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Distance education as socio-material assemblage: Place, distribution, and aggregation

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Abstract

This paper outlines some of the material assemblages that are formed in international distance education (DE) in Africa. It offers a first exploratory study of materialities in DE and how they potentially distribute and aggregate to form a network to provide education. Through the use of interviews, students lived experiences are explored to unpack the multiplicity of networks needed to overcome the de-aggregated and distributed institution. The multiplicity of networks that form in DE brings challenges that question how spaces become connected and disconnected and how different materialities shape DE. The materialities in DE produce forces and effects, such as translocal and transmobilites that are more than just the human actor, but extrude materials, networks, and connectives that transform continuously. The interconnectivities of the university and home or institution and students are brought together through enabling technology, but infrastructure does not always have the ability for the facilitation of aggregation.

KEYWORDS
distance education, higher education, international students, South Africa

1 | INTRODUCTION

Arguably, recent changes in higher education (HE), such as internationalisation and the impact of technology (Altbach, Reisberg, & Rumbley, 2009; Wihlborg & Robson, 2018), suggest that the university is increasingly becoming disembodied, disembedded, and decontextualized from its physical moorings (Friedman & Silberman, 2003). Although the unbundling of HE is not, necessarily, a recent phenomenon (Wang, 1975), it is now occurring at an unprecedented pace (Morris, Swinnerton, & Czerniewicz, 2019). Unbundling can refer, inter alia, to "the process of disaggregating educational provision into its component parts for delivery by multiple stakeholders" (Morris et al., 2019, p. 44), the increasing marketisation, commercialisation, if not privatisation of HE (McCowan, 2017), and the use of technology in education (Altbach et al., 2009; Craig, 2015; Wihlborg & Robson, 2018).

The specific role of distance education (DE) in this unbundling of HE, however, remains largely unexplored (Holmberg, 2005; Peters, 2001). Although DE has a long history, the adaptation of teaching and learning to new technological and social conditions has been revolutionary: "There is no other form of teaching and learning that has broken away from tradition so sharply, that is so flexible and conducive to further societal changes in the postindustrial knowledge society. DE achieved a first significant breakthrough in the reform of higher education" (Peters, 2010, p. 10). Not only does DE provide "access for all learners, with special focus on those disadvantaged by distance, by precarious economic conditions, by belonging to discriminated minorities, or by being disabled" (Peters, 2010, p. 10), it redefines and unbundles the relation between the materialities of place, space, and time (at the location of the providing institution) wherever students find themselves (Edwards & Usher, 2007; Evans, 1989).

The (increasing) unbundling of education from time/space resembles the often mooted notion of studying "anywhere, anytime, anyplace" that is found in the teaching statements and marketing materials of many DE institutions and/or online teaching programmes.[1] Although it is true that traditional material entanglements that make up education no longer appear to be binding, it does not mean that "place" as a specific configuration of space and

time does not matter anymore. As we will show in this paper, a different configuration of space and time matterings plays an important role in the lives and learning of DE students. In DE, the university is materialised as both distributed and aggregated. Multiple agencies come together in both informal and formal systems to facilitate this (Rizvi & Lingard, 2011), pointing to the everyday act of infrastructural maintenance and ongoing entanglements with the materialities of education, which do indeed make this "placelessness" of education possible (Breines, Raghuram, & Gunter, 2019). Seeing the university through these functionalities offers a way forward for future research in the new geographies of learning (Ross, Gallagher, & Macleod, 2013).

In this paper, we focus on how the materialities in international DE (IDE) lead to the distribution and aggregation of socio-materialities and the intersection of technology, work, and organization (Bozalek & Zembylas, 2017; Fenwick, 2011). We particularly highlight how a socio-material understanding of DE in Africa contributes to existing debates in HE. We suggest that open or DE University in Africa aggregates materials to overcome the challenges of studying through an institution that is often overwhelmed with students who are widely distributed across borders. This paper explores these issues through the case of international students at the University of South Africa (UNISA), a DE provider.

2 | TOWARDS UNDERSTANDING MATERIALITY IN DE

The boundaries between face-to-face HE and DE are becoming increasingly porous (Jandrić & Hayes, 2019; Swinnerton et al., 2018) as face-to-face students too choose to listen to their lectures online, synchronously, but also asynchronously—in their own time. Moreover, increasing numbers of HE institutions are venturing into (online) DE for a number of reasons: massification and demand management, increased flexibility for staff and students, profitability, or as part of their internationalisation strategy (Altbach et al., 2009; Bates, 2015; Wihlborg & Robson, 2018). They all point to the growing influence of DE modalities for educational delivery across all types of HE. Arguably, the socially defined vocabulary of "the university" as a physical premise where education is imparted to students no longer captures the bringing together through networks and materials, or "assemblage" of materials that make up these institutions (e.g., Roth & McGinn, 1997).

Then where is the university in DE? This question alludes to much more than the physical location of the institution in a DE context. Rather it points to the "placelessness" of learning, that is, the specific, normative socio-material configuration of space, time, and place, which make up HE. DE therefore challenges the idea of the university as a physical location (Anderson & Dron, 2012) where learning "takes place" (Edwards & Usher, 2007; Evans, 1989) and, as such, brings into sharp focus the porosity of the boundaries of a university and the notion of "place" in teaching and learning (see Boyd, 2018; Sun, 2018).

In DE, the university cannot be defined as a premise, a set of buildings, and a place where classroom education is imparted. The DE student equally is difficult to define; what has been written on the DE student deals with student enrolment patterns (Allen & Seaman, 2017), their readiness for the online environment (Crawford-Ferre & Wiest, 2012; Poellhuber, Anderson, & Roy, 2011), and pedagogical approaches to reaching DE students (Thomas, Kern, Hughes, & Chen, 2016). Little has been done to explore their location and relation to the university. DE distributes the functions, relations, and engagements between the different actors involved in university education in distinctive ways (Boling, Hough, Krinsky, Hafiz, & Stevens, 2012). For instance, a tutor may have large numbers of students in many places; many of whom may remain nameless and faceless as they do not engage online nor interact with the tutor. The relationship with these students is mostly digitally mediated, and the engagements are timed according to the teaching and assessment strategies in a particular course and institution, as well as student demand. This is very different from residential, on-campus teaching where student–lecturer engagement takes place through lectures in a specific configuration of space, time, and place (Sun & Rueda, 2012). In this sense, a "university" is not an entity that "sits" in time and space independently of the agency it exercises: "rather it manifests through the negotiation of the elements it comprises and enables, with differing degrees of strength" (Bacevic, 2019, p. 6). The place and the time of teaching and learning in DE, as well as the DE university as entity, are, thus, not clear cut.

Sun (2018), for example, outlines how students actively reconfigure their learning spaces as they engage online in teaching environments that are "placeless"—"participants immediately started configuring personal learning spaces as soon as they began the online course" (p. 944). In doing so, they engage in "a process of place-making in which students are making small but significant adjustments to their existing personal study spaces" (p. 944; emphasis added). This "place-making" includes digital and digital-material configurations such as downloading and printing materials and making screenshots of materials. Interestingly, the "place" of learning is also woven into the broader "social fabric" (Sun, 2018, p. 948) as students' "formal" learning spaces morphed with and/or overlapped with their informal extended learning spaces. An example of the fluidness of configurations of space, time, and place is seen when students who are learning a foreign language practice their learning with a librarian when checking out a book. "Students showed some skill in weaving together the fabrics, physical and digital, to provide further opportunities for their own learning and extend their online language-learning environments" (Sun, 2018, p. 948). Their learning therefore "spilled over" into other spaces and places and at different times. Figure 1 illustrates the overlapping configurations of space, time, and place in a DE learning context.

In this example, DE is disconnected from a physical, spatial, and time configuration but distributed and spills over (from left to right for the sake of illustration) into other physical locations (e.g., regional centres), "locations" in cyberspace (e.g., the LMS), specific configurations of place, space, and time wherever students are, and finally is entangled into students' socio, economic, political, legal, technical and

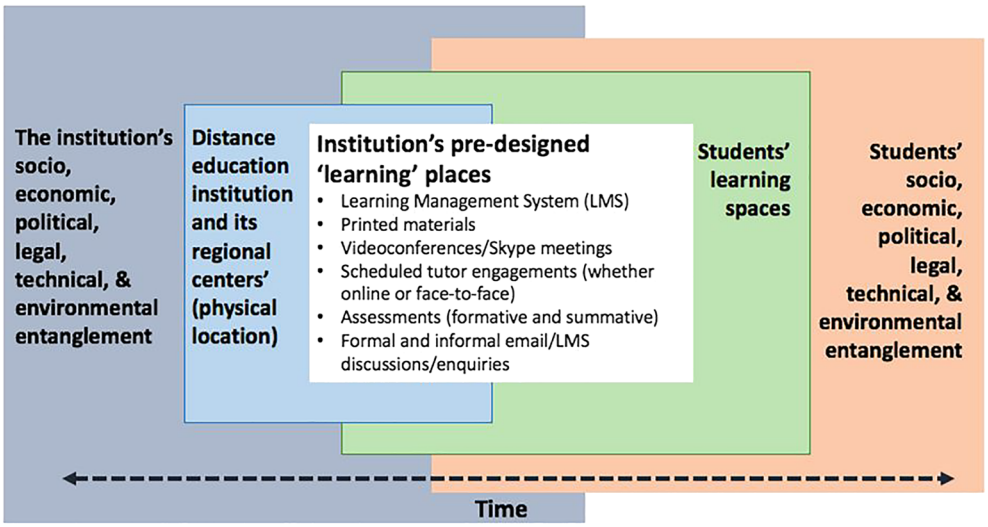

FIGURE 1 Learning taking "place" [Colour figure can be viewed at wileyonlinelibrary.com]

environmental context. Reimagining the university, in all of its nuances (Blewitt, 2012; Habib, 2016; Rousell, 2016; Tannock, 2017), and reframing it as an assemblage emphasise its relational nature. Ross et al. (2013) state that though "nearness" in the context of DE is seen as desirable, student engagement in DE "oscillates through a continuum of nearness and distance" and nearness is "neither a fixed state, nor one whose meaning is stable" and "must continually be assembled" (p. 52). They propose that the proximity or nearness of students to the providing DE institution and the various dimensions of distance (technological, relational, emotional, and spatial) in educational provision must be understood as a material assemblage. The physical boundaries of the institution are blurred by the materials that pass throughout and into the larger knowledge production and educational networks of education and research, and the university is reterritorialised through the remapping of the socio-materialities within the network (Fenwick & Edwards, 2010). This ad hoc assemblage of a variety of materials is brought together to create networks, connections, and flows that actualise the materials that make up the university.

The materialities of education have varied over time. This is particularly important in the context of DE, which depends on a range of technologies used in *education*—from pen to stylus to photocopy machines and on to computers (Al-Fahad, 2009; Monahan, 2008). Moreover, it is dependent on many different forms of *communication* between students and the university, involving another set of material objects—postage stamps and envelopes to radio and television and finally to computers and internet and through to cloud computing and perhaps intelligence-based platforms. The intermingling of technology with education is so fundamental that the history of DE is even periodised through these entanglements (Garrison, 1985). The technologies of education and those of communication have to come together to bridge distance and make education possible. Thus, the materialities of education are bound up with those of communication (Baocun, 2003).

Although most universities are increasingly online (whether to supplement face-to-face teaching or as only form of delivery), the materialities of DE are also somewhat distinctive. DE is a mass education system catering to large numbers of students simultaneously (Tavukcu, Arapa, & Özcan, 2011). This is often made possible by universities producing, or at least curating, bespoke material for use in their study (Lloyd, 2013). Time and effort are spent on designing and producing materials, irrespectively of whether they are made available on paper or digitally, as DE universities produce learning materials in more durable forms. The adjustments, the adlibbing, the contextualisation, and the provisionality that face-to-face offers are often removed. Instead, things quickly get "hard-wired" as materials have a long shelf-life. Moreover, "once the courses are prepared, the delivery costs of DE arise from the maintenance of large files and multiple simultaneous users and typically require considerable bandwidth. Together, these factors imply that distance-education courses and programmes have a relatively high share of fixed costs and require sufficient students to achieve economies of scale with delivery" (Zhang & Worthington, 2017, p. 1788).

This is not to say that the physicality of the university as a site no longer matters, especially as these technologies often co-exist with face-to-face education in contact universities in the form of blended learning. In considering the assumed "placelessness" of DE, whether with reference to the "place of learning" or to the geographical, time, and space differences between the delivering institution and its students, it is important to note that place, space, and time continue to matter, albeit differently from how these matter in residential educational settings. It is also crucial that we accept and foreground the fact that, depending on a specific geopolitical context, the configurations of time, space, and place are differently mattered than in other contexts. In the context of this study, namely, postapartheid South Africa, the intergenerational effects of historical configurations of space and time (Badat, 2009; Bangeni & Kapp, 2018; Gunter & Raghuram, 2016; Subotzky & Prinsloo, 2011) in the context of the "colonial present" (Vimalassery, Pegues, & Goldstein, 2016) is particularly pertinent. In an African and specifically South African context, issues such as service delivery, sustainability electricity, and affordable and consistent internet access and postal services differ from other contexts and

shape students' learning journeys (Badat, 2009; Gunter & Raghuram, 2018). However, before we turn to students' experiences, we explore the materialities turn in HE and what it can offer educational research.

2.1 | Materialities turn in HE

For Fenwick (2011), educational studies have shifted away from the poststructural paradigm to engage with knowledge flows, practice, and politics of the lifeworlds of students. There is thus a move to recognising how study is entangled with socio-material objects such as technology, bodies, text, discourse, and tools (Brooks & Waters, 2017; Fenwick, Edwards, & Sawchuk, 2015; Fenwick & Landri, 2012; Kontopodis & Perret-Clermont, 2016; Mittelmeier et al., 2019) and thus the materiality of learning. These materials create the context of study by showing the work that has to be done in order to enable study. The identity of a student is redrawn through the timely availability of educational materials, the ability to submit assignments, to have them received and acknowledged and to be able to pay the fees in order to have them marked. Sørensen (2009, p. 2) argues that there is a "blindness toward the question of how educational practice is affected by materials." However, the turn to technology has actually made engagements with the materialities of education more obvious. For instance, there is a large literature that highlights the limits of technological access and how this influences DE (Ertmer & Ottenbreit-Leftwich, 2013; Hong & Songan, 2011; Selwyn, 2013).

The issue of limited access to education materials and its influence on HE is particularly important in sub-Saharan Africa. As access to traditional knowledge was marginalised, the materialities of things, books, infrastructure, and IT equipment became the focus of the university to legitimise itself in a modern setting (Mamdani, 2016), whereas other materials disappeared. Hence, the centring of particular materialities of learning has always been part of the modern educational process on the continent.

Moreover, from the availability of books to internet access, the story of education is a story of inequalities in material access, subtended by race and locations (rural/urban) among others (Ofulue, 2011; Olakulehin, 2010; Yusuf, 2006). HE in Africa remains the preserve of the elite, with approximately only 18% of all youth in HE, and education is often seen as the path to better employment outcomes (Tamrat, 2018). However, existing systems of inequality on the continent are perpetuated in education where first generational enrolments are low (McMillan & Barrie, 2012). DE provides an alternative path for many students into the educational system and plays a significant role in bringing education into the grasp of more people (Subotzky & Prinsloo, 2011).

What socio-material approaches offer to educational research are resources systematically to consider how the unpredictability built into the entanglements of the different material objects is managed to make educational activity possible. They promote recognition of the multifarious struggles, negotiations, and accommodations whose effects constitute the "things" in education: students, teachers, learning activities and spaces, knowledge representations such as texts, pedagogy, curriculum content, and so forth. Rather than take concepts such as education as foundational categories, or objects with properties, they become explored effects of heterogeneous relations.

Thus, education cannot be seen as a pre-existing system but emerges through various forms of association, as network effects, which are materialised as a university (Fenwick & Edwards, 2010). This assemblage highlights how both nonhuman and human, things and people, come together and manage to stay together as a collective or network. What is the work required to make these networks and connections to create associations between and among things? As the network evolves, dissolves, and expands, some linkages work and others do not. Most importantly what does this mean for how the university materialises?

In education, studies drawing from these orientations explore ways that human and nonhuman materialities combine to produce particular purposes and effects in education (Roth & Mcginn, 1997). They examine the messy textures woven through different kinds of networks—and the resulting ambivalences—that intersect in pedagogical processes. Most phenomena are hybrid assemblages of materials, ideas, symbols, desires, bodies, natural forces, and so forth, but what work is required to produce these phenomena and to what effects? For example, how is the functioning university produced through patterns of assemblage and how does this unsettle the notion of the university as a physical location?

However, despite the wider turn to materialities of education in HE research, work on DE has largely eschewed questions of its materialities, instead focusing on the problems of distance and how this affects student experiences, pedagogy, assessment, and modes of delivery (Keegan, 1980, 1986; Peters, 1983; Holmberg, 1989; Moore, 1993; but see Lee, 2008). In particular, the question of how to transcend distance through pedagogical strategies, instructional design, and use of an increasing array of technologies has received attention (Anderson & Dron, 2011; Ascough, 2002). In much of this research, human agency in the form of student persistence or additional support is foregrounded and separated from the socio-material conditions in which the potential for and enactment of agency emerges. However, the institutional and individual strategies and materialities are intertwined and mutually constitutive.

DE in Africa has played a central role in expanding access to HE in the continent, where in South Africa, UNISA represents almost 40% of all students (UNISA, 2018). Since independence, many African countries have established a DE institution to further the reach of HE. The increase in access is an attempt to overcome the historical legacies of the colonial period and the dominant systems of knowledge production (Hoppers, 2000; Stack, 2016). The rise of the DE institution in Africa is thus linked to the evolution of knowledge production in the global south (Heydenrych & Prinsloo, 2010).

Many DE institutions in Africa are mega universities, with institutions like the National University of Nigeria, UNISA, the Open University of Zambia and Open University of Tanzania having hundreds of thousands of students. DE represents an important force in HE in these countries, as they enable students who cannot access contact universities an opportunity to study. This size has significant

implications for the nature of the university and the materialities that make up the university and for student interaction with the university.

As the African DE institution reaches to the students, and the student reaches to the university, a number of materialities aggregate to form the networks of study. These networks are often unstable and shifting. For example, electricity supply, internet connection, and even university centres themselves might be unreliable. Many African DE universities supplement their learning material with classes and contact sessions to try and overcome these unstable networks, students may also access libraries and computer laboratories on campus; however, this would be voluntary and not be a formal intervention. However, the reality is that infrastructure often remains patchy (Breines et al., 2019). Forming connections in the African context requires flexibility, fluidity, and an ability to adapt when the existing networks fail to bring the student and university together. Focusing on these strategies complements current research on the materialities of HE.

3 | METHODOLOGY

This paper is based on a research project exploring the role of the University of South Africa's (UNISA) DE provision in enabling equitable access to education in Africa (October 2016–June 2019). The study was a collaboration between UNISA and The Open University in the United Kingdom.

UNISA is one of the largest universities in Africa, with over 337,000 students (UNISA, 2018). About 29,000 of its students are international, defined as students who do not have either South African Citizenship or permanent residence status. The students are from 29 countries, but by far, the largest cohort are Zimbabweans. Other Southern African Development Community countries contribute large numbers due to a preferential fee regime and because of the perception of South Africa as a continental and regional hub for HE. The lack of locational requirements—no time has to be spent on a campus or centre in South Africa—coupled with its reputation as a provider of quality education in Africa has attracted many regional students (Mittelmeier et al., 2019).

The project employed a mixed-methods approach that included tracking students' learning outcomes using data analytics, a survey questionnaire with 1,295 students studying at UNISA, as well as semistructured interviews with 165 students (77 women and 88 men). The majority of the survey respondents were female (n = 710, 58%), which is in line with demographics across the institution. Due to purposive sampling, 369 students were South African (32%), and 772 were international students (i.e., not South African; 68%) from 24 countries across Africa, primarily from Zimbabwe (27%), Namibia (12%), Botswana (4%), Swaziland, and Zambia (each 3%). Twenty-four participants were from countries outside of Africa. Most students were black (n = 70%), followed by white (15%), mixed-race (5%), and Indian or Asian (4%).

The interviewees were recruited through their survey participation. Thirty lived in South Africa, 85 in Zimbabwe, 40 in Namibia, and 10 in Nigeria. DE students from the case countries were interviewed in English by six postdoctoral researchers over the duration of the study. The interviews were conducted via Skype to phone, which increased the accessibility to international students by facilitating "access to global research participants" (Deakin & Wakefield, 2014, p. 603). Three interview schedules were developed, which had a suite of common questions, but due to restrictions of time and internet connectivity, the second half of the schedules adopted three different foci: migration, social media, and student adaptation to the academic environment (Mittelmeier et al., 2019). The interviews were recorded, transcribed, and then coded in NVivo through a combination of deductive methods using the key themes in research design and inductive—coding structure based on emergent themes in the data. Materialities of education emerged as a theme across all three interview schedules and were therefore an emergent code. The in-depth analysis of the data, as well as the use of several methods of data collection, facilitated a deep understanding of DE in Africa and the broader context of UNISA students' learning environment. The analysis in this paper draws on the interviews where students emphasised the materialities of learning at a distance. In exploring DE students' engagement with materials, this paper aims to build an understanding of the distribution and aggregation of materials as they blur the boundaries of the university by passing through, out, and into it. In particular, we focus on the interviews that speak to the work that has to be done to make education possible.

4 | MATERIALISING THE UNIVERSITY AT A DISTANCE

DE institutions in Africa offer an excellent example of how seeing the university as a symbolic mooring of materials (Ploner, 2017) is inadequate. Instead, the university is better seen as a space of multiplicity through which knowledge circulates. In this section, we first explore how study occurs across many sites and the work it takes for the university to reach into these distributed spaces. We then explore the points at which the university is aggregated and how this plays out through student experiences. Finally, the conclusion explores what this means for defining the "place" of the university and how it is distributed across borders.

4.1 | The university distributed

For DE students, study space is not a distinctly different space from that of home or work. Although they are well aware of UNISA's physical existence in South Africa, the materialities relating to their own HE studies are primarily embedded in their daily lives. With many students using their office spaces to study after working hours or on weekends, it was also common for students to turn part of their homes into a study space, thus, extending the boundaries of the university and its materialities (Brooks & Waters, 2017). As such, students "enact" the university wherever they are (Bayne, Gallagher, &

Lamb, 2014). For DE students, this distributed nature of the university is not a shortcoming (Bayne et al., 2014; Sheail, 2018); rather, it is what makes HE possible:

> UNISA provided me with the solution to the difficult things that I was encountering as a parent and working, because I didn't have the opportunity to go to university before I found a job. At UNISA, I could study at my own time and secondly, they don't do what other universities do; they say, if a student is studying full time, their degree is three years; those studying part time, they also study for three years. I found it very difficult, but at UNISA you study at your own pace for any degree up to eight years. (Sabelo, black Zimbabwean man)

Internet access was essential so that the student could obtain study materials that were uploaded by UNISA and the studies could then be done at home. As such, it was the possibility of generating the material presence of UNISA that enabled students to turn their homes into study places. For Zandile, a black Zimbabwean man, the place of study was online rather than a spatial location: "Now I don't go to any office, my network is my office, I'm now doing everything online." For him, being far away from the UNISA's main campus was not an issue: "These days you can access some of the information through internet so it doesn't give me any difficulty." Sheail (2018, p. 66) uses the concepts of translocal and transtemporal to move beyond "the ubiquitous 'anytime, anywhere' notion of online learning and teaching, which fails to recognise the significance of context, of time taken in the practice of studying." In addition to the context shaping the ways in which students relate to their studies, home and work take on new meaning through DE; it is a place to study, a place to rest, a place to learn, and a place to engage with other students online. These may best be thought of as a "topological multiplicity," where students "enact" the university in spaces in which they find themselves (Bayne et al., 2014).

Access to education is linked to having access to an affordable, reliable internet connection at work, at home, and on their mobile phones. Laptops, mobile phones, and internet networks become nodes in the connections between university and home or work. But connectivity (or lack of it) can also mobilise students. Poor access to the internet (at work and home), more common for poorer students, means that they must become mobile and go to another location to access the internet (e.g., an internet café). The wealthier students with good internet at home or those with better jobs may do their study at home or work.

As the university is at a distance, it is not only the student who must connect to the university, but the university too relies on a range of modalities to reach into these study spaces. For UNISA, this involves the distribution of materials, such as supplying printed study materials to the students. Some students received all they needed within a matter of days, whereas others pointed out that they did not receive them before the end of semester:

> At times, we get the materials really late and at times we struggle, like really struggling. We can get the modules and the stuff when the assignments are two weeks away, so you have to race against time, you have to work extra hard, so that you meet the deadlines. Somehow we manage, but with difficulty. (Charlize, mixed-race woman, Zimbabwe)

Such issues of distribution were influenced by multiple factors:

> They sent the work out but there was a strike in the post office, so the work didn't arrive and we tried to access the work online instead but the website was down for maintenance. So by the time we got access to any work the deadline for the first assignment had already passed, which means we couldn't write the exam. (Susan, white woman, Zimbabwe)

In addition to the study materials provided by UNISA, students were also expected to obtain course-specific textbooks. These were not always easily available outside South Africa:

> The prescribed text books, that's my biggest challenge. Some of those text books, you have to buy them online in South Africa, but our banks, our economy it is not allowing us to do that, so some times you even go the extra mile whereby you could make some contact with some previous UNISA students or those who are travelling to South Africa. To be honest, in my previous experience I didn't even get any one prescribed text book, I just have to make do with what is there. (Thabo, black man, Zimbabwe)

Although students were physically distributed and distanced from UNISA's central campus, the university and students had to engage multiple means to connect, but the disconnections brought to the fore the materialities of DE. Internet enables UNISA to reach out to students across South Africa and beyond, but the interruptions to the internet connection as well as the various obstacles students faced in getting their hands on printed materials and textbooks illustrate that the distribution was at times patchy. Students have to be resilient to overcome these issues but are also influenced by these material objects. Their identity as students but also their behaviour and routines will be shaped by these materialities as Fenwick and Edwards (2011) suggest. Thus, focusing on DE students shows the new meanings that home takes in study. The home becomes a space for study, which materialises DE student's engagement with the university. Home is no longer a space that is left behind to attend university, which is often the case in, for example, international student migration (King & Sondhi, 2018). Second, DE students are often viewed as immobile (Hellman, 2003), but the materialities of education and their patchy distribution mobilise students to go out and find new places where they can connect to the university. Third, the university and its

material presence show the differences between students. Perhaps even more than face-to-face students, differential access to study materials can influence study trajectories. Materials therefore matter. Finally, all these point to how the university is distributed and the flows that are necessary for making study possible. Thus, rather than university as a place to which students go, perhaps it is more useful to consider the spaces of mobility for these students as fluid, as a type of hypermobility (Crampton, 2002) where near and far are mixed together in everyday life. The university becomes a mobile presence with the student, capable of being accessed on a mobile phone or computer, while at home or even when commuting or in the midst of preparing dinner. The location of the student does not limit access to the university.

4.2 | The university aggregated

Bayne et al. (2014) challenge the negative ascription of DE as that which is not on campus, as negatively defined, instead suggesting that "the material campus continues to be symbolically and materially significant for a group of students who may never physically attend that campus" (p. 569). However, the student's learning experience clearly has other moorings too as we explore below.

The connections between the place of study and the university have to be maintained in DE too. The distribution of UNISA materials takes different forms, as Thomas described:

> They make use of varied methods of delivering, like for example, they use the modules, they use the CD, there is a platform where you can call your lecturer, there is that discussion platform, and there is the my.unisa platform where you can engage with other students. (Zimbabwean, black, man)

Similarly, Lebo explains that at UNISA,

> [I have access to] … two Facebook pages for the module that I've just written, but they're very quiet, no one really uses them, but there is a WhatsApp group as well, which is Zimbabwean students, South African students and Zambian students, and that is very active even now when the exams. (Zimbabwean, black, man)

The online technologies and specific learning interface shape how students engage with UNISA and with other students (Breines et al., 2019). This becomes a path for both aggregating students and allowing them to coordinate the approach to studying at a distance.

The my.unisa platform (UNISA's official study platform) enables students to connect with the university and pursue their studies from various locations off campus. Thembi a black female student from Namibia, who was studying at UNISA and at the University of Namibia (UNAM) at the same time, outlined the significance of it:

> It was an online subject, completely online. It didn't have any books, so we had a discussion option on the my.unisa portal. There we would discuss and write.

The university has thus created online spaces, bringing human and nonhuman together; this changes the manner and expectation of interaction between student and institution, which impacts how the university distributes both knowledge and equally a sense of being part of the institution (Kem, 2018).

Many found the online communication to be working well and allowed for interaction beyond their immediate location. For Thembi, it was clear that the online interaction brought students together: "It's a totally different concept in group-work with people, but actually very interesting to see different opinions and experience all the people come from different backgrounds and different cultural groups." Although people's preferences of communication vary, it is clear that the online interaction is a process of aggregating people and ideas (see also Muhirwa, 2009).

The aggregation was not only online, but the students also relied upon other place-based practices to be students. For example, exams took place in exam centres and for international students, these were often located in their countries' capital. For those residing elsewhere, this required them to relocate temporarily, which required both time and money:

> From my location to the exam centre, if I go by bus, it's about five to six hours. So that means that for each exam period, I've had to transport myself and find accommodation. You have to go several times, so you find out that it becomes a financial burden to an average student. (Ogi, black man, Nigeria)

In this case, the experience of IDE students in UNISA was similar to those more commonly associated with HE. The aggregation of the university then takes a very different form for a fixed period of time. For some, these engagements disrupted their everyday aggregation of university spaces but, at the same time, gave the university a materialised and localised presence.

5 | CONCLUSION

This paper offers a first exploratory study of materialities in DE and how they potentially distribute and aggregate to form a network to provide education (Fenwick & Edwards, 2011). In doing so, the paper outlines some of the material assemblages that are formed in IDE in Africa. By exploring students' lived experiences through interviews, the paper has unpacked the multiplicity of networks needed to overcome the de-aggregated and distributed institution. The material aggregation that accompanies student experiences in the African DE context highlights the challenges that these students face when studying at a distance. These challenges bring into question how different materialities shape DE and how spaces become connected and

disconnected. The materialities in DE produce forces and effects, such as translocal and transmobilites that are more than just the human actor but extrude materials, networks, and connectives that transform continuously (Brooks & Waters, 2017). For the DE student, the interconnectivities of home and the university or student and institution require enabling technology to bring it together, but infrastructure does not always allow for the facilitation of this aggregation.

Our understanding of the traditional university is thus forced to change when looking at DE (Baocun, 2003). The university becomes a space of multiplicity, as knowledge and ideas move between and across spaces. The physical university becomes a type of psychological mooring of materials, yet the student may never have physically seen or encountered this space Deconstructing the university as a place enables us to show how the university is distributed across space but also aggregated by students (Fenwick, 2011). By opening up the space of learning in DE and redefining institutional space, this paper argues that the university is fluid, multifaceted, and connected along networks and relationships that change and adapt along with the student's socio-material environment. Spaces such as home, work, and university become intrinsically linked in new ways. These links can be strengthened or weakened depending on the materialities within and between the spaces. This has implications for future research in HE, particularly in Africa, where infrastructures remain precarious. The materialities that make up the network of the university need to be better understood to enable both students and academics to strengthen these assemblages.

The impact of the materialities of not being "at" university forces different assemblages to arise that are unique to the DE environment (Fenwick & Edwards, 2010). Despite the complexities of trans-border interaction, DE students have had to make sense of studying "anywhere, anytime, and anyplace" drawing on the materialities of their locale to do so. Although the claim of borderlessness and timelessness creates the impression of disembodiment, decontextualised, and place-less learning, our research provides evidence of students enacting the university where they are (Sheail, 2018). This means that students then create their own perceptions of nearness and distance depending on the strength of their networks and the materialities they have at their disposal both spatially and temporally. Although DE students in Africa may not always be connected to the institution, they are proactive in bringing together the materialities of studying at a distance. This form of connectivity is neither fixed nor stable but must constantly be assembled. The dimensions of distance (technological, relational, emotional, and spatial) in DE are then material assemblages at particular times and in particular places.

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ENDNOTES

[1] We need to acknowledge, from the outset, that online and distance education are not homogenous phenomena and that although all distance education assumes a geographical separation between the delivering institution and students, the fastest growing trend in online education may take place in residential, on-campus institutions (Canadian Digital Research Association, 2019).

REFERENCES

Al-Fahad, F. N. (2009). Students' attitudes and perceptions towards the effectiveness of mobile learning in King Saud University, Saudi Arabia. *The Turkish Online Journal of Educational Technology*, *8*(2), 1–9.

Allen, I. and Seaman, J., (2017). Digital Compass Learning: Distance Education Enrollment Report 2017. Babson survey research group. Retrieved from https://eric.ed.gov/?id=ED580868.

Altbach, P.G., Reisberg, L., and Rumbley, L.E., (2009). Trends in Global Higher Education: Tracking an Academic Revolution. A Report Prepared for the UNESCO 2009 World Conference on Higher Education. Retrieved from http://www.cep.edu.rs/public/Altbach,_Reisberg,_Rumbley_Tracking_an_Academic_Revolution,_UNESCO_2009.pdf.

Anderson, T., & Dron, J. (2011). Three generations of DE pedagogy. *The International Review of Research in Open and Distributed Learning*, *12*(3), 80–97. https://doi.org/10.19173/irrodl.v12i3.890

Anderson, T., & Dron, J. (2012). Learning technology through three generations of technology enhanced distance education pedagogy. *European Journal of Open, Distance and e-learning*, *15*(2), 23–38.

Ascough, R. S. (2002). Designing for online distance education: Putting pedagogy before technology. *Teaching theology and religion*, *5*(1), 17–29. https://doi.org/10.1111/1467-9647.00114

Bacevic, J. (2019). With or without U? Assemblage theory and (de) territorialising the university. *Globalisation, Societies and Education*, *17*(1), 78–91. https://doi.org/10.1080/14767724.2018.1498323

Badat, S. (2009). Theorising institutional change: Post-1994 South African higher education. *Studies in Higher Education*, *34*(4), 455–467. https://doi.org/10.1080/03075070902772026

Bangeni, B., & Kapp, R. (2018). Negotiating learning and identity in higher education: Access, persistence and retention. *Canadian Journal of Education*, *41*(1), 1E–4E.

Baocun, L. (2003). What is the university: An analysis of the Western ideologies about the university. *Comparative Education Review*, *4*, 1–24.

Bates, A. W. (2015, 20 December). Teaching in a digital age. Retrieved from https://irl.umsl.edu/oer/6/

Bayne, S., Gallagher, M. S., & Lamb, J. (2014). Being 'at' university: The social topologies of distance students. *Higher Education*, *67*, 569–583. https://doi.org/10.1007/s10734-013-9662-4

Blewitt, J. (2012). The future of the public library: Reimagining the moral economy of the 'people's university'. *Power and Education*, *4*, 106–116. https://doi.org/10.2304/power.2012.4.1.106

Boling, E., Hough, M., Krinsky, H., Hafiz, S., & Stevens, M. (2012). Cutting the distance in distance education: Perspectives on what promotes

positive, online learning experiences. *The Internet and Higher Education*, *15*(2), 118–126. https://doi.org/10.1016/j.iheduc.2011.11.006

Boyd, S. (2018). *Making digital compost: Place-responsive pedagogy at a distance*. Zagreb: Paper presented at the Networked Learning Conference. Retrieved from. https://www.networkedlearningconference.org.uk/abstracts/papers/boyd_19.pdf

Bozalek, V., & Zembylas, M. (2017). Towards a response-able pedagogy across higher education institutions in post-apartheid South Africa: An ethico-political analysis. *Education as Change*, *21*(2), 62–85. https://doi.org/10.17159/1947-9417/2017/2017

Breines, M., Raghuram, P., and Gunter, A. (2019). Infrastructures of immobility: Enabling international distance education students in Africa to not move, *Mobilities*, in-press. https://doi.org/10.1080/17450101.2019.1618565

Brooks, R., & Waters, J. (2017). *Materialities and mobilities in education*. London: Routledge.

Canadian Digital Research Association (2019). Tracking Online and Distance Education in Canadian Universities and Colleges: 2018. Retrieved from https://onlinelearningsurveycanada.ca/publications-2018/

Craig, R. (2015). *College disrupted: The great unbundling of higher education*. New York: Palgrave Macmillan Trade.

Crampton, J. (2002). Virtual geographies: The ethics of the Internet. In J. Proctor, & D. Smith (Eds.), *Geography and Ethics*. London: Routledge.

Crawford-Ferre, H. G., & Wiest, L. R. (2012). Effective online instruction in higher education. *Quarterly Review of Distance Education*, *13*(1), 11–16.

Deakin, H., & Wakefield, K. (2014). Skype interviewing: Reflections of two PhD researchers. *Qualitative research*, *14*, 603–616. https://doi.org/10.1177/1468794113488126

Edwards, R., & Usher, R. (2007). *Globalisation and pedagogy: Space, place and identity*. London: Routledge.

Ertmer, P. A., & Ottenbreit-Leftwich, A. (2013). Removing obstacles to the pedagogical changes required by Jonassen's vision of authentic technology-enabled learning. *Computers and Education*, *64*, 175–182. https://doi.org/10.1016/j.compedu.2012.10.008

Evans, T. (1989). Taking place: The social construction of place, time and space, and the (re) making of distances in distance education. *Distance Education*, *10*, 170–183. https://doi.org/10.1080/0158791890100203

Fenwick, T. (2011). Reading educational reform with actor network theory: Fluid spaces, otherings, and ambivalences. *Educational Philosophy and Theory*, *43*, 114–134. https://doi.org/10.1111/j.1469-5812.2009.00609.x

Fenwick, T., & Edwards, R. (2010). *Actor-network theory and education*. London: Routledge.

Fenwick, T., & Edwards, R. (2011). Introduction: Reclaiming and renewing actor network theory for educational research. *Educational Philosophy and Theory*, *43*(1), 1–14. https://doi.org/10.1111/j.1469-5812.2010.00667.x

Fenwick, T., Edwards, R., & Sawchuk, P. (2015). *Emerging approaches to educational research: Tracing the socio-material*. New York: Routledge.

Fenwick, T., & Landri, P. (2012). Materialities, textures and pedagogies: Socio-material assemblages in education. *Pedagogy, Culture and Society*, *20*(1), 1–7. https://doi.org/10.1080/14681366.2012.649421

Friedman, J., & Silberman, J. (2003). University technology transfer: Do incentives, management, and location matter? *The Journal of Technology Transfer*, *28*(1), 17–30. https://doi.org/10.1023/A:1021674618658

Garrison, D. R. (1985). Three generations of technological innovations in distance education. *Distance Education*, *6*(2), 235–241. https://doi.org/10.1080/0158791850060208

Gunter, A., & Raghuram, P. (2016). Internationalization, localization, and the eduscape of higher education in the global south. In M. van Riemsdijk, & Q. Wang (Eds.), *Rethinking International Skilled Migration*. London: Routledge.

Gunter, A., & Raghuram, P. (2018). International study in the global south: Linking institutional, staff, student and knowledge mobilities. *Globalisation, Societies and Education*, *16*(2), 192–207. https://doi.org/10.1080/14767724.2017.1401453

Habib, A. (2016). Transcending the past and reimagining the future of the South African university. *Journal of Southern African Studies*, *42*(1), 35–48. https://doi.org/10.1080/03057070.2016.1121716

Hellman, J. A. (2003). *The riddle of distance education: Promise, problems and applications for development*. New York: United Nations Research Institute for Social Development.

Heydenrych, J. F., & Prinsloo, P. (2010). Revisiting the five generations of distance education: Quo vadis? *Progressio*, *32*(1), 5–26.

Holmberg, B. (1989). The concept, basic character and development potentials of distance education. *Distance Education*, *10*(1), 127–134. https://doi.org/10.1080/0158791890100110

Holmberg, B. (2005). *The evolution, principles, and practice of distance education*. Oldenburg: BIS-Verlag der Carl von Ossietzky Universität Oldenburg.

Hong, K., & Songan, P. (2011). ICT in the changing landscape of higher education in Southeast Asia. *Australasian Journal of Educational Technology*, *27*(8), 1276–1290. https://doi.org/10.14742/ajet.893

Hoppers, C. (2000). African voices in education: Retrieving the past, engaging the present and shaping the future. *African Voices in Education*, *6*, 1–11.

Jandrić, P., & Hayes, S. (2019). Who Drives the Drivers? Technology as the Ideology of Global Educational Reform. In The Mundy, I (Ed.), *Wiley Handbook of Global Educational Reform*. New York: John Wiley and Sons, Inc.

Keegan, D. (1980). On defining distance education. *Distance Education*, *7*, 13–35. https://doi.org/10.1080/0158791800010102

Keegan, D. (1986). *The foundations of distance education*. London: Croom Helm.

Kem, D. (2018). Role of information and communication technology in open and distance learning. *Research journal of Social sciences*, *9*, 89–103.

King, R., & Sondhi, G. (2018). International student migration: A comparison of UK and Indian students' motivations for studying abroad. *Globalisation, Societies and Education*, *16*, 176–191. https://doi.org/10.1080/14767724.2017.1405244

Kontopodis, M., & Perret-Clermont, A. N. (2016). Educational settings as interwoven socio-material orderings: An introduction. *European journal of psychology of education*, *31*(1), 1–12. https://doi.org/10.1007/s10212-015-0269-2

Lee, F. (2008). Technopedagogies of mass-individualization: Correspondence education in the mid twentieth century. *History and Technology*, *24*(3), 239–253. https://doi.org/10.1080/07341510801900318

Lloyd, P. (2013). Embedded creativity: Teaching design thinking via distance education. *International Journal of Technology and Design Education*, *23*(3), 749–765. https://doi.org/10.1007/s10798-012-9214-8

Mamdani, M. (2016). Between the public intellectual and the scholar: Decolonization and some post-independence initiatives in African higher education. *Inter-Asia Cultural Studies*, *17*(1), 68–83. https://doi/full/10.1080/14649373.2016.1140260#metrics-content

McCowan, T. (2017). Higher education, unbundling, and the end of the university as we know it. *Oxford Review of Education*, *43*(6), 733–748. https://doi.org/10.1080/03054985.2017.1343712

McMillan, W., & Barrie, R. (2012). Recruiting and retaining rural students: Evidence from a faculty of dentistry in South Africa. *Rural and Remote Health*, *1855*, 1–10.

Mittelmeier, J., Rogaten, J., Long, D., Dalu, M., Gunter, A., Prinsloo, P., & Rienties, B. (2019). Understanding the early adjustment experiences of undergraduate distance education students in South Africa. *The*

International Review of Research in Open and Distributed Learning, *20*(3). https://doi.org/10.19173/irrodl.v20i4.4101

Monahan, T. (2008). Picturing technological change: The materiality of information infrastructures in public education. *Technology, Pedagogy and Education*, *17*, 89–101. https://doi.org/10.1080/14759390802098581

Moore, M. G. (1993). Theory of transactional distance. In D. Keegan (Ed.), *Theoretical principles of distance education*. New York: Routledge.

Morris, N., Swinnerton, B., & Czerniewicz, L. (2019). Unbundling education: Mapping the changing nature of Higher Education in South Africa-ESRC. *Impact*, *1*, 44–46. https://doi.org/10.21820/23987073.2019.1.44

Muhirwa, J. M. (2009). Teaching and learning against all odds: A video-based study of learner-to-instructor interaction in international distance education. *The International Review of Research in Open and Distributed Learning*, *10*, 768–780. https://doi.org/10.19173/irrodl.v10i4.628

Ofulue, C. (2011). Survey of barriers affecting the use of information communication technologies (ICTS) among distance learners: A case study of Nigeria. *Turkish Online Journal of Distance Education*, *12*(3), 142–154.

Olakulehin, F. (2010). Open flexible lifelong learning as a catalyst for sustainable development in sub-Saharan Africa. *Turkish Online Journal of Distance Education*, *11*(4), 171–180.

Peters, O. (1983). Distance teaching and industrial production: A comparative interpretation in out- line. In D. Stewart, D. Keegan, & B. Holmberg (Eds.), *Distance education: International perspectives*. London: Croom Helm.

Peters, O. (2001). *Learning and teaching in distance education. Pedagogical analyses and interpretations in an international perspective*. London: Routledge.

Peters, O. (2010). *Distance education in transition: Developments and issues*. Oldenburg: BIS-Verlag der Carl von Ossietzky Universität.

Ploner, J. (2017). Resilience, moorings and international student mobilities—Exploring biographical narratives of social science students in the UK. *Mobilities*, *12*, 425–444. https://doi.org/10.1080/17450101.2015.1087761

Poellhuber, B., Anderson, T., & Roy, N. (2011). Distance students' readiness for social media and collaboration. *The International Review of Research in Open and Distributed Learning*, *12*(6), 102–125. https://doi.org/10.19173/irrodl.v12i6.1018

Rizvi, F., & Lingard, B. (2011). Social equity and the assemblage of values in Australian higher education. *Cambridge Journal of Education*, *41*(1), 5–22. https://doi.org/10.1080/0305764X.2010.549459

Ross, J., Gallagher, M. S., & Macleod, H. (2013). Making distance visible: Assembling nearness in an online distance learning programme. *The International Review of Research in Open and Distributed Learning*, *14*, 51–67.

Roth, W. M., & McGinn, M. K. (1997). Science in school and everywhere else: What science educators should know about science and technology studies. *Studies in Science Education*, *29*, 1–44.

Rousell, D. (2016). Dwelling in the Anthropocene: Reimagining university learning environments in response to social and ecological change. *Australian Journal of Environmental Education*, *32*, 137–153. https://doi.org/10.1017/aee.2015.50

Selwyn, N. (2013). *Distrusting educational technology: Critical questions for changing times*. London: Routledge.

Sheail, P. (2018). The digital university and the shifting time–space of the campus. *Learning, Media and Technology*, *43*, 56–69. https://doi.org/10.1080/17439884.2017.1387139

Sørensen, E. (2009). *The materiality of learning: Technology and knowledge in educational practice*. Cambridge, New York: Cambridge University Press.

Stack, M. (2016). *Global university rankings and the mediatization of higher education*. London: Springer.

Subotzky, G., & Prinsloo, P. (2011). Turning the tide: A socio-critical model and framework for improving student success in open distance learning at the University of South Africa. *Distance Education*, *32*(2), 177–193. https://doi.org/10.1080/01587919.2011.584846

Sun, J. C. Y., & Rueda, R. (2012). Situational interest, computer self-efficacy and self-regulation: Their impact on student engagement in distance education. *British Journal of Educational Technology*, *43*(2), 191–204. https://doi.org/10.1111/j.1467-8535.2010.01157.x

Sun, S. Y. (2018). Student configuration and place-making in fully online language learning. *Computer Assisted Language Learning*, *31*(8), 932–959. https://doi.org/10.1080/09588221.2018.1466808

Swinnerton, B., Ivancheva, M., Coop, T., Perrotta, C., Morris, N.P., Swartz, R., Czerniewicz, L., Cliff, A. and Walji, S. (2018). The unbundled university: Researching emerging models in an unequal landscape. Preliminary findings from fieldwork in South Africa. In *Proceedings of the 11th International Conference on Networked Learning* (218-226). Leeds.

Tamrat, W. (2018). Private higher education in Africa: Old realities and emerging trends. *International Journal of African Higher Education*, *4*(2), 17–30. https://doi.org/10.6017/ijahe.v4i2.10295

Tannock, S. (2017). No grades in higher education now! Revisiting the place of graded assessment in the reimagination of the public university. *Studies in Higher Education*, *42*, 1345–1357. https://doi.org/10.1080/03075079.2015.1092131

Tavukcu, T., Arapa, I., & Özcan, D. (2011). General overview on distance education concept. *Procedia-Social and Behavioral Sciences*, *15*, 3999–4004. https://doi.org/10.1016/j.sbspro.2011.04.404

Thomas, P. A., Kern, D. E., Hughes, M. T., & Chen, B. Y. (2016). *Curriculum development for medical education: A six-step approach*. Baltimore: JHU Press.

UNISA. (2018). Facts and Figures. Available from https://www.unisa.ac.za/sites/corporate/default/About/Facts-&-figures.

Vimalassery, M., Pegues, J. H., & Goldstein, A. (2016). Introduction: On colonial unknowing. *Theory and event*, *19*(4), 1–16.

Wang, W. K. (1975). The unbundling of higher education. *Duke Law Journal*, *1*, 53–91.

Wihlborg, M., & Robson, S. (2018). Internationalisation of higher education: Drivers, rationales, priorities, values and impacts. *European Journal of Higher Education*, *8*, 8–18. https://doi.org/10.1080/21568235.2017.1376696

Yusuf, M. O. (2006). Problems and prospects of distance education in Nigeria. *Turkish Online Journal of Distance Education*, *7*(1), 1–12.

Zhang, L., & Worthington, A. (2017). Scale and scope economies of distance education in Australian universities. *Studies in Higher Education*, *42*(9), 1785–1799. https://doi.org/10.1080/03075079.2015.1126817

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