Digital Biomes: Lessons From COVID-19 Remote Coursework Ecosystems and Interfaces

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Early in the pandemic, when the shutdown and the adjustment it would require were still becoming clear, I worried, as most of us did, that it was likely to create sudden new stratifications of talent and skills among our colleagues and students. I recognized the concerning possibility that reliance on new task cycles and tools learned incompletely or not at all could worsen technological inequalities, to say nothing of eroding teaching effectiveness. What I discovered, however, was that these constraints, as so often happens in creative processes, occasioned new opportunities for perspective and reevaluating what core teaching competencies really are.

About a month before the shutdown, during my office hours, a faculty member came in and asked to borrow an office mate's old iPad because she "thought it was about time" she learned how to use one. A stalwart resister of technology, she expressed some reluctance and explained that this felt like an acquiescence to something inevitable rather than something positive or necessary. I remember marveling that she'd held out as long as she had and being impressed at the determination needed to manage a paper-only modern classroom and to somehow also get dozens of digital-only students across the finish line in writing classes.

My own teenage son, in contrast, uses iPads exclusively for both schoolwork and entertainment. When I offered to buy him a laptop for doing schoolwork, he turned me down. Even his older, beat-up iPad was evidently preferable to using what he saw as a stodgy, old-fashioned device. Meanwhile, the faculty member I mentioned above was reluctant to even possess a modern tablet, preferring to borrow an old one rather than buying her own (this was a permanent full-time faculty member who presumably could afford it). I pondered this disconnect for a while, and it dawned on me that a complete refusal to use computers in the classroom represented not a one-way, one-step technological remove as we usually conceptualize this kind of resistance (no computers←computers), but rather a complete break from several generations of digital literacies both very new and much older (computer-free classroom←stand-alone desktop micro-computing for personal use←desktop computers with internet←ubiquitous laptops ←iPads). In other words, there are *decades* of digital literacies and workflow strategies jettisoned in such an approach, a return not merely to our students' parents' classroom ideals but to those of their grandparents or beyond.

iPadOS, the new operating system for Apple's tablet, was released during the Fall 2019 semester. Being the techie and early-adopter I am, as well as being interested in digital literacies as a learning objective, I began to experiment with iPadOS on my own six-year-old iPad Air 2, the oldest compatible device. As a daily work computer, I found it differently but pleasantly usable, and it gave me a new appreciation for my students' technological

landscape. A quick example: iPadOS has a different and more aggressive version of spellcheck built into its operating system, the source, I'd long suspected, of certain typo patterns in my students' papers. This experiment was a simple but meaningful way for me to improve my teaching and feedback through embracing "their" (rather, "our") tech. The device handles files very differently from a desktop or laptop, and it became immediately apparent how tablets funnel users into one or another "biome," favoring the word processing and productivity platforms of Google, Apple, or (less and less these days) Microsoft. This solved another minor riddle I'd been pondering recently: why my students become comfortable with one ecosystem and then carefully avoid the others, even tools once as ubiquitous as Word. Using the device the way they did not only helped me understand where various workflow problems might emerge but also made the practicality of their choices much more transparent to me.

Sometimes my students' software preferences are driven by which devices they can afford, although Apple mercifully now offers students a $300 iPad, which levels this playing field considerably. But I have to be careful if, for example, I forbid submissions of student work as a Google Doc. A budget tablet, older sibling's hand-me-down Chromebook, or a high school that economized their learning management system (LMS) may be the origin of any given student's Google Doc preference rather than it being a conscious choice on the part the student. But what began as a simple device choice, perhaps driven by money or familiarity or the willingness to adopt a new technology, can rapidly become a fundamental question of classroom practicability. Especially, we soon learned, when we are thrust into a prolonged distance-learning effort.

This will come as no surprise to anyone who has spent months of quarantine teaching, but these small tech differences (which I can only imagine seem like arcane figures to the technology-shunning colleague I mentioned above) come to the fore and must be navigated. Brightspace and Blackboard will not open or scan Google Docs or Pages files for plagiarism. Anticipating this, I included a paragraph in my syllabus about how papers must be submitted in Word or PDF formats, reasoning that even these mobile and tablet-friendly word processing apps can output those common file types. What I didn't anticipate, until a student pointed it out, was that some Chromebooks weren't able to easily open Word documents from my course shell at all. As the months of remote learning dragged on, and I continually reshuffled the technology to try and find solutions that were equitable and frictionless, I realized that I was approaching class tech in a way that wasn't all that dissimilar to the Luddite instructor I mentioned initially. Even with my own familiarity with the LMS and my growing confidence providing video and audio versions of my content and holding livecast-style classes for blank Zoom squares and a chat feed, I was continually confronted by the fact that my iPad and its fresh way of doing things wasn't my preferred work environment. Like my students, somewhere along the line I'd become comfortable in my own chosen biome— a 27-inch iMac in a robust home office—which meant, I realized, that at best I was only dabbling. No matter how many times educators heard the phrase "our shared tools" in the last year, "their" tech wasn't really "our" tech after all, and I was still on a number of levels attempting to standardize the experience of my students' technological biomes against my own chosen platforms. When I specified "no Google Docs files," I was saying just a milder form of "I know better, my way is road-tested and professional-grade, your iPads aren't serious work tools" when the reality was much more complex and demonstrative of how easy it is for us as instructors to lose perspective.

I decided to double-down and start doing serious work on my iPad, which I'd always considered something of a novelty device, and what I got instead was a fascinating window into my students' workflow. Hiding behind my iMac workstation was the true technological diversity of our situation: the beat-up tablets, the hand-me-down Chromebooks, the shared living room computers, and the students trying to type papers on their phones that were the only device in their house with reliable WiFi.

Remarkably, though, this was only the *first* layer of what was hidden behind these tech choices. My iMac cost around $1700 when I bought it in 2014, which was expensive, at least to me, but some of my students come to class toting brand new $3000 MacBook Pros, the same machines used by studio recording artists and digital animators, and which they use mostly to type their first hesitant college essays about whether global warming is bad or whether marijuana should be legalized. Many more come with iPads, Chromebooks, Windows laptops, or with nothing at all, relying on not just cloud file storage but cloud-based word processing applications accessible from any web browser. Their technology preferences, in other words, from the hardware all the way down to the file types, are *sometimes*, but not necessarily always, an artifact of inequalities. The $3000 MacBook Pro with nothing on the hard drive except an outline of a paper that was due two days ago might be an artifact of well-meaning parents who insisted that investing in such a high-powered machine was both necessary and desirable to get a student confidently launched into college. Or, maybe not. The Chromebook festooned with inscrutable decals and sporting a broken hinge might mean the student could afford only an inexpensive option or had to make do with a hand-me-down. Or, maybe not. Maybe that same Chromebook is an ultra-low cost portal to the only cloud ecosystem they care to use, which is the same experience no matter which keyboard and screen is attached to it, and if that's the case, why spend *any* additional money on hardware? Or maybe, perhaps most interestingly, a student like my son, who does their work on a basic iPad with a dinged-up corner and a hairline crack in the screen, knows something that I don't. Maybe they quietly scoff at the idea of computers entirely and can't, or don't feel the need to, articulate that it's really *me* and my stodgy old home office iMac that's creeping slowly toward obsolescence. In other words, perhaps even an enthusiastic early-adopter of tech like myself is still on that continuum of digital literacies I mentioned earlier.

It's this last possibility that fascinates me the most. When the quarantine came down on us, it was *so* easy to imagine that it would create predictable inequalities. The easy assumptions were that "tech savvy" faculty and students would be stronger than the "not tech savvy" or that students' tech needs were cognizable in terms of emergency dollars spent. For those of us paying attention, though, this wasn't at all clear. One comment I heard repeated toward the end of the first semester from my colleagues was surprise at how well some of the shy, wallflower-type students took to remote learning. Instead of being "at risk" because of less-than-ideal classroom demeanor (another too-easy assumption, it turns out), they flourished. Students who might have been confident and dominant in person hung back with their cameras off and passively consumed the class while those emboldened by the new platform took center stage of discussions, maybe for the first time in their lives.

But the assumptions didn't stop crumbling there. As I slowly learned which questions to ask, I spent time letting the students tell me about their experiences in their other classes, an opportunity they seemed both grateful for and enthusiastic about. They described a wide range of professor approaches, some of which seemed ostensibly rooted in "tech savvy" but

which ended up being a frustrating mess of third-party teleconferencing tools and one-off apps, indecipherable instructions, and over- or under-communication. By now all of this is familiar territory for those of us in our second semester of remote instruction, but it's easy in retrospect to see what a muddled, ineffective impression this early scramble made on students. *Who, precisely, did we imagine was less technologically prepared for this?* I wondered, and not for the last time.

I urged my students to tell me what they thought *did* help, and their feedback revealed yet another layer of technological sense-making that I want to credit them here for helping me see. Some instructors simply "checked out" they said, dumping information into a clunky LMS and leaving them to learn the material on their own, unhurried but unsupported. Others, they complained, piled tasks on them at a pace that was impossible to keep up with and demanded relentless face-to-face "engagement" that felt invasive, awkward, and generally exhausting. Many students craved the connection of the classroom and wanted some synchronous portion of the class but one as thoughtfully curated to the situation as the circumstances warranted. This was a task that almost none of their instructors were ready for, they reported. When I asked about tech platforms and common usability concerns the faculty had, they surprised me by brushing these questions aside. Far more important, they insisted, was the flow of lessons and expectations behind the screens. They told me the extent to which instructors prioritized clarity, organization, and occasional opportunities to socialize, and pared away all other busywork and extraneous "engagement" factors, was what determined the course quality on their end. Put another way, irrespective of their particular technological situation, they wanted what most students want from ordinary college classes. They found the sudden new regime of tech engagement tiresome, an exercise, I realized, in trying to settle a point about the viability of online education that none of them much cared about the answer to. A shared desire, far more than any particular tech choice or digital solution, was a request so simple and yet squarely fundamental that it continues to guide how I approach my courses during the pandemic: "we like your class because you tell us *how* to do things, not just *what* to do."

This is, to some extent, the *cri de cour* of every college student. Part of higher education is figuring out the "how" as you go. But in quarantine, the "what" is multiplied by every new app and tool. As we attempt our own small-scale disaster mitigation by trying to anticipate our students' tech needs, it's worth taking a harder look at how the very deepest layers of our pedagogical philosophy somehow become spontaneously articulable by the same students who write papers about the virtues of off-grid living on $3000 Macbook Pros or the pitfalls of social media composed on their literal cellphones. This is a moment when assumptions are crumbling with regularity, but what this shift reveals is not the vulnerability we've long suspected. Far more cogent to my students was the inequality of expectations than that of technology. Writing a paper in Google Docs with a cell phone was a practical problem that they could overcome. Knowing *how* to write the coursework—the *critical thinking* their instructors were asking for—was, as ever, the abstract hurdle. Sure, they grumbled about spotty WiFi, but what they craved most acutely was clarity of purpose, a sensible—and telling—request. They wanted instructors who felt approachable, teaching a class that was streamlined, predictable, explanatory, and organized enough that it left time for spontaneous questions and conversation, instead of having to constantly guess at what was expected of them or prove how "engaged" they were via the busywork of graded discussion posts or mandatory camera-on lectures.

The good news for us instructors is that if what I'm seeing here is true, and what makes for effective emergency remote teaching is clarity, organization, and process-focused pedagogies, then it doesn't especially matter if their instructor is a recalcitrant Luddite, an early adopter of new tech, or, like most of us, a professional somewhere in between where our experience and confidence with digital tools may occasionally hamper our perspective. We need only walk their technological path rather than demanding they walk ours, be models, demonstrators, and collaborators rather than conjurers of obstacles, and show them what, how, and as much as possible *why* to do the work of our courses. Oh, and I wrote this on my iPad; you should try it. ⚴