Higher Education for Good

Teaching and Learning Futures

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4. Imagining higher education as infrastructures of care

Leslie Chan, Mona Ghali, and Paul Prinsloo

Universities are rarely characterised as extractive, having largely evaded critiques levelled commonly against extractive industries like mining. The COVID-19 pandemic has amplified extractive processes due to the increased reliance on digital platforms and infrastructure controlled by corporate players known for extractive business models built on surveillance, technocratic control, and non-transparent governance. This essay is an exercise in reimagining the "good" university as an institution enabled by infrastructures of care in contradistinction to extractive infrastructures.

We begin by laying out why an infrastructural lens is essential for revealing extractive infrastructure's deep history and politics and how they became entangled with higher education institutions (HEIs). By taking an infrastructural approach, we suggest care is highly contingent upon infrastructures that predispose persons and groups within higher education institutions to embody and enact care. Then, we use a variety of historical and contemporary examples centred around three themes of land, bodies, and data, including land grant universities, slave economies, internationalisation strategies, labour precarity, and learning management systems (LMS) — to show how extractive logics operate, who benefits, and who suffers harm. We then reflect on educational infrastructures as complex socio-techno-political systems that are continually captured by iterations of colonial relations and racial capitalist logic. Finally, we discuss the principles integral to reimagining universities as infrastructures of care.

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We authors include an independent education researcher and two long-time educators and education researchers situated in prominent HEIs in the North and the South. We share a common concern for how higher education policies, procedures, and practices reinforce a technocratic infrastructure of extraction and exclusion; how they manifest in the prolific use of performance metrics, surveillance technologies, inequitable assessment practices, asymmetrical private-public partnerships, discourses of work readiness and employability as well as in the precarity in academic employment and beyond.

Why an infrastructural lens?

Infrastructures are fundamentally socio-techno-political in that technical components are embedded in social relationships, institutions, and practices that contribute to their persistence (Franklin, 1990). At the same time, infrastructures co-constitute social and political practices. In this way, infrastructures define the conditions for possible actions while at the same time precluding or foreclosing other possibilities of social practices and relations (Coutard & Shove, 2018). A crude example is a school building with no accessibility features that would likely preclude or impede the participation of students with disabilities.

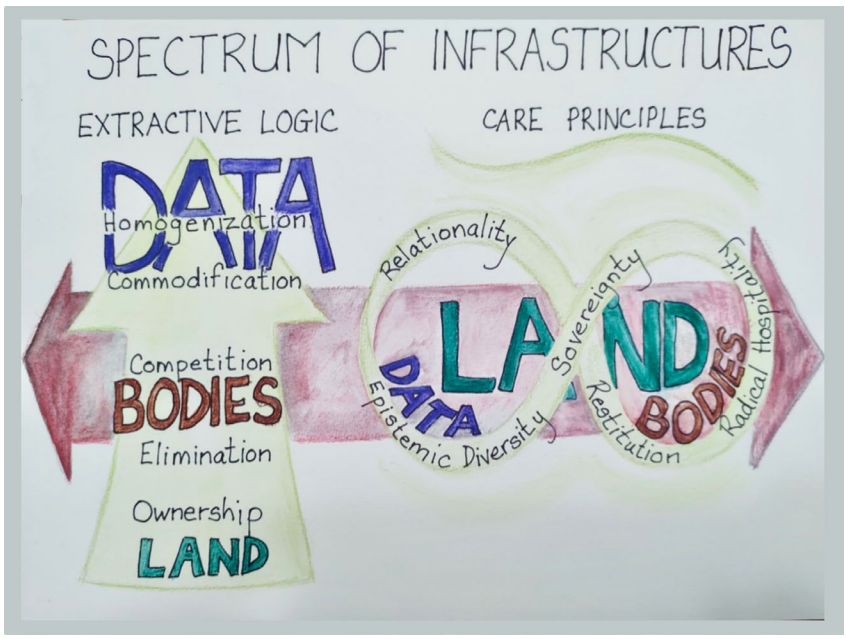
Infrastructures also assume multiple forms. As material infrastructures, universities facilitate the flow of persons and ideas across time and space (Larkin, 2013). As knowledge infrastructures (Bowker, 2018), HEIs are sites where knowledge is classified, disciplined, (re)created, (in)validated, and disseminated, and where epistemic and social relations of power are subtended and reproduced. Infrastructures are also affective and summon emotions tied with dualisms of self-other, human-nature, success-failure. Selfies of ebullient graduates against some iconic campus structures are not just Instagram-worthy posts, they are declarative statements of success that are linked to both their location and identity. Places have stories, though dominant stories by the powerful often erase the real and deep history of places and the original inhabitants.

These three infrastructural forms — material, knowledge, and affective — inform social relations that can be located along a spectrum spanning from purposefully extractive to generative and

caring practices. We focus on infrastructures that orient or predispose individual and organisational behaviours toward extractive or caring relations and actions, as shown in Figure 4.1, and we focus on three broad and intersecting themes of Land, Bodies and Data to illustrate how extraction logic operates in contradistinction to the infrastructure of care. While we understand that HEIs will never be free of extractive practices, our aspiration is to encourage practices and designs that increasingly centre the principles of care.

Figure 4.1

Spectrum of infrastructures



Infrastructures of care and extraction are governed by different logics. Extraction is characterised by colonial logics of elimination, ownership, commodification, and homogenisation that contribute to the erasure, dispossession, and marginalisation of certain groups based on hierarchical relations of power. In contrast, infrastructures of care are governed by logics of reciprocity, reparation, gifting, sovereignty, hospitality, and epistemic pluralism that support a deep relationality and respect for the land and non-human life forms (Simpson 2014;

Tallbear & Willey, 2019). Notions of "the good" grounded in different cosmologies/spiritualities are centred on human interconnection and our "radical interdependence" with the earth (Escobar 2018; Mignolo, 2014). By extension, the "good" university is entangled with the land (water and air) on which it exists, faculty members, administrators, and students, academic and non-academic partners, support workers, and surrounding communities.

In making this argument, we examine how infrastructures affect the capacity of individuals and groups to exercise autonomy in relation to land, bodies, and data. We focus on these material, corporal, and data fields because the evolution of higher education systems has been contingent on the allocation of lands, the expansion of higher education through cheap and unpaid labour, internationalisation, and assetisation of data for measuring productivity and institutional effectiveness (Dijck et. al. 2018; Komljenovic, 2021; Williamson, 2017; Williamson et al., 2020). At the same time, these three domains are interconnected since place shapes knowledge, knowledge is embodied, and bodies are sites for extraction. While data is the most recent frontier, the evolution of universities suggests that extractive infrastructures date to the origins of higher education institutions through land grants, the "gift" of land by settler colonial governments to incentivise the development of HEIs in newly acquired territories through "treaties" designed to dispossess Indigenous people from their land while deeply enriching the new landlords.

Land

It is now common across Canadian, US, New Zealand, and Australian universities to open public meetings, lectures, and ceremonies with a land acknowledgement, "a formal statement recognising the unique and enduring relationship that exists between Indigenous peoples and their traditional territories."[1] While such acknowledgements are meant to honour and express gratitude to past and present Indigenous peoples connected to the lands on which the university is built, they

1 For an example, see https://indigenous.utoronto.ca/about/land-acknowledgement/

rarely acknowledge the expulsion of peoples and the dispossession of Indigenous lands. This practice also leaves unproblematised the violent colonial histories, policies, and legal frameworks of settler colonial governments that "othered" Indigenous peoples and attempted to erase their culture and epistemologies.

Land-grant universities, in countries like Canada and the United States, wherein "public" lands were donated to establish higher education institutions, conformed to a "logic of elimination" (Wolfe, 2006). Apart from the use or threat of use of force to control land, settler colonial governments incentivised homesteading of European settlers and provided social infrastructure such as schools and universities for newcomers and growing communities. These policies resulted in the erasure of Indigenous peoples through forcible transfer and territorial displacement to reserves and attempted cultural assimilation through Indian residential and day schools (Truth and Reconciliation Commission, 2015).

Variations of the logic of elimination were enacted across settler colonial states. The University of Auckland (New Zealand) benefited directly from the oppression of the Ngati Awa people, whose land was confiscated in 1865 for the university (Kuokkanen, 2011). In the US, the Morrill Land-Grant Acts of 1862, involving almost 11 million acres, established land-grant colleges from proceeds of the sale of federally owned land, often obtained from tribal nations through treaty, cession, or expropriation (Busch & Lucy, 2019; Lee & Ahtone, 2020). Following the land transfer, these universities continued to profit from their land holding through leasing and other financialisation arrangements (Valverde et al., 2020). As historian Caitlan Harvey (2021) calculates, the territoriality of land grant universities covers three continents, over 15 million acres, and implicates settler universities in the process of Indigenous dispossession and the subversion of Indigenous sovereignty.

Beyond their material infrastructure, land grant institutions constitute centres of knowledge production and innovation. These universities established new disciplinary fields like agricultural sciences and engineering that altered human relations with the land. Commercial farmers and plantation owners supported agricultural research institutes and extension services to raise production and efficiency and were early adopters of new technologies (Busch & Lacy, 2019). The spread

of agricultural technologies transformed settler landscapes by replacing Indigenous knowledge systems that valorised human-nature relations with an extractive model of exploitation that now risks our planetary boundaries (Harvey, 2021).

The worldview of seeing the land as an infinite resource to be exploited and extracted has been at the core of Western expansionism and the ethos of modern science, positioning "man" above "nature", which is to be controlled and reconfigured to serve capitalism's insatiable need for raw materials and above all, cheap labour (an important topic, and the focus of the next section). Many higher education institutions are not only complicit in this form of racial capitalism but active in the ongoing extraction of land and bodies. As Mzileni and Mkhize (2019) noted, the "colonial nature of the university in South Africa is directly linked spatially to the historic land question of dispossession in South Africa" (p. 104). This preoccupation leaves little room for an ethics of care; and the respect, responsibility, and relationality with the land that are central to Indigenous ways of knowing and being have largely been dismissed by the institutions that continue to extract and benefit from the land, without any thought of giving back to what gives life and well-being in the first place. (Simpson 2014; Tuck and Yang 2012; Tynan 2021).

Sámi scholar, Kuokkanen (2007), detailed the limitations and harms caused by settler expectations and proposes in resonance with other Indigenous scholars and knowledge keepers, a different episteme, which she terms "the logic of the gift". This entails moving away from market-based exchanges that expect the transfer of value for value, or thing for other thing, which is founded on hegemonic standards of rationality, especially rational self-interest, and on the ideals of individual freedom. This market-based exchange economy model is so normalised within the academy that we seldom question its validity, "but it is this mentality of exchange, ownership, and competition, that has made it possible for the university and the 'value' it produces to be made to conform more and more to neo-liberal monetarist expectations" (Lange, 2010, p. 89).

The "gift logic" and its call for a communal-based exchange model resonates with the growing understanding of the importance of land-based pedagogy as practiced by many Indigenous communities around the world, while calling for the validation of Indigenous knowledge, epistemology, and ontology within the hegemonic structure of higher

education (Fraser, 2022; Simpson, 2014). Escobar (2022) reminds us that throughout history and across cultures, human experience has largely been place-based and communal, enacted at the local level, and with deep respect for the land, the source of all life's gifts:

> This condition of existence is an important dimension of relationality and responds to the symbiotic co-emergence of living beings and their worlds, resulting in "communitarian entanglements" that make us kin to everything that is alive. Oaxacan activists refer to this dynamic as the *condicion nosótrica de ser*, the we-condition of being. If we see ourselves *nosótricamente*, we cannot but adopt the principles of love, care and compassion as ethics of living, starting with home, place and community — this not in order to isolate ourselves but to prepare for greater sharing rooted in autonomy, for communication and *compartencia* ("sharingness"). (para. 2)

Along with other Afro-Indigenous communities in Latin America, Escobar and other activist scholars call for new design thinking to transition our world of brutal extraction to a pluriverse, where many other worlds coexist in harmony and peace with the earth. In the final section of this paper, we explore how some of these design principles can inform how we nurture infrastructures of care in higher education.

Bodies

Extractive infrastructures commodify human bodies based on social constructions of difference (Bowker & Star, 2000). Due to space considerations, we limit the conversation to "bodies" differentiated by race, class, and precarity, while acknowledging that bodies othered by abilities and other dimensions have also been subject to harm and invisibility in the academy. With respect to race, economic historians document the association of higher education institutions with slave economies and racial capitalism (Robinson, 1983). In tandem with Black and Indigenous protest movements for racial justice like Black Lives Matter, Rhodes Must Fall, and Curriculum So White, archival searches of university records have made visible institutional ties to slavery.

While not directly involved in British slavery (1600–1838), British universities benefited from the unpaid labour of enslaved peoples. Some university founders, benefactors, and faculty were slave owners and

traders, or trustees and family members of persons involved in the slave economies in the Caribbean (Draper 2018; Mullen, 2021). For example, Codrington Library at All Souls College Oxford was gifted books valued at £6,000 upon the death of Christopher Codrington in 1710, a sugar plantation owner and former governor of Barbados (Williams, 2021, p. 71).

In the United States, enslaved peoples who laboured on plantations contributed to the wealth of the white slaveholding class and, by extension, university endowments. In the case of Georgetown University, the Jesuits of Maryland sold 272 enslaved men, women, and children who worked on Jesuit plantations in 1838 for about $400 per person (Georgetown Slavery Archive, n.d.). Harvard University acknowledged its leadership, faculty, and staff enslaved at least 70 Black and Indigenous peoples. Its benefactors amassed their wealth through slave trading and the unpaid labour of slaves on plantations in the American South, northern textile industries, and the Caribbean. Their donations enabled the college to expand its faculty, buildings, student residences, and professorships (Harvard University, 2022). In other words, the commodification of black bodies enabled universities to amass endowments and fund research projects. At the same time, the social construction of racial hierarchies, endorsed by what Frederick Douglass called "scientific moonshine" legitimated slavery, segregation, the denial of Black people's access to formal education, and other racist practices (Harris et al., 2019).

Some social movements upset the status quo, disrupt self-other constructions, and dismantle extractive infrastructures with discourses of abolition, resurgence, or other expressions of resistance and solidarity. In the context of 21st century #IdleNoMore, #BlackLivesMatter and #RhodesMustFall protests, statues were felled or trucked away, building names were vetted, anti-racism policies were rolled out at higher education institutions, often framed as diversity, inclusion, and equity. The latter typically include actions to expand representation of underrepresented groups at all levels, including governance bodies, faculty, and student enrolment.

It remains unclear whether such reforms will make space for epistemic pluralism based on the lived experience and situated knowledge of groups historically subjected to systemic discrimination, or if inclusion will be

thin and measured with facile metrics (Stein, 2017). Thin inclusion like liberal multiculturalism emphasises tolerance and fails to problematise both meritocracy and selection criteria established by the dominant group that makes invisible alternative forms of knowledge. The concept of meritocracy emphasises individual responsibility and minimises historical, political, economic, and legal practices that privilege white faculty and students over others (Sandel, 2020). These include legacy admission practices, historical and ongoing systemic violence including land expropriation, institutional slavery, mass incarceration, and denial of property, civil, political, and social rights that disqualified e.g. non-European, non-Christians, and women from accessing education. Here again, we see evidence how infrastructures are not static; they morph in response to resistance and may be reinvented to reinforce underlying logics and unequal power relations.

Internationalisation and academic precarity

Since the 1990s, new forms of commodification have arisen with internationalisation policies in the context of demographic shifts in western states. This is accompanied by increasing domestic student debt levels commensurate with rising tuition fees. Since economic growth rates selectively enabled the expansion of a middle and upper middle class in China, India, and elsewhere capable of paying a premium for study abroad, universities compete for these elite populations. In some cases, Canada for example, inbound student mobility is conjoined with immigration policies that offer youthful, foreign graduates a pathway to citizenship to generate "work-ready" newcomer Canadians in the context of demographic transition. In Canada, international students contributed more to the country's economy than auto parts, lumber, and aircraft exports. They spent $CDN 21.6 billion on tuition, accommodation, and other educational expenditures in 2018, and international graduates filled 170,000 jobs in 2016 (Government of Canada, 2019).

Increased competition for international students links universities with other extractive infrastructures. These include student recruitment and immigration agencies, private tutoring services, SAT, IELTS, and TOEFL test preparation companies. Competition also reinforces the use of national, regional, and global university ranking systems as

universities seek positional advantage in league tables to signal higher education excellence (Hazelkorn, 2015). These rankings and their composite indicators inform institutional policies and resource allocation decisions, data sharing with private data analytics companies, actions that ensure better conformity to standards, and translate into improved results in league tables (Chen & Chan, 2021). Moreover, these standards elicit behaviour in ways that are not necessarily visible. Shahjahan et al. (2021) claim that rankers like Times Higher Education (THE) and Quacquarelli Symonds Ltd (QS) use their social media platforms as an affective infrastructure to evince certain emotions and desires among their audience including parents, students, and HEIs that help sustain, diffuse, and normalise global university rankings. Storytelling by tweets, hashtags, and reactions enables rankers to create feedback loops with HEIs through congratulatory remarks to top scorers and positive chart movers, and to convince students that it is a trusted and compassionate source for information to support decision-making.

While the use of contract staff predates internationalisation policies, universities have scaled up the recruitment of part-time teaching staff concurrent with expansion of international students and cuts in public spending. For example, sessional lecturers and part-time instructors hired to teach a specific course vary in motivation for academic contract work. Some may enjoy teaching and have full-time employment or alternative sources of income. In these cases, sessional teaching supplements income. Others, including recent graduates and post-doctoral researchers, use it as an interim phase while searching for a full-time teaching position to obtain teaching evaluations necessary for tenure-track positions or long-term contract academic work (Field & Jones, 2016).

Extraction largely affects the latter group, an unlikely segment of the "precariat", which is characterised by unstable labour and insecurity, undervalued or unpaid work, as well as the erosion of rights, including economic rights (Standing, 2011). With the expansion of enrolment at all levels, the surplus pool of applicants has outstripped the number of open full-time faculty positions, contributing to hardship and disaffection for some unsuccessful candidates. For university administrators, this surplus provides an opportunity to recruit overqualified persons for positions that do not require specialised knowledge, research, and

analytical skills, thereby intensifying competition for those roles with MA degree holders. Moreover, while precarity may be a condition of this class of instructors, the decision to exit academia cuts across early to late-stage academics. This is due to the increased demands for productivity that disproportionately affect females because of the feminisation of child and elder care, poor work-life balance, and implicit biases that sway promotions and tenure away from persons from ethnic and racialised groups (Gewin, 2022).

This discussion conveys the extraordinary reach of extractive infrastructures, their embeddedness in historical and contemporary forms of capitalism, and complicity in global inequality.

Data

A growing number of scholars (Benjamin, 2019; Browne, 2015; Dhaliwal, 2022; McIlwain, 2019; Noble, 2018) and research initiatives document how surveillance practices, datafication of bodies, and algorithmic governance are well rehearsed colonial practices now encoded into digital infrastructure, both computational hardware and software architectures. They are continually reshaping our cultural imaginaries, political-economic frameworks, and epistemic beliefs about education and its purpose in accordance with market and capitalist logic. Accordingly, it is important to explore digital platforms such as Learning Management Systems (LMS) that have become part of the standard operating procedures of HEIs in pandemic times. As universities adjusted to the COVID-19 lockdowns and governments increased spending on digital solutions, the pandemic presented an opportunity for enterprising, cloud-based, learning platform providers and digital education consultants to expand their market share in response to surging demand.

We focus here on LMSs because they constitute socio-political-technological infrastructures for organising the flow of student bodies by structuring courses, storing teaching and learning materials, managing communications, and monitoring academic performance. Providers like Canvas, Blackboard, D2L, and Moodle constitute more than technical solutions for translocating curricular materials from the physical to the virtual environment. Knowledge managed in learning management

platforms and stored in digitised and data-field forms on institutional servers or in "the cloud" is characterised by several features that differentiate today's storage systems from historical depositories like archives and libraries. Yet, like earlier knowledge depositories, it does not escape epistemic violence, the imposition of hegemonic epistemic frameworks that establish and entrench practices of domination while erasing other ways of seeing and making sense of the world (Fricker, 2009; Spivak, 1988).

First, it is crucial to understand and interrogate "the cloud" as much more than a convenient storage for data but as linked to the previous discussions of land, bodies, and (academic) precarity. Far from being placeless and ethereal, "the cloud" is deeply embedded in the imperial and colonial history of the West, as its transglobal infrastructure of server farms, cables, and routers largely depend on colonial occupation (Hu, 2015). We cannot talk about "the cloud" without considering how it acts as a superstructure disembodying land and bodies, and presents data-as-resource to be used, reused, cleaned, massaged, and cooked.

Second, learning management platforms make possible a myriad of ways of analysing and extracting knowledge not just with unprecedented speed, but also remoteness from the site of learning — thereby decontextualising the data and stripping it of its sovereignty. Third, data can be mobilised to generate "objective" representations of academic achievement (such as percentile ranking) and recommendations on pathways for completion based on past academic performance, effectively streaming students without regard for contributing factors not measured. Fourth, designing for interoperability allows platforms to use third-party apps and the extraction of data far beyond the LMS, thus expanding the highly profitable surveillance edtech economy (Marachi & Quill, 2020). The array of these vendors suggests that they not only provide a service or product, but they also define the rules of the game in terms of educational objectives (Williamson 2020, 2022).

These features of the new digitised containers are the product of the confluence of factors internal and external to the university. They include the failure of academic institutions to invest adequately in research and development of independent open-source learning platforms and cybersecurity systems (see also Amiel & do Rozário Diniz, Chapter 18, this volume). When combined with fiscal constraints due to downward

pressures on public investment in higher education, HEIs have tended to outsource infrastructure provision to save on capital investment.

We also see the rise of philanthropic foundations integrated in global educational governance systems promoting specific socio-technical imaginaries in a post-pandemic world (Tompkins-Strange, 2020). These imaginaries respond to concerns about student success, retention, and employability. Under these circumstances, it comes as no surprise that edtech companies offer data as "prosthetic vision" (Beer, 2019, p. 7), and a particular imaginary of the affordances of data. Student data is a "data frontier" where data can be extracted and the student experience colonised (Beer, 2019; Prinsloo, 2020). In exchange for extraction, they offer analytics as "*speedy, accessible, revealing, panoramic, prophetic* and *smart*" (Beer, 2019, p. 22). This imaginary is ultimately realised through algorithmic decision-making.

Recent contributions by Birch et al. (2021) and Komljenovic (2021) adopt the concept "data rentiership". They suggest that personal data, when aggregated, can be mined and sold to generate rents that share similarities with extractive industries producing commodities, like oil, minerals, and illicit goods. Data rentiership entails the generation of revenue from ownership and control of a data asset due to constructed value of the data (Birch et al., 2020). While it is important not to overstate the parallels between rentier states and data rentiership in HEIs, nonetheless the comparison is worth exploring. Commercial LMS providers negotiate agreements with a small cadre of managers typically not inclusive of student or faculty representatives. Like mining companies, they offer a reciprocal, if unequal exchange, providing technologies, maintenance, and upgrades for operating platforms in return for licensing fees and far more important, data assets. These assets are turned into analytics that are then sold back to the HEIs and a multiple of buyers at much higher costs. But these costs far exceed monetary terms.

Rentier state theory is instructive in highlighting the potential risks in the absence of social mobilisation that checks the power of private companies on the one hand (i.e. land grabs, environmental degradation, and labour exploitation), and incentivises conflict on the other hand. These risks in HEIs include the potential (mis)use of learning analytics like user engagement metrics to create new products that address

poor academic performance among "at-risk" students. They may use metrics to inform university policies and practices regarding admission criteria and program offerings to improve graduation and employability rates, hence gaming performance-based financing systems wherein government accountability mechanisms peg financing levels to results. Finally, they may exercise influence to lobby for loosening data privacy regulations to enable more intrusive data collection and mining systems.

While the full downstream impact of data extraction in HEIs may only become clear in the future, we can learn from other harmful surveillance technologies such as proctoring software using facial recognition technologies and plagiarism software based on text matching (Caines & Silverman, 2021; Gilliard & Selwyn, 2022). So far, learning management and financial systems operate on separate platforms. If these were merged, then data analytics would combine students' social-economic status with academic performance. With the concentration of platform providers, a relatively small number of companies would control a volume of global data and generate predictive analytics with machine learning that could conceivably influence decision making including admissions, thereby reducing students to economically productive individuals dislocated from place and history.

Resource-poor institutions might be forced to open their platforms to commercial advertisers and private companies, and buy pre-packaged course content to offset costs. If rentier state theory has predictive value, it suggests that institutional policies and practices might be driven by short-term decision making designed to improve enrolment, retention, graduation rates, and ranking positions within global ranking systems, and to curate disciplinary forms of knowledge that contribute to "work-ready" graduates. In other words, the private firms that own the LMS platforms might begin to guide decision-making on course provision based on selective judgements regarding valuable/superior versus worthless/inferior forms of knowledge in relation to the marketplace. Epistemic violence will no longer be enacted in spectacular bonfires, but in opaque algorithmic decision making. At its extreme, the rentier university is a dystopian imaginary of institutions with selective memory, coupled tightly to capitalist forms of production, and wayward from its missional purpose as a public good.

Critical explorations of data colonialism (Couldry & Mejias, 2019), surveillance capitalism (Zuboff, 2019), digital serfdom (Fairfield, 2017), and technoscientific capitalism (Birch et al., 2020) bespeak the risks of data collection, aggregator platforms and using data for profiteering. Like historical colonialism, data colonialism changes the evolution of economic and social relations, distributes benefits from resource appropriation unequally, and normalises datafication of all aspects of life to support capitalism (Couldry & Mejias, 2019). Data extraction is not only intensified, but also expanded to "data frontiers" — *terra nullius* spaces (geopolitical, personal, social, and private) — ripe for the picking (Prinsloo, 2020). The parallel between data colonialism and land-grab universities are becoming clear. Just like the universities benefit from land grants, while ignoring Indigenous land claims and epistemologies, the ownership, control, and use of personal student and faculty data erases the situated knowledges and claims to data sovereignty.

In the context of this chapter, we must consider how to move from data extraction and data colonialism to data as in service of care. It is, however, crucial that in the context of data-as-care, we distinguish between current practices where the extraction of data is portrayed as care, e.g. learning analytics to support students, data-as-care distanced from capitalist accumulation, and colonial and patriarchal relations (Ricaurte, 2022). Data sovereignty is a multidimensional concept encompassing much more than the right to know *why* individuals› data are collected, *by whom* and *combined* with other databases, and *reformatting* for other purposes, but rather to have full control about the scope and purpose of collection as well as ownership of data (Hummel et al 2021). Linked to the notion of data sovereignty is the notion of data-as-repair, emerging from commitments of restitution, reparation, and repair (e.g. Zolkos, 2020).

In moving towards data-as-care, we must acknowledge and account for how data emerges from and perpetuates structural inequalities, erasure, and intergenerational trauma. Data-as-care means data sovereignty and repairing its inequalities means acknowledging the situated knowledge(s) of women and girls, racialised groups, Indigenous communities, immigrants, refugees, persons with disabilities, non-binary people, and rural communities to understand algorithmic harms (D'Ignazio & Klein 2020; Costanza-Chock 2020; Ricaurte, 2022).

Glimpses of infrastructure as care: Data sovereignty and epistemic pluralism

Several projects offer insights into how infrastructures of care can be imagined and defined. The Papa Reo project (Papa Reo, n.d.), located in Māori, envisions the enabling of "smaller indigenous language communities to develop their own speech recognition and natural language processing capabilities, ensuring that the sovereignty of the data remains with them and the benefits derived from these technologies goes directly to their communities." The project arises from the reality that minority languages and the communities who speak these languages are "largely invisible and unheard in the digital world", and due to the absence of large data sets required for machine learning, peoples speaking minority languages cannot engage and participate fully in a digitally networked world. In this project, Indigenous land and culture intersect with language, making different bodies possible using a different digital infrastructure. Significant in the context of this article is the undertaking that the data used in the Papa Reo project will not be owned by the initiative but "cared for under the principle of *kaitiakitanga* [guardianship] and any benefit derived from data flows to the source of the data" (Papa Reo, n.d.). This implies guardianship instead of ownership of the data. Those undertaking the initiative are seen as "caretakers of the data and seek to ensure that all decisions made about the use of that data respect its mana and that of the people from whom it descends" (Papa Reo, n.d.).

Other examples of data-as-care include the *CARE Principles for Indigenous Data Governance* and the *Indigenous Protocol and Artificial Intelligence* (Carroll et al., 2020; Lewis, 2020). Both affirm the centrality of Indigenous knowledge and self-determination in the governance, design, and use of data systems. CARE principles of Collective benefit, Authority of control, Responsibility, and Ethics, affirm Indigenous control of data and mitigate harm from data appropriation and misuse (Lewis, 2020, p. 4). The Protocol provides guidelines for the ethical design, use, role, and rights of artificial intelligence (AI) entities, which include acknowledging locality (specific territories), relationality (to humans, non-human species, and the earth), responsibility, awareness of cultural and social systems, and data sovereignty. The guidelines indicate that AI should be co-designed with and responsive and

accountable to local communities and connect to global contexts. Rather than uniformity and standardisation, the protocol acknowledges variation between specific communities. These principles indicate that AI system designers need to be aware of their cultural biases and accommodate other cultural and social frameworks in decision-making. Every component of the AI system hardware and software stack should be considered in the ethical evaluation of the system given that their raw materials are extracted from the earth and may one day return there. Indigenous communities must control how their data is solicited, collected, analysed, and operationalised, and decide when to protect and share it, where the cultural and intellectual property rights reside and to whom those rights adhere, and how these rights are governed.

These projects conceived by Indigenous and Non-Indigenous peoples are instructive for the "good" university in both how they were developed through consultative processes, and their articulation as a set of principles grounded in Indigenous knowledge systems that value guardianship over ownership, and life rights over human rights (Mignolo, 2014). In much the same way, the "good" university cannot assume that data governance systems will protect the rights of students, staff, and faculty, communities, or the environment. Norms and rules regulating the reuse and dissemination of the knowledge produced, disseminated through learning management systems, and other data platforms must affirm the control and sovereignty of academic faculty, staff, and students. To this end, negotiations must be inclusive of representatives from these groups and transparent. Given the concentration of power among platform providers, universities might find common purposes and create codes of conduct to regulate contractors and establish principles that affirm data and epistemic sovereignty (see also Pechenkina, Chapter 9, this volume). These should be the minimum duty of care when negotiating with vendors on infrastructural provision.

Discussion

Thus far, we outlined how infrastructures of extraction have become the default at higher education institutions. Only with active resistance and its inversion (Bowker, 2018) do infrastructures of care emerge to expose shortcomings and contest inequities. At each reversible turn to care from

extraction, persons or groups once labelled as non-human beings or problems wilfully demand recognition, access, reparation, and justice. But even when more inclusive and just spaces are established, whether through selective recruitment of faculty, accommodative practices, affirmative action programs, protection of data privacy, pluriversal learning or other means, still, there may be efforts to subvert, diminish or otherwise steer reforms.

So, infrastructures of care can be differentiated into weak and strong forms spanning thin inclusion to decolonisation, from restorative to regenerative. They are always emergent, historically contingent, and subject to a clash of infrastructural mindsets, because there is no consensus around what constitutes "care" and a "good university". If framed mainly by efficiency and productivity, it produces extractive infrastructures that fetishise quantifiable and transactional relations. Care in this context simply means getting students to graduate on time and finding employment in their field.

Conversely, if the "good" university is framed by a relational ethic, then it leans toward material, epistemic, and affective infrastructures that are reparative insofar as they acknowledge complicity in historical and ongoing racial injustice, and act to atone with reforms in admission policies, scholarship programs and transitional pathways for racialised youth and adults, and provision of adequate academic support systems. Blanco (2021) writes on radical hospitality, which begins with exercising empathy. As applied here, care infrastructures that follow a logic of radical hospitality acknowledge a shared humanity, are redistributive, and affirm the public good. Hospitality is not solely governed by wealth; even resource poor institutions can practice hospitality. This can include decommodifying international students and making visible data on student drop out, suicide rates, and wellbeing that remains undocumented and anecdotal. Universities can extend the radical hospitality offered to Ukrainian refugee students following Russia's war in Ukraine in 2022 to other non-European refugee groups. But hospitality can be performative and patronising, just like thin inclusion. Guarding against thin hospitality demands attention to epistemic pluralism in design choices, including the design of holistic technologies, giving control and freedom to the users for flexible processes, not prescribed outcomes (Franklin, 1990). Such care infrastructures allow social actors

or learners to be in charge, to strive in a non-hierarchical environment that is free from patriarchy, racial biases, and toxic competitiveness.

In our journey of collaborating on this chapter, we grappled with how forms of extractive infrastructures are entangled with one another. This involved two steps. First, peeling them apart to better understand the logics that underlie their durability and their differentiated impact on land, bodies, and data. Then we reassembled them to see the whole but not to create a roadmap for transformation from A to B packaged in a series of discrete moves. This might disappoint some. As extractive infrastructures are not specific to universities but are co-constituted by relationships beyond the academy, infrastructures of care may seem like dreamscapes. But both extractive and care-full infrastructures described in this chapter coexist in tension. Universities are never fully extractive, nor can they become totally caring; this is an obvious statement. On balance, based on the limited examples provided here, universities tend to bend toward extraction and constitute "sites for social reproduction and conquest denial" (Moten & Harney, 2013). Our injunction to reimagine the good university is offered with the qualification that there are no ready-made solutions to the complex problems of care and its provision in our institutional infrastructure. We take solace in the words of Ursula Franklin: "For your own sanity, you have to remember that not all problems can be solved. Not all problems can be solved, but all problems can be illuminated."[2] Still, our chapter, alongside others in this collection, is an invitation to reflect on the infrastructures that govern higher education institutions, their underlying logics, and intergenerational consequences in terms of who is harmed and, conversely, who benefits. Reflection is necessary but not sufficient. The next phase is to (re)design infrastructures — material, epistemic, and affective — governed by care principles. Already, such work is evidenced in distributed, decentralised initiatives involving faculty, students, community groups, and bottom-up networks (see examples in Hall & Tandon, 2021). This may include local organisations proximate to campus, as well as distal, transnational, and diasporic communities that seek to collaborate, learn, and find common purpose with differentiated

2 Quoted by M. Meredith. *All problems can be illuminated; not all problems can be solved. BB9*. http://bb9.berlinbiennale.de/all-problems-can-be-illuminated-not-all-problems-can-be-solved/

pathways and rebuff efforts to scale and speed up. These are not the same as "maroon communities" in the sense that they do not seek refuge separate from the wider, extractive university infrastructures. On the contrary, they seek to subvert these infrastructures, as groups engage across disciplinary and national boundaries, ethno-cultural and racial identities and other forms of difference with care.

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