A Sociomaterial Investigation into Chinese International Students’ Navigation of a Doctoral Trajectory During COVID-19

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Abstract
Despite a vast body of scholarship delving into international students’ educational experience during the COVID-19 pandemic, little is known about the doctoral group’s perception from a sociomaterial perspective. Utilizing a group of Chinese international doctoral students while drawing on semi-structured interviews, the article unpacks what and how matter and human forces are entangled with one another as bricolages to shape a disrupted doctoral trajectory. It reveals that, within working and social spaces, human agency and non-human matter mediate, forge and produce a doctoral trajectory embedded within a complex lived experience of responding to shifting dynamics during the pandemic. It also shows how doctoral students aligned material and social assemblages to construct sociomaterial bricolages that facilitate a restoration of relative stability. The study contributes to the literature of international doctoral education with a nuanced disclosure of its navigation as a continual process of mobilization, negotiation and construction emerging from the performative flow of sociomaterial practices. It concludes that a doctoral trajectory represents network operations of experiencing and accounting for, not just what humans do with matter, but what matter does to human thinking and action.

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Overview: Research on Chinese International Doctoral Students and International Students During COVID-19

Internationalization has been a key feature of modern doctoral education. This is even more so in the world today when internationalization of doctoral education is widely implemented as an important tool of boosting a country’s technical innovation and international competitiveness. With a history of development spanning across four decades, China is, comparatively speaking, a late starter in doctoral education. To bridge the gap and prosper the country through educational advances, it has been strengthening its efforts in prioritizing the internationalization of doctoral education as a national strategy over the past decades. Despite China experiencing an internationalization shift to a more balanced approach in recent years (Wu, 2018), the strategy of introducing foreign knowledge, culture and technology via dispatching Chinese students abroad for advanced studies and research remains salient (Yang, 2019). Since the 1990s, China has been the biggest source country of international PhD students (Shen et al., 2016). According to a recent report issued by EIC Education (2022), one of the biggest service agencies on studying abroad in China, the U.S., Australia, the U.K. and Canada remain the top four destinations for Chinese students pursuing a post-secondary education level, and the PhD cohort is primarily clustered in STEM subjects. Emerging studies have shed light on this cohort studying in different education systems, with a focus on their supervisory experience (Shen, 2018), career decisions (Lee et al., 2018), academic socialization (Weng, 2020), cross-cultural adaptation (Xu et al., 2020), etc. Albeit these scholarly insights, more efforts are needed to delve into other facets of this body of students, given its salient status and a new context encountered during the COVID-19 pandemic whose knock-on effects are still being felt.

Since early 2020, the outbreak of the pernicious COVID-19 pandemic has disrupted every facet of the world we live in. Its knock-on effects have also infiltrated higher education, creating a watershed that necessitates a radical reshaping of how universities operate and how staff and students manage their work and study (Green et al., 2020). A large volume of pertinent studies has emerged, attending to the status quo, ramifications and prospects for Higher Education (HE) in a new conceptual and operational context where old norms may not be applicable (Xu & Tran, 2021). Within this body of literature, the international student community, as a key stakeholder, has attracted much scholarly attention.

A hotly discussed topic is the struggles experienced by this cohort. Vulnerabilities related to racial discrimination, financial precarity, job losses, temporary migrant status and loss of mobility capital (Cairns et al., 2021; Farbenblum & Berg, 2021; Ma & Zhan, 2022) are well documented, resulting in intersecting marginalities that exacerbate...
inequalities that threaten international students’ physical safety and wellbeing (Coffey et al., 2021). Counteracting measures to address these struggles are also analyzed. For example, online ethnic communities were evinced to assume a social and communicative role, serving as a platform for information dissemination and emotional support (Jang & Choi, 2020). Moreover, for overseas students, staying within one’s innermost circle of ecological system, family-mediated migration infrastructure rendered visible the intimate fabrics that contribute to transnational (im)mobilities during the pandemic (Hu et al., 2022). In contrast with efforts at a personal level, scholars seemed less sanguine about institutional support. The Australian government was blamed due to inadequacies in welfare packages for international students during stressful times (Nguyen & Balakrishnan, 2020). Within the U.S. context, Veerasamy and Ammigan (2022) explored delivery of support services in an online environment, appealing to institutions to be strategic and deliberate in equipping their support offices with necessary tools and guidance to optimize this delivery. Finally, another noticeable branch of research delved into the under-explored area of recruitment, illuminating new geopolitics and diplomatic relationships in affecting students’ study choices and plans (Mok & Zhang, 2022), as well as suggesting measures to identify uncertainties that prospective international students experience to facilitate the application process during and beyond the pandemic (Kim & Spencer-Oatey, 2021).

As has been teased out above, the pertinent literature offers a perceptive analysis into issues at the interface between international students in HE institutions and the global health risk, drawing from different lenses such as psychology, sociology, cultural studies and education. Whereas this body of scholarship has enriched insights, vis-à-vis multifactorial shifts and adjustments experienced by international students, there is a dearth of specific focus on international doctoral students whose academic training differs from their coursework peers at undergraduate and postgraduate levels. In particular, to the best of our knowledge, there is no study yet that unpacks how international doctoral students perceive their navigation of a disrupted study journey from a sociomaterial perspective. It is not yet clear what and how the performative roles played by matter and human forces shape this process of navigation from their emic views. Despite some emerging studies, they mainly pertained to doctoral students’ emotional geographies (Phan, 2022) or untangled their lived experience from an ecological perspective (Wang & DeLaquil, 2020). Bearing these gaps in mind, this study recruited a group of Chinese international doctoral students (CIDS) to share their emic perceptions. Specifically, it employed a sociomaterial approach to enabling exploration, with the aim of tackling the relevant lacuna and being a timely contribution to international HE. The next sections delineate education within the sociomaterial framework, followed by a presentation of research questions, the methodology, findings and implications for international HE.

Theoretical Underpinning: a Sociomaterial Approach to Education

A theoretical perspective that highlights sociomateriality in social sciences has been widely argued since the past two decades or so. In the domain of educational research,
an increasing number of scholars corroborate a sociomaterial approach that challenges the subordination of materials to the human subject and foregrounds messy textures woven through hybrid assemblages of objects, discourses, bodies, technologies, etc. Abundant theoretical underpinnings prevail, examples being new materialism (Kim & Canagarajah, 2021) and post-humanism (Hultin, 2019), rendering sociomateriality more of a research orientation than a unified theory. Despite discrepancies and convergences, restoring a focus on the more-than-human dynamics, this approach generally challenges the separation logic but supports an interpenetrated entanglement between the human and non-human as a constitutive force of building everyday action and knowledge (Edwards & Fenwick, 2014). Albeit comparatively marginal in education (Fenwick & Landri, 2012), this conceptual lens however is gaining momentum in educational inquiries that center around diverse components of education as an entangled web in which they find themselves a role to play.

Firstly, given that technologies saturate contemporary learning practices, many studies explored sociomateriality of digital information technologies in education, arguing for overcoming a dualism between the social implications of technology use and the material aspects of technology design (Johri, 2017), contending that technologies are artefacts whose objectives are temporally and contextually emergent through human engagement (Gourlay & Oliver, 2013). Others attended to pedagogy. For example, a sociomaterial exploration of pedagogic practice in simulation foregrounds matter and bodies as co-constitutive dimensions of simulation learning out of fluid emergence and performance (Hopwood et al., 2014). Focusing on student agency, Kumpulainen and Kajamaa (2020) challenged agency as a property of individual human actors, but evinced that educational potential of students’ engagement in maker spaces depends on a sociomaterial movement through a range of elements within environmental assemblages. Recently, Guerrettaz and colleagues (2021) proposed a refined understanding of teaching and learning materials in use, encouraging teachers’ less control over what is predictable and planned out of these materials, but more responsiveness to what emerges via the entanglements of classrooms.

Teasing out pertinent literature showcases that a sociomaterial approach to education enriches our understanding of learning, vis-à-vis sociomaterial entanglements that are represented in one’s emerging attunement to fluctuations, surprises and interruptions in the larger sociomaterial collective that constitutes capillaries of human/non-human relationships (Fenwick, 2015). Moving away from a view of either downplaying materiality or separating it from the human, this approach adds new insights from a relational and performative perspective. Despite its insightfulness, there remains a scarcity of research on doctoral education adopting this lens. We contend that this lacuna should be addressed, not least amidst the pandemic that complicates these entanglements, which may empower and/or disempower international doctoral students. As disclosed above, most of the prevalent discourse on international doctoral education against the pandemic has not explicitly delved into a sociomaterial dimension, thus instigating questions for this study to unpack: 1) What matter and human forces shape a disrupted doctoral trajectory? 2) How are these forces entangled with
one another as bricolages to restore relative stability to the disruption? The following section situates exploration into these questions in a case study of a cohort of CIDS.

**Methodology**

The current study employed a qualitative methodology to facilitate a deep exploration of the students’ lived experience. As Creswell (2003) argued, it is imperative to seek written consent from participants before the commencement of conducting a research study. Accordingly, invitation letters and consent forms were distributed at a personal level. Circulated with a purposive snowballing strategy, the recruitment targeted CIDS who were either overseas or in China when an interview took place. The invitation also detailed research objectives and procedures. The recruitment lasted two months and the researchers stopped recruiting more participants when the recruitment secured 20 participants, reaching a point of qualitative saturation in relation to the key research questions (Hu et al., 2022). Despite this being a relatively small sample size that ensures neither a good representativeness nor generalizability of the CIDS cohort, it features diversity at several levels, somewhat mitigating limitations intrinsic to qualitative research. First, the sample constituted both onshore and temporarily offshore students, with 12 of them continuing study in respective host universities and eight either having been stranded in China due to the travel ban, or choosing to stay in China temporarily. Second, the sample was relatively rich in a geographical sense, sourced from major receiving countries of Chinese students such as the U.S., the U.K., Australia, Canada and other host countries in Europe (Germany, Belgium and the Netherlands) and in Asia (Japan, Singapore). Third, the sample came from a wide range of disciplines and were at different stages of doctoral candidatures. This multidimensional diversity facilitated researchers to delve into convergent and divergent perspectives exposed in the data set that saturates nuances and complexities, thus enabling a disclosure of a fuller picture. All participants were pseudonymized to protect privacy. Table 1 details their demographic information.

After participation was approved, interviews were conducted, lasting from late September 2020 until September 2021. To overcome physical constraints, online one-on-one semi-structured interview was conducted, each lasting approximately 30 to 60 min. During this time, they were encouraged to share their lived experiences of navigating a disrupted PhD trajectory since the outbreak of the pandemic. In order to elicit substantial empirical information about the theme of the study within a limited time, the interviews focused on questions around sociomaterial dimensions, such as, “What is your family’s role in your doctoral study during the pandemic?”; “How does your institution help to address the adverse impacts?”, “How do you adjust changes in relation to your study?”, etc. For the purpose of facilitating effective communication, Mandarin was chosen for the interviews as a mother tongue shared by a research assistant and the participants. The research assistant then transferred all transcripts into NVivo 12 for an inductive thematic analysis (Braun & Clarke, 2006) informed by the data. It is worth mentioning that during the analysis process, iterative
| Participant | Gender | Academic discipline                | Host Country | Years in PhD | Whereabouts at the time of interview |
|-------------|--------|-----------------------------------|--------------|--------------|-------------------------------------|
| Wendy       | female | biomedical sciences               | Australia    | 4            | China                               |
| Dan         | male   | business                          | Australia    | 4            | China                               |
| Sammi       | female | education                         | Australia    | 2            | China                               |
| Mia         | female | education                         | Australia    | 3            | China                               |
| Nancy       | female | education                         | Australia    | 3            | China                               |
| Joseph      | male   | communication studies             | Belgium      | 2            | Belgium                             |
| Matt        | male   | architectural engineering         | Germany      | 3            | Germany                             |
| Olivia      | female | architectural engineering         | the Netherlands | 4       | the Netherlands                      |
| Zoe         | female | linguistics                       | New Zealand  | 3            | New Zealand                         |
| Emma        | female | math                              | the U.S.     | 2            | the U.S.                            |
| Jessica     | female | comparative literature            | the U.S.     | 3            | the U.S.                            |
| Leo         | male   | chemistry                         | the U.S.     | 5            | China                               |
| Linda       | female | finance                           | the U.K.     | 2            | the U.K.                            |
| Amelia      | female | environmental engineering         | the U.K.     | 2            | the U.K.                            |
| Liam        | male   | civil engineering                 | the U.K.     | 5            | the U.K.                            |
| William     | male   | architectural engineering         | the U.K.     | 2            | China                               |
| Hannah      | female | linguistics                       | New Zealand  | 3            | New Zealand                         |
| James       | male   | computer science                  | Singapore    | 2            | Singapore                           |
| Luis        | male   | architectural engineering         | Japan        | 3            | China                               |
| Lucy        | female | cultural studies                  | Canada       | 4            | Canada                              |
inter-coder verification was conducted between the researchers to ensure the reliability of data interpretation. Data analysis was conducted following four steps: 1) reading and segmenting, 2) sorting and labeling, 3) comparing and synthesizing and 4) categorizing and reporting. We started with rounds of reading, after which data were segmented into basic meaning units. Some topical codes emerged from these segments were then labeled, compared and synthesized. Themes were then generated, reviewed, and defined with a cross-codes examination. Finally, a set of themes were categorized and reported. Despite the analysis being performed in Chinese, researchers translated the excerpts used throughout the paper in order to reach a wider English readership. Member checks were adopted to mitigate misinterpretation and boost credibility, with translated transcripts returned to some participants for examination. Corresponding revisions were then made where necessary so that the quotes were rendered fully, accurately and impartially. The findings are detailed in the next section.

**Findings**

The study manifests how human agency and non-human matter in CIDS’ working and social spaces mediate, forge and produce a doctoral trajectory embedded within a complex lived experience responding to shifting dynamics amidst the pandemic. It shows how CIDS aligned material and social assemblages to construct sociomaterial bricolages that facilitate to restore relative stability of a disrupted doctoral journey.

**Material Infrastructure in Working and Social Spaces**

The study manifests that a well-resourced working environment, including material provision such as infrastructural facilities, equipment for conducting effective study and practical activities outside of a university context were considered pivotal to doctoral education. Many of these material enablers, however, were disabled due to travel restrictions and lockdowns amidst COVID-19, which caused adverse impacts on a doctoral trajectory. Wendy and Mia shared the following views:

Due to the travel restrictions, I couldn’t make it back to Australia, so I have applied for an extension. In experimental disciplines, reagents and samples have a definite life span. I have been stranded at home for so long that I may have to start over many experiments from scratch when going back. It’s really time- and energy-wasting. (Wendy)

Based on my timetable, I should have had my fieldwork done within the past five months. But travel restrictions and health protocols just made a physical approach to many participating schools impossible. Let alone travel across different regions in China. So I had to depend on an online alternative, which is less satisfactory. (Mia)

Physical characteristics of a school setting have been widely documented as impacting young students’ academic performance and general wellbeing.
Nevertheless, they appear to be less explored at a doctoral level, despite previous research identifying an associative significance between valid occupancy of an office and fostering of a researcher identity (Xu, 2021). This study lent weight to attending to doctoral students’ sense-making of the significance of materiality to their study. Ab Marais and colleagues (2018) contended that when material comfort goes beyond a certain threshold, university facilities do not exert major impacts on PhD students. In contrast, this study disclosed that when material provision is below an essential level, doctoral study is compromised. For those who work on lab-based subjects such as Wendy, the denial of an access to a lab understandably takes a toll. As Latour and Woolgar (1986) argued, machines assembled in a laboratory represent a particular configuration specifically tailored for a particular task, and their significance is laden with their direct functions, work relationships in the laboratory, and material and symbolic connections to the outside cultures. The pandemic deprived the students of access to the material setting of a laboratory where the above meanings are embodied and created, thus exerting adverse impacts. Additionally, doctoral training is operated in a distributed environment that encompasses a diverse array of facilities/infrastructure within and external to one institution (Pearson et al., 2015). One important part of social science research is fieldwork, which represents the social practice of bodily doings and sayings amidst, and attuned to, material environments (Hopwood, 2013). In Mia’s case, fieldwork should ideally be a material assemblage of physical travels, on-site interaction with participants and objects that help to enrich meaning-making. Nevertheless, COVID-19 has closed off these traditional fieldwork options, posing additional challenges to researchers.

Apart from the working space, material infrastructures in the social space are notably significant to the participants’ perceptions and practices of study. During the pandemic, the place-making of learning was morphed, extended, blurred, and becoming so porous (Gunter et al., 2020) that multimodal social support from family and institutions was thrown into bold relief, proffering students physical and affective strength to maintain the stability of a doctoral trajectory as an ecological system (Xu & Tran, 2021). Dan, Emma and Matt explained it this way:

I have been living with my parents since I came back. I don’t need to worry about daily life, like grocery shopping, cooking, cleaning, etc. I used to spend much time on all the stuff when I was in Australia alone. Also, it’s the longest period that I have been with my family. Thanks to the pandemic, I get more time to feel family love. (Dan)

My family has been very supportive materially and emotionally. They sent me face-masks twice. My parents give me a video call every day, offering me a lot of comfort and support. (Emma)

My university has distributed personal safety kits to us, containing face-masks, hand sanitizer, tissues, etc. (Matt)
In the first two cases, family-mediated infrastructure practices by means of mobilizing and creating multiple forms of resources were considered important to alleviate vulnerability (Hu et al., 2022). For those who have been back home (such as Dan), family remains a key source of material supply in respect of accommodation, catering, housekeeping aid and learning space. For those stranded in the host context (such as Emma), family serves as both an instrumental storehouse and affective buffer, providing masks and emotional support to combat this plight. Similarly, transcending delivery of educational functions, institutions initiated supportive crisis management exemplified by distributing care kits, which mitigated CIDS’ physical and psychological strains as they were trapped in precarious circumstances.

**Border Crossing Scrutiny and Daily Racialization of the Chinese Student Body**

Another noteworthy experience denoting sociomateriality in the data relates to CIDS’ bodies. Some of the CIDS’ embodied engagement with devices, physical objects and space (Gourlay, 2021) was brought into bold relief and transformed due to the pandemic. Firstly, some participants mentioned that strenuous border-crossing scrutiny targeting the Chinese student body increased their insecurity and vulnerability. Apart from hard material infrastructure, border-crossing is not distanced from corporeal and affective repercussions (Waters & Leung, 2021), not least amidst the pandemic when intensified sociopolitical conflicts were laid bare in strengthening scrutiny and control of Chinese international students. Leo’s experience cast some light on this:

> Sino-US relations plummeted last year, including expelling Chinese graduates in STEM. Many of my friends chose to leave America. It took me several months to get flight tickets for my whole family to come back. I remembered I was questioned at the XX Airport on my departure day. We barely caught our plane! Luckily, I am finally back. (Leo)

For one thing, borders are places where mobilities, materialities and power converge (Burrell, 2008). Those material infrastructures underpinning borders and accompanying mobilities, such as visas and passports are state agents that have the capacity to define travelers as safe or risky, desirable and undesirable, thus reinforcing mechanisms of state control (Zureik & Salter, 2005). Leo’s experience of being questioned for an exceptionally long time showcases that a visibly Chinese passport encountered more complicated and difficult border experiences, echoing Burrell’s (2008) assertion that border crossings can be a materialized undertaking embedded in a highly politicized process. Leo’s troublesome border crossing encapsulates the experiences of many Chinese who fell victim of Trump’s “painted as spies” allegation that targeted particularly Chinese STEM doctoral students and scholars working in American universities and labs.

Besides, Chinese students are unprecedentedly racialized and bear the brunt of anger towards China following the misinformation manipulated by the Trump
administration that China mismanaged the outbreak and spread of COVID-19. Jessica and Emma shared the following views:

The media criticized the Wuhan virus…I felt discrimination against China and Chinese is increasing. A friend of mine was once verbally abused by a white guy and was hopelessly devastated at that time. (Jessica)

News said that an Asian girl wearing a face-mask was assaulted in New York. I don’t know why people here dislike having a mask on…I feel insecure, physically and emotionally. So most days I stay home and if I really have to go grocery shopping, I will ask some friends to go together. (Emma)

To a certain extent, Jessica’s discriminatory experience did not surprise us given that it has long been argued that body-based material markers or corporeal dispositions such as gender and skin tone are accorded a hierarchy of values and statuses, thus (dis)empowering the educational experience (Alizai, 2020; Brooks & Waters, 2018; Hunter, 2015). This study further portrays extra vulnerability and hostility imposed upon a particular race by political and media manipulation against a backdrop of a pervasive health crisis. The hatred targeting the Chinese student body is a result of racialization (Murji & Solomos, 2005) whereby racial labels are attached to the health crisis in such a manner that race appears to be the key factor in understanding and responding to the crisis. Having being misperceived as a proxy for virus, a Chinese person is thus unfairly excluded and assaulted. Subsequently, the intensified vulnerability, exemplified by physical and emotional insecurity, as Emma averred, posed another obstacle to an already challenging learning context.

Sociomaterial Bricolages of Coordinating Space-, Time-, and Place- Spanning Learning Practices

The participants experimented with developing sociomaterial assemblages to help them conquer barriers to educational practices that were at risk due to inadequate technical support, time zone differences, and social media censorship attendant with their temporary relocation to China. The following excerpts showcase how they created space-, time- and place- spanning learning practices by drawing on different facets of sociomateriality.

Wireless connection at home is not very good. I went to a nearby cybercafe for an academic conference once. (Laughs). Basically all others were engaged in games you know, so it’s a very special experience. (Luis)

Time zone difference is a very tricky issue. So after each meeting these days, I will work out some workable slots for my supervisor to choose from for our next meeting. Of course, late nights are avoided when families are asleep. (Nancy)
Doing a PhD is lonely enough. Keeping interpersonal exchange is very important to me, even mundane chit-chats. But some social media are blocked in China, so I recommend my supervisors and close foreign friends to download WeChat. We often interact with each other there. (William)

As indicated above, the students reconfigured a digitally mediated learning space that constitutes messy assemblages of material and social practices. For one thing, academic exploitation of a cybercafe where “basically all others were engaged in games” manifests unusual consumption of its materiality, namely the business premise and the Internet technology for knowledge construction, given that its physical setting is normatively geared towards pleasure-seeking in China. This echoes Taylor and Ivinson (2013) that matter is not inert but performative, the meaning of which is emergent from appropriation. As well, the adjustment of work schedules to the physicality of the setting in which they take place, namely a home setting where night is supposed to be saved for family members to rest without disruption indicates that they attended to suitable arrangement of digital engagement that is no “escape” from the material surroundings (Gourlay, 2021). For another, the assemblage is also woven into the broader social fabric (Sun, 2018) that is intricately entangled into the affective and political milieux. Mindful of the significance of social bonds via “even mundane chit-chats”, they expanded learning spaces that “spilled over” into (Gunter et al., 2020) informal social media platforms. In view of the fact that some platforms are disabled in the home country, they reconfigured the accessible ones, such as WeChat, to maintain social dimension that is pivotal to compactness of the learning ecology. The above elucidation lends weight to Johri’s (2017) conceptualization of sociomaterial bricolage that throws into relief people’s drawing on available artifacts at hand in conjunction with other social resources in situated activities so much so that the material and social is aligned to serve a learning purpose. Aligning material and social assemblages across space, time, and place, the CIDS enacted agency to construct sociomaterial bricolages that facilitate overcoming new challenges instigated by COVID-19.

Discussion
This study brought sociomateriality of international doctoral education to the fore amidst the unprecedented health crisis. Firstly, it problematizes human-centeredness in conceptualizing learning practices that were peculiarly complicated by the precarious socio-historical context. Backdropped the pandemic, some activities, settings and relationships integral to doctoral training were disabled, with learning space morphed, material provision disrupted and extra scrutiny imposed. These destructive forces undeniably contoured the educational experience, serving to exclude, invite, and regulate particular forms of participation (Fenwick, 2014). As illuminated above, the students’ navigation of a doctoral trajectory was entangled with, subject to and shaped by these material dynamics in different ways, echoing Fenwick’s (2014) assertion that human agency is enacted in the emergence, interactions, and
exclusion of the smallest encounters with material things. Having said that, this study did not embrace the notion of underscoring matter at the sacrifice of human agency; rather, it supports sociomateriality in the performative flow of practices (Hultin, 2019) whereby social and material potentials are realized through embodied encounters with the world (Hawley, 2021). In this study, it is when the student repurposed a cybercafe for conferencing that its transformative capabilities and energies were set in motion; similarly, meanings attached to and performances exerted on a Chinese passport and a Chinese body were unfolded and constructed in interactions with human agents in the host milieux, the primary tendencies of which were underpinned by sweeping hostility towards China over the pandemic. Briefly, built upon a perspective of more-than-human relational formulation (Fox & Alldred, 2021), this study contributes to unpacking mutually appropriative entanglement between non-human and human matter in carving out a doctoral trajectory.

Secondly, resonating with other studies that disclose how the ripple effects of the pandemic penetrated multiple facets of a study trajectory (Aristovnik, et al., 2020; Xu & Tran, 2021), instigating disruption of learning ecology, intensified racialization and bodily scrutiny, this study offers further insights by revealing how socio-material bricolages were mobilized to address these plights and even transform them into empowering energies. This process is facilitated by interdependencies of humans and material forms. Whereas human actors use and thus transform material objects, things as mediators of practices are also capable of transforming human actions (Brooks & Waters, 2018). As the findings showcase, faced with dysfunction of some material infrastructure, students made use of available resources, making use of physical and affective support offered by family and institutions to realize their instrumental and emotional functions. Conversely, material environment also moderates learning behaviors. For example, an internet-unfriendly home pushed a student to achieve academic purposes in a cybercafe; a family context regulated one’s study activities to accommodate others’ work and rest patterns. As a consequence of the myriad interrelationships, new meanings were produced among these hybrid assemblages of materials, ideas, and bodies (Guerrettaz et al., 2021).

Conclusion

To summarize, as one of the first studies investigating international students’ navigation of a doctoral trajectory in COVID-19 from a sociomaterial lens, this study contributes to pertinent literature with an in-depth disclosure of matter and human forces in co-shaping a disrupted doctoral trajectory, as well as how these forces are entangled with one another as bricolages to counteract this disruption. This represents a continual process of mobilization, negotiation and construction emerging from the performative flow of sociomaterial practices. It manifests that doctoral education embodies network operations of experiencing and accounting for, not just what humans do with matter, but what matter does to human thinking and action (Hultin, 2019).
Despite reporting on a small sample, this study offers valuable insights on internationalization of doctoral education and practical implications for stakeholders to better support international doctoral students in the current dire situation. Firstly, it lends empirical weight to a nuanced conceptualization of university internationalization against new circumstances. For many students stranded in China, they need readjustment relying at least temporarily on technology-enabled learning across geographic boundaries “abroad” while simultaneously remaining at “home”, which falls into the category of internationalization at a distance (Ramanau, 2016; Mittelmeier et al., 2021) that goes beyond the binary of internationalization at home and internationalization abroad. Echoing previous scholarship that endorses an integration of infrastructural resources in situ and opportunities provided through distance learning via this category (Breines et al., 2019; Mittelmeier et al., 2019), this study however contributes distinct subtleties that lay bare how internationalization at a distance is compromised when it is practiced not as a fully-developed educational mechanism but as an expedient response to the sudden and massive rupture following the pandemic. The managerial, technological, operational and mental unpreparedness of temporary readjustment at the institutional and personal levels diminishes doctoral students’ educational quality. This warrants practical implications for facilitating a sustainable doctoral trajectory, during and beyond the current health crisis. At the macro level, innovation of technologies and formalization of the virtual delivery, cooperation and research should be further strengthened (Huang et al., 2022) as internationalization strategies in the interest of local and global common goods (Marginson, 2020). At the micro level, international doctoral students should sharpen their psychological and behavioral responsiveness to future challenges, mobilizing and appropriating possible resources in order not only to survive but also thrive in unpleasant circumstances. As revealed in the study, one possibility is to tap the sociomaterial potential, facilitating human and non-human forces to form assemblages that act together through ongoing coordinating work (Fenwick & Edwards, 2010) to sustain stability of an educational journey. Having said that, we must admit that a fine-grained articulation of these efforts is neither the focus of the current study, nor can be succinctly elaborated in a piece of this length. Focusing on doctoral students solely, this study has not unpacked comparative (dis)similarities with other international student cohorts such as the course-based master students. We as researchers suggest future research attend to this limitation based on a larger pool of student participants with heterogeneous background characteristics. Also, future endeavors are encouraged to shed more light on sociomateriality of international education, which we believe can contribute to the sustainability of internationalization of doctoral education in a post-pandemic world.

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