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Infrastructures of Play

Labor, Materiality, and Videogame Education

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ABSTRACT

Preparing students for the job market is not the limit of our responsibilities as videogame educators. We must also prepare them to be ethical actors within the industries they may join. This paper argues for augmenting player-centric videogame design education and game studies pedagogies with approaches that situate videogames in context as operational components of extractivist business models and the political and financial economies that support them. This approach entails teaching videogames as technical systems with complex and expansive

upstream and downstream supports and impacts. These supports and impacts have real and frequently detrimental effects on the environment, communities, and individual human lives, and yet are relatively rarely discussed in the literature, especially in comparison to discussions that focus on representation and rhetoric. By looking beyond the frame of the individual videogame as an expressive artifact, educators can help learners to apprehend issues such as the growing material and environmental costs of computer-based entertainment and the many tiers of labor exploitation involved in producing videogames and the computing machinery that makes them possible, among other concerns. The paper concludes by suggesting that students equipped with these kinds of understandings will be able to make more informed ethical assessments, and thus wiser choices, as they percolate into the videogames industries and, in some cases, into positions of leadership.

Keywords

Environmentalism, ethics, labor, materiality, platforms, videogames

INTRODUCTION

How should videogames educators respond to the growing crises in the environment and in democracy? Is it enough to simply advocate to students that they consider developing or studying videogame content that addresses these issues? Or are there other responsibilities we bear?

It is true that videogames educators, particularly in design domains, have a responsibility to help their students prepare for employment. After all, our students have entrusted us with their post-secondary education, at least in part, on the premise that the learning experiences we provide them with will lead to sustainable career outcomes. This is especially important in the United States,

where many post-secondary students will accumulate massive debt in the course of attaining a degree. But the economy is tight everywhere. Graduates need jobs.

Still, our responsibilities clearly do not end there. It is also our responsibility to ensure that students have an understanding of what the videogames industries do *as industries*, alongside what videogames themselves can say or do as interactive cultural artifacts, so that they can make more informed ethical assessments and choices, both as citizens and as workers. This means helping students to understand—through reading, reflection, and even critical videogame design itself—the reach and scale of these industries, their imbrication in some of the most extractive of sectors of the 21st century global economy, and the many ways that the infrastructures they co-construct impact human life and the biosphere.

Illusions of Immateriality

One reason why this is an important pedagogical aim is that the material and human costs of all things digital are largely hidden behind an illusion of immateriality put forth by the computing machinery industries and encoded in the norms that govern how we talk about our experiences with computers, especially in the English-speaking world (Carruth 2014; Chang and Parham 2017; Ensmenger 2013, 2018). The virtual can feel otherworldly and mystical—indeed, this is sometimes a key aspect of its appeal. Steve Jobs famously described the iPad as a "magical device" (Arthur 2010). But the fact is, the iPad is not magical, and neither are the PlayStation nor the latest graphics cards from nVidia or AMD. The "cloud" is not a cloud, but rather a resource- and energy-intensive network of data centers, undersea cables, satellites, water suppliers, and power plants. The technical infrastructure that makes possible the videogame is composed of physical machines—and every part of those machines, from housings to microprocessors to cooling systems, are the result of

decidedly “unmagical” processes, such as mining and refining, international shipping logistics, trade pacts, assembly line labor, the burning of coal and other fossil fuels, and so on.

In developing new curriculum materials for the University of Southern California to address these issues, I have identified several pathways to help students to understand the industrial and human supports that underwrite 21st century videogaming. These pathways are worthy of both their own courses and of further integration into existing theory, history, and production offerings—not only here, but at all institutions seeking to provide students with ways to critically design and assess videogames. In this paper, I will discuss two of these pathways: *Materiality and the Environment* and *Labor*.

In the sections below, I will outline some of the reasons why I think traversing these pathways is so essential to videogame pedagogy in 2019 and beyond. In so doing I will identify selected research, reporting, and critical writing on each topic, with an eye toward providing educators with trailheads for developing or augmenting syllabi. Finally, I will conclude by gesturing first at the urgency of this kind of intervention given the present global political and environmental situation, and second, at the importance of recognizing videogames and associated technologies not only as contributors to, and enablers of, some of the thorniest problems of our time, but also as necessary vectors for their amelioration.

MATERIALITY AND THE ENVIRONMENT

While the material underpinnings of an individual videogame or videogame console may not be apparent to the end users of such products (or to their creators), their impacts on human beings and the physical environment are profoundly real, even if one completely sets aside the play experiences they facilitate and the psychosocial transformations those experiences can usher into

being. As videogames educators, it is our responsibility to bring students into contact with these impacts.

In a reflection on computer science pedagogies, sociologist and technology scholar, Nathan Ensmenger, argues that greater attention should be paid to the "real world" impacts of computation. To this end, Ensmenger proposes that educators move beyond the traditionally "conceptual" introductions to computing topics that characterize many post-secondary courses in computer science—introductions that tend to concentrate on things like abstract descriptions of Turing machines, depoliticized histories of storage media, and so on. Instead, by treating the computer as a "physical artifact, rather than as an ideal," Ensmenger argues that we can put students in contact with the lived and material realities of computation and its industrial supports, and in so doing "avoid the kinds of one-sided utopianism that dominates much of the conversation about computers and society" (Ensmenger 2013, 81).

Likewise, videogames educators could improve how they serve their students by moving beyond idealizations that can elide the significant and growing material impacts of the medium. As Alenda Chang and John Parham put it in their introduction to *Green Computer Games* (2017), such idealizations can "fetishize the player and the act of play" (11) in ways that can drastically limit students' understandings of the broader industrial contexts of videogames and the platforms that support them. By leavening our discussions of the formal properties, psychosocial impacts, and emancipatory powers of games and play, with a recognition that 21st century computer-organized play is in fact an extremely resource- and labor-intensive proposition, videogames educators can disclose to students a fuller picture of what the object of their study does in (and to) this world.

One entry-point to this discussion is the relationship of videogames to time—in this case, to *geological* time. Consumer electronics—the substrate of all videogames—can seem

ephemeral and entirely of-the-moment, but are in fact intimately connected to geological processes that extend into the deep past. As Kate Crawford and Vladan Joler note, home computing devices such as iPads, gaming consoles, and smart speakers involve the extraction and refining of materials that took the earth billions of years to produce, only to "serve a split second of technological time" before they become obsolete and are thrown away (Crawford and Joler 2018, 5). Further, these resources are finite, and recycling them is a dangerous and expensive process that many jurisdictions simply do not support. How does this reality interface with the economic imperatives of the videogames industries, which demand constant growth and "innovation?" How does this fold into discussions of immersion, verisimilitude, and virtual reality, especially as they map to the development of ever more powerful graphics processing units and new classes of devices, such as VR headsets and motion capture volumes? Most importantly, how might a contemplation of the radical extractivism (Mezzadra and Neilson 2017) entailed in the videogames and computing machinery industries change how students conceive of their futures? Asking such questions can help educators to challenge students to "[engage] candidly with how games and gamers may be complicit in, or at least uncomfortably close to, legitimating unsustainable practices" (Chang and Parham, 1). In the absence of such challenges, students could find themselves entering into industry only to participate unawares in the reproduction of harmful practices they may otherwise oppose.

LABOR

Another important aspect of the videogames industries hidden behind the veils of inconsequentiality and immateriality is the labor that goes into creating the devices, applications, and platforms that characterize play after the internet. Hidden here, too, are the fraught histories of the computing machinery industries, and of the often-exploited workers who have made

their long booms possible (Hicks 2013; Lécuyer 2017; Nakamura 2014).

In "Indigenous Circuits" (2014), Lisa Nakamura traces some of this history, and begins by pointing out how Donna Haraway's 1985 essay, "A Cyborg Manifesto," amid its many insights, "draws our attention to the irony that some must labor invisibly for others of us to feel, if not actually be free and empowered through technology use" (Nakamura 2014, 920). Pointing to the example set by a variety of critics, organizations, and artists working in the fields of technoscience and entertainment, Nakamura invites us to "question and challenge the human cost of computing and mobile telephony" (921). She illustrates this human cost by showing how the labor of women of color was both fundamental to the birth of Silicon Valley, and a preview of the exploitative outsourced labor practices that keep game consoles and laptops alike both accessible and disposable today. What becomes clear from this example is that the development of such labor practices is as much a part of the technology business as is the development of ever smaller and more powerful computers, or ever more compelling entertainment and applications. Indeed, as Nakamura shows, one of the industry's most storied corporations, Fairchild Semiconductor, pioneered not only microprocessor engineering, but also the methods and supply chains by which such complex products could be cheaply manufactured (923). Industrial labor downstream from the consumer can be equally exploitative—and equally invisible. For example, the over 80,000 people living in the Agbogbloshie slum in Ghana's capital city, Accra, subsist by scavenging copper and other metals from the massive e-waste dumps located on the outskirts of the city. The concentration of toxic dioxins and PCBs at these dumps can cause serious health problems, including nervous and immune system disorders. These problems afflict not only the dump workers, but also their families, as the toxins seep into the groundwater and thereafter the food chain. According to research conducted by the International Persistent Organic Pollutants Elimination Network (IPEN), a single egg laid by a chicken raised in Agbogbloshie "[exceeds] the

European Food Safety Authority limits on chlorinated dioxins 220 times over" (Beaumont 2019).

In addition to these "offshore" labor implications, videogame design students outside the developing world also ought to be made aware of how they, too, can face exploitative and even dangerous conditions should they end up working in the videogames industries. Game developer "crunch" is one of the few areas where some public awareness of the labor practices of these industries exists (Fenlon and Chalk 2019; Glasner 2019). However, despite nascent efforts to unionize game workers ("Game Workers Unite!" n.d.), professional game development remains a life-consuming grind for many. Those fortunate enough to land jobs in the videogames industries can quickly discover that the work demands placed upon them, buttressed by their implied near-instant replaceability, can be extreme. As Marcin Iwinski, a Polish game developer, told the New York Times, making games is "hard-core work. It can destroy your life" (Schreier 2018).

Finally, other forms of labor associated with videogames, from the "free" labor (or "playbor") of live streamers and the players of online multiplayer games (Walker 2014), to the ever-expanding demand for content moderation on para-gaming social media platforms (Noble and Roberts 2017), deserve disclosure as a part of any complete videogames education. Simply put, educators do students a disservice if they deprive them of the opportunity to understand not only the risks they may incur personally, but also those that the industries to which they intend to devote their lives can inflict on other workers up and down the supply chain.

CONCLUSION

As with all things educational, disclosing difficult truths about our field of research and practice is not exclusively about our students and their moral and economic well-being. It is also about the society they belong to and the ecosystem we all depend upon—and how our students, insofar as they aspire to become involved with

an increasingly powerful and transformative set of industries, will impact the world as they graduate our programs and take on positions of responsibility.

Only from a position of understanding can our students become the agents of change that our troubled world urgently needs them to be. Rather than understanding games as something separate—an escape, a distraction, a sealed-off "magic circle"—we must enable our students to see that no such separation is possible, or even desirable (Consalvo 2009). We must inspire our students to ask difficult questions about where videogames and interactive entertainment fit into the epochal struggle for the survival of our ecosystems and the democratic way of life. We must face, with our learners, the very real roles that videogames and the computing machinery industries have played in exacerbating the environmental and social problems that now threaten to bring ruin to the world; and so too must we recognize that play remains the *sine qua non* of transformation and discovery in human affairs, and that games can order and direct play's energies in many directions other than the pursuit of endless growth and profit.

BIBLIOGRAPHY

Arthur, Charles. 2010. "Apple WWDC Liveblog: New IPhones and Software – and the Rest."The Guardian. June7,2010.

http://www.theguardian.com/technology/2010/jun/07/apple-wwdc-iphone- announcement.

Beaumont, Peter. 2019. "Rotten Eggs: E-Waste from Europe Poisons Ghana's Food Chain." *The Guardian*, April 24, 2019, sec. Global development. https://www.theguardian.com/global-development/2019/apr/24/rotten- chicken-eggs-e-waste-from-europe-poisons-ghana-food-chain-agbogbloshie- accra.

Carruth, Allison. 2014. “The Digital Cloud and the Micropolitics of Energy.” *Public Culture* 26 (2 (73)): 339–64. https://doi.org/10.1215/08992363-2392093.

Chang, Alenda, and John Parham. 2017. “Green Computer and Video Games: An Introduction.” *Ecozon@: European Journal of Literature, Culture and Environment* 8 (November): 1–17.

Consalvo, Mia. 2009. “There Is No Magic Circle.” *Games and Culture* 4 (4): 408–17. https://doi.org/10.1177/1555412009343575.

Crawford, Kate, and Vladan Joler. 2018. “Anatomy of an AI System: The Amazon Echo as an Anatomical Map of Human Labor, Data and Planetary Resources.” AI Now Institute and Share Lab. http://www.anatomyof.ai.

Ensmenger, Nathan. 2013. “Computation, Materiality, and the Global Environment.” *IEEE Annals of the History of Computing* 35 (3): 80–80. https://doi.org/10.1109/MAHC.2013.33.

———. 2018. “The Environmental History of Computing.” *Technology and Culture* 59 (4): S7–33. https://doi.org/10.1353/tech.2018.0148.

Fenlon, Wes, and Andy Chalk. 2019. “Former Devs Speak out about ‘severe Crunch’ at Mortal Kombat Studio.” *PC Gamer* (blog). April 26, 2019. https://www.pcgamer.com/former-devs-speak-out-about-severe-crunch-at-mortal-kombat-studio/.

“Game Workers Unite!” n.d. Gameworkersunite. Accessed June 7, 2019. https://www.gameworkersunite.org.

Glasner, Eli. 2019. “‘I Just Broke down Crying’: Canadian Video Game Creators Face Gruelling ‘crunch’ Hours.” CBC. April 26, 2019. https://www.cbc.ca/news/entertainment/burnout-crunch-canada-1.5109599.

Hicks, Marie. 2013. “De-Brogramming the History of Computing.” *IEEE Annals of the History of Computing* 35 (1): 88–87.

Lécuyer, Christophe. 2017. “From Clean Rooms to Dirty Water: Labor, Semiconductor Firms, and the Struggle over Pollution and Workplace Hazards in Silicon Valley.” *Information & Culture: A Journal of History* 52 (3): 304–33. https://doi.org/10.1353/lac.2017.0012.