



When Silent Actors Talk: Bodies as Learning Infrastructure in the Post-Pandemic World

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Abstract

This paper is based on a qualitative research study that explored the lived experiences of 25 high school students when they first transitioned to online learning during the Covid-19 lockdown. The objectives of the study were to describe the lived experiences of high school students who transitioned to online learning during the lockdown in terms of their learning, and their mental and physical well-being; and to map the resources and strategies deployed by the students to navigate the difficult circumstances of studying during a global public health crisis. The study employs the actor-network theory in education, a sociomaterial approach, in identifying the silent, taken-for-granted human and non-human actors

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that constitute learning infrastructures whose presence and effects become visible only during infrastructural breakdowns such as the pandemic (Alirezabeigi et al., 2020; Facer & Buchczyk, 2019). The findings are organized into four themes and each of them identify different aspects of the resources, that is, the learning infrastructures needed for high school students to learn well. The first theme describes how learners are affected by the shift in responsibility of providing learning infrastructure from private schools to private homes. While the second theme focuses on how historically developed classroom surveillance mechanisms play out when the body is no longer visible, the third theme explores how bodies can be envisioned as technologies of engagement. The last theme explores how students as integral beings respond physically and emotionally to the learning process. The findings of the study have implications for policymakers, school leadership, and educators to expand their understanding of learning infrastructures needed for learning in the post-pandemic online and offline contexts.

Keywords: Actor-network theory, educational technology, Online learning, Pandemic, Student Well-being

1. Introduction

The pandemic prompted a major transition for schools and higher education institutions alike, from offline face-to-face settings to online settings. Much research has been done since the pandemic to document how schools, students, and teachers have adapted to this change (Mseleku, 2020), some identifying the best practices in online learning as a solution from technological and educational psychological perspectives (Dhawan, 2020; Morgan, 2020), and others deeming it to be reinforcing existing social inequalities from sociological and political-economic perspectives (Williamson, Eynon & Potter, 2020; Teräs, Teräs, & Curcher, 2020). This paper adopts the actor-network theory, a sociomaterial approach that analytically treats human and non-human actors equally, and brings together technological, psychological and sociological approaches to understand the issue of the transition from pre-

pandemic offline settings to post-pandemic online settings (Latour 2005 as cited in Alirezabeigi et al, 2020). Note that by post-pandemic, we do not suggest that the pandemic is over but that the pandemic has marked an irreversible change in sociospatial relations. In this study, we aim to describe these changes through the lived experiences of 25 high school students, 5 boys and 20 girls studying at private, English-speaking elite schools in India (n =14), Malaysia (n=2), Singapore (n=6), and the US (n= 1) as they transitioned from offline to online teaching-learning settings during the Covid 19 pandemic. These high school students from different countries were selected based on their common affiliation to their mentor, who was guiding them towards gaining research experience for applications to higher education in the U.S. and other western countries. The study was, therefore, designed to be participatory in nature, whereby they would gain research skills, and also be participants of the study. By focusing on their experiences, the study aimed to understand what counted as 'normal' in relation to the 'abnormal' that the pandemic constituted to this particular cohort.

The objectives of the study were to a) describe the lived experiences of these young students as they transitioned to studying online during the lockdown in terms of their learning, and their mental and physical well-being; b) map the resources and strategies these young students deployed to navigate difficult circumstances such as studying during a global public health crisis; c) understand the changes in sociospatial relations prompted by the pandemic in relation to particular taken-for-granted understandings of 'normal'.

We have used the concept of "infrastructure" to understand the taken-for-granted resources and relationships that make this "normal" possible (Alirezabeigi et al., 2020; Facer & Buchczyk, 2019). This hidden infrastructure is revealed only when "breakdowns" take place, and the pandemic constitutes a significant breakdown in the infrastructure that we depend upon in carrying out human activities (Alirezabeigi et al., 2020). While breakdowns in this infrastructure during the pandemic may have constituted "abnormal" conditions for these young girls from relatively privileged backgrounds, infrastructural breakdowns may have been the norm for many students who are from less

privileged backgrounds even before the pandemic. In this paper, the body is conceptualized as a sociomaterial infrastructure that we take for granted in the learning process, and how its 'absence' in online learning platforms reveals to us the role of the body in learning. While the role of the body has often been used in educational psychology from biological perspectives, our goal in conceptualizing the body as a sociomaterial infrastructure is in relocating learning abilities from the individual body and mind to complex networks of human and non-human actors (Facer & Buchczyk, 2019).

1.1 Learning Infrastructures and Infrastructural Breakdowns

A sociomaterial approach has been employed to frame this study, and in particular, two key concepts - infrastructure, and breakdowns in infrastructure (Alirezabeigi et al. 2020; Facer & Buchczyk, 2019). Drawing from geography and science and technology studies (STS), the concept of "learning infrastructure" draws our attention to "the material, discursive, social, and technological mechanisms" (Facer & Buchczyk, 2019, p. 171) that constitute an "architecture for circulation, literally providing the undergirdings of modern societies" (Larkin, 2013, p. 328 as cited in Facer & Buchczyk, 2019) of "flows of knowledge, information, and educational opportunities" in a particular place (Facer & Buchczyk, 2019, p. 171). Importantly, Facer & Buchczyk (2019) argue that learning infrastructures need to be understood as discursive, material, and affective, and as deeply interconnected with the place-based infrastructures such as childcare and transport. Learning infrastructures are discursive in that they are shaped by particular understandings of learning and appropriate student behaviour, material in that they are made up of various resources such as bodily, technological, economic, bureaucratic, and cognitive resources, and affective in that they are maintained, reproduced, and/or reconfigured through relationships of trust and care between various actors (Facer & Buchczyk, 2019).

The socio-material approach which focuses on the relationship between human and non-human actors entails "inventing specific tricks to make objects talk" (Alirezabeigi et al, 2020). Latour (2005 as cited in Alirezabeigi et al., 2020) suggests that moments of

accidents and breakdown are occasions when silent objects suddenly become loud. This approach of scrutinizing breakdowns has been used in studying digital practices in schools (Alirezabeigi et al., 2019). Importantly, this approach has been a crucial conceptual tool within ethnomethodological research, in particular, where disruptions in social order have been used to understand how social order is maintained (Alirezabeigi et al., 2020; Packer, 2017). Thus, the pandemic constitutes a disruption and a breakdown in the relationships that constitute learning infrastructures and reveal the silent doings of various actors within them. These breakdowns, thus reveal that notions of “normal” as socially constituted through political and affective investments into particular resources and relationships. Infrastructural breakdowns are also anarchic moments in which existing power relationships can be reconfigured.

Mapping learning infrastructures helps us to identify the silent doings of actors that make “normal” possible, particularly for the privileged students. Hence, the abnormality is not attributable to particular individuals or cultures but shaped by unequal power relationships with learning infrastructures. We explored how our participants mobilized human and non-human actors to reconfigure their networks in navigating breakdowns in infrastructures. Thus, we re-conceptualize learner capacities in terms of the effects produced through their social interactions with learning infrastructures. In the next section, we briefly outline the various discourses of the body as encountered in theories of learning.

1.2 Discourses of the Body in Education

The body, historically, has been studied in abstract, universalistic, and functionalist ways through subjects such as biology, physiology, and kinesiology (Shapiro, 1999). Within psychology, the body has been perceived as a sensor that sends signals to the mind which controls and processes perception and/or as a container for the mind, again in universalistic ways (Shapiro, 1999). The body is often abstracted out of specific social contexts, thus disallowing an exploration of how bodies are socially marked and positioned in social worlds, and shape particular kinds of

experiences and ways of being. Such a disembodied approach has emerged from a Cartesian mind/body dualism, the foundation of positivist epistemology, which presumes that the rational mind is the source of knowledge in ways that transcend the body, emotions, time, and space. (Bordo, 1993, Shapiro, 1999). Furthermore, the rational mind has been historically coded as masculine in relation to material nature, the body, and emotions, which have been coded as feminine, and are often seen as barriers, uncertain, unruly, and that which needs to be controlled (Haraway, 1989; Soper, 2000). This plays out in the classroom as well in that the bodies are sought to be regulated for several hours in a day. The needs of the body such as hunger, thirst, and going to the toilet have to be regulated according to the rhythms of the school, which in turn, are framed in accordance to the rhythms of the industry so that children are corporeally regulated to participate in a capitalist system that privileges the mind. The lack of bodily and emotional regulation is also seen as immature and/or underdeveloped. Thus, children, people with disabilities, women and queer folks who are perceived to be less in control of their bodies, desires, and emotions are often interpreted as immature, inferior and/or underdeveloped. The caste system in South Asia also, similarly, creates hierarchies of work with physical labour deemed as less worthy than mental labour, the domain of the so-called upper caste Brahmins (Sunandan, 2016).

Darder (2016, p. 3) has drawn attention to Freire's critique of how banking education through the privileging of cognition 'domesticates' students and teachers, estranges them from their own bodies and their social worlds through the transmission of abstract 'decontextualized, disembodied, and objectified' knowledge in emotionally distant ways. She reminds us, through Freire's work, that students are integral beings and that learning through the body and mind involve cognitive, physical and affective responses, and is situated within social relationships. Although institutional practices strive to control the bodies of both students and teachers, students (and teachers) often resist such institutional practices, often through their body. For instance, through wearing items of clothing that may be counter-cultural (Darder, 2016). She suggests, therefore, that teachers need to

acknowledge and engage with students as integral beings, including their cognitive, physical, affective, and relational responses to the learning process. Such an approach would mean that teachers can no longer be dispassionate and detached but have to be aware of their own selves as integral beings. To cultivate such “human connection, intimacy, trust, and honesty”, love serves as an “emancipatory and revolutionary principle” of a critical embodied pedagogy (Darder, 2011, p. 356-357). To summarize, discourses of banking education and of critical pedagogy differ significantly in the ways that they conceptualize the role of the body, and in turn, of affect in the learning infrastructure.

2. Methodology

This study was initiated by a group of 5 high school girls from India, Malaysia, and Singapore who, led by their mentor, wanted to process their own experiences of studying online during the lockdown, and also wanted to develop their research skills as part of their applications for university education. Hence, the research team, which included six graduate students pursuing Masters’ programs at Christ (Deemed to Be University) led by two faculty members from the Department of Psychology, under the aegis of Christ Consulting, decided to design a participatory research study that allowed the girls to speak up about their own experiences openly, and to also be involved in the research design including data collection, data analysis, and writing processes. The study design included the following procedures:

1. Semi-structured interview protocols and structured memos were designed by the first author, and validated by the second author. Graduate students were trained to interview high school girls and to note down interpretations in the memo. Consent forms were designed and students were trained to acquire informed consent before conducting interviews with school students. Since the girls were all minors, the team approached their parents to get written informed consent as well. The research proposal was submitted to the Institutional Ethical Review Board and was deemed exempt from a full review.

2. Pilot phase was conducted where each graduate student interviewed one of the five high school girls and documented the interpretations in memos. Following this, the high school girls were trained in qualitative interviewing. They, in turn, interviewed one of the five graduate students in order to get an experience of interviewing and documented interpretations in memos. All interviews were conducted online, the audio recorded and transcribed using a software called Otter.ai and they were checked for accuracy.
3. The inputs were taken from all students to revise the interview protocol. Each high school girl then identified four school students from within their networks who were willing to participate in this study and whose parents consented to their participation in the study. In order to maintain the confidentiality and privacy of participants, the team ensured that each of the five high school girls would interview four participants who were not from their network. Further, we believed that such a process would allow for participants to be more open about their specific contexts with an interviewer who did not know them, and yet who shared a similar experience. We also hoped that this dialogue would allow for the interviewers, the primary participants of this study, to engage with contexts different from their own, and therefore share insights on how their contexts were both similar and different from their participants. Each school student, thus, interviewed four other school students online, transcribed the audio recordings, and did a member-check with the participants around the accuracy of the transcripts. They also wrote down their impressions of the interviews in memos.
4. Data analysis was done in two stages. Memos can be considered an early stage of data analysis where early impressions were noted for specific broad themes such as teaching/learning, physical well-being, and mental well-being. Three teams constituted by one or two high school students and college students analysed all 25 memos to explore similarities and differences for one of the themes named above. The second stage involved the identification of nine transcripts which demonstrated extreme variations in

responses within each theme. These were then coded using open coding by college students to gain deeper contextual understandings of their responses. Discussions were held by the team on coding procedures to ensure inter-coder reliability, and differences in interpretations were negotiated. Themes were then generated, compared with findings generated from the memo analyses and between each sub-team working on different transcripts, written and rewritten through frequent discussions.

5. Below, we discuss the findings from this study, exploring how the pandemic has reconfigured relationships of the body with space and time, and what it means for learning.

3. Results

The findings are organized into four themes each of which highlight how the pandemic has reconfigured relationships of the body with space and time. Figure 1 illustrates how the body is a component of the learning infrastructure, while being material is central to the way in which social, affective, and discursive relations are organized in different spaces. The first theme describes the changing face of privatization, as the responsibility of providing learning infrastructure has increasingly shifted from the state to private schools, and, in the context of this study, from private schools to private homes. The second theme focuses on how bodies have historically functioned as technologies of surveillance in learning spaces, and how such surveillance mechanisms play out when the body is no longer visible. The third theme explores what it might mean for bodies to be envisioned as technologies of engagement. The last theme explores how students as integral beings respond physically and emotionally to the learning process, and how taken-for-granted bodies talk when they are strained.

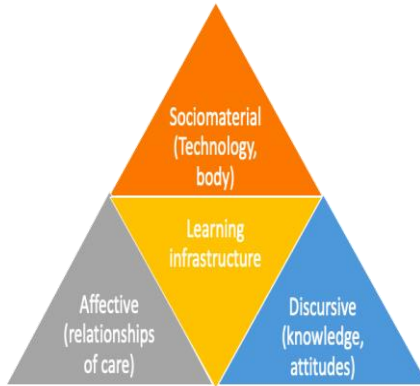


Figure 1: Actors Constituting a Learning Infrastructure (Facer & Buchczyk, 2019)

3.1 Private Spaces, Privatized Learning

As learning has shifted from schools to private spaces, learning infrastructures have become increasingly privatized, and have revealed the dependence of private learning infrastructures on city infrastructures. City infrastructures include public transport, electricity, and internet connectivity. While the dependence on public transport was low during the pandemic, the necessity of homes to be equipped with continuous and stable electricity and internet connections has become very significant. This issue predates the pandemic with considerable research work mapping unequal urban geographies in terms of their differential access to such material resources based on their socioeconomic status (Nambissan, 2017). In neoliberal times, the state has privatized the provision of electricity and the internet that has further accentuated the gap between haves and have-nots with respect to access to these basic material infrastructures that in turn enable the acquisition of valued symbolic and cultural forms of capital. The quote below from a student illustrates that despite being from a relatively higher socioeconomic-status background, she faced challenges in accessing the internet.

....Sometimes when Wi-Fi connection was really bad, some students, like they couldn't make it into class then they would have to explain it to their teachers, because Wi-Fi

issues happen a lot, but you can't really do anything about it.

It is insightful also to note that this student had to negotiate with non-human actors that mediate learning such as the Wi-Fi connection but also with her teacher in order to explain her delayed and/or patchy participation in online classes.

We also want to highlight housing as an important component of the learning infrastructure. While it is known that home contexts influence academic outcomes culturally (Mansour et al., 2016; Gonzalez et al., 2006), comparatively less importance has been given to the built environment of homes. Certainly, there is much evidence around the importance of physical infrastructure including the built environment contributing to student performance (Barrett et al. 2019). In the context of online learning, schools may vary with respect to their investments in learning infrastructures (e.g. digital platforms for hosting classes and assessments, training of staff and students), with private schools having greater capacities to do so by generating capital from their students (Lynch, 2020). While access to private schooling and the learning infrastructures they provide are paid by the students, privatization of schooling during the pandemic has taken on a different meaning with students having to pay for not only the learning infrastructure such as laptops and internet connections but also to have a private learning space within their own homes. Even though homework has been a part of schooling, requiring students to have quiet and private spaces to facilitate learning even before the pandemic, the relevance of housing infrastructure for learning has become even more pronounced during the pandemic. A few illustrative quotes from students highlight the importance of housing infrastructure below:

I feel like some kids with multiple siblings, they had a hard time because all their siblings would have to join their classes at the same time and there would be so much noise going on here and there because all the classes will be going on at the same time.

In the above quote, the participant highlighted how online learning put a strain on the housing infrastructure in terms of its built

environment to facilitate learning for students, particularly if they had siblings who were also in school. The quote below suggested that the participant had to negotiate with other family members to get quiet time, and she was not always comfortable or capable in doing so.

Because like I mentioned, like for me it's hard because I live in a house with like 11 other people and you know, I can't assure that they'll be quiet for like, you know, my sake and stuff like that.

The two quotes above illustrate that negotiating private space for learning within households was contested between siblings as well as between children and adult family members in the household. This points to a reconfiguration of the body in relation to learning spaces, and in turn, the learning process. While online learning platforms mute voices and shut off the videos that can interrupt the teaching/learning process, what teachers are often unable to see is the struggle between multiple bodies negotiating shared material resources in order to participate in the learning process. Indeed, students' relationships with time too have changed significantly, as a student expressed that she feels "like because we're stuck at home, the weekends and the weekdays have kind of merged". Thus, neoliberal forces during the pandemic have pushed for the privatization of learning by colonizing private spaces and private time further circumscribing the role of public investment in education.

3.2 Bodies as Technologies of Surveillance

Classroom management strategies informed by technologies of surveillance have often focused on monitoring students' bodies and keeping them under control. Students' motivations to stay attentive in class have also been facilitated by such technologies of surveillance. Online learning during the pandemic turn technologies of surveillance on their head with bodies no longer being part of the classroom. A student shares how she wasn't able to pay attention in class in part due to her dependence on technologies of surveillance to facilitate learning:

What I found was challenging when studying at home was

that since there is no one to like, monitor you like you don't have your teacher in front of you. So it's really easy to become distracted. And because you're constantly in your room where you have, like your bed and everything, it's really hard to be focused.

Yet, while the above student's attention structures for learning were mediated by body surveillance, for another student the invisibility of her body in the online setting, and the surveillance that it entails, particularly from peers, represented an opportunity to approach the teacher for help regarding studies.

...I honestly think it's gotten better for many of my classes as being online, you can be more discreet about whatever teachers you need to see for extra help. Whereas at school, you may feel pressure not to see the teachers because let's say you're struggling at a subject but your friends aren't really struggling with that subject, you wouldn't be as motivated to walk all the way up those stairs and go see that teacher, but online, it's more convenient. So you can just drop them a quick email and ask for some help.

Together, the above quotes illustrate how bodies acted as technologies of surveillance enacted by teachers and peers in ways that both enable and constrain learning. They also raise a question around what it means to engage students who are dependent on body surveillance for learning. In the next subsection, we hope to explore this question further.

3.3 Bodies as Technologies of Engagement

The role of social interaction in learning has been a cornerstone of Vygotskian educational psychology with peer learning becoming a mainstay of teaching/learning processes for many teachers. The apparent removal of bodies from the online learning space, however, has revealed the importance of the body in facilitating such social interaction in ways that go beyond peer learning. For instance, one student describes how peer learning did not work very well in the online setting:

In like, normal school, there's a lot more face to face

interaction whereas in e-learning we zoom but a lot of times people don't turn on their cameras and class discussions, like discussions in groups when they move you to meeting rooms, they're like super stagnant. And it's much harder to communicate in my opinion. But in physical school, we have a lot more like social interaction.

The above student's experience suggests that bodies mediated social interaction in significant ways. Hence, even though technologies such as 'zoom' offered opportunities for social interaction, the absence of bodies made social interactions harder, which, in turn, affected the learning process. Furthermore, online learning during the pandemic appeared to have not only privatized learning but also individualized learning through the separation of bodies. The student below notes the importance of bodies in creating communities of practice.

Sometimes your classmates are the ones who motivate you to keep studying even when you don't feel like it, especially if it's a class that you find quite tedious. If you're in a class with some of your good friends, then obviously, you're going to be motivated to study along with them. But because you don't have that anymore, and because you're at home, in an environment where you can easily get distracted, then it's a different issue.

While peer-learning is often designed to be task-oriented, bodies play a role in social interactions that go beyond learning tasks, and enable the creation of social communities within which learning tasks are embedded. Hence, technologies of engagement need to engage bodies in ways that enable the creation of such communities of practice (Lave & Wenger, 1991) which may happen informally in-between scheduled times or even during scheduled hours. Indeed, keeping bodies disengaged has effects on physical and mental health that affect learning too, emphasizing that students are integral beings. We will explore this aspect in the next section below.

3.4 Healthy Bodies are Effects of Care Networks

Numerous students pointed out to us the high amounts of screen time they spent on studies as well as for leisure, and the effects this had on their bodies, in turn, affecting their sleep, eating habits, and learning processes. Notably, participants also shared their emotions. For instance, one student said, “This is really embarrassing, but I'd say a solid 10 to 11 hours [of screen time]”, while another said, “I really hate the amount of time I've been spending on screen because spending this much time is making me nauseous.” Thus, students’ physical and emotional responses to online learning were quite significant. Another student expressed her embarrassment: “I’ve kind of fallen asleep quite a few times more than I'd like to admit”, suggesting that they were not happy emotionally or physically with the ways their bodies were experiencing alienation in the learning process. Indeed, quite a few students said they had been getting headaches because of the high screen times. A student expressed that, “it takes a massive mental toll to stare at the screen for 15 hours a day”. A few students mentioned that they spoke to their teachers about the repercussions of the learning process on their bodies. For instance, one student said that she spoke to teachers about her “messed up sleep schedule”. Several students reported poor sleep with one saying that she was “functioning on 2 hours of sleep”. A few students also spoke about having developed unhealthy food habits because “you stay at home a lot and you have to like to order delivery food a lot of the time”. All of these instances show that students are integral beings, and that learning engages the whole body, although organizers of teaching/learning activities do not always acknowledge the role of bodies in learning.

What might it mean to engage with bodies and hearts, and not only minds? A few students shared how they were coping with the pandemic and in particular online learning during the pandemic. One student shared,

I used to have unhealthy coping mechanisms, but now it's mainly like, you know, music and journaling down like my thoughts because I'm supposed to do that in therapy too. So, you know, whatever my therapist tells me like the homework I'm supposed to do, I make sure I get it done.

Not like last year that I just like, it was like this entire hopeless situation where like, nothing's going to change, it's not going to get better. So I'm working towards it.”

Thus, this particular student who was already going to a therapist employed music and journaling to engage her heart and her body that she was being alienated from during online learning. Another student shared a physical activity that she engaged in,

Our physical education department is rather concerned about keeping us healthy and fit so they'll have these challenges for us to go outside and run for a certain amount of time and send in a picture.

The above activity helped this particular student to engage her body and interact with her own space and environment while sending ‘evidence’ of having done the activity online.

This particular section reveals to us that students are integral beings in that they engage with learning using their bodies, minds, and emotions as a whole rather than in separate ways. They constitute the learning infrastructure in that they are often taken for granted. When bodies speak through nausea and headaches, they make their presence felt. Further, healthy bodies do not exist in vacuums, and are produced by the care networks that they are a part of. For instance, care workers such as cooks who provide healthy food, therapists who create opportunities for engaging with students’ emotions through music, and physical educators who create opportunities for engaging with their bodies and environments help produce healthy bodies. Bodies carry the marks of the lives they live in particular sociocultural contexts (Darder, 2016), and are effects of the care networks that they are a part of that different bodies may have differential relationships with.

4. Discussion

In this study, we sought to unpack the pandemic as an infrastructural breakdown, and identify the human and non-human actors that we take for granted in constituting our understandings of ‘normal’. In particular, we were interested in exploring the body as a taken-for-granted actor in mediating the learning process. As learning spaces shifted from physical spaces to

online spaces, bodies have become increasingly invisible. Moreover, the role of the state in providing learning infrastructure has also diminished as private households have taken on greater responsibility in providing learning infrastructures such as the internet and laptops, even as they remain dependent on the state for such basic needs as electricity and internet connectivity.

Although the body has become invisible for teachers and students alike in online classrooms, students remembered the surveillance of their bodies in different ways. Whereas for some, online learning spaces meant an escape from the surveillance of their bodies by their peers, and hence, greater ownership in the learning process, other students' cognitive capacities for paying attention were dependent on surveillance technologies. The latter tendency highlights the productive and disciplinary power of body surveillance technologies employed in the classroom in shaping particular subjects with particular cognitions (Kitto, 2003).

If physical classrooms have fostered technologies of surveillance through the body, the body has been central in the creation of communities of practice as well that facilitate learning (Lave & Wenger, 1991). The transfer of peer learning from physical classrooms to online classrooms has not been easy as it has been technologized into a teaching strategy that is task-oriented and transactional. The body is an integral part of the actor-network that shapes peer learning which is not necessarily transactional and task-oriented but embedded in social practices where cognitive tasks constitute one kind of activity.

In short, bodies are social and social bodies both facilitate and constrain learning through surveillance and engagement. Online learning practices would need to consider how to engage students' not only as cognitive beings but as integral beings whose bodies respond socially, physically, and emotionally. Even though students' bodies were invisible in the classroom, students felt their bodies through nausea, eye strain, sleep deprivation, and headaches. They experienced emotions of embarrassment as their bodies refused to cooperate with the online learning process. Even as bodily fears in public spaces have shifted learning into private spaces, bodies nevertheless were strained, taken for granted, and abused, in online learning spaces. Students possibly felt

embarrassed because they may have felt that their bodies were letting them down. Yet, it would be important to remember that while healthy bodies constitute an integral component of the learning infrastructure, they too, are effects of care networks rather than individual capabilities. When bodies get strained, they reveal our dependencies on care networks (e.g. domestic workers, therapists, physical educators) that help keep the bodies healthy. Although this study focused on the experiences of privileged high school students, the infrastructural breakdowns of the pandemic helped unpack what constituted 'normal' for such students, and therefore, highlighted the learning infrastructure that needs to be in place for creating the optimal conditions for learning for all students. Even though pre-pandemic learning conditions have been characterized as 'normal' for some students, we wonder if this characterization is due to a normalization of disabling learning environments as bodies themselves are effects of care networks.

5. Conclusion

This study has several implications for policy and practice. Firstly, the study illustrates that learning infrastructures are dependent on city infrastructures such as care work, electricity, and the internet. With increasing privatization of investments for online learning, and the diversity of resources that different families have with respect to both socio-material and affective infrastructure, we argue that educational policy needs to broaden their understanding of "learning infrastructure", and pay attention to strengthening these infrastructures through public investments in socio-material, discursive, and affective infrastructures (Hargreaves, 2020).

Public investment in socio-material infrastructures would entail strengthening place-based infrastructures such as access to stable electricity and internet connectivity, affordable digital devices, and improvement of housing infrastructures so that students from varied backgrounds have the necessary personal space to engage in learning. This suggests that educators need to play a stronger advocacy role in negotiating with the state to provide better place-based infrastructures as crucial actors in facilitating learning. Although connectivity issues were faced across the different places

in which our participants were located, the privatization of investments in such infrastructures suggests that those from lower socioeconomic backgrounds may face the brunt of it no matter the place.

Secondly, schools need to be supported not only financially but also in terms of capacity-building to invest in technologies of learning that are interactive and facilitate learning through communication, with a relatively lesser emphasis on investing in surveillance-based technologies. This also means a concomitant shift in affective and discursive infrastructures around learning that has to be based on trust and care rather than on monitoring and surveillance. Additionally, care workers who constitute the underlying affective infrastructure on which learning is possible whose absence was felt strongly during the pandemic, also need to be supported (Gary & Berlinger, 2020). Currently, care work is highly privatized and teachers in physical schools often take on the role of care work in addition to facilitating learning tasks. Hence, we suggest that the affective infrastructure be strengthened by carving more definitive roles for school psychologists in schools to support the emotional well-being of learners. Supporting care workers and mental health workers entail a strong discursive shift. For instance, early childhood educators are often perceived as lower in skills and status when compared to higher grade teachers and university professors because of the tendency to associate the work of early childhood educators as primarily care work. This discursive shift needs to occur to recognize that care work, regardless of age, has to be valued for the kind of infrastructural support they provide for productivity in any domain. Other ways in which care work can be supported is by ensuring that there are restrictions on the exploitation of the emotional and physical labour of care workers whether these are domestic workers, overworked mothers and/or teachers. Similarly, there is much stigma related to accessing mental health, and a discursive shift is needed among teachers, students, and parents regarding the role of school psychologists in supporting student learning.

Another discursive shift that we argue for is that, the bodies are often perceived to be ancillary to the learning process which is perceived as largely, a mental process. Physical education is

accorded a lower status in the hierarchy of subjects. While we suggest that physical education be given importance for its own sake, we also suggest that pedagogies need to engage with bodies not only in a kinaesthetic sense but as beings-in-the-world in a Heideggerian sense (Shapiro, 1999). Further, the ableist assumptions embedded within educational systems globally encourage the abuse of bodies in the service of cognitive development despite the crucial roles that all bodies play in enabling social interaction and the creation of learning communities. In order for these communities to be inclusive, it is important that students are able to speak about how their bodies are being stretched and/or constrained, and to ask for time for self-care and for recovery. School leaders have had to recalibrate school policies towards more empathy and kindness during the pandemic (Harris, 2020). From a disability perspective, there is much shame in acknowledging the limits of one's bodily and mental capacities and temporarily able-bodied persons need to be able to talk about these limits and ask for help in order to create an inclusive culture for all bodies (Kamperman, 2020). Psychosocial education therefore needs to enable the students to ask teachers for time which is a very precious commodity in schools where the time-tables allow little space for leisure, self-care and healing.

To sum up, we propose strategic interventions in strengthening socio-material, affective, and discursive infrastructures through advocacy and capacity-building, interactive technologies over surveillance-based technologies, pedagogies based in trust and care over those based on surveillance, increasing role and support for care workers and school psychologists to support learning, and an emphasis on a critical praxis of the body within schools in order to change ableist cultures in mainstream schools.

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