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Space as an un/equalizer in times of technology and crisis in higher education

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ABSTRACT

This paper problematizes the argument that technology supports spaceless education, and analyses how space acts during remote teaching. This study examines how physical spaces can act as un/equalizer among higher education students. With interview data produced by international students studying in Finnish universities during the outbreak of the COVID-19 pandemic in 2020, our study shows that spaces play a pivotal role in shaping study experiences. When the universities' physical spaces were closed, the introduced pedagogical practices, along with students' socio-material realities, formed new entanglements that positioned higher education students in different, often unequal, positions.

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Introduction

Recent decades have witnessed governments and higher education (HE) institutions putting forward wider spatial, and often temporal, flexibilities in HE studies. This can be linked to the processes of digitalization that enable many spatially flexible ways of studying that support economies of scale in education (Morris, 2008) and at the same time the strive for individual learning arrangements due to the heterogeneity of the student body and growing numbers of students (König et al., 2024). In earlier studies, technology was often discussed as a skill to have (Williamson et al., 2020) rather than as an actor itself in constructing learning spaces. Despite the seemingly spaceless study opportunities offered by technologically mediated remote teaching, space is always in some way present in studying (Tummons et al., 2016) and hence, we need to understand how space shapes and acts among different student groups.

Earlier studies have shown how different kinds of spatial and material arrangements shape learning (e.g., Acton, 2017; Acton & Halbert, 2018; Alzeer, 2019; Goodyear, 2020), also in crisis conditions (Keser Aschenberger et al., 2023). To conceptualize our observations on the connectivities of space and society in international students' study reflections, we approach space in HE learning with socio-material theorization (Fenwick & Landri, 2012) that enables us to understand space beyond physical solid entity

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(Massey, 1994, 2005) and approach it as an agent itself. We then ask how changes in physical spaces can act as un/equalizer among HE students. We base our analysis on interviews with international students studying in Finnish universities during the COVID-19 pandemic. Despite often being presented as a coherent group, international students form a heterogeneous group (Filippou & Jokila, 2024; Jones, 2017) that negotiates differently their studying and moving abroad experiences, especially during the pandemic when there were limited options to be mobile (Filippou & Jokila, 2024; Jokila & Filippou, 2024).

Spatiality in higher education studies

Spatiality has long been identified in the research literature as a significant element in the structure of students' everyday lives (Alzeer, 2019; Fenwick & Landri, 2012; Gomes, 2015). The effect of the environment on the students' educational activities and experiences is built through different spaces. Students' requirements for the study environment vary depending on their degrees and the spatial dimensions they contain. For example, exercises that guide learning for students doing laboratory work are strongly related to the spatial context of the university and the guidance received from the teacher there. Goodyear (2020) states that the teaching of practical skills takes place in a complex socio-technical space, each element of which plays a significant role in terms of learning and pedagogy.

Spatial in/equality

Seminal work by Massey (1994, 2005) has shown how spaces are not just contexts but rather entangled with history and people in many different ways that denote power. Following Massey's (1994) thought, spaces – whether at university or remotely – can only be analysed by taking into consideration the wider socio-spatial and societal entities. Massey (2005) finds that the spatial is constantly evolving, becoming and made rather than fixed. As a result of the COVID-19 pandemic, students and teachers had to promptly switch to distance learning, which practically meant being isolated at home while continuing studies virtually. This exceptional situation, and the resulting change in spatial reality, affected students' sense of attachment to their studies (Jokila et al., 2023). Spatial learning environments connect students not only to their studies but also to the social context of universities. In addition, learning spaces can be used to contribute to the realization of equality between students, and university spaces have been identified as a tool for spatial inclusion in HE (Wong, 2024).

Spaces do not represent equal meanings as lived spaces but rather as Alzeer (2019) has identified entail varying meanings. The spatial environment for studying has 'cold' or 'hot' spaces, depending on how many social encounters the different spaces allow for their users. In the context of HE, for example, lecture halls and classrooms, where teaching takes place and students gather with their teachers, can be understood as hot spaces. As a result of COVID-19, students had to adapt their living environment to also meet the needs of their studies. In times of restrictions, university campuses were largely closed and virtual learning environments became new hot spaces for interactions and socio-material entanglements. For many students, this functional change in spatiality forced

them to do their studies in their home spaces which were usually reserved for leisure activities (Keser Aschenberger et al., 2023), thus blurring the distinction between studies and their free time.

HE students had good learning experiences when the technical conditions of their home (IT equipment) met their requirements of the working space in terms of the exceptional and unexpected time of distance learning during COVID-19 (Keser Aschenberger et al., 2023). The access to separate and fixed spaces for studies was important for better learning; hence, the function of technical tools, as a combined dimension of space and material, creates the conditions for the realization of the social dimension. In addition to the practical activities of the studies, the effects of the individual situation of each student relate to the construction and emergence of social relationships. Students used to spend time on university campuses, where they had the opportunity to participate in developing social relationships. This practice and the sense of belonging in socio-material spaces were altered during COVID-19 restrictions, forcing students to find their way into virtual educational space (Jokila et al., 2023).

Identity of spaces (Massey, 2004) refers to the identity acquired by places, which is linked to the place's functionality, and the place's identity is, therefore, built on the spaces used for it in the context of studies. For students, the spaces of home and HE have traditionally been separated, but because of COVID-19, university campuses were emptied and homes had the identity of both study and free time. In this case, the spatial experience of the students was mixed and the importance of the space as a rhythm of the studies was missing. In non-crisis situations, students' everyday life is punctuated by various transitions, either between home and college or between the social connections of different spaces within the campus. Moving between facilities or moving away from the university can also be perceived as an obstacle to participation. Finn and Holton (2019) call this transition between different states as everyday rhythm-making. The rhythm of everyday life is evident in repetitive spatial activities, such as transition situations between university and home (van Tienoven et al., 2017).

Blended learning, which combines both virtual and face-to-face teaching, has been seen as a valuable development target in the HE context long before the time of the COVID pandemic. Despite major efforts, blended learning, as well as virtual learning, has faced challenges in the practices and structures of educational institutions. Sufficient resources and support from the education organizer are needed for a full-scale and functional implementation (Graham et al., 2013). The pandemic changed this in a fast full-scale implementation of almost solely virtual learning arrangements.

Temporal in/equality among students

For Massey (2005), space and time co-exist and need to be analysed together. Also, closely linked to spatial perspective in technologically mediated learning arrangements is temporal conceptualization. A growing number of studies have examined temporality in HE and how it is understood and experienced (Bennett & Burke, 2018; Bunn et al., 2019; Gibbs et al., 2015). As Bunn et al. (2019) discussed, the decrease of temporal structures in studying due to recorded lectures and online access to material, shows an expectation of students to be able to navigate between studying and other life commitments regardless of their social positioning and responsibilities beyond their studies.

Moreover, students are deemed responsible for monitoring their temporalities as they deal with their social lives, working conditions and family commitments (Bunn et al., 2019).

Bunn et al. (2019) underlined a form of temporal inequity which is produced by the individualization of student time. They found that the 'failure' of time management was perceived as a personal failure which ignored structural changes and different positionings that influenced their study routines. Considering that students have different positionings within the university and its structures more attention should be paid to the spatial entanglements in learning.

Gourlay (2014) showed the complexity and dynamics of the dimension of time for post-graduate students. The students' 'temporal practices', through their interaction and use of networked devices and digitally mediated texts, developed intricate relationships of shared agency with devices and technologies. However, the provision of online learning and communication produces new forms of inequities between students (Bunn et al., 2019). Studies have highlighted the lack of recognizing different temporalities between groups of students, especially for students from non-traditional backgrounds (e.g., Bennett & Burke, 2018; Bunn et al., 2019). Similarly, Brooks et al. (2021) indicated how social characteristics, such as disability, social class, and being responsible for others, lead to different 'student timescapes' and highlighted how the nation-states influence how students conceptualize time. Responding to the call for more studies on time–space within HE (Bunn et al., 2019) and using temporality as a lens to 'help to de-naturalise and problematise temporal structures, cultures and practices' (Leathwood & Read, 2022, p. 757), Kosonen et al. (2022) showed variation among students in how they approached their study time.

Previous studies that have examined international students and temporalities focused on the temporal aspect of residence permits (Maury, 2022), on self-development abroad (Hansen, 2015), career imaginations (Xu, 2021) and the intersectional temporal dimensions of student-parents (Dickson et al., 2024). In the context of Finland, international students from non-EU countries receive temporary permits and, as Maury (2022) showed, they are constrained by the temporal aspects of working and living. During the COVID-19 pandemic in Australia, Gomes (2022) introduced the term 'shock temporality' to analyse the lived experiences of international students and graduates. Due to the lack of control over the situation and the feeling of being 'stuck', the temporality seemed perpetual with a suspended future. In their analysis of people's experiences of time and rhythm of life during the pandemic, Lyon and Coleman (2023) identified variation in experiences. While some find that time has intensified, for others it has slowed down. Also, practices in everyday life came together differently and blurred the different spheres of life.

In this paper, we approach learning spaces in HE with a socio-material approach that enables us to analyse the everyday life of HE students with broader spatial, material, social and temporal contexts (Barad, 2014; Fenwick & Landri, 2012). The analysis aims to extend the analysis from the human-centred ontological understanding of the world (Fenwick & Landri, 2012) to recognizing non-living and material entities, including science laboratories, instruments and technological devices (Fenwick et al., 2011) as having agency (Tietjen et al., 2023). The analysis does not separate the entities but rather approaches them as a whole (Mulcahy et al., 2015). Sociomaterial analysis approaches the phenomenon through relations between different entities that are formed (Decuypere & Simons, 2016). For understanding physical spaces, socio-material

conceptualization is perceived as helpful (Acton, 2017; Acton & Halbert, 2018). Acton (2017) finds that the socio-material approach 'carefully illuminates the junctures, tensions and lived practice of spatial-social relationships' (p. 1442). An unexpected change in physical study places, such as the pandemic, may show the particularities the learning spaces entail.

Methodological approach

This study is part of a larger research project called 'International students in times of crisis' (EqualISM) that analysed international students' everyday lives and studies during the COVID-19 pandemic. The project was conducted at a time when the Finnish government applied multiple measures to restrict the spread of the virus including the physical closure of universities in March 2020. During spring 2020, it was estimated that more than 15,000 international students were studying in Finland out of which 5000 of them were international master's degree students (Vipunen, 2024a, 2024b). The majority of them were from Asian countries, followed by European, African, American, and Oceanian countries (Finnish National Agency for Education, 2024). To investigate the impact that the absence of physical studying places had among students we set the next research question: *how do changes in the physical learning environment act as un/equalizer among students?*

Our analysis is based on semi-structured interviews conducted mainly remotely in May–June 2020. We recruited our participants from a survey we conducted in May 2020. We sent our survey to all universities in Finland, directly to degree coordinators and student unions, and received 192 participants. Those who indicated in the survey that they were interested in participating in interviews were contacted with information about the research project, the purpose of the interviews, the ethical considerations such as the participants' rights, and information about data protection and management regarding storing, confidentiality and securing anonymity. Then we also used the snowball sampling technique to recruit more participants. We conducted 33 semi-structured interviews with master's degree students during May–June 2020. Most interviews were done online and, in the interview guide, we included questions about students' studies, social lives, financial situations and plans. The majority of interviewees were women ($n = 21$). Out of 33 interviewees, 25 came from non-EU countries, seven from EU countries, and one had dual citizenship. The interviewees studied in the fields of humanities ($n = 11$), social sciences ($n = 10$), medicine ($n = 5$), technology ($n = 4$) and natural sciences ($n = 2$). The names used in the results section are pseudonyms.

In this article, we develop our analysis based on Jokila et al.'s (2023) work on responsibility and freedom in HE studies during the changing everyday life in the COVID-19 pandemic context. We followed a socio-material approach to analyse the data and focus on the participants' descriptions of the changes in the physical learning environment. During data analysis, the authors read multiple times the transcribed interviews and took notes on the quotes where the students outlined the changes and consequences that the closure of the universities led to distance teaching and learning. Then we created mind maps of all the interviews (Fearnley, 2022), which identified the kind of changes that happened and their impact. Specific descriptions related to materials, places, time, and social relationships were also included. The mind maps were particularly useful in

examining this complex phenomenon and the relationships between various activities and actors (Fearnley, 2022). From the mind maps, we have selected students to maximize the variety of situations that students were in and in that way illustrate the heterogeneity of socio-material entanglements in higher education learning.

Entanglements in studying higher education

In the pandemic context being at home and studying remotely was set for safety and prevention of spreading the virus. Despite these aims to continue studies in these difficult circumstances, there were significant differences among students between the spatial arrangements created at home spaces, and how these contributed to learning in HE. Hence, studying remotely from home was a very different experience for students. In this section, we show how the physical closure of universities contributed to different kinds of learning entanglements at home and how this created unequal circumstances. We identified differences among students with different disciplines, gender, caring responsibilities, distance to university, stage of studies and social needs (see also Jokila et al., 2023). To discuss these different entanglements, we refer to selected students to show what kinds of spatial, temporal, social and material entities come together in students' study entanglements.

During the outbreak of the pandemic, **Pedro** was studying in his last semester and needed to work on his thesis. He had many concerns related to his family's situation back home and was reflecting his situation to other students and people in general.

> That was really really surprising situation. Since the lockdown I have managed my time in an incredible way. I was awake very early in the morning, I worked on my thesis, I cook my food, I went outside to take a walk so to make some exercise then I came back home, relaxed, watched some Netflix or listened to music. So my routine was very organized, there was no time pressure because the next morning you don't need to wake up early to go anywhere. (Pedro)

His reflection shows how he had individual pressure to organize his new daily routines to feel comfortable. Putting away the time pressure of other activities in life meant a more relaxed experience of life. During the interview, he is also aware of others' situations and refers back to his family's situation and other classmates in his programme about the difficulties they are facing. Hence, these experiences form an entanglement with wider historical and social contexts (Massey, 1994):

> So it was at least for me I know that people doesn't feel like that but at least for me was a blessing this coronavirus because it made, it made me very very efficient in an academic way. I completed my thesis very quickly because I feel very productive intellectually. (Pedro)

Pedro's situation exemplifies entanglement where spatial closures, which often also reduced social gatherings, meant more time for the thesis writing. There were no other activities, leaving time for thesis work. This reflection also highlights the intertwines of social, spatial and temporal elements in studies.

Diana is studying natural sciences. During the outbreak, her laboratory courses were greatly modified and although she continued her studies and met the expected number of credits, the learning itself changed. She reflects on the changes with modified learning content:

> Yes, I could finish all the courses which were planned originally. Yeah, and like they kind of completed the course but they just, they changed some of the grading criteria to get give us more attendance and we had to write like a couple of more assignments for, for like, covering up the credits which we assigned for the lab work initially so yes they managed it somehow and we were able to complete all of those courses. (Diana)

Modified learning arrangements and grading eventually met the needed criteria for the coursework. The student specifically recalls meeting the needs for the grading system but is less reflexive about the potential deficits caused by the situation. As the interviews took place early in the pandemic, there was a lot of understanding of the situation and teachers in it. When asked about her daily routines, she reflects on the intertwines of physical spaces and time and the difficulties she faced in managing her new routines:

> it seems like it's really like a bit disruptive because, as I said like there's no set timetable, because if I went to the university like in the middle of the lectures, if I had time, I would complete like I would try to complete all the … like any type of assignment or something I would work and then if I, when I would come back home in the evening then I would not have a lot of work left to do, but because now the lectures are online and also the … I could like, I don't really have a set time table, and plus like the sleeping pattern has also changed because I don't need to get up early and go to class I can like stay up late, and then get up late and so it's, it's just been a bit difficult to attend class. (Diana)

Having set daily routines that included some mobility between localities and temporal restrictions enabled her studies earlier. Individuals then had the responsibility of the rhythm-making of their everyday lives when practices that were present previously were not supporting the temporality of life anymore (Bunn et al., 2019). Being spatially separated from her classmates also shaped her experiences of very mundane daily activities, for instance, going for lunch.

> I feel like another issues like staying alone all the time not having to go out, or like, even eating at the university, seems like it was a lot of fun now, like looking back, like I was eating at the University also, which also means like, I need to cook for myself, which is again like a time consuming process and that's so. It's changed a lot and it seems like there is a lot of work to do now than back when I went to the University. (Diana)

Her reflection shows how time management can be attached to spaces and mobility between spaces. Hence, the move to online teaching without temporal restrictions meant greater responsibility for time management (Bunn et al., 2019).

Simon is a student in natural sciences. During the outbreak of the pandemic, globally, he reflects on his decision to stay in Finland from the perspective of studies, resources and facilities in his home country. The pandemic situation, in the first phase, was rather calm, providing safety to stay in Finland. He reflects on his situation as a combination of macro- and micro-spatialities:

> I feel my studies needs to continue and I will probably have a greater chance to participate in my study while I am here than in my country. (–) Nothing was happening here in Finland. We were all okay and safe you know and so there was no need for me to go back since I know that being here would give me the opportunity to continue my studies safely. So going back to my home country, I might not be able to get, like, continuous internet connectivity or constant electricity to do my work. (Simon)

Besides the safety issue, he also compares the online facilities in both of the countries. Despite the possibility to continue studies remotely, access to the internet is not

guaranteed in all countries, limiting his opportunities to go back home. This then repositioned students from less advantaged countries into unequal positions.

Kun has been studying social sciences for several years but due to some personal problems, she has had breaks in between. During her studies, she has worked all the time.

> The major change is working. So before the outbreak I always had to work. I have been working since I came to Finland. (Kun)

She moved to another city to work but has done some courses remotely. For her, the pandemic enabled her to continue her studies more actively since she has been able to attend remote lectures.

> I think it is quite comfortable I would say like 80% comfortable, because I don't have that much need to go out anyway all the time. But it is of course little bit bad for mental health that I cannot go anywhere and very little contact to friends. However, it has been very good for study, because I live in (one Finnish city), and without this online study, I would have to travel to (university city) every time I need to take a lesson. It would take a lot of time. It would be inconvenient, but thanks to this situation, I can study from my room in (one Finnish city). (Kun)

Due to the extensions in her study time, Kun does not know her classmates that well prior to the pandemic and she continues how the unexpected move to online space increased the barrier for her to speak out in class.

> It has been good, because as I mentioned classes are easier to study that way, it is a little bit difficult in terms of communication with classmates and teachers but mostly the classmates because I don't know them well and it (is) hard to talk online with a group of people I don't know, it's like I didn't feel the connection, and because of that I was more hesitant to speak up in discussions. (Kun)

Susan is studying education with her child living in Finland. She was working on her thesis which she considered to be an advantage as one of her rationales to study was to develop social relations in Finland. For her, staying at home to study enabled her to continue her studies while having her child at home with her. This required time management to organize her studying routines within her child's sleeping schedule.

> we did our best to avoid her daytime sleeping so that she goes to bed 8.30 as early as possible. And then when she sleep at 9 o'clock probably I start working sometimes until 2 o'clock night and then I go to bed and morning my husband takes care of breakfast and things so that I can sleep at least until 10 o'clock so when I wake up because (name of the child) wakes up at 7, 7.30 so I couldn't really leave this rhythm waking up at 7 and sleeping at 2 o'clock so we've done this. I said that I need evening hours more so he was taking care of this morning hours and morning routines. (Susan)

Compared to some of our participants, her husband was in Finland and shared the childcare with her. Parents without family in Finland needed to manage sharing the space with children who required constant care.

Georgia is studying in an arts programme where the physical closure of university facilities significantly shaped the material opportunities for studying. When asked about her study opportunities during the pandemic, she recalls the social aspects of continuing to study online hence affected her sense of belonging and even contributed to the purpose of being in Finland. She reflects:

> Well, my program was pretty fast in adopting to this Microsoft Teams format. And despite it being quite difficult, I think it was also very helpful to have an engagement and not have this complete lockdown with sort of nothing going on. Like, I didn't feel abandoned in that sense. Like I felt that why I'm here was actually being justified somehow, somewhat – not fully. (Georgia)

Due to her field of study, there were material needs for practice which were not available due to the lockdown. Although the focus shifted more towards theoretical studies, the online format enabled the studies to continue and finish:

> Because we need facilities, we need to rehearse, and so on – and that was not possible. But still, to a certain degree we got to cover some material. We also have a lot of guests' workshops from other schools and all of those got cancelled, because people couldn't travel. So, some classes got postponed. But other ones that had, you know, less physical engagement or need for less physical presence, like theoretical classes, we kept going. So basically, we managed to finish the year. (Georgia)

These descriptions of students in very different socio-spatial entanglements show how seemingly spaceless remote teaching actualizes in so many different forms among HE students.

Conclusion

This study contributes to the body of work on spatiality in HE studies (Acton, 2017; Acton & Halbert, 2018) with a socio-material approach to the analysis (Fenwick et al., 2011; Fenwick & Landri, 2012). Despite the processes of digitalization in education that have contributed to an increase in online and distance learning, it does not remove the significance of space in studying and what that may bring with it (Massey, 1994). Hence, understanding the socio-material entanglements where students are studying is important to support the students in their studies and highlight issues of equality. In this study, we have used a socio-material approach to analyse how changes in physical university spaces produced a variety of entanglements among HE students and acted as an un/equalizer among the student body. We illustrated the use of entanglement in higher education studies to highlight the complex and intertwined nature of human and non-human actors (Fenwick & Landri, 2012) in HE studies.

Although the idea that technology acts as an equalizer in HE is rather prevalent, our study shows how moving to technologically mediated teaching with new spatial arrangements still produced inequality (Massey, 1994; 2005) in HE studies. These differences were identified in relation to their discipline, gender, caring responsibilities, distance to university, stage of studies and social needs. This created very individualized learning experiences. In studies of technologically mediated HE, based on our findings we argue that in designing pedagogical practices the spatial realities of different students need to be considered.

Even though the policy to close university facilities and remote teaching was the same for everyone, the impacts and outcomes varied widely despite the notion that the pandemic situation is the same for everyone. Students had varying possibilities to continue their studies at times in very restricted ways and the effort to continue their studies required an unequal amount of effort. This also hints that in 'normal' situations students are in varying entanglements with physical spaces doing their studies. Our study shows

that spaces create a structure for higher education studies. For policy, our study shows that remote teaching as such is not an equalizer to all but is packaged with a wide variety of socio-material entanglements.

This study is limited to a specific time and hence future studies could investigate situations where onsite and offsite learning take turns. Comparisons between fields of study, where the use of physical spaces varies, can reveal further socio-material entanglements.

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