checking text messages has little to no impact on their understanding of classroom discussion. Nonetheless, Shirky arrived at the controversial decision to exclude electronics from his NYU classes. “Allowing laptop use in class,” he wrote on a September, 2014 blog post, “is like allowing boombox use in class—it lets each person choose whether to degrade the experience of those around them.”<sup>[xvii]</sup> Shirky cites Sana’s study as proof. In a second experiment, the researchers found that students *in view of multitasking peers* dropped 17% in post-lecture test performance. In other words, they suffered more than the ones who were actually doing the multitasking.<sup>[xviii]</sup> Like the multitaskers themselves, those students reported that they were “barely” affected by their neighbors.

Shirky’s device ban is not unheard of in college classrooms, but it is prevalent in primary and secondary schools. In both one-to-one programs like St. John’s and bring your own device schools like DeMatha, cell phones may still be confiscated if students use them during class time. Researcher Danah Boyd sees this as nothing new, however, and believes that trying to solve it by limiting device use is just the latest episode in the teen-adult power struggle. Her book *It’s Complicated: the social lives of networked teens* contributes an invaluable perspective in the voices of the teens she interviewed across the US for ten years, but often reads more like a manifesto than a report. She writes that adults blaming technology is a misdirected attempt to address the timeless issues of teen rebellion and parental limits: “As teens seek out new spaces where they have agency, adults invent new blockades to restrict youth power,”<sup>[xix]</sup> she writes. If it is difficult to view parental limits on the devices they buy for their children as a desire to remove agency, it is all the more difficult to believe that schools merely seek to exercise power over students when they ban devices for non-academic use. If technology is only making more obvious the perennial problem of student engagement, then it seems absurd to combat that issue by adding new sources of distraction.

Boyd is not a critic of American culture; she accepts technology, and in particular social media, as given. She does, however, attempt to argue for moderation in conversation about the appropriate use of technology by youth. Her arguments would be more effective if she did not tend to dismiss critics like Carr as Chicken Little while arguing that “digital celibacy” holds no more promise for happiness than digital engagement.<sup>[xx]</sup> Better is her excellent clarity on the multiple and mistaken notion of youth as “digital natives.” If she sometimes makes too much of the intergenerational gap, she at least points out that teaching students about networked environments is a much better role for education than issuing devices, and asking all the same questions of online artifacts that we would ask of print forms is the central goal of producing literacy.<sup>[xxi]</sup> It is simply not convincing that these skills require or even benefit from the use of a device.

We have a history of rushing to broadly implement solutions after minimal research, and then strategically backing down when they inevitably encounter unforeseen obstacles. This trend is plainly evident in our repeated experiments in US education. Perhaps it is our repeated failure to produce a reform, standard, or approach satisfactory to all critics that has encouraged us in desperation to try and minimize the effect of the only factor that has been shown time and again to be the most influential in education: a great teacher. In dark homage to Aldous Huxley, our ideal digital future is being envisioned as one in which teens socialize themselves in their free time and teach themselves during school hours. At the center lies an indifferent technology, supporting a networked public materialized out of the only semi-intentional interactions of a global society. The adults who built this digital world best serve their offspring by largely leaving them to their own devices so that they can reinvent the social order and produce, presumably, something which their parents cannot fathom. But technology is

not indifferent. Each tool we produce, though it may be put to many uses, excels at only a few. In light of our track record to date, it may be wiser, cheaper, and far more responsible to set aside devices and apps. The absurdities created by hanging so much weight on a technology that excels at disruption would be amusing if it did not constitute yet another distraction from the deep educational goals of clear thought, reasoned discourse, critical reflection, and respectful discovery.

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[viii] Pearson, "Blended learning public charter school outperforms district on state tests", Web blog post, Pearson Education, 2015 (<http://www.pearsoned.com/education-blog/blended-le...>: Accessed December 2015).

[ix] Anne Mangen, Bente R. Walgermo, Kolbjorn Bronnack, "Reading linear texts on paper versus computer screen: Effects on reading comprehension," *International Journal of Education Research* 58 (2013) (<http://www.sciencedirect.com/science/article/pii/S...>: Accessed Dec 2015): p. 65.

[x] Diane Mizrachi, "Undergraduates' Academic Reading Format Preferences and Behaviors," *The Journal of Academic Librarianship* 41, Issue 3 (May 2015), (<http://www.sciencedirect.com/science/article/pii/S...>: Accessed December 2015), abstract. It remains to be seen what those who learn to read on digital devices will prefer, but the current age of digital reading is so low that we may need to wait until digital text becomes ubiquitous before preferences change. By that time, display technologies may be very different.

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[xii] Gausby, p. 4.

[xiii] Gausby, p. 2.

[xiv] Gausby, p. 3.

[xv] Clay Shirky, "Why I Just Asked My Students to Put Their Laptops Away," Medium, [Medium.com/@cshirky](https://medium.com/@cshirky) 9 September 2014 (<https://medium.com/@cshirky/why-i-just-asked-my-st...>: Accessed November 2015), para. 19.

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[xix] danah boyd, *It's Complicated: the social lives of networked teens* (New Haven: Yale University Press, 2014), 96.

[xx] boyd, 93.

[xxi] boyd, 179-82.

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