

# A Decolonial Moment in Science Education: Using a Socioscientific Issue to Explore the Coloniality of Power

## Um Momento Decolonial na Educação em Ciências: Usando uma Questão Sociocientífica para Explorar a Colonialidade do Poder

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Decolonialism as a politically engaged endeavour interrogating enduring colonial knowledge production is essential to any discussion of global injustices including those that sociocultural approaches to science education seek to challenge and ameliorate. This paper describes a decolonial moment in my own science teaching to undergraduate primary (elementary) preservice teachers around a socioscientific issue of *Ethical Clothing/Fashion*. The decolonial moment consists of a semiotically guided reading of some of fashion designer Vivienne Westwood's promotional photographs for *The Ethical Fashion Initiative* (EFI), a development project in Kenya. Through this reading, differing social and power relations emerge than probably intended, aimed at unsettling the Eurocentric colonial discourses that many students carry with them into the classroom. The paper concludes with a review of both my own, and the pre-service teachers' reflections on our learning.

**Keywords:** Socio-scientific Issues; Decolonialism; Ethical Fashion; Pre-service Teacher Education.

A perspectiva da decolonialidade, como uma tentativa politicamente engajada de questionar formas coloniais de produção de conhecimento, é essencial a qualquer discussão acerca de injustiças globais, incluindo aquelas que a Educação em Ciências, quando fundamentada em perspectivas socioculturais, visa a desafiar e a melhorar. Este artigo descreve um “momento” decolonial em minha própria prática de ensino na formação de professores dos primeiros anos de escolarização em torno de questões sociocientíficas relacionados à ética no âmbito da indumentária e da moda. O momento decolonial consiste numa leitura semiótica de fotografias que promovem roupas desenhadas pela estilista Vivienne Westwood para o projeto Iniciativa para uma Moda Ética, desenvolvido no Quênia. Neste processo, emergiram leituras de relações sociais e de poder, que são diferentes das leituras provavelmente pretendidas e que desestabilizam os discursos coloniais eurocêntricos que alguns estudantes trazem consigo para a sala de aula. O artigo é concluído com a apresentação de uma discussão sobre as reflexões feitas por mim e pelos professores em formação sobre nossa aprendizagem neste processo.

**Palavras-chave:** Aspectos sociocientíficos; decolonialismo; ética na moda; formação inicial de professores.

## Introduction

Sociocultural science education as a means of broadening science education's remit to be inclusive of culturally and socially diverse students and knowledges has had at least a four-decade history. Much of this scholarship has been within the critical tradition seeking social and eco-justice (see for example, Barton, 2002; Burke & Bazzul, 2017; Gilbert, 2013; Levinson, 2010). Such critical work can promote emancipatory discourses that privilege social redistribution without necessarily interrogating the Eurocentrism that has contributed to centuries worth of colonial oppression, inequality and planetary harm. Quijano's (2007) coloniality of power thesis also known as 'modernity/coloniality' describes how power acts through political, social, cultural and economic formations privileging Western ontologies and epistemologies, and reinscribing colonisation as they silence other ways of being and knowing (also Mignolo, 2011a; 2011b; 2007). Decolonialism is a politically engaged endeavour that understands historical colonialism and the continuing implications of colonial knowledge production within contemporary arrangements. As part of the entangled histories of modernity/coloniality in its current and previous guises, science is not immune and is, for Harding (2016), empire's handmaiden utilising its expertise and institutions in the exploitation of the knowledges, resources and processes of the colonised.

Decolonialism is hence, central I believe, to any discussion of contemporary global injustices including those that sociocultural approaches to science education seek to challenge and ameliorate. De Lissoy (2010) suggests that a truly ethical and democratic education is only possible if the colonial power relations shaping globality are fully recognised. "Imagining an ethics of the global in this context means articulating a decolonial perspective" (p. 279). Similarly, Zembylas (2017) argues the need for decolonial strategies and pedagogical/curricular possibilities to bring a more multiperspectival and pluriversal understanding of human experience. While there is now a small but growing literature exploring decolonialism and decolonial education (see DesRoches, 2016; Gorski, 2008; Takayama, Sriprakash, & Connell, 2017), Daza and Tuck (2014) remind us "de/colonizing, (post)(anti)colonial and Indigenous studies, theories, and issues were not part of mainstream education until very recently". Instead they were seen as "subfields of critical, antioppressive, ethnic, and multicultural education – which were also kept to the outskirts of mainstream/Whitestream conversations about education" (p. 307). For Baker (2012), decolonial education acknowledges the geohistorical and biographical conditions of knowledge production, exposing the pretense of the universalisation and superiority of Northern epistemologies.

By way of contributing to this nascent field, this paper reflects on my efforts to include a decolonial moment in my own science teaching when implementing curricula around a socioscientific issue (SSI). My context is a semester-long science and technology course taken as an elective by a mixed group of undergraduate primary (elementary) preservice teachers (PST) of largely European background. I begin here with a short overview of decolonialism before considering its importance in science education. I

move on to describe the SSI of *Ethical Clothing/Fashion* around which the course was built. The decolonial moment consists of a semiotically guided reading of some of fashion designer Vivienne Westwood's promotional photographs for *The Ethical Fashion Initiative* (EFI). Through this reading, differing social and power relations emerge than probably intended, aimed at "unsettle(ing) the Eurocentric colonial discourses that many students carry into the classroom" (Daigle & Sundberb, 2017 p. 338). I finish with a brief review of some of the comments and reflections on their learning PST's provided at the conclusion of the course.

## Decolonialism

Decolonialism is often considered in tandem with its similarities and differences to postcolonialism. One obvious difference is that postcolonialism predominantly, although not exclusively, arose from former colonies of the British Empire with theorists such as Said (1978), Bhabha (1994) and Spivak (1998). Decolonisation had its origin in Latin America's historical trajectory with the Peruvian sociologist Anibal Quijano (2007) credited with theorising coloniality/coloniality of power in the early 1990s to describe the extensive and continuous nature of the colonial project (also Quijano & Ennis, 2000). This thesis was developed further by Walter D. Mignolo (2011a; 2011b; 2007) and others like Arturo Escobar (2002), and Enrique Dussel (1995) as part of the modernity/coloniality/decoloniality (MCD) research program at the University of North Carolina. More of a collective project than research in its usual sense, the MCD aims to shift the geopolitics of contemporary knowledge production enabling decolonial thinking to emerge from lived colonial experiences. The MCD's use of the term *modernity/coloniality* positions modernity as only possible because of its coloniality, where the geographic, epistemic, and subjective borders were established to ensure the "control of knowledge (the epistemology of the zero point as representation of the real) by disqualifying non-European languages and epistemologies" (Mignolo & Tlostanova, 2006, p. 208). Decolonisation means then, "ethically oriented, epistemically geared, politically motivated and economically necessary processes, (that) have the *damne's* as the central philosophical and political figure," and is consequently "*articulated by the colonized*" themselves (Mignolo, 2007 p. 458, original italics). Here Mignolo (2017) is referencing Fanon's seminal work "*Les damne's de la terre*" (*The wretched of the earth*).

For scholars like Noxolo (2017), the prefix "post" is unhelpful as it implies a time after colonisation which she argues, is not a reality for many of the world's inhabitants. Radcliffe (2017) suggests that decolonial scholars build upon postcolonialism though taking on a more radical positionality. However, the most persuasive difference between postcolonialism and decolonialism is their theoretical moorings. While not all would agree, postcolonialism's communion with postmodernism and poststructuralism did not encourage the interrogation of its own Eurocentric moorings. Decolonialism on the other hand, saw coloniality as primarily an epistemic project that firstly, challenged geopolitical and socio-historical relations of knowledge production, and secondly,

encouraged a ‘delinking’ from Eurocentric knowledge enabling alternatives. Mignolo (2011b) expresses it thus:

Western epistemology (from Christian theology to secular philosophy and science) has pretended that knowledge is independent of the geohistorical (Christian Europe) and biographical conditions (Christian white men living in Christian Europe) in which it is produced. As a result, Europe became the locus of epistemic enunciation, and the rest of the world became the object to be described and studied from the European (and, later on, the United States), perspective.

Being ‘described’ and ‘studied’ depend on processes of cultural representation and translation through which the Other can be recognised and apprehended. Cultural translation refers to the imposition of the coloniser’s perspective onto the colonised, translating them in familiar and predictable ways, and configuring Otherness as alternative forms of sameness appreciable only by the dominant group in whose cultural forms the difference has been constructed. Representation refers to the way knowledge about the Other was collected, classified and represented to the West, and ultimately back through Western lenses to those who had been colonised (Smith, 2012). Decolonisation recognises that enduring racialised discourses translate and represent the Other from within hegemonic taxonomic categories, interpellating their cultural forms, and making them available for Northern/Western purposes.

The difference in intellectual moorings of decolonialism is an important point, as it goes to the need for something more than criticality. Postcolonialism is not alone in its failure to interrogate its origins, with Legg (2017, p. 345) noting that Leftist projects of all types set within “recursive networks of empire” (read universities amongst other formations) criticise colonialisation even as they are its beneficiaries. Many critical projects intellectual and otherwise, seeking redress, recuperation, redistribution and justice leave their Eurocentric fingerprints in tack. I have written about this elsewhere (see Carter, 2010), and I wish to repeat it here as it speaks to the emancipatory critical projects of much education:

Mignolo (2007) interestingly illustrates this embedded Eurocentrism with a discussion of the term “emancipation,” ... Anchored firmly within its historical experiences in the Reformation, emancipation argued for “freedom of subjectivity: individualism, the right to criticism, autonomy or action” (p. 467), lacking at a time due to the power of the crown and church. Later on, it became part of liberal and Marxist discourses as it sought the freedom of an ascending new social class, the bourgeoisie, and after industrialization, the Northern “working classes.” Colonialism saw the construct also exported from Europe and applied to the colonized whether or not they required individual and religious freedom. Most recently, emancipation has been utilized by the critical discourses to encourage tolerance in areas such as multiculturalism, difference, and pluralism. Mignolo argues that while “denunciation within the colonizer’s society (is) important, (it) is not sufficient in itself” (p. 458) and “the ‘emancipation’ of people in the non-European world . . . (should not be) . . . dictated by and from that original point” (p. 457). For Mignolo then, emancipation may seek freedom, but having arisen within

Eurocentrism itself, it is a necessarily limited construct and most importantly, does not disturb modernity's reference points of disciplinary hierarchies, political orthodoxies, and economic imperatives. (Carter, 2010, p. 438).

Mignolo (2007) contrasts emancipation with "liberation" that he argues, was put to use in the social movements in the South particularly from the 1970s. Interestingly, the word emancipate comes from the old French *emancipare* from e-meaning "out" and *mancipium* meaning "slave," whereas liberate is from the Latin verb *liberare* meaning "free." For Mignolo (2007), liberation subsumes emancipation, and it does challenge Eurocentrism having a strong tradition Latin America's liberation philosophy. (Carter, 2010, p. 440).

Clearly, projects like sociocultural science education need to be conscious of the limitations of critical work as they seek to enact their agendas.

### **Decolonialism and science education**

Dutch educational philosopher Gert Biesta's sees the purposes of education as involving qualification, socialisation and subjectification (construction of the person):

some would argue – and have argued (see, e.g., in the analytical tradition Peters 1966; 1976; Dearden et al. 1972; and, for a recent contribution, Winch 2005; and in the critical tradition Mollenhauer 1964; Freire 1970; Giroux 1981) – that any education worthy of its name should always contribute to processes of subjectification that allow those being educated to become more autonomous and independent in their thinking and acting. (Biesta, 2009, p. 41).

Biesta's (2015; 2009) point here and elsewhere, is that each of the educational functions are important but the least discussed – the making of the subject – reiterates our responsibilities for the moral and ethical formation of our students. Consequently, science education, like other forms of education, has the same ethical responsibility to contribute to subject formation. Adopting decolonising curriculum and pedagogies that critically examine the geopolitics of knowledge and power structures, at the same time as they consider the material conditions of coloniality, and intellectual histories and experiences of colonised people can be part of that subject development. Decolonising curriculum and pedagogies seek a renewed academic/ethical vocabulary and methodologies that aim to disentangle modernity and coloniality and open spaces for different viewpoints. They are premised on the role curriculum has in complicating the conversation (Pinar, 2004), and that pedagogies can be emotionally disruptive (Boler, 1999; Zembylas & McGlynn, 2012). For sociocultural approaches to science education, this means going beyond the usual critical perspective housing injustices and oppression of all types, and interrogating the Eurocentric coordinates that remain in play in many of the world's formations. It means exposing to the students, the ever present (re)inscription of colonial power relations, even as they maybe unintended. And it means science being taught/learned in different contexts, cultures, peoples and experiences.

While I have written about postcolonialism and decolonialism in science

education on a number of occasions (see for example Carter, 2003; 2004; 2006; 2010; 2011), generally speaking, it is an area with scant literature. There is some research around decolonising methodologies in science education (Beeman-Cadwallader, Quigley & Yazzie-Mintz, 2012), and on place-based studies in both science and environmental education (for example, Tuck, McKenzie & McCoy, 2014). Scholarship on privileging or recuperating aspects of Indigenous knowledge alongside science conceptual knowledge and processes makes the largest contribution (see Aikenhead & Elliott, 2010; Bang & Medin, 2010; Boisselle, 2016; Kimmer, 2012; Reis & Ng-A-Fook, 2010; Shizha, 2011, 2012 amongst others). More often than not though, this scholarship does not note a specifically decolonial perspective. Also apparent are studies on working with Indigenous and culturally diverse students (for example, Mellow, 2015).

There are also relatively few studies of decolonialism and initial teacher education (exceptions for science teacher education are Belczewski, 2009; Reis & Ng-A-Fook, 2010). Daigle and Sundberg (2017) is one of the few attempts documenting the challenges of implementing decolonial theory and practice in an undergraduate university course. Within their science related discipline area of geography, they invited students to “see themselves as entangled in processes of colonisation” prompting reflection and dialogue (p. 338). They sought to achieve this in various ways including using non-Eurocentric resources both human and otherwise which told of ongoing power asymmetries and colonial, racial, class and gender oppressions. Daigle and Sundberg (2017) provoked their students to

“bridge the personal and political” and locate themselves within regimes of power by getting them to “(a) analys(e) how they came to be in their current location and (b) evaluat(e) how specific geographical formations (colonial capitalism, diaspora, Indigenous legal geographies, place, settler colonialism, social movements) shaped personal (or family) experiences and, therefore, life opportunities” (p. 339).

They reported that their students were predominantly unreceptive to their curricula/pedagogies expressing emotions including “anger, frustration, hostility, antagonism, (and) denial,” (p. 340), though a few voiced sorrow for the past and pride in new ways of thinking. Clearly, my work here can contribute further ideas about ways of implementing decolonial (science) teacher education.

## **Implementing a Decolonial Curriculum Moment**

### **Socioscientific Issues**

Broadly described, socioscientific issues (SSI) are, for Stewart (2009), socially significant extended argumentative engagements comprising communicative events and practices in both scientific and nonscientific spheres, or as Sadler and Zeidler (2004, p. 5) put it, “societal dilemmas with conceptual, procedural, or technological links to science.” Ratcliffe and Grace’s framework for SSIs is somewhat more extensive, usually identified as an issue with a basis in science and:

Involv(ing) forming opinions, making choices at personal or societal level; are frequently media reported, with attendant issues of presentation based on the purposes of the communicator; deal with incomplete information because of conflicting/incomplete scientific evidence, and inevitably incomplete reporting; address local, national and global dimensions with attendant political and societal frameworks; involve some cost-benefit analysis in which risk interacts with values; may involve consideration of sustainable development; involve values and ethical reasoning; may require some understanding of probability and risk; and are frequently topical with a transient life (Ratcliffe & Grace, 2003, p. 2–3).

SSI's are regarded by many sociocultural science educators as important in empowering learners to become more scientifically literate, as well as fostering strategies to enable the complicated and multifaceted decision making required to negotiate the complexities of 21st democratic and technoscientific citizenship (Levinson, 2006). Much debate though, surrounds the placement of SSIs in the time-poor curriculum, the amount and type of required science knowledge (Lewis & Leach, 2006), the provision of various supports, the suitability and choices of SSIs, as well as investigations into the developmental mechanics of argumentation skills, formal or informal reasoning, and evidence or intuitive-based decision-making (see for example, Grooms, Sampson & Golden, 2014; Zeidler, Walker, Ackett & Simmons, 2002). Teacher expertise is another concern. Pitpiorntapin and Topcu (2016) are amongst those calling for SSI-based instruction in PST education programs and in-service professional development (also Evagorou, Guven & Mugaloglu, 2014). Taking this call seriously is the soon to be concluded four-year European Union PARRISE (Promoting Attainment of Responsible Research & Innovation in Science Education) Project across a number of European countries that promotes teacher professional development in SSIs. My response to such calls has been to develop a SSI based topic for my PST science and technology elective course with a particular focus on decolonialism.

While the principles of the negotiated curriculum and democratic classroom pedagogy would suggest that the PSTs should select their own SSIs for investigation that was not the teaching context available. My choice of ethical clothing/fashion as our SSI, stemmed from a magazine article I had read on fast fashion that both shocked and appalled me given that the planet's more than 7 billion people need to be clothed. Western fast fashion from well known 'High Street' chains promote increased consumption through heavily advertised new weekly collections, and an average garment wear before being discarded of around seven times (Remy, Speelman & Swartz, 2016). Moreover, at 27 kilos of clothing each year per head, Australians are the world's second largest consumers of new textiles (Dunner, 2017; Pepper, 2017). Much of this consumption is targeted at the young adult demographic of which our PST largely comprise. Ethical clothing/fashion, defined as clothing that takes environmental and social responsibility for its creation, does not harm other species, and whose profits are used to promote a particular socially just causes (Ethical Fashion Forum, n.d.), is also increasingly prominent amongst socially and ecologically aware young adults. Many Millennials wish to know the provenance of their clothing and its social and ecological credentials,

or in marketing terms, its back story (Clarkson, 2017; Dunner, 2017).

It is worth noting in passing, that I originally called the SSI *Ethical Fashion*, influenced perhaps by the article I had read. Upon reflection, the title *Ethical Clothing* offers broader appeal, as while everyone wears clothes and should know about their origins, not everyone is interested in ‘fashion’ as such, encoded as it is with various ideological/gendered meanings. Nevertheless, cognisant of the SSI’s original title, I will refer to it as ethical fashion throughout the rest of the discussion.

Ethical fashion as an SSI meets most of Ratcliffe and Grace’s (2003) framework. It is based in many science concepts such as the biology of natural fibres like wool, silk, linen and cotton, alongside the chemistry of dyes, synthetic fabrics and petrochemicals. Materials science is also clearly relevant, and these topics lend themselves readily to primary (elementary) and secondary school science. In terms of technology, and indeed STEM (science, technology, engineering and mathematics), beyond the fabrication technologies, closed loop or otherwise, there is also body scanning technologies, human anthropometrics with sizing and measurement, and pattern making skills. Environmental sustainability and social issues are also apparent with the former comprising, for example, debate about whether the significant amounts of water to farm cotton and grazing land required for sheep, outweigh the environmental footprint of synthetic fibre production (Muthu, 2014), and waste generation (Dunner, 2017) just to note a couple. Social issues include the increasing economic divides under global trade agreements, poverty and sweat shops/slave labour, and gender politics questions where the largely female workforces can be forced into prostitution when, for the best of intentions, sweat shops are closed. Clearly apparent in these issues are the “local, national and global dimensions with attendant political and societal frameworks; involve(ing) some cost-benefit analysis in which risk interacts with values; may involve consideration of sustainable development; (and) involve values and ethical reasoning” requiring some personal decisions (Ratcliffe & Grace, 2003, p. 3)

As indicated earlier, my focus here is not on the science and technological basis of the ethical fashion SSI but in exploring how a decolonial perspective could be developed within my curriculum and teaching. Hence, the discussion to come confines itself to those aspects of the classes which occurred post the science knowledge and pedagogical discussions. While Daigle and Sundberg’s (2017) and others decolonial approaches have been more holistic, teacher accreditation and registration restraints in my context allowed only for the implementation of a few focussed seminar sessions. Such back loading models are not uncommon in science classes. Nevertheless, encoded throughout are the social and science criteria that go to form an SSI.

### **Ethical Fashion Initiative**

A major teaching resources for the section on decolonialism was the Ethical Fashion Initiative (EFI) website (Ethical Fashion Initiative, n.d.). Founded in 2009 by Italian development consultant Simone Cipriani, the EFI is a flagship programme of



the International Trade Centre (ITC) that is itself a joint agency of the United Nations and the World Trade Organization. Commencing in the Kenyan slum area in Nairobi known as Kibera, and having expanded to other areas of Africa and beyond (González, 2015), the EFI according to its website, aims to connect “artisans from the developing world to the international value chain of fashion... harness(ing) fashion as a vehicle for development”. It seeks to forge “ethical, sustainable and creative collaborations with artisans from the (African) continent ... (enabling a) ... positive impact and tangible results to the communities” through a “fair supply chain, living wages, (and) dignified working conditions.” Artisans, the website goes on to suggest, “can change their lives for the better by manufacturing luxury value-added ethical fashion products for top fashion designers” which concomitantly “encourages the building of a more ethical and responsible fashion industry”. Moreover, the EFI aims to grow Africa fashion brands as it supports “the rising generation of fashion talent” and “support(s) of the African fashion industry’s potential for growth”. The EFI approach has been aimed at empowering women, roughly 7000 is it claimed to date, as micro-producers able to earn regular income, and improve the circumstances of their families and their communities.

Kibera is one of the world’s largest ‘slums’ (alternatively identified as informal settlements in more socially sensitive discourses) with well over a quarter of a million people (depending on how inclusions are defined) living with limited access to water, electricity, sanitation, health clinics and education. Largely housed in single room dwellings, unemployment is high as is drug and alcohol use, HIV/AIDS infection rates, and violence. Its origins date back to the development of Nairobi as a racially zoned British colonial town in the early 1900s. Returned Sudanese soldiers from the British East African army, unable to access ‘Native Reserves’ as non-Kenyans, were allocated land plots on Nairobi’s outskirts that came to be known as Kibera. Over the decades, despite many attempts at clearing and rehousing, Kibera has continued to grow with an ethnic mix now largely of Kenyan and other immigrant and displaced groups.

Much of the popular discourse describing Kibera utilises the ‘deficit slum discourse’ that for Ekdale (2014), without denying the sub-standard living conditions of such low-income urban spaces, marginalises Kibera’s inhabitants as it negates their overt social cohesion, structures and contracts. Such representations, often for the external Northern gaze, constructs a type of poverty porn with inhabitants portrayed as dependent and without dignity (see also Selinger & Outtersson, 2010). Slum discourses are reductionist and their limited representations of social life obscure the fact that living conditions are always dynamic. Ekdale’s (2014) and others show that “there is a significant disconnect between the lives experienced by Kibera residents – in Swahili, *maisha mtaani* [life in the neighbourhood] – and the prevailing popular discourse about Kibera” (p. 93).

## **Vivienne Westwood**

One of the early EFI partners in Kibera was British fashion designer and business entrepreneur Dame Vivienne Westwood. Famous for her early work in the 1970s anti-

establishment British Punk Rock group, the Sex Pistols, Vivienne Westwood has grown a successful international business on new wave and idiosyncratic haute couture that is frequently showcased on the world's red carpets (Vivienne Westwood (hereafter VW), n.d.). Only one amongst many high profile people who showcase her clothing, current Conservative British Prime Minister Theresa May, has famously worn a Vivienne Westwood tartan fabric suit to make several significant speeches, including the recent and widely disseminated Brexit agenda address (Holt, 2017). Given the prominence of Vivienne Westwood fashion in the British consciousness, media headlines regarded the traditional tartan selection as a 'full battle dress', with the Guardian newspaper arguing that the clothing choice needed to be read for its full "semiotic overtones" of a reasserted Britishness (Ferrier, 2017). Indeed, her designs are frequently regarded as encapsulating a playful British historicism (Goodrum, 2001). Westwood's contribution to British industry has been recognised with many awards including the 1990 and 1991 British Fashion Designer of Year, a royal honour – an Order of the British Empire (OBE) – in 1992 for services to creative industry, and in 1998, the Queen's Award for Export in recognition of Vivienne Westwood Ltd's growing overseas market.

Given her anti-establishment origins, unsurprisingly Westwood is a well known Green Party voter and activist for all types of causes. She campaigns vociferously for example, against fracking and anti-terror legislation in Britain, for PETA (People for the Ethical Treatment of Animals) and vegetarianism, for Scottish independence, for nuclear disarmament, for clean energy, and she has launched her own Climate Revolution media site/events to address climate change issues (Climate Revolution, n.d.). Westwood's clothing, shops, catwalk fashion shows and other promotional opportunities are saturated with her activist slogans. Somewhat contrarily to her business interests, she is also known for her anti-consumption campaigns and anti-capitalist stance encouraging more meaningful choices. Speaking after her 2014 Spring/Summer fashion show and widely reported in the media, Westwood is credited as saying: "Buy less. Choose well. Make it last. Quality, not quantity. Everybody's buying far too many clothes." "And I think that poor people should be even more careful." "I just think people should invest in the world. Don't invest in fashion, but invest in the world." "The first thing they can do, if they live in a town, is they can go to art galleries. Start building different values, where you engage with the past, with the human race" (VW, n.d.) (see also Clarke & Holt, 2016).

Westwood's pro-environmental and equity politics meshes together with the espoused tenets of EFI. She is not without her critics though, and she has been accused of high jacking eco-friendliness as a green wash marketing tool given some of the unsustainable textiles and practices in her clothing production (Eluxe Magazine n.d.; Lyons, 2015). Similar scrutiny has forced Westwood to sort out her own taxation avoidance and exploitative labour systems which fell short of the standards she publically avowed for others. In a statement responding to such criticisms, Westwood's company has claimed that "all clothing and accessories, whatever they are made of, have

some impact on the environment. However, as Vivienne wishes her company to reflect her personal views, we are working to reduce that impact” (Lyons, 2015).

Westwood’s earliest involvement in Kibera was her ‘Handmade with love’ collection, “a range of bag styles for men and women, including unisex rucksacks, totes, patchwork drawstring bags and Maasai hand beaded clutches and key rings” (VW, n.d.). Local materials were utilised such that all “styles are created using recycled canvas, reused roadside banners, unused leather off-cuts, and recycled brass” (VW, n.d.) and other discarded materials. Over the intervening seasons:

The Africa bag collection evolves each season, introducing new styles and in turn skill development of the artisans in Africa. The collections are brought to life through the use of distinctive Westwood archive prints, shapes and finally stamped with Vivienne’s latest political or environmental Climate Revolution message, in particular her antifracking and anti-capitalism campaign (London, 2013).

Her Kiberan products are heavily promoted both on Westwood’s own and the EFI websites, as well as other online shopping outlets.

### **Exploring the coloniality of power in designer Vivienne Westwood’s activism for the Ethical Fashion Initiative**

As already noted, upon completion of the more formal science, environmental and social aspect of the ethical fashion SSI, the focus turned to decolonialism. Several class sessions were spent discussing salient ideas from decolonial theory, not unlike those covered in the overview. The PSTs were then invited to review the EFI and Westwood websites and any other materials they found pertinent. They looked more closely at certain photos on the websites, including those referenced in the Figure 1, for discussion and analysis in small groups. These photos are presented here as web links rather than images in order to avoid any copyright issues. Readers are invited to explore these photos and others on the EFI and Vivienne Westwood sites to be cognisant of the ensuing discussion.

The photos were semiotically ‘read’ through a decolonial lens looking to uncover colonial representations, translations and “practices of absencing, exploiting and, ultimately, forgetting the Indigenous people on whose material conditions” they were based (Noxolo, 2017 p. 344). Semiotics is the field of research that studies signs as an essential part of cultural life and communication. Barthes’ (1978) semiotic theory of denotation and connotation was useful here. Barthes (1978) argues that

when we read signs and sign complexes we can distinguish between different kinds of messages. Denotation is the “literal or obvious meaning” or the “first-order signifying system”. For example, the denotative meaning of an image refers to its literal, descriptive meaning. A painting or photograph of a rose is at a denotative level a rose. Connotation refers to “second-order signifying systems”, which refer to the additional cultural meanings we can also derive from the image or text. This implies that the painting or photograph of the rose is symbolic of something else, such as love, for example. (Chasomeris, 2006 p. 25).

Barthes (1978) also believes that ideology embroiled as it is in power struggles, can be hidden from view in images due to the myths of connotation. As images are polysemic, implying an uncertainty of meanings, the photographer (or artists, creative director, etc.) often uses a linguistic message or caption to guide interpretation towards an intended meaning. Barthes (1978) calls this ideological functioning anchorage. Table 1 contains a denotation or literal description of the image to be 'read', the anchoring accompanying caption used to guide the images intended interpretation as well as the images' web link.

Image Description	Caption	Web Link
1. Vivienne Westwood poses in a rubbish dump in Kibera wearing a Renaissance print dress and holding a bag with slogan "I am expensive"	Vivienne Westwood poses for Gold Label Autumn/Winter 2010-2011 Collection	<a href="http://www.shanghaidaily.com/newsimage/2017/01/05/020170105220645.jpg">http://www.shanghaidaily.com/newsimage/2017/01/05/020170105220645.jpg</a>
2. Bag displayed by a local Artisan so it reveals the Anglomania trademark	Traceability. Do you know where the bags you buy are made? This is a Vivienne Westwood bag made by artisan in Kenya.	<a href="http://ethicalfashioninitiative.org/partners/vivienne-westwood/">http://ethicalfashioninitiative.org/partners/vivienne-westwood/</a>  Scroll down to photos
3. Local model wearing a bridal dress gazed upon by a heavily costumed Vivienne Westwood, photograph in an area of housing in Kibera.	Elsie Njeri was a wonderful model for this gown. When I spoke with her I quickly realized that she's a very clever girl. Elsie is studying international relations and she knows more about China than I do!	<a href="http://climaterévolution.co.uk/wp/2011/06/16/our-1st-trip-to-africa-kenya/">http://climaterévolution.co.uk/wp/2011/06/16/our-1st-trip-to-africa-kenya/</a>  Scroll half way down the page

**Figure 1.** Details of the photographic images

In Image 1, Westwood is positioned in an area of waste accumulation, a garbage dump, surrounded by discarded materials of all kinds somewhere within Kibera. She is holding one of the Artisan produced bags with the slogan 'I am expensive.' She wears a dress featuring a Renaissance style painting – a symbol of high European flourishing. Suggested on her website, the image could be read as utilising the recycled and repurposed available materials to the benefit of the producers through sale into wealthy Western markets. If viewed from a decolonial standpoint, the dress, the bag slogan and the location suggest an asserted Eurocentrism over the detritus of the Other. That Kibera exists as it does is a direct result of colonial British intervention and ongoing cultural and economic globalisation. It remains a place to be mined for its resources, and represented for the Western gaze as stereotypically deficit by those deciding on its representation (Cieplak, 2009; Gorski, 2008). Ekdale (2013; 2014) reminds us that different narratives exist for the

inhabitants of Kibera on issues and perspective unavailable in popular media. Moreover, the promotion of the bag is one of “socializing a compliant and complicit populace into a market hegemony that normalizes consumer culture” (Gorski, 2008 p. 581).

Image 2 shows a bag made in Kibera for Westwood’s Anglomania collection. Dating from 1993, *Anglomania*, one of Westwood’s more recognisable collections, references in appellation the mid-to-late eighteenth century period when Continental Europe greatly admired all things English. Formed by fictive and imaginary narratives, England was seen as both the land of liberty and the bastion of tradition. While much of Europe was beset by revolutions and upheavals, for Stille (1999), the “country’s voracious capitalism kept England open to new ideas but made it shy away from ones that would disrupt the economic order”. It was the time of the British Industrial Revolution, the ‘First British Empire’, and the dawn of Pax Britannica when it emerged as the global hegemonic power (Johnson & Reisman, 2008). As we have seen above, decolonial theorists use the term *modernity/coloniality* to remind us that modernity was possible only because of its coloniality. Interpreted through fashion, Anglomania for Westwood reasserted English style tailoring with a twist, the use of traditional fabric and motifs such as tartan, and Harris Tweed, and voluminous, corseted and bustled dresses in the style of the famous British portraitist to the wealthy, Thomas Gainsborough (1727–1788).

Of particular interest here, is the Anglomania trademark or logo that features a black male arm holding a cutlass style sword or curved machete, raised militaristically but overlaid by the Westwood trade mark of an orb, cross and Saturn style ring. Westwood’s orb logo pays homage to the Harris Tweed trademark of orb and cross (Harris Tweed, n.d.). Harris Tweed is a textile long associated with the British aristocracy and their outdoor pursuits, made popular by Queen Victoria’s set at the height of Empire in the late 1800s. The orb is a symbol of “the world, yet it is very British – it is part of the royal regalia which the Queen holds at the State Opening of Parliament. . . . The Orb represents tradition. . . and describes the work of Vivienne Westwood where all new discoveries in design come from studying tradition” (Vivienne Westwood PR Pack, 1998).

Westwood’s appropriation of various clothing symbols of the British aristocracy references for Goodrum (2001) and others, Westwood’s discursive ambivalence of Britain’s place in the late 20<sup>th</sup> and early 21<sup>st</sup> centuries. Her designs are read as self-consciously irreverent, subversive, or seditious even when she combines high art and traditional tailoring with gritty urban street subculture style (see also Blaxendale, 2012; Choi, 2005). Westwood’s common use of tartan fabric for example, encoded as it is with its history as the banned Scottish Highlander dress under English occupation, undercut by tears, slashes and frayed edges gives Anglomania a somewhat ironic character. The appeal of such critical commentaries are in how they calibrate with Westwood’s activism and anti-establishment credentials.

Nevertheless, there are ways of reading her work beyond the critical. A decolonial lens on the Anglomania trademark and prominence on some of the Kiberan bags, reveals unconscious but ongoing colonial coordinates as the raised black arm is vanquished by

the orb and Christian cross of empire. Image 2, and other photos on VW and EFI sites showing black hands fabricating the orb logo from the recycled local waste, work with the symbol that encodes, if not of enslavement, then certainly of colonisation under the British Empire. The semiotics of the photos are of the intense contradiction and ambivalence that make up global modernity as it continues to enact the coloniality of power.

In Image 3, Westwood, elaborately costumed herself, has dressed a local fashion model, Elsie Njeri, in a Western style white wedding gown, sexualised with suggestively nipped waist and strapless bodice. Westwood is known for her bespoke and exclusive bridal gowns costing up to \$US10,000, and the contrast couldn't be more stark between the expensive, gleaming and clean white gown, and the darkly-hued, dishevelled surrounds of Kibera where people's average income is between \$US1-2 per day. Through a decolonial lens, Westwood's stance towards the model can be read as one of surveillance, with colonised people continuing to exist for the consumptive Western gaze that reasserts Eurocentrism. The bridal gown encodes contemporary Northern idealisations of beauty, wealth, knowledge and a privileged lifestyle. For Gross (2015), such photos map relational systems of power onto the bodies of individually raced persons, and serve to emphasise a social category of transnational structural privilege. Moreover, Westwood's comment in the photo's accompanying caption about Njeri, a student of International Relation, "know(ing) more about China than I do", patronising reiterates racist hierarchies. It is accordingly to Noble (2015), always ensuring that the Other remains *other*, partially welcomed in but inevitably in a subordinate position. One cannot help but wonder what the onlookers who are just outside the photograph frame in this version but visible in other shots of the same scene, make of the enterprise and its representation.

In one sense, it is hard to argue with the successes of the EFI. Addressing the Canadian Department of Foreign Affairs, Trade and Development in 2015, the Executive Director of the ITC, Arancha González claimed that

skilled workers who supervise, quality control and stitch saw an average salary rise of 275%; semi-skilled and manual workers who cut, fold and pack saw an increase of 500%; women have reported an increased ability to finance their children's education, better diets and healthcare for their families; purchase or make improvements to their homes; and/or start savings. Moreover, on my own visits to these women, they told me about the positive changes in the way that their male partners and children view them, leading to fewer incidents of domestic violence (González, 2015).

Amongst other reports, Safe (2017) suggests that Australian brand Mimco employed 134 artisans in Kenya to produce 1724 totes, pouches and purses which "led to a 27 per cent increase in income for the artisans, with 83 per cent saying it was more than they could make in the domestic market. Thirty-six per cent said they were able to save and invest – in small businesses, education and training, livestock and housing." Endorsements came from:

(b)earer Jane Njeri, a 35-year-old mother, used the money to pay primary school fees for all five of her children, and to buy them uniforms and more nutritious food ... (while)

(m)other-of-one Miriam Mwangngi, 29, said: “Working on the Mimco Constella order gave me a lot of joy. The months of January and February were very dry, which led to a scarcity of food and water. The order gave me enough income, which I used to feed my family and to pay rent.” (Safe, 2017).

Vivienne Westwood’s commissions for EFI in Kenya also meant employment for 1558 artisans from 21 different communities of which 76 per cent are women. Some 72 per cent of artisans saved from the income received enabling them to plan for their future, while training to international skill standard during the production was received 86 percent of artisans. These commissions have resulted in more than 950 children able to attend school (Vivienne Westwood and the EFI- 10<sup>th</sup> season anniversary, n. d.).

Moreover, the bridal model from Image 3 Elsie Njeri, credits Westwood and the EFI as assisting her career

Working with Vivienne Westwood was one of the best experiences in my life! Honestly, I was still in total disbelief after i (sic) got home from the shoot, i (sic) had to pinch myself a couple of times. It is such a great deal for me as a new model to work with Vivienne and her team off the bat and I am incredibly grateful for that opportunity, i (sic) know that this is just the beginning (sic) and it will open more doors in my career!!! Thank you very much Vivienne {^\_^}. (Njeri, 2011).

Njeri went on to develop a successful international career, closing Westwood’s spring/summer 2014 fashion show in Paris.

Coexistent with EFI and Westwood’s successes, there is nevertheless a ‘darker side’ to the work in Kibera (after Mignolo, 2007) riddled with ambivalence, contradictions, tensions and contingencies. The EFI project advances the Northern views of modernity as development, and economic emancipation, through promoting consumption as fashion, overwriting other ways of conceptualising meaningful lives. Lurking within the project is a modernised colonial paradigm of contemporary saviour, even if it is something to which EFI and Westwood would not overtly subscribe. For Spivak (2010),

“the real question is not the people who are trying to do really nasty things, but the people who are trying to do decent things out of an unexamined ideology. ... Ideology is larger than personal good will” (p. 338).

Development projects like EFI within unconscious Eurocentric frameworks, do not seek to dismantle dominant hegemony, hierarchies, and concentrations of power and control. Instead, cultural translation and representation reproduce stereotypical views of Kiberan life that can be further marginalise and disempower, simultaneously enabling the already privileged North with a ‘feel good’ factor from corporate or individual philanthropy.

“At stake is who/what remain objects, whether an object of oppression ... or an object of benevolence in human rights discourse (Spivak 2008) or damaged-centered research and pedagogy (Tuck 2009)” (Daza & Tuck, 2014, p. 309).

Exposing these coordinates, importantly “shifts of consciousness that prepare us to see and react to the socio-political contexts that so heavily influence education theory and practice” (Gorski, 2008, p. 515).

### Preservice Teacher’s Reflections on their Learning

The decolonial moment attempted in the ethical fashion SSI as exposing modernity/coloniality (after Mignolo, 2007) generated a range of responses in the PSTs. These responses were collected both informally through conversations, as well as in the anonymous course evaluation questionnaires required to be completed upon course conclusion at most Australian university. Figure 2 summarises representative comments of the various positionalities adopted by the PSTs.

Comment	Interpretation
It was interesting because I hadn’t thought of anything like this before.	Open to SSIs and to expanded views of learning, teaching and science beyond conceptual knowledge and processes. Good fit with academic vocabularies. Open to decolonial critical inquiry of values and beliefs (Daigle & Sundberg, 2017).
Not sure I could use it in my own classroom with primary age students, but I found it really informative	Established beliefs about science and schooling but open to SSIs. Interested in being reflective about values and beliefs.
I wasn’t interested in a topic on fashion – couldn’t relate to it.	Entrenched stereotypes. Not prepared to interrogate cultural and personal identities (Sfard & Prusack, 2005). Not open to decolonial perspectives (Daigle & Sundberg, 2017). Gendered choice on my part – should have called the SSI ‘ethical clothing’.
What did the Vivienne Westwood stuff have to do with teaching science?	Strong view of what science is as knowledge. Established beliefs about ways university should prepare PST – that is that PSTs can acquire strategies to enable transmission of unproblematic knowledge (Faulkner & Crowhurst, 2014). Resistant to emotional change.
Vivienne Westwood is trying to do good things – its easy to be critical.	Exhibits hostile responses (Daigle & Sundberg (2017). Expectation of learner comfort freedom from challenge/ disruption/confrontation (see Boler, 1999).

**Figure 2.** Preservice teacher comments and their interpretation

The table also explores possible interpretations of the PSTs comments in relation to relevant literature. There is much in common with some of these responses and those found in Daigle and Sundberg (2017) attempts at implementing their ‘unsettlingly’



decolonial curriculum and pedagogies. Faulkner and Crowhurst (2014) have reported hostile and strident PST responses when they attempted a course in social justice to PST at another Australian university. While not a decolonial endeavour as such, Faulkner and Crowhurst's (2014) experience of strong animosity left them wishing to redouble their efforts at, as LaBoskey, (2007 p. 829) expresses it, engaging PSTs "in contexts discrepant from what they have previously experienced so that the limitations of their autobiographies might be exposed and reframed". I am in full agreement with these scholars, and the performative effect of including decolonialism as part of an SSI engenders a truth to the internet meme 'once seen, it can be no longer unseen' (Dave Sim Quotes, n.d.). While not all PSTs are receptive at the time, important thinking may emerge in other contexts at later dates. After all, the processes of decolonisation require continual efforts toward questioning and revealing hidden colonial influences in our past and current beliefs and practices to enable collective awareness and responsibility.

### **Some Final Comments**

It is more appropriate to complete this paper with some final comments rather than the usual 'conclusion section,' as work like this eschews conclusions leaving instead further contingencies, ambivalences and uncertainties. Hence, I narrate some of my musings, reiterating some points and making some others for which space was not made earlier for fear of interrupting the 'academic flow' of the paper.

This paper is, in some ways, a text on ambivalences, contradictions and tensions, a point already made above in relation to the EFI and Westwood's work, but reiterated here in the context of academic endeavour. It exposes the double binds of decolonial work while being within the academy and consequently complicit with empire, and simultaneously needing to be without, as the "masters' tools will never dismantle the masters' house" (Lorde, 1983, p. 27). As a science education scholar and teacher, and a member of the academy, I am conscious again of Noxolo's (2017) (see also Legg, 2017) provocation that asks

"to whom educational institutions belong, when they were built on money gained through colonial exploitation, and crucially, whether the knowledges and curricula accessed actually challenge, or in fact continue to justify that exploitation?" (Noxolo, 2017, p. 343)

While Northern academics such as myself, may not have the place-based or embodied colonial experience that real decolonialism requires, Mignolo (2007) suggests they can make a contribution by recognising the totalitarianism of Northern/Western epistemologies, and further, working toward their fracture. It is from this position that I offer my decolonial intervention, given that confronting marginality should not be left to those who occupy the margins. While arguably my approach could just be a fleeting irruption, such interventions nevertheless contribute to the critical awareness of colonial durability in our institutions, location and knowledges that, in this instance, we call science education.

Ambivalence arises though, as there is a risk of decolonial endeavours becoming domesticated and harnessed to further Northern privilege. As Noxolo (2017 p. 343) drawing on Silvia Rivera Cusicanqui (2012) so eloquently argues, we must be alert to how “theories and concepts that began with Indigenous scholars get repackaged and disconnected from the struggles and concrete experiences in which they were originally grounded” and become fodder for the academic practices of the Global North (also Jazeel, 2017). Indeed, this very article bordered as it is within the confines of academic journaling could be regarded as complicit with empire. Nevertheless, Harding (2016) believes that those who benefit from colonial orders have even more responsibility to further a decolonial agenda but must remain alert to the political problematics, as well as the containment proffered by colonial translations and representations (see Jazeel, 2017).

A related point refers to my own positionality as a white, middle class, educated woman at ease in academic spaces and other colonial formations. It’s the elephant in the room. I can’t claim to share the material conditions out of which decolonialism emerges. As an Australian, I live in an affluent and stable participatory democracy, and as a native English speaker, the language of neoliberal globalisation, I am afforded great access. While I clearly can’t be decolonial I can claim however, perspectives forged outside the North. Australia, while simultaneously a part of, is also apart from, Euro-American global Northern culture. It shares the geographic and other rhythms of the South like climate, distance, isolation (real or imaginary), and a sense of not quite belonging. It is, in its cultural psyche, ambivalent, a place on the margins – with its centre located elsewhere. There is an entanglement between Indigenous Australians as the world’s oldest continuous culture with European settler colony, and contemporary Asian migration finally acknowledging Australia’s geophysical location outside of Europe in the Asia Pacific. Unique hybridities are at play here. Understanding these histories enable me to “bridge the personal and political” and locate myself within regimes of power not unlike Daigle and Sundberg’s (2017 p. 339) challenge to their students to

“(a) analys(e) how they came to be in their current location and (b) evaluat(e) how specific geographical formations (colonial capitalism, diaspora, Indigenous legal geographies, place, settler colonialism, social movements) shaped personal (or family) experiences and, therefore, life opportunities.”

Hopefully, it reiterates the sense of humility and gratitude that comes from the growing awareness of Other narratives.

And finally, what of science education? Can science education be decolonial? What would it look like? How can the production of science education knowledge be delinked from hegemony of the discipline infrastructure? Certainly, there is an enormous opportunity for science education to interrogate the teleology of its own intellectual processes, academic culture and knowledge production (after Jazeel, 2017). Will it – that remains to be seen! My hope is that at least, the performative acts of teaching and writing about my decolonial practice is, itself, a decolonising act in science education, providing

generative forums to unsettle the dominant underpinning ideology. Decolonialism after all, demands action just as it does intellectual elaboration, but agreeing with Jazeel (2017), it must be cautious, tentative and above all, collaborative.

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