

The Subjectification of Black Engineering Educators: A Posthumanist Cartography

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Abstract

We are three Black engineering educators in South Africa who are inspired by the work of Ezekiel Dixon-Román and Eve Tuck. We critique several so-called “universal truths” that are apparent in engineering education from a posthumanist standpoint and focus on the subjectification of Black engineering academics. We draw a cartography of engineering education, to show how subjectivities are influenced by powerful agencies. The cartography gives an idea of the *potestas* that is exerted upon educators as a result of historical forces. We then give an idea of the *potentia* that is possible through micro-instances of activism.

Keywords

posthumanism, engineering education, post-qualitative, cartography, Black subjectivity

Introduction

We are three Black engineering educators who are employed at two universities in Cape Town, South Africa. For this special issue, we are inspired by the work of several of the presenters on the Post Philosophies webinar series but will focus mainly on the scholarship of Ezekiel Dixon-Román and Eve Tuck.

In this article, we draw a critical cartography of engineering education in South Africa, focusing on geomatics and electrical engineering. As expounded by Braidotti (2002),

A cartography is a theoretically-based and politically-informed reading of the present . . . As such it responds to my two main requirements, namely to account for one’s locations in terms both of space (geo-political or ecological dimension) and time (historical and genealogical dimension), and to provide alternative figurations or schemes of representation for these locations, in terms of power as restrictive (*potestas*) but also as empowering or affirmative (*potentia*). (p. 2)

A cartography can help to account for people’s situated historical locations, and also assist to show how a specific type of subject (Black engineering educator) has been promoted and produced through engineering education and practice in South Africa. We supplement our cartography by diffractively reading together selected theorists (mainly Tuck and Dixon-Román) with the development of engineering education in our context. Diffractive reading is a

strategy that involves, “reading insights through one another in ways that help illuminate differences as they emerge: how different differences get made, what gets excluded, and how those exclusions matter” (Barad, 2007, p. 30). Diffraction helps us to make connections across space and time to unearth patterns such as dualisms in our contexts. Cartography and diffraction are complementary methodologies—for example, cartography is diffractive when reading the present through theory/data/place/time in affirmative and more than representational ways.

The critical cartography combines Foucault’s power/knowledge (Foucault, 1980) and Deleuzoguattarian desire (Deleuze & Guattari, 1987). Following Braidotti (2013), our argument is situated and partial—we admit that our cartography does not claim to be an authoritative historical account of engineering education, and that engineering curricula are created as a result of power relations in context. We also note that Foucault and Deleuze come in for criticism for their simplistic and romanticized understanding of labor (Tuck & Yang, 2014). Tuck’s notion of desire-based research is used to move our critique in an affirmative direction. Tuck’s writing is in the context of research on

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marginalized peoples, who are constantly being mapped out, but always along lines that reify their marginalization. We see Tuck's (2010) "break up" with Deleuze as a diffractive move—it is not a wholesale rejection of his notion of desire, yet it adds a level of complexity by considering Indigenous worldviews. Dixon-Román's (2016a) notion of the ontology of data helps us to understand data as an assemblage that is materially and discursively produced from a multiplicity of apparatuses including sociopolitical relations of power and difference.

The analysis assists us to critique several so-called "universal truths" that are apparent in engineering education and the academy. We do this from a posthumanist/new materialist/non-representational standpoint and focus on the subjectification of Black academics and students in the South African higher education context. It shows how the odds are stacked against us to fully realize our potential. The cartography hopes to give the reader an idea of the massive *potestas* that is exerted upon engineering students and educators as a result of historical, environmental, and socio-political forces. We then give an idea of the *potentia* that is possible through micro-instances of activism.

Our Positionalities

Siddique is employed at a historically White university, in the department of civil engineering. Prior to that, he taught geomatics students. During apartheid, he was labeled as "Indian South African" due to his Indian ancestry. This put him in an unprivileged position in apartheid South Africa and a slightly advantaged position in the "new" South Africa, depending on the context.

Khaled is employed at a university of technology, in the department of electrical engineering. Prior to that, he was a staff member at a university in North Africa. Khaled immigrated to South Africa from Egypt and was granted permanent residency. He believes that colonization haunts all African nations, and that South Africa has a good opportunity to contribute meaningfully to decolonization, social justice, and human rights in the African continent, but it is—and will be—faced by forces that resist this change.

Marco is employed at the same university of technology as Khaled, in the same department. Under apartheid, he was classified as Colored.¹ Under the new dispensation, he is regarded as Black which includes the term Colored. The past continues to haunt the present.

We look to Dixon-Román for guidance on how data haunt us and represent us and Others within our university assemblages. The ghosts of racialization continue to haunt us, and we are often classified a priori. We show that, despite conscious efforts toward excellence, the logic of settler colonialism is pervasive. Taking seriously Tuck and Yang's (2014) advice on not to let our work be simplified as damage-centered research, the cartography requires a

balancing of critique with creativity, so we explore how our pedagogical outlook seeks to counter the influence of hierarchizations of bodies. We focus on the disciplines of geomatics and electrical engineering which fall under the umbrella of engineering education.

Data for this research emanate from several interviews with Black academics at South African universities, and, following post-qualitative advice, is emergent out of our practices. We draw on 20 interviews with Black academics in engineering faculties at two South African universities, which form part of two complimentary studies in engineering education. The interviews form part of an assemblage of data, together with our own experiences and desires, our institutional contexts, moods, and silences. We are committed to be "for some worlds" (Motala & Bozalek, 2022, p. 254) and foreground the Black experience. Following Tuck's (2009) desire-based research, we do not want our work to account only for "loss and despair, but also the hope, the visions, the wisdom of lived lives and communities" (p. 417).

Engineering Education: A Cartography

In this section, we draw a cartography of engineering education in South Africa, focusing on geomatics and electrical engineering. Motala and Stewart (2021) draw a cartography of geomatics education in South Africa, and show how early geomatics education was geared toward Whiteness and maleness. This education benefited directly from the subjugation of Black and female subjects and contributed to the degradation of the natural environment in the name of "progress." In this article, we build on the cartography by adding and analyzing electrical engineering education.

Agents

In South Africa, we can identify several powerful agencies which have a direct influence on the practice of engineering education (and, by extension, engineering practice itself). The agencies are non-human agents, industry, universities, and government. Each can be seen as apparatuses, which, in turn, are co-constituted by assemblages of data (Dixon-Román, 2017). Dixon-Román argues (2016a) that "data are not independent of ideology, techniques, political interest, economic forces, people, cultural practices, and context. Data have histories and are temporally and spatially produced" (p. 484). Black staff and students may be represented as data, and this representation in turn plays a role in their performative self-definition. Furthermore, these four agencies can be directly mapped onto Dixon-Román's (2016a) elements of data assemblage. These agencies are iteratively analyzed and policed, and in turn shape and form the lives of educators and students.

Non-human agents. Without the inclusion of the land, water, fossil fuels, and technology, this list risks promoting anthropocentrism. The stories of colonization and engineering practice are intimately entangled with valuable land and resources. Land is the agent which is surprisingly silent in much of the literature on land surveying. This is largely due to the humanistic nature of the dominant engineering epistemology and its incommensurability with decolonization—after all, Tuck and Yang (2012) remind us that decolonization is not a metaphor. Electricity generation relies on renewable natural resources (solar, water, and wind) and more so in South Africa, fossil fuels such as coal. Western epistemology ignores Indigenous ways of being-with the land, and assumes that land is inert (Ghosh, 2016). Other non-human agents are technology and data. Unlike the land, there is much attention paid to these agents in the literature. Taking a new materialist stance makes us realize the vibrancy of the land; furthermore, Dixon-Román (2016a) allows us to “profoundly rethink the ontology of data as not an inert entity but rather a lively and vibrant conception of digital data” (p. 483). Digital data shape our lives through algorithms that form racialized assemblages. During the COVID-19 pandemic, the move to online learning has amplified the importance of technology, but also highlighted the asymmetrical precarity of students, which makes visible the material vulnerability of certain groups, such as Black students (Motala, 2020).

Universities. Universities are where the teaching and learning of engineers happens, during a pre-determined period governed by strict timetables. There is a close relationship between South African universities and the government. In Dixon-Román’s ontology, places (e.g., universities), practices (education), communities (students and staff), and systems of thought (engineering education) may be seen as apparatuses that produce data which in turn are analyzed and hierarchized. This analysis (usually by powerful agents) then goes on to inform how the human and non-human agents are treated and utilized. Later, in this article, we describe how universities were implicated in the propagation of apartheid logic through such practices as eugenics.

Government. There are several government agencies that have a direct influence on the geomatics and electrical engineering professions, such as the ministries of education and the South African Qualifications Authority. They articulate a philosophical vision for qualifications in line with the South African Constitution. In addition, the national imperatives that relate to the practice of our branches of engineering are operationalized through several departments and entities, and a significant number of graduates would be employed by them. Statutory councils regulate the engineering professions and have a direct influence on university curricula. At a local level, municipalities influence the professions too.

Industry. This is a very broad category and refers to companies or entities in which graduates could be employed. Examples include surveying companies, power plants (e.g., nuclear power plants), solar and wind energy farms, consulting engineers, and corporate companies (such as retailers, mining companies, or insurance companies). Note that this is very simplistic and does not include other agents who are outside the universities and do not fall into any of these groups, such as non-governmental organizations, civil society bodies, and unemployed people. They are agents in their own right, but they have historically been excluded from this arrangement.

Historical Development

The history of engineering education in South Africa can be simplistically told as such: the resource-rich African colony was needed by industries to create profit for the owners of the industry, not only in the new colony, but in the home colonial power. After some time and acclimatization, local engineering education was required to feed the hungry industries. Curricula were developed to service the needs of the powerful, and government policy supported both the exploitation of the natural environment, and the Indigenous people who were viewed as sub-human and sources of cheap labor, and racialization and sexualization of the education system to favor a certain group of people. Government also exercised their power through accreditation processes. The postcolonial and post-apartheid education system still maintains many of the early power relations.

Surveying education in South Africa still pays homage to the achievements of the great White surveyor-explorers and their colonial masters, who ostensibly brought progress to the wild, untamed subcontinent. Their maps and chronicles silenced the Indigenous population and give the impression that Southern Africa was *terra nullius* (Motala, 2020). As more land and resources (such as gold and diamonds) were “discovered,” better maps were needed, and technical education improved. As the British colony, the 19th century grew and more land was claimed, the government was pre-occupied with granting legal title to White subjects. The beginnings of the conflation of ethics and accuracy can be observed around this period. The increasingly legalistic nature of land surveying was also being formalized within an environment that was guided by early Christian morals. In a posthumanist ontology (Braidotti, 2006), there is a clear difference between morality (the normative stance taken by a society in a particular context and which exerts *potestas* over subjects) and ethics, which is related to how subjects deal responsibly with alterity. In early engineering education, alterity was not considered, and engineers were predominantly White and male.

The history of power supply in South Africa as a coordinated industry started in 1906 (Richards et al., 1948). This year marked the advent of large-scale generation and

distribution of electricity. Power supply to the gold mines on the Witwatersrand was a critical national imperative. By 1900, the major centers like Johannesburg, Cape Town, and Durban were being supplied with electricity. R. Christie (1984) explains that within the market economy, a major function of engineers in general is to save labor in the production of wealth and prosperity, mainly for the benefit property owners. This humanist view of the engineering profession shows that “the profession of engineering has historically served the status quo, feeding an ever-expanding materialistic and militaristic culture” (Riley, 2008, p. iv). This culture is seen as a capitalist culture, where

capitalism, through its process of production, produces an awesome schizophrenic accumulation of energy or charge, against which it brings all its vast powers of repression to bear, but which nonetheless, continues to act as capitalism’s limit. (Deleuze & Guattari, 1983, p. 34)

Old property ownership patterns haunt South Africa today, with the majority of South African private land (agricultural and urban) still being owned by Whites (Department of Rural Development and Land Reform, 2017).

During the apartheid era, academic publications in geomatics and electrical engineering education were relatively silent on the plight of Black South Africans. Silence on the abnormal nature of South African society by White academics could be viewed pragmatically. One could simply blame them for ignoring the plight of the Black populace and the atrocities of their government. However, there was much state-sanctioned violence, and there was a very real threat of violence against those who spoke out against the government, something that we (Siddique and Marco, whose families were involved in the struggle against apartheid²) can attest to. The sympathetic White voices were in the minority, and there was an environment which supported what Tronto (1993) calls their “privileged irresponsibility.” The result is that much of the engineering scholarship of the time appears ahistorical (e.g. Scogings, 1982). In rare cases, authors situate their practice as part of a troubled, divided society, with entrenched boundaries. Not all literature towed the line of the racist government though, and there were a few critical voices that queried the progress from the point of view of the downtrodden. For example, during the apartheid era, R. Christie (1984) cogently pointed out that

Electricity was not used in the 20th Century South Africa to serve the common good but was used by the capitalist state and by owners of property to serve their own particular interests of control and capital accumulation. (p. 204)

With the dawn of democracy in South Africa, Steyn (1995) explains that South Africa embarked on a national electrification program and had simultaneously began

restructuring its electricity supply to adjust to the new constitutional imperatives. In South Africa, the surveying and electricity supply systems have been acknowledged to be exemplary, but this is only one side of the story. While scholarship focuses on technical aspects of our disciplines, there is silencing toward social and environmental issues. Leydens and Lucena (2018) explain that issues of social and environmental justices are usually not included in engineering education, but rather left to the lecturer’s interest.

In an interview with an engineering academic, they exhibited a sense of resignation to the dominance of hard science in the hard/soft science dualism. In discussing the curricular reform in the geomatics curriculum at their university:

We haven’t really considered [environmental issues] because we are so concerned with the challenges of our own technical requirements of the discipline, so how do we put all that in? To make space for something else like this, as valuable as it may be, is difficult.

The above statement was made in response to a question about how to teach for an awareness of environmental ethics. As alluded to, technical issues take precedence over others. We recognize, through posthumanist ethics, a silencing of alterity by ignoring the plight of the environment (the naturalized other) as well as the plight of Black subjects (the racialized others; Braidotti, 2013).

Essex and De Groot (2019) explain that the energy transition in South Africa in the period 1860–2019 can be divided into the following four phases: colonial, apartheid, post-apartheid, and low-carbon phases. The agendas influence the generation, distribution, and consumption of electricity are multiple and potentially conflicting, which are emblematic of the limitations of the modern infrastructure ideal, particularly in relation to the formation of an “energy underclass” (p. 3). Engineering education was aligned with the objectives of these eras. Kloot and Rouvrais (2017) explain that the impetus for the offering of engineering training in the British Cape was the discovery of diamonds in about 1870 near Kimberly. In early 1900s, the general mining engineering qualification contained elements of both mechanical and electrical engineering. In 1915, the subdivision of engineering was formally recognized by the introduction of diplomas in civil, electrical, and mechanical engineering. During apartheid, the Extension of University Education Act officially prohibited Black students from attending White universities. However, a few comparatively under-resourced institutions were established for Black students, such as the Peninsula Technikon and the University of the Western Cape. Since the advent of democracy in 1994, social and economic factors still form barriers for Black students. These barriers are a part

of the colonial legacy for most parts of Africa (Marwah, 2014).

As noted by Tuck and Yang (2014), the settler-colonial nation state requires the clearing of Indigenous inhabitants off valuable land, their enslavement and labor, and the importation of other Black slaves to maintain the dominance of settler colonialism. Universities are complicit in this system, and education may be focused on the propagation of settler-colonial knowledge. Motala and Stewart (2021) show how the afterlife of the colonial and apartheid schooling systems continue to haunt modern engineering education. Fataar and Subreenduth (2016) refers to the manufactured absence of African epistemologies in the South African academy as “epistemicide”:

a product of the constant hegemonic western science model of knowledge construction, production and consumption that unproblematically circulates within education discourse and practice on the African continent as relevant, valuable and best practice. (p. 107)

Lebakeng (2011) notes that before European colonization, Africans had built up a pool of knowledge and technology which included agriculture, human and animal health practices, industrial production, food processing, metallurgy, leather tanning, timber seasoning, beverage fermentation, mining, and architectural engineering. Furthermore, political subjugation by European colonizers traumatized Africans, who lost confidence in and looked down upon their own knowledge and culture. This resonates with Steve Biko’s (2004) point that the scientific achievements of Whites serve to further entrench Black hopelessness, who do not realize that much Indigenous knowledge had been appropriated during the process of colonization.

Tuck and Yang (2014) note that universities may accomplish settler-colonial dominance in various ways, such as noting examples of injustice without making an explicit commitment to social justice; producing knowledge that is shaped by nationalistic imperatives while claiming neutrality in knowledge production; and accumulating knowledge from subaltern subjects who give part of themselves away in the process. We recognize all of these observations in our context.

As Black academics, we want to acknowledge that our partial escaping of the silence of subalternity can unwittingly promote the status quo by focusing on the documentation of damage (Tuck & Yang, 2014).

Part of the uncritical uptake of social justice issues is focusing on the present injustices, and forgetting the acts of violence that caused it in the past. Dixon-Román’s (2017) hauntology explains that ghosts of the past are part of the object of present-day social injustices,

thus, haunting contaminates the haunted products of social inquiry. The specters are seemingly not present or visible yet

form and shape the assemblages of data and knowledge. (pp. 46–47)

Posthumanist and new materialist theoretical turns can provide alternative perspectives to engineering academic subjectivities. Critical cartographies, supplemented by diffraction, may unearth dualistic patterns which entrench dominant discourses. Braidotti (2013) believes that critical posthumanism can assist in producing socially relevant knowledge

that is attuned to basic principles of social justice, the respect for human decency and diversity, the rejection of false universalisms; the affirmation of the positivity of difference; the principles of academic freedom, anti-racism, openness to others. (p. 11)

Ferrando (2019) critiques the binary conceptions of male/female and Black/White and proposes post-dualism as an important characteristic of posthumanism. Motala and Stewart (2021) investigate types of dualism evident in higher education (e.g., incorporation, instrumentalism, and homogenization), as well as ways to dismantle them.

Over time, power relations in the engineering academy get sedimented, and knowledge produced by the engineering academy gets canonized, not just within engineering, but in other areas of knowledge too. Forlano (2017) argues that the outcomes of engineering training are based on market approaches, which focus on profit and often disregard the needs of specific communities in favor of others. For electrical engineering graduates implementing renewable energy solutions, the technical aspects override any concerns for the impact that these actions may have on societies in the vicinity or the environment. These human communities are more often than not, poor and Black. In addition, Indigenous knowledge systems that allowed for environmental protection over millennia have been quickly dismantled in the name of “progress.”

Besides the powerful agencies earlier, the intra-actions of engineering with other branches of science are important. Engineering is a Royal Science, which is protocol-bound, dominant and linear (Braidotti, 2013). It has a natural science base, and, as noted by Dixon-Román (2016b), many of the “paradigmatic assumptions, activities, and practices of the social sciences are some form of reappropriation of the natural sciences” (p. 158). The use of the practices of the natural sciences to make neutral the social sciences is problematic because there is no neutrality in either branch of science.

South African Cosmogenies

Dixon-Román (2017) argues that racializations

are not just enacted via human cultural laws and neural networks but also inherited in data. The data produced from the

iterative human intra-actions with the more-than-human agencies of sociotechnical assemblages are both products and producers of the principle of cosmogonic/sociogenic causality. (p. 53)

Cosmogenies are the origin stories “that both ground a culture’s understanding of who they are and forms and shapes their auto-instituted behaviors and practices” (Dixon-Román, 2017, p. 50). With respect to the origin stories of the hegemonic Western Man, cosmogenies occur throughout the world and can appear as religious origin stories or part-science, part-myth stories, such as Darwinian evolution. The former can be deployed as the dominant Christian origin story, and the latter can be informed by eugenics research. Both of these were propagated-investigated within educational assemblages such as universities in South Africa and served to subjugate the Black populace. The mission schooling system is a case in point. By the end of the 1800s, many Western missionaries had set up mission schools to convert the Indigenous people to Christianity, to spread Western cultural ideas, to teach them work values, and generally to “civilize” the heathens (P. Christie, 1985). Universities in South Africa were also important intellectual centers that concerned themselves with the justification of apartheid using biblical scriptures.

As Naicker (2012) points out, along with Christian nationalism (which inspired Afrikaner nationalism), the study of eugenics also played a critical role in the social and political development of racism. Early eugenics was focused on maintaining White racial purity and saw a direct relation between the health of the White population and the health of the nation state. In the early 1900s, doctors and eugenics scientists were “particularly concerned about the escalation of ‘feeble-mindedness’ among white people and attributed the condition to the degeneration of the white race as a result of racial mixing” (Naicker, 2012, p. 3). Once again, universities (such as the University of Cape Town Anatomy Department) were places where eugenics research was undertaken (Kasibe, 2018). The underlying ethic of this early research continued well into the 1980s, and evidence of eugenics could be observed in the apartheid government’s covert chemical and biological warfare program Project Coast (Singh, 2008).

As practitioners in South African universities, we are aware of the hauntings of religious or evolutionary cosmogenies in our contexts. As noted by Zembylas et al. (2021), “the past is not something which is left behind, but exists in the present” (p. 22), so we wonder to what extent the ghosts of the stories of the “uncivilized native” or the “feeble-minded Black” haunt engineering education today? After all, we are situated in the very places that developed these knowledges. The places that academic staff encounter students are active and agentic participants in pedagogical encounters (Motala, 2020). In some ways, we are asked to

leave our bodies outside the academy and when we enter, we must perform in specific ways. The subjectivities that emerge are entangled with dominant histories of engineering and engineering education. Spivak (1993) has shown how difficult it is to critique the academy from within. Critique can be done from within a structure, it cannot be transcendental, and one should take up the position of being in the middle. We are situated at the intersection of engineering practice and education, within the academy and can identify with both the center and the margins. Being male, middle class, and holding academic power over students, our sense of inhabiting the center is not unproblematic. Yet, we are also residents of the margin: we are “Indian” and “Colored” according to our apartheid-era labels, and “African foreigner” which is universally marginal. Like Spivak, we cannot not inhabit both spaces.

Experiences of Black Academics

We continue with our cartography, looking at the historical erasure of Blackness in the academy and focus on the experiences of Black academics, ourselves included. Following Tuck, we want to move past damage-centered narratives of Blackness in the academy. Our findings show that, despite systemic injustice, Blackness can and does produce excellence. We want to make visible this excellence, within the context of *potestas* exerted upon us and our fellow Black academics.

As Black academics, we understand the experiences of exclusion that many others report on. Behari-Leak (2017) showed that new academics (mainly women and women of color) experienced the challenges of exclusion, marginalization, and alienation. Francis (2020) demonstrates how the project of decolonization in some universities are still controlled by powerful White staff, who speak on behalf of Blackness. This “ventriloquism of the speaking subaltern” (Tuck & Yang, 2014, p. 226) is a part of the settler-colonial project of replacement, which aims to “vanish Indigenous peoples and replace them with settlers, who see themselves as the rightful claimants to land, and indeed, as indigenous” (Tuck & Gaztambide-Fernández, 2013, p. 73).

Of the 20 Black academics interviewed, 15 indicated they experienced career challenges due to their race. Racism ranged from subtle to blatant incidents—some described instances where their academic scholarship was questioned, or their staff development aspirations were derailed by a White superior. To illustrate the point, one academic described his early career experiences. His head of department, a White man, did not assign him a computer or office space. He wandered the halls finding open benches and slumming amenable colleagues’ offices to prepare his teaching material. He points out that this did not happen with White employees.

Favoritism and alienation are recurring themes. Another academic mentioned that his requests to his White supervisor always experienced delays, something that his White colleagues never experienced. A lecturer related how his application for promotion encountered hurdles from his White supervisor who indicated that institutional policies hindered his appointment, yet foreign White academics had no such hurdles. Their treatment is a source of pain. Despite this pain, the interviews also reveal the perseverance of Black staff to overcome these challenges.

We also acknowledge our experiences of prejudice, which resonate with those of the interviewees. We have experienced the following:

Limited travel opportunities. One of us was not given the opportunity to travel to conferences, yet a White manager allowed some lower ranked White colleagues to do so. This blocking of travel opportunities to Black staff was echoed in an interview.

Unacknowledged excellent performance. One of us succeeded in securing substantial research funding (over R10 million [South African Rand]). This was unacknowledged by a White manager who never mentioned this in any communication. Yet, a White colleague secured substantially less funding (approximately R100,000) and this achievement was widely communicated and acknowledged. The interviews also reveal other examples of unacknowledged excellence, such as research and teaching awards.

Unacknowledgement while Black. We often experience meetings in which a White chair will know, acknowledge, affirm, and address all White meeting attendees, but ignore everyone of color. This phenomenon extends to many other groupings in the university, in which White staff do not know or remember the names of their Black colleagues or students, yet do not have this issue with White staff or students. An interviewee expressed her feeling of invisibility when White colleagues spoke Afrikaans around her, a language she did not understand.

Doubt about our competence. After applying for a new academic position, one of us was interviewed and got the job. For renewal of the contract, he was re-interviewed for the same job that he was doing, to recheck his capabilities or skills; while other European colleagues were not re-interviewed, and their contracts were converted to permanent employment.

A posthumanist analysis pays attention to affect and emotion, and we are aware that affects and complex materialities emerge as a result of colonial hauntings (Zembylas et al., 2021). As Black academics, and after conducting the interviews, we get a sense that Black success is viewed with suspicion and considered a mistake, an aberration to be

corrected later. It is as though we are placeholders for White academics-to-come. Whiteness and Africanness are “socio-political forces that differentiate and hierarchize bodies rendering certain bodies fully human and others as nonhuman” (Dixon-Román, 2017, p. 47). As pointed out in the cartography, the traumatization of Black people due to colonization is re-turned in the modern academy, and the materiality of our lived realities points to our dehumanization.

Tapping into *Potentia*: Moving Past Critique

An assemblage, such as an engineering curriculum, is “a sticky constellation of a multiplicity of forces producing an event, situation, or composite grouping or body” (Dixon-Román, 2016a, p. 484). This means that a socially just pedagogy (Bozalek et al., 2018) could be open to new connections and possibilities. It is into this *potentia* that classroom interventions could tap by opening up a space for the student voice. Through giving voice to Black academics, we are countering dualisms by discovering stories, recognizing the needs, values, and diversity of the Black experience (Motala & Stewart, 2021). In this regard, we point the reader to several interventions we have been involved in and have already reported on.

A way of understanding rich and complex subjectivity in engineering education was demonstrated by the use of digital storytelling. Digital storytelling in geomatics education was shown to make students appreciate complexity (Motala & Musungu, 2013), it allowed students to connect across difference, it gave space for students’ subjugated knowledge and showed how these knowledges can have rich pedagogical potential (Motala, 2017). By allowing students to tell their own stories, *potentia* was activated, Black pride and excellence emerged. This was in stark contrast to the usual settler-colonial knowledge structures or the damage-centered Black stories. The storytelling intervention served to “seemingly liberate by inviting those on the margins to speak, to tell their stories” (Tuck & Yang, 2014, p. 228).

As academics, we are continually challenged to accept that Black students are weak and lack the capacity to learn advanced skills. Yet, we continue to prove the rhetoric false by showcasing and producing Black postgraduate students who obtain accolades by achieving distinctions in their research outputs after examination by external international subject experts. Black students contribute to high-quality knowledge production, through publications in international journals and conferences. It is a fallacy that Blackness is linked to non-excellence.

A pejorative focus on difference relies on representation of bodies. MacLure (2013) points out that representational thought “is the enemy of difference, movement, change and the emergence of the new” (p. 659). We argue that representational thought is deeply embedded in engineering education.

However, we do not wish to entirely pass judgment on the use of representation in engineering education. A diffractive (Barad, 2014) or non-representational analysis (Thrift, 2008) allows for complexity to emerge, and is resonant with a desire-based analysis, as described by Tuck and Yang (2014). We question representation's influence on the subjectification of engineers, yet some of our work has benefited from the logics of representation. For example, Siddique's "counter-surveying" methodology (Motala & Bozalek, 2022) uses modern land surveying techniques to mark out the locations of houses that were demolished by apartheid forced removals, yet the intention and manifestation of counter-surveying is different. Counter-surveying is similar to Tuck's (2009) desire-based research, which, instead of focusing on the documentation of damage, is "concerned with understanding complexity, contradiction, and the self-determination of lived lives" (p. 416).

Conclusion

As Black academics, we are subject to powers that constrict our abilities to act through the *potestas* in the academy. These are what Spinoza referred to as negative passions that result in bodies being slowed down (Deleuze, 1988). Posthumanism requires a balancing out of critique with a measure of affirmative action. Affirmative affects result in the relations between bodies being strengthened, sped up, and enhanced. These are possible through micro-instances of activism, such as the digital storytelling and counter-surveying interventions mentioned earlier.

We understand, through theorists like Dixon-Roman and Tuck, that we as individuals do not solely determine our agency, yet the agency of Black engineering academics may be challenged by relations in the academy.

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Notes

1. During the apartheid era, all South Africans were classified according to their racial group, the main groups being Black, Colored, Indian, and White. Coloreds were people of mixed race.

2. Between the two of us, we have experienced apartheid security police invade our home; and some family or friends being forcibly removed from their homes, arrested, harassed, tortured, or murdered.

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