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FROM SHOCK TO AWE

HOW THE PANDEMIC CRISIS HAS OPENED UP THE DIALOGUE FOR A TRUE REINVENTION OF EDUCATION

David L. Shrier

AS COVID-19 spread like wildfire across the world, public health response was swift. Within weeks, we entered a global lockdown. Most nations sequestered their citizens behind closed doors, with people fearfully accepting food delivery where they could afford it, or reluctantly venturing out to grab what they could out of a set of dwindling supplies, before retreating for the safety of their homes.

Weeks turned to months, as it became clear that the pandemic was not going to be over quickly. Educational institutions—from primary schools to universities—attempted to resume operations virtually. Overnight, technology platforms and teaching models that were originally designed for in-person instruction were hastily applied to digital learning environments—most often,

in the form of Zoom and other video conferences.

AT THE GATES

This may be a lost year or two for students. One engineering professor estimated that students finishing their first half semester of “zoominar” learning were only retaining 20 percent of the knowledge they should be gaining, versus what a student would absorb in a regular classroom setting.

For anyone with primary school aged children, this was also a lost year of work. In the United States, a staggering number of parents had to cope with job losses, lack of childcare, immense burnout, and home-schooling pressures—sometimes all at once. Essential service workers were forced to choose between going to their jobs and staying at home to watch their children. Supply

chains ground to a halt. Even in domiciles with better social safety nets than the United States (e.g., the EU member states, the UK) the work-at-home environment proved challenging for parents and children alike.

The COVID-19 crisis exposed policy gaps in not only how we have trained teachers and collectively constructed entire pedagogical journeys; but also in how educational environments serve a vital social services role, especially for lower income families.

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As vaccination programs roll out and nations sluggishly begin to reopen (India and Brazil are still grappling with slow vaccine adoption, coupled with new, resistant strains of the virus) educational institutions are now attempting hybrid or mixed mode classroom models. These ‘mixed mode’ models are often worse than purely virtual or 100 percent in person learning environments. In the mixed-mode model, some students are seated in a socially distant fashion in a classroom with a professor, while other students participate through video conference platforms.

This approach has several notable flaws.

First and foremost, there’s teacher safety. Many professors are in COVID-vulnerable age brackets. Asking them to deliver in person instruction while allowing safety-minded students to participate virtually still poses a health risk and fails basic epidemiological science.

Second, the sparse and interrupted nature of these new, hybrid in-person learning environments defeats the multitude of benefits of in-person learning environments.

One of the top benefits of in-person instruction is the ability to facilitate small group interactions at distances of less than two meters. Decades of research on group collaboration revealed that at short distances, individuals are able to communicate critical social cues to each other that facilitate understanding and reciprocal trust. The best learning environments create the opportunity for nonverbal communication and social signaling, which have been proven to increase knowledge retention as well as create a sense of psychological safety necessary for the exchange and acceptance of new ideas

In a mixed-mode classroom, students are deliberately situated in ways where these critical psychological

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cues cannot be so readily exchanged. Even worse, the classroom flow is constantly interrupted to allow for student participation from video screens scattered around the room.

For the distance learners and the distance educator, mixed-mode instruction removes the control and digital capabilities that can be offered in a virtual learning environment. In a purely virtual experience, digital environ-

ments—if well-designed and well-architected—can offer learning experiences that are, in some ways, superior to the in-classroom world. Brief, well-illustrated points from the instructor can lead to prompts or breakout group conversations, which can then be woven back into the main discussion, as insights from small virtual breakout groups are recaptured into the larger seminar. Interactive media, such as high-quality video and audio, can be easily interspersed into the presentation, and students who are already sitting at keyboards can jump into interactive elements such as hallways, chats, word clouds, and even more elaborate engagements (digital simulations).

In contrast, students in a physical classroom can't really experience this immersive, media augmentation in the

same way, unless they participate with a laptop open in front of them at all times—lessening the cognitive benefits of in-person attendance. It's a Catch-22 Joseph Heller would have appreciated.

Global policymakers should be thinking ahead on how to mandate emergency response planning, including long-term, alternative options for learning.

Or perhaps Jean-Jacques Rousseau is a better touchstone for us, since in *Emile* he speaks to the importance and centrality of the learner in pedagogy, rather than the pedagogue. Rousseau anticipated a more flexible approach

to curriculum that even today edtech companies struggle to deliver. Universities, unfortunately, remain largely mired in 'sage on the stage' scale models where the professor lectures and the students transcribe lecture notes. COVID-19 expediencies have laid bare the deficiencies of the incumbent system, and mixed-mode instruction highlights further how far we have deviated from the Rousseauian ideal.

POLICY OPPORTUNITY

While COVID-19 is the first major global pandemic we've had in a century, epidemiologists believe many more are expected in the coming years. With the effects of climate change accelerating and becoming more pronounced, we may see widespread environmental disruptions (i.e. superstorms, extreme heat and cold

spells) of schooling. Global policymakers should be thinking ahead on how to mandate emergency response planning, including long-term, alternative options for learning. Contingency plans will not be enough—we'll need to train and resource organizations and leaders in how to support rapid transitions to digital-only models of learning delivery. We must better prepare the world's educational systems for the next widespread, global crisis.

The forced march to all-digital learning was mitigated, somewhat, by 30 or more years of experimentation by higher educational institutions with remote digital learning.

Deficiencies in teacher training became apparent under COVID-19. Although a select few educators are familiar and comfortable with digital delivery (and are able to provide rich classroom experiences in a purely virtual platform), the vast majority of educators confronted with the prospect of converting their classrooms from fully in-person to virtual environments stumbled badly. Some educators at some institutions—such as my colleagues and collaborators at University of Oxford—quickly convened peer-mediated pedagogical workshops where tenured and adjunct instructional staff could trade tips and techniques on how to deliver the ultimate remote virtual instructional experience. Many simply dumped their faculty into the deep part of the ocean and left them to sink or swim.

National mandates around providing high-quality teacher training on how to offer virtual delivery of classes, and ultimately knowledge, will ensure greater classroom flexibility as well as solve for wider access to learning—even during non-pandemic eras. These would require investment in the future, but one that has a 'force multiplier' effect; each teacher has the potential to touch hundreds or thousands of students a year, and appropriately-directed and planned investment in professional training for instructors could yield a renewable array of benefits by improving downstream learner outcomes.

Standards bodies and accreditation authorities have a role to play here. Just as organizations like the International Accreditors for Continuing Education and Training (IACET), which issues Continuing Education Unit accreditation, as well as the international and national degree-accreditation bodies that evaluate and approve programs of instruction, it would be possible to also provide accreditation for the instructors themselves. Best practices can be distilled into a meta-training of trainers, and standardized levels of excellence adopted.

BEFORE THE DELUGE

The forced march to all-digital learning was mitigated, somewhat, by 30 or more years of experimentation by higher educational institutions with remote digital learning. Success, when measured in total learner impact and results, remained modest during those three decades, and only a handful of professors had exposure or experience with all-digital delivery going into the lockdown.

Many of these prior experiments were in the realm of Massively Open Online Courses (MOOCs), such as those offered by edX or Coursera. The former firm has recently been in the headlines with the late June 2021 announcement that course purveyor 2U, Inc. will purchase their commercial assets for \$800 million.

In some respects, the MOOC experiment has been a tremendous success—hundreds of millions of learners have been exposed to classes, including from such exclusive universities as MIT or Harvard or Oxford or Cambridge. People from almost every country on the planet were able to ‘dial in’ to the world’s top professors at its most elite institutions, for free. We were introduced to heartwarming stories, such as the young herder’s child from Outer

Mongolia who was able to gain acceptance to MIT on the basis of having excelled in a free MIT MOOC.

In other important regards, MOOCs have been a colossal failure. The aver-

age edX completion rate, according to a 2019 MIT study by Justin Reich and José A. Ruipérez-Valiente published in the journal *Science* was a dismal 3 percent—part of a declining trend of the 5 percent from only a few years earlier. This means that out of 100 students who start a MOOC, only

3 of them finish it. As well, the many promises of learning research on MOOC platforms—to use all of that learner data to improve pedagogy globally—have only partially been fulfilled.

In the past six years or so, however, a new kind of concierge learning has emerged, where students were organized in cohorts and teams, primarily for professional education-oriented non-credit online classes. First pioneered on a global scale by Alex ‘Sandy’ Pentland and I at MIT in 2015—with the original MIT fintech course delivered to over 150 countries, and eventually propagated to Oxford and soon other universities—the small private online course (SPOC) offered a better way forward: completion rates approached or exceed-

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ed 90 percent, instead of 3 percent, and learner satisfaction was much higher.

The SPOC model relied on new models of pedagogical design and a high-touch, human-mediated support infrastructure to ensure learners were engaging with the material. Colleagues and I also created another novel online delivery model with Boeing and NASA around systems engineering that remains a significant portion of MIT’s digital revenue even in 2021.

The MIT fintech class—and its successor at Oxford—was so successful that some finance ministries in Asia were willing to accept proof of completion of this class in lieu of work experience in fintech, for employment purposes. One of the leading fintech companies in Brazil, which recently completed an initial public offering, designed a key component of its growth plan using the class as a stimulus. One of the largest banks in Switzerland sent 50 executive a year through the class, to ‘mass produce’ organizational innovation. The Commonwealth of Nations funded dozens of central bankers to take Oxford Fintech to build regulatory capacity around fintech policy across 53 countries around the world. Routinely, people from countries around the world would come up to me on the promenade at Davos to tell me how the class changed the courses of their lives.

Despite these anecdotal successes, scale has remained small for SPOCs: hun-

dreds of thousands of students, perhaps, in aggregate, across all classes and institutions. However, impact has been notable, ranging from career progression and corporate innovation, to a global wave of startup activity. Analogous providers emerged in the K12 market providing primarily technology-related online classes and summer camps, but those efforts, pre-pandemic, were modest.

Another, related domain has been the rise of digital outside program management (OPM) companies, which run degree-granting programs on behalf of universities, and noncredit ‘boot camp’ providers, that run longer, more intensive skills-focused activities. Companies such as Noodle and Academic Partnerships help academic institutions navigate the transition to digital without distracting the core business; accelerated bootcamp providers such as HackerU and Kingsland Academy deliver tangible career benefits and jobs placement to learners for 9-month ‘degree-like’ programs that offer measurable skills development for adults around areas like cybersecurity or blockchain.

Institutions like Imperial College London even funded the creation of their own learning management system (LMS) called Insendi, joining a small club of other university-derived LMS platforms like open edX. While not the subject matter itself, these next-generation technology solutions

made the process of bringing a quality class online easier, providing a notable improvement over prior systems like Blackboard or Canvas.

In aggregate, the revenues from all of these digital delivery providers and systems, partnered with established institutions or offering programs independently, perhaps entered into the billions of U.S. dollars per year, but remained dwarfed by the on-campus, in-person tuition-bearing activities and focus of educational institutions.

The COVID-19 pandemic forced upon the \$7 trillion global education industry a new perspective. Instead of optional ‘extras’ around online, it now became the only way to deliver instruction. In the words of one top business school dean, digital went from “nice to have” to “core competency” in a matter of months. This rapid reorientation of a multi-trillion-dollar enterprise was not without its frictions.

STUDENT, INTERRUPTED

Let us return to the question of the broken journey of learning. The COVID-19 lockdowns occurred roughly in the middle of semesters or school years. People who have been navigating an accredited learning path, working in a certain format or style of class delivery, were thrust into a virtual classroom—a completely different model of learning. They were often ill-prepared

to the different learning style and discipline required to acquire knowledge in this manner, and the course curricula they encountered were likewise ill-constructed to serve this new digital need.

Some educators were advised to simply lecture for three hours in the exact same way online, as they typically do in person. Unfortunately, it’s not that simple. The in-classroom environment creates and facilitates a cognitive bubble of focus. Even social cues from peers and instructors lend themselves to helping create a more focused environment in-person versus on video. Online, our attention spans are much shorter—and have only been diminishing in the last 18 months. One of the top thought leadership video streaming platforms in the world reported an 80 percent decrease in average video view length. In this environment, a three-hour lecture simply will not be sufficient.

But with no time and no curricular flexibility, students and professors attempted to make do, and the results have been predictably awful. Expensive graduate programs such as MBAs have been facing a glut of students demanding refunds due to the loss of social collaboration and a “full and complete” learning experiences on campus.

Indeed, the pandemic has laid bare the greatest failure in online learning: the lack of effective collaboration spaces, present in in-person learning

environments, where students can come together to generate new ideas and think through solutions to complex problems. The face-to-face experience of instructor to student is diminished. Innovation suffers when there is a loss of serendipity—the possibilities of running into an old friend with a new idea, or meeting a key individual who might be a catalyst for a new company, are now absent. The learner is left in isolation, perhaps hopeful for scraps of connectivity or information to be found on a poorly-curated online discussion forum.

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There has been more scholarly research of late centered around the value of university campuses as innovation clusters. Most think of universities as drivers of research, and perhaps institutions where the best teaching methods are developed and refined. Universities are actually concentrated nodes of stakeholders, students, professors, advocates, government officials, and industry leaders who come together in structured and unstructured ways to spur new ideas, approaches, and even entire ecosystems. The ideas that emerge out of these interactions are the most important product of these institutions, along equally with the peo-

ple that they train to create, refine, and understand these ideas through their instructional vehicles of classes and degree programs. Students who have spent months in isolation, staring into the glow of Zooms, have missed out on

these key benefits of in-person collaboration.

The loss of serendipity and idea-flow can be seen and felt beyond academia. We’ll be seeing the effects of decreased innovation stemming from cancelled conferences, festivals, and business gatherings over the next few years. Research has shown that three

quarters of a conference’s value is derived from networking and accidental encounters versus formal panels and presentations. Collaboration research pioneered by MIT Professor Thomas J. Allen in the 1970s backs this up. His research revealed that people more than 50 meters apart fail to collaborate, and the farther apart workspaces are, the less communication there is between them, in a power law curve of declining performance. Later elaborations on this work in the digital age show that teams even forget to email people they don’t physically sit near or run into at the water cooler. Extensive research on the disconnectedness induced by the all-remote COVID-19 workforce has yet to be published, but

past work suggests that there has been a meaningful long term innovation decrease (perhaps offset by the productivity increases of eliminating commute time, and conscious/intentional adoption of remote digital collaboration tools that previously workers had resisted).

POLICY OPPORTUNITY

There are several opportunities for policymakers to address the issues raised in these disrupted learning journeys.

First and foremost, funding is required to further research the benefits of in-person collaboration, and to develop technology solutions that might expand or extend these types of collaborative interactions in purely digital learning environments. Support needs to be provided for educators who need to adapt physical classroom environments to better engage in effective hybrid or completely digital learning. The pedagogical theory and evidence advocating for collaborative learning approaches have been around for decades, but for reasons ranging from lethargy to cost, they have not been as widely adopted in institutions of primary or higher education.

Second, it is essential to provide educators with teaching methods and instruction on how to create more dynamic classroom environments. But in fact, the three-hour lecture referenced earlier is also

a suboptimal approach to classroom teaching. The ideal classroom environment is an interwoven experience, with brief, stimulating lectures punctuated by small group discussions, table exercises, and dynamic question and answer sessions. Policy mandates can help with greater adoption of these effective learning approaches.

LOST CONNECTION

The interim, and even long-term solutions, discussed in this article rely on a connected world. In fact, these solutions hinge upon the success of student-teacher interaction mediated seamlessly through computer screens. However, large proportions of the world's population, primarily in developing countries, lack access to a simple mobile phone, let alone much more sophisticated technologies.

UN Deputy-Secretary-General Amina Mohammed noted in April 2021 that 3.7 billion people—a majority of whom are women—lack digital access. She called this digital divide the “new face of inequality.” Without digital access for all or even a super majority of the world, we cannot begin to ponder, or even implement, successful solutions for digital learning and education.

Global connectivity remains a critical imperative for ensuring that educational inequalities do not become exacerbated in the near future. Loan-and-subsidy programs hold the

potential to support greater digital access by increasing the supply of digital devices to underserved populations.

However, technology alone cannot solve this problem; digital literacy also is a prerequisite to successfully bridging the digital divide, and proper training must be integral to any solution pathway.

PHOENIX RISING

Humanity has time and time again demonstrated an ability to overcome crises and turn these challenging eras into opportunities to inspire hope and to propel society forward. The United Nations was born out of the horrors of World War II and the failures of the League of Nations. The art of Michelangelo and Rembrandt burst into expression in the shadow of the Black Death. The recent COVID-19 crisis has unlocked an array of new biotechnology advances and spurred multiple pharmaceutical companies to create safe, effective vaccines in only a matter of months. There are now indications that the same technologies leveraged in the vaccines will cure cancer, HIV, and an array of other diseases.

The failures of online education, now being made ever-more apparent in the mass adoption mandated by COVID-19, may perversely stimulate a new willingness to experiment with and subsequently adopt solutions that actually work. MIT spinout Esme Learning (which I co-founded and lead) uses artificial intelli-

gence systems to help people learn faster, better, and with greater applicability to work, while at the same time addressing the punishing isolation that is the usual experience surrounding digital learning.

Policymakers hold a singular moment of time in their hands due to the exigencies of recovering from COVID-19 disruption. Fiscal policies in countries around the world are orienting to stimulus versus constraint; and with this comes the opportunity to advance policy initiatives that align scope, span, and outcome. Holistic or ‘ecosystem’ approaches can be supported, bringing together fundamental enablement, such as digital access with the means to capitalize on this access through training, work placement, innovation stimulus, and other interventions. No longer is resource constraint the guiding principle: with the acceptance of greater deficit and debt levels, the opportunity emerges to create optimal solutions, not the expedient or compromise pathways so often required by competing interests.

“The future is already here,” as science fiction author William Gibson famously wrote, “it’s just unevenly distributed.” The catastrophe of COVID-19 may perversely enable governments to address widespread inequalities, improve competition, and foster greater innovation, both in the education arena and in the interconnected realms of work and society more broadly. ●