

From places to paths: *Learning for Sustainability*, teacher education and a philosophy of becoming

David A.G. Clarke^{a*}  and Jamie McPhie^b 

^a*Outdoor Education Department, Plumpton College, Lewes, United Kingdom*; ^b*Outdoor Studies, University of Cumbria, Ambleside, United Kingdom*

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The purpose of this paper is to explore what thinking with a philosophy of ‘becoming’ might produce in terms of conceptualising *Learning for Sustainability (LfS)*, a recent development in Scottish educational policy. The paper posits that animism and the immanent materiality of a philosophy of becoming have important ramifications for contemporary approaches to sustainability education. ‘Becoming’ is described and its relationship to prevailing ‘systemic’ approaches to sustainability education explained. *LfS* is then described and conceptualised with a philosophy of becoming by examining its implications for Education for Global Citizenship and Outdoor Learning. The concepts of communication as expression; the subject undone (as haecceity); the distinction of ‘nature’ as ‘other’; and the centrality of a storied world are discussed as important elements of *LfS* becoming. Lastly, teaching materials and interviews with two initial teacher educators help create a rhizomatic assemblage of teacher education practice and *LfS* as becoming. This assemblage creates lines of flight for considering practice, including making explicit the expressivity of communication in course descriptor/teaching/learning relationships; highlighting the place/becoming assemblages of ‘indoor’ and ‘outdoor’ learning environments; and storying the world with learners through haecceity description/experimentation.

Keywords: *Learning for sustainability*; teacher education; immanence; rhizoanalysis; animism

Introduction

On the 13th of March 2013 the Scottish Government accepted, nearly in full, all 31 of the One Planet Schools Working Group (2012) recommendations, entitled *Learning for Sustainability (LfS)*. *LfS* combines Outdoor Learning, Sustainable Development Education (SDE) and Education for Global Citizenship (EGC) into a coherent set of guidelines. The guidelines have been embedded into the new standards for teachers across the areas of initial registration, career-long professional development and leadership and management. These standards became active on July the 31st 2013. All teachers in Scotland will be required to demonstrate *LfS* in their teaching. Martin et al. (2013, 1530) state that this ‘is a significant development that will require a national commitment to pre-service and in-service training of all members of the profession’. Whilst the policy has significant implications for schools and teachers, this paper is concerned with the equally significant area of *LfS* and initial

*Corresponding author. Email: dave.a.g.clarke@gmail.com

teacher education. Teacher education programmes in Scotland are validated by the General Teaching Council for Scotland (GTCS) which has incorporated *LfS* into its validation process. Teacher education programmes will need to demonstrate *LfS* to ensure continued registration of courses with the GTCS. These developments bring to the fore questions as to how to educate prospective teachers for sustainability.

Concurrently, developments in new materialist philosophy raise questions about prevailing approaches to sustainability education that aim to tackle a perceived ‘disconnection’ in the human/nature relationship (see Coole and Frost 2010). Systems-informed ecological approaches have been popular in the literature on sustainability education as they are seen to demonstrate the implicit ‘connectedness’ of humans and the environment in an attempt to overcome what has been referred to as a ‘crisis of perception’ of a prevailing conception of the environment as distinct from human concerns. However, recent theory demonstrates how new materialist philosophy (what we term here a philosophy of becoming) suggests that the relational assumptions upon which systems approaches are built may be open to some of the criticisms of binaried thinking that they seek to overcome (Clarke and McPhie 2014). This second development brings to the fore questions of what an ontology of becoming might mean for prevailing systemic and relational approaches in sustainability education in specific contexts.

Theoretical discourse in Environmental Education, and more recently Education for Sustainability, has been informed by myriad philosophical positions that often move beyond realist ontologies. Recently, for instance, pluralistic conceptions of reality and phenomenological practices have been offered (Nicol 2014; Quay 2013) and pre-given notions of space and place contested (Hill and Brown 2014; Nakagawa and Payne 2014). The popularity of approaches to sustainability education which promote ecological literacy or systems thinking demonstrate a move away from an essentialist understanding of the environment in environmental education. In a previous paper (Clarke and McPhie 2014) we offer a critical approach to these ‘ecological’ pedagogies by drawing from Deleuzo-Guattarian materialist philosophy and the work of Ingold (2011) to problematise dominant terminology as applied to discussions in sustainability education through ecological or ‘systems’ approaches. With this paper we aim to apply this philosophical approach to statutory curricula developments in Scotland in the hope of being generative for curriculum theorists and educators. This is not intended as a comprehensive policy review, or a detailed research study, but rather an attempt to employ Deleuzian thought in the same manner as Gough (2006, 625), so as to ‘generate questions, provocations and challenges to dominant discourses and assumptions’. The purpose of this paper is therefore to examine how *LfS* might be conceptualised through thinking with an ontology of becoming; and to examine what barriers and opportunities might exist in the application of *LfS*, as conceptualised through an ontology of becoming, to initial teacher education practice.

Animism and the immanent materiality of a philosophy of becoming

Deleuze and Guattari (2004) describe a metaphysics of immanence where objects, or ‘points’ of being (subject/object) are illusory. Rather, reality is comprised of an indivisible smooth space made up of intensities, speeds and folds. Immanent materialism is a philosophy of becoming that ‘is reducible to neither mechanistic materialism, dualism’, nor is it ‘dependent on a higher power’ (Connolly 2010, 178). In this

way immanence contrasts with the established and more popular transcendent ontology, which prioritises a taxonomic classification of ‘things’. For instance, Bonnett’s (2015) recent call for an acknowledgment of the ‘transcendence of nature’ in environmental education stands in contrast to the immanent conception we advocate here. Bonnett defines nature as transcendent as a result of its ‘otherness’, its ‘mysteriousness’, its ‘integrity’ and the manner in which it ‘lies beyond our authorship and authority, and yet exercises agency in our lives’ (Bonnett 2015, 7). We consider that the very setting up of a culture/nature division is inherently transcendent, depicting ‘nature’ as a pre-given category. Immanence, by contrast, is the conceptualisation of a plane of reality not composed of pre-given structures (‘nature’ for instance). In simplistic terms, where transcendence takes signifying language as the mould into which the world must fit, immanence challenges the popular dominance of the signified, and in so doing ‘shakes’ the language that is so often seen as immutable. Deleuze (2001, 26–27) most famously advocated a conceptualisation of the world as immanent rather than transcendent:

Absolute immanence is in itself: it is not in something, *to* something; it does not depend on an object, or belong to a subject. In Spinoza, immanence is not immanence *to* substance; rather, substance and modes are in immanence. When the subject or the object falling outside the plane of immanence is taken as a universal subject or as an object *to which* immanence is attributed, the transcendental is entirely denatured, for it then simply redoubles the empirical (as with Kant), and immanence is distorted, for it then finds itself enclosed in the transcendent.

Immanence is a philosophical perspective which presumes that all of reality exists within (or more properly ‘of’) the world and that all things exist without a pre-given (transcendent) form or conceptualisation. Immanence is oppositional to structured notions of the world, denying that things have essential qualities or characteristics which, when taken together, form the physical or conceptual boundaries of material objects *and* conceptual categories, such as ‘nature’. A focus on this type of materialism in a philosophy of becoming incorporates ‘embodied humans within a material world’ (Coole and Frost 2010, 3). This concept is explored by Deleuze and Guattari (2004, 223) who suggest that, in the absence of points of being, as individuals or groups, ‘we are composed of lines ... or rather, bundles of lines’ constituted by the very materiality of the world; we are a ‘haecceity’ of becoming (Deleuze and Guattari 2004, 290). To consider the world as made up of haecceities (a things ‘thisness’) stands in contrast to the prevailing worldview of considering it to be made up of quiddities. We tend to think of the world as consisting of ‘things’ of certain types; species of plant or animal, types of clouds, makes and models of cars and even categories of knowledge (natural science, social science, etc). These are quiddities; metaphysical ‘points’ defined by the characteristics which make a thing a certain type of thing, or its ‘whatness’. A haecceity is instead made up of lines of material force and movement, never between points, creating a fluid space of relations.

These haecceities are not what we perceive, since in the world of fluid space there are no objects of perception. They are rather what we perceive in. In short, to perceive the environment is not to take stock of its contents but to follow what is going on, tracing the paths of the world’s becoming, wherever they may lead us. (Ingold 2009, 157)

Ingold (2011), cultivates this idea of humans, as well as other concentrations of material lines of flight, as ‘knots’, in his dense theoretical meshwork of lines that he

describes both metaphorically and literally as an entanglement. ‘Instead of thinking of organisms in relations, we should regard every living thing as itself an entanglement’ (Ingold 2011, 87); or, as Deleuze and Guattari (2004) would say, a ‘rhizome’, that stretches out on a horizontal plane, in opposition to a vertical or hierarchical tree-like structure. And so, according to Ingold (2011, 148, our emphasis), human existence:

unfolds not *in* places but *along* paths. Proceeding along a path, every inhabitant lays a trail. Where inhabitants meet, trails are entwined, as the life of each becomes bound up with the other. Every entwining is a knot, and the more that lifelines are entwined, the greater the density of the knot. Places then, are like knots, and the threads from which they are tied are lines of wayfaring.

As we shall discuss, places are not the outside, the boundary or locationality of a geographic delineation within the abstract conception of ‘space’, but are composed of the paths of human movement (Ingold 2011). Ingold (2011) suggests that to see the world as immanent is to see the world as animistic peoples do. That is to say, an animist is a person who understands the world to be immanent, sees it as such, and whose habits of thought and action are resultant of their enmeshment in this ontology. This *new* (Western) conception of animism may be held in contrast to an older (Western) conception, in which animism was often associated with “‘a belief in spirits” or “non-empirical beings”, and/or a confusion about life and death among some indigenous people, young children or all religious people’ (Harvey 2005, xi). This view is of course laden with the assumptions of the ‘truth’ of the ‘rational’ Western observer vs. the presumed naivety of the observed *other*. New or *contemporary animism*, as Graham Harvey refers to it in his wide-ranging 2013 edited collection of essays on the subject, is radically different to this Occidental view. In the collection, contemporary understandings of the manner in which animistic peoples conceive of reality are aligned with fundamental and pressing discussions rising simultaneously in the social sciences. A call for post-Cartesian ontologies (Morrison 2013), a move beyond culture/nature dialectics (Descola 2013), the acknowledgement of the materiality of life (Rival 2013), and a recognition that the world does not consist of objects (Ingold 2013) all jostle to demonstrate a worldview both *immanent and becoming*. As one engages with contemporary understandings of animism, one begins to see how much post-structural theory may only be beginning to catch up with a world as understood by many animistic peoples. For instance, Hallowell’s 1960 study of the Ojibwa people has been influential in the resurgence of the term animism. In his study Hallowell (2002) recognised that animists see the world as constituted by many people, only some of whom are human. This animistic envisioning of people pushes at the transcendent notion of the person as the thinking human subject or agent that is of such significance to Western academic practice. Similarly, Basso’s (1996) study of the Western Apache demonstrates that, to many animists, people and places are constituted by storied social relationships and that, as Morton (2007) has identified, this ontological standpoint forgoes any conception of the existence of a discrete, and transcendent, ‘nature’ so common in Western envisionings of the world. More recently Bird-David’s (1999) study of the Nayaka of Southern India, entitled *Animism Revisited*, demonstrates the relationality of the human engagement with the world. Ingold (1999, 82) notes the implications of Bird-David’s (1999) understanding of Nayaka relationships:

To ‘talk with a tree,’ as [Bird-David] points out, is a question not of (mistakenly) attributing to it an inner intelligence and then configuring how it might decide to react to what one does but of perceiving ‘what *it* does as one acts towards it, being aware concurrently of changes in oneself and the tree.’ Responsiveness, in this view, amounts to a kind of sensory participation, a coupling of the movement of one’s attention to the movement of aspects of the world. If there is intelligence at work here, it does not lie inside the head of the human actor, let alone inside the fabric of the tree. Rather, it is immanent in the total system of perception and action constituted by the co-presence of the human and the tree within a wider environment. To develop this idea further, the first thing we shall have to jettison is the cognitivist conception of intelligence as a mental computational device responsible for processing the data of perception and pulling the strings of action.

In this way animistic ways of seeing become modes of living where some of the conceptual foundations of the ‘crisis of perception’, argued to result in environmental degradation by environmental educators such as Orr (2004) and Capra (2009), are overcome. For instance, the fragmentation of the world into objective forms and the instrumental manipulation of these objects – as distinct entities that have little relation to, and thus little impact on the world – becomes an ontological impossibility (Clarke and Mcphie 2014).

Yet current relational, or systems-informed approaches in sustainability education may be open to some of the binaried thinking it hopes to overcome in its attempts to tackle the ‘crisis of perception’ of a disconnection to ‘nature’. Ingold (2011, 89–94) demonstrates this criticism of relational theories in his arthropodic battle, ‘When ANT [Actor Network Theory] meets SPIDER [Skilled Practice Involves Developmentally Embodied Responsiveness]’. Ingold’s (2011) critique lies in suggesting that ANT (and its ‘hybrid’ partners) implies no material presence in the relations between ‘things’, only in the things connected that are set over against each other (Ingold 2011). In this way ANT places more importance on the ‘points’ (such as subject/object or agency/structure), by focusing on agential/structural *orientations* and *impetus*, rather than following the motions *along* the paths (of becoming) in the middle, as proposed by Ingold (2011). Therefore, any impetus for action, for example, must evolve along lines always in the making (constantly becoming) rather than from a set of stationary objectifications (perhaps an animal, or perhaps any agent or a structure such as nature). Deleuze and Guattari (2004) call these paths, ‘lines of flight’ or ‘lines of becoming’. In his ‘meshwork’ (taken from Lefebvre 1991), that is the web of the spider; Ingold (2011) reasons that the lines of the web ‘are the lines along which [*the spider*] lives and conducts [*her*] perception and action in the world’ (Ingold 2011, 91). For Ingold the lines of flight that constitute the human becoming of the world are as literal, physical and necessary as the web is to the spider. To divide the two, is to place boundaries where only illusory ones exist.

The relevance of this line of reasoning becomes apparent when the academic discussions of sustainability education are considered in terms of their ontological assumptions and foundations. These discussions are often implicitly metaphysical in nature focusing, for instance, on emphasising the human relationship to ‘nature’ or a pre-given ‘environment’; that the world is constituted of a multitude of entities bound up in systems (through ecological literacy); and the human relationship to place (through place-based and place-responsive pedagogy). In addition there is an emphasis on a pre-given human subject, who can be taken into separate environments. Educational policy that incorporates sustainability education must look to these discourses for ideas for practice, and yet the metaphysics that underpins these

approaches are by no means settled. In the following section we begin to highlight how these pre-given conceptualisations might be ‘shaken’ in *LfS* by considering how they may appear through animistic ways of seeing, as grounded in a plane of immanence.

A philosophy of becoming and *LfS*

In the Professional Standards for Registration the GTCS define *LfS* as ‘a whole-school commitment that helps the school and its wider community develop the knowledge, skills, attitudes, values and practices needed to take decisions which are compatible with a sustainable future in a just and equitable world’ (GTCS 2012, 2). This is a broad agenda and understanding how *LfS* could be conceptualised in its entirety from a perspective of becoming is something of an impossibility. Rather, the first research aim is to explore some of the more prominent points of interest in these areas, given a perspective of becoming as described above and current topics of discussion in environmental education.

In the Scottish Government’s response to *LfS* Dr Alasdair Allan, Minister for Learning, Sciences and Scotland’s Languages, notes that:

Scotland has a distinguished history and international reputation recognised by UNESCO and others for sustainable development education, global citizenship and outdoor learning, which are firmly embedded within Curriculum for Excellence. Learning for sustainability encompasses all of these themes and approaches and sets out recommendations to build on successful practice in Scotland. The approach being recommended complements the General Teaching Council Scotland’s new Professional Standards which affirm the importance of values and learning for sustainability. (Scottish Government 2013, 3)

With this being the case we will explore areas of particular relevance in EGC, SDE and outdoor learning from a perspective of becoming. These will include discussion of communication in curriculum, how this relates to the learner as a ‘subject’ and how the ‘subject’ relates to the wider world.

‘Developing our children and young people as global citizens through SDE is a key context for learning within Curriculum for Excellence’. This quote from Education Scotland’s (2013) website seems to infer that SDE is the process by which global citizens *become*. Education Scotland (2013) list interdependence, diversity, carrying capacity, rights and responsibilities, equity and justice and uncertainty and precaution as the six core principles that lay at the centre of their interpretation of SDE, stating that these principles are embedded in global citizenship. There are some elements of EGC that are pertinent given a philosophy of becoming. We will thus focus on the ‘end goal’ of the global citizen before discussing outdoor learning.

From the viewpoint of Deleuze and Guattari’s (2004) philosophy of becoming it is appropriate to ask both how EGC reterritorialises and deterritorialises¹ and assess the extent to which it permits animistic ways of seeing to develop in teaching and learning. This last point is of most significance to the present study given the perspective endorsed by Clarke and McPhie (2014) that animistic ways of seeing may overcome the pointillist limitations of critical systems approaches to sustainability education (i.e. prioritising action and impetus from assumed or illusory subjects and objects or ‘points’). Our first critique then will address the static notions of what constitutes a global citizen. In their document entitled ‘Developing Global Citizens with the Curriculum for Excellence’, Learning and Teaching Scotland (2011, 10)

(now Education Scotland), demonstrate how a global citizen will ‘value and respect others, think critically and participate, understand interdependence, appreciate diversity and act responsibly’. These attributes reflect the principles of SDE and are seen to fit into the broader agenda of the Curriculum for Excellence which promotes the development of four competencies in learners; namely that they will become successful learners, confident individuals, effective contributors and responsible citizens (Learning and Teaching Scotland 2011). Implementing a Deleuzian perspective, Roy (2004, 297) lists skills, effectiveness, and ‘competencies’ among other terms, as ‘means of leveling nuance and banishing irreconcilables’ in education. Undoing the notion of straightforward *communication* in education’s institutional structures, Roy (2004) notes that assumptions concerning the nature of communication have resulted in staid educational conceptions of relations between, for example, policy and teaching practice and what is taught and what is learnt. Roy (2004) considers prevailing understandings of communication in education as a form of Oedipal apparatus (referring to Deleuze and Guattari’s critique of Freud’s persistent use of Oedipus as the central signifier for diverse mental projections). Roy (2004, 303) argues that the dominant educational institutional conception of communication supports the production of practice and policy that fails to acknowledge ‘that there are no ready answers or values that we can seize upon and put to use in organising learning’. Rather, communication as currently conceived in dominant educational praxis results in ‘a narcissism that shepherds diverse experience toward the reflection of a unity that can then be easily placed within a pre-existing hierarchised system of values’ (Roy 2004, 303). The prescriptive nature of educational policy, including EGC in *LfS*, reflects a misconception of the emergence of meaning (Roy 2004). Where communication, as currently conceived, understands meaning as packageable and transferable, a Deleuzian conception sees communication as an event, as *expression*:

What we have to do is to create new values in expression that are free from all final determination through the practice of counter-actualization, and by entering asignifying zones. By means of such disruption, normal hierarchy is lost, and the teacher becomes a part of expression, reinserted into the immanent plane just as the student. (Roy 2004, 311)

This understanding of the limitations of Western perceptions of communication as the transmission of information is highlighted by Ingold (2011) when he notes Hallowell’s (2002) identification of animistic people’s conceptions of communication (specifically a Northern branch of the Ojibwa people of Canada) as an immanent, interrelational expression, operating on an ontological plane quite different in nature to the prevailing Western conception of perceiving subjects sending and receiving packets of information.

Ross and Mannion (2012), in their discussion of curriculum making as dwelling in places, note that the material entanglement and relationality of an ontology of dwelling challenges the notion of fixed, prescriptive curricula ‘containing’ propositional knowledge, and we would extend this thought to curricula aims such as skills, attributes or ‘competencies’. They take their ontology of dwelling largely from the work of Heidegger through Ingold (2000, 2006). Communication, from this perspective, is expressive, it is an enactment of engagement in the shared environment, as opposed to representations *of* the environment (Ross and Mannion 2012).

From a dwelling perspective, the necessary alternative is to consider that a curriculum can only be lived as an on-going process, an improvisation, a response to a context inherent in the relations among people, places, materials and activities. In the absence of the capacity to represent or construct the world, curriculum texts and plans can only be directly experienced in and of themselves. Of course, curriculum texts and plans exist – it is what they implicitly claim that is at issue. (Ross and Mannion 2012, 307)

The curriculum approach described (of improvisation and response to processes) is evocative of an animistic way of seeing in curriculum making. Understandings of curriculum as prescriptive, where notions of personal attributes and ‘competencies’ are designated targets for which to aim (such as in Teaching and Learning Scotland’s [2011] conception of a ‘global citizen’), may staticise, rather than animate, the world. This is because they claim representational ways of knowing the world, over the actual immediate and visceral experience of becoming with the curriculum, place and people. An animistic approach, by contrast, is similar to Ross and Mannion’s (2012, 310) curriculum making as dwelling in that it is ‘no less than a non-representational account of teaching and learning, in which material-relational-context is the only stimulus and the only outcome, and the learner and teacher are points of growth therein’. Similarly Mannion, Fenwick, and Lynch (2013, 804) touch on the notion of a process-orientated curriculum of place, drawing on the influence of Deleuze in new materialist philosophy to suggest that:

Place-responsive pedagogy ... can be aligned with emerging post-humanist lines of thinking and theorising that attend to the sociomaterial which we consider a critical feature of emerging debates in environmental education about how to change human–environment relations.

Although we agree, we would look to establish an important distinction; a phenomenological ontology of dwelling – of *being* ‘points of growth’ *within* the world (Ross and Mannion 2012) and an animistic ontology of immanence, hinted at by Mannion, Fenwick, and Lynch (2013), crucially differ in the manner in which they conceive of the subject, and it is to the subject that we now turn.

In relation to the manner in which the subject exists in/of the world, Wylie (2007, 201, cited in Clarke and McPhie [2014] original emphasis) notes the contrast between a Deleuzo-Guattarian ‘becoming’ and a Heideggerian phenomenological perspective of ‘being’:

The notion of *becoming* first captures the Deleuzian sense of a world continually in the making, continually proliferating. It also captures the strongly anti-phenomenological bent of Deleuze’s writing; in so far as ‘becoming’ is explicitly a radical alternative to what Deleuze would see as the static and sedentary tonalities of Heideggerian notions of dwelling and ‘being-in-the-world’.

This point is a significant critique of EGC from a perspective of becoming in that in EGC, by definition, the subject is held up apart from the world, as a distinct point of being. Systems-informed sustainability education suggests that points of being relate to each other through a process of *non-linear* cause-and-effect where the subject is a point of being *in relation to* a world of objects (other points of being). In contrast a Heideggerian phenomenological conception suggests the subject (as a point of being) is placed within the single objective whole (Quay 2013). A Deleuzian conception, however, tells us the relation is one of *affect*, an *intra-relation*, which sweeps away the possibility of points of being, whether object or subject and that, as points disappear:

there is nothing left for the spatial scientist but the play of joints (and ... and ... and) ... What remains is precisely that which maintains the different detached pieces in their incalculable disjointure – AND ... AND ... AND – : the interval takes all; the ontology of being gets carried away by the conjunctives. (Doel 2000, 130, cited in Clarke and Mcphie 2014)

In this way the critical environmental educator is left only with movement and a view of a world that problematises the notions of ‘connecting’ and ‘disconnecting’. Clarke and Mcphie (2014) highlight how the nexus of people and environment is moved on from both eco-systemic and subject-orientated phenomenological understandings of reality by Deleuzo-Guattarian philosophy to a metaphysics of a smooth space, or plane of immanence. On this plane ‘nature’ and ‘people’ (subjects) are one and the same.

If the subject is dissolved how might learners be conceived in relation to *LfS*? St. Pierre (2004) takes up the task of considering ‘the subject undone’ in education from a Deleuzian perspective. She notes that the notion of the human subject deterritorialising was one that came easily to her upon reading Deleuze and Guattari for the first time.

Because the human/nonhuman binary had always troubled me, I had no difficulty thinking of myself – the human – as an assemblage with the earth, space/time, speeds, intensities, durations, lines, interstices, hydraulics, turbulences, folds – the nonhuman. (St. Pierre 2004, 289)

This description is animistic in its nature and we suspect that this way of thinking may come easily to others also, yet this step across the human/non-human divide will seem ludicrous to many. The individualised² subject is a cornerstone of not only the modern educational institution but also the Western world and is, at the very least, a requirement for the possible attainment of the competencies required of a global citizen as conceived within *LfS*. St. Pierre (2004, 293) argues that ‘all of education and science is grounded in certain theories of the subject; and if the subject changes, everything else must as well’. She (St. Pierre 2004, 290) asks why we would want to think/live outside of the established ‘I’, answering for herself by stating that Deleuze ‘might respond to that last question by saying that we might live differently if we conceive the world differently’. Indeed, the repercussions of this view are that discussions of a global citizen move from competencies and attributes, to the shifting of our assumptions (whether articulated or not) of our ontological existence, which then impact on our modes of being, or more accurately, becoming. In short, seeing the self as distributed or extended, in the animistic sense, may result in a behaviour of ‘care, judgment and sensitivity’ (Ingold 2011, 75). We would suggest that curriculum making as animistic expression may offer one view of this changed educational landscape. One way to attempt the dissolving of the object/subject with learners may be to try and explain it, another may be to try and demonstrate it and there is potential to do so with the focus that *LfS* places on outdoor learning, though prevailing conceptions of ‘the outdoors’ may first have to be overcome.

Outdoor learning plays a significant role in *LfS* and has had a prominent role in Scottish Education for some years. The alignment of outdoor learning and learning about and for sustainability has been achieved through a small but steady number of articles and research studies. A recent review of literature identified early childhood experiences, direct contact with nature, promoting ecological literacy, developing a

sense of place, developing critical thinking and tackling students ‘ecophobic’ perceptions of nature as important (Christie and Higgins 2012). A philosophy of becoming has significant implications for some of these dominant narratives. For instance Clarke and Mcphie (2014) draw from Deleuze and Guattari to critique the idea that learners can go into – and have an experience – of a geographical location that is ‘nature’ and then return to a geographical location that is not. Morton (2007) urges us to begin an ‘ecology without nature’ so as to overcome the dominant romantic narrative in environmental studies and the environmental movement in general. His ideas have great significance for any outdoor education research which essentialises ‘nature’, objectifying it as a substance that can be experienced. Zink and Burrows (2008) application of Foucauldian theory to outdoor education similarly questions the sanctity of the indoor/outdoor binary.

The critique offered above covers some of the broader issues involved with *LfS* from a perspective of becoming. *LfS* is neither supported nor unsupported by an ontology of becoming. Rather, it can be conceptualised through *LfS* to provide a way of understanding educational practice for sustainability which questions prevailing systems-informed, or citizen-orientated, approaches. How *LfS*, as conceptualised through becoming, may compare to current practice is the focus of the next section so as to highlight some possible barriers and opportunities in the approach.

Sustainability and teacher education research ‘with political teeth’

UNESCO’s³ declaration that the years 2005–2014 constitute a decade of sustainability education and their request that ‘all levels and forms of existing educational and teaching and learning programmes need to be reviewed and re-orientated to address the causes and consequences of climate change’ has resulted in a significant increase in research in sustainability and teacher education internationally (UNESCO 2009, 1). In the last few years alone, multiple studies have sought to ascertain ‘pre-service’ teachers’ environmental/sustainable development knowledge and efficacy (Boon and Wilson 2011; Boubonari, Markos, and Kevrekidis 2013; Effenev and Davis 2013; Evans, Whitehouse, and Hickey 2012; Karpudewan, Ismail, and Mohamed 2013; Kennelly et al. 2012; Lugg 2012). However, posthuman/poststructural research in this area has been sparse. Whilst Deleuzian approaches have been used in educational research to discuss classroom interactions, interpretation of policy texts, use of technology, disabilities, the notion of the ‘subject’ and other areas, we have yet to come across an example discussing teacher education (Bowles 2012; de Freitas 2012; Handsfield 2007; Honan 2004; Ruitenbergh 2007; Sellers 2006; St. Pierre 2004).

Le Grange (2011, 752) employs Deleuzian rhizomes in discussion of sustainability education in Higher Education to ‘escape from potential homogenising and normalising effects of notions of sustainability (education) as defined at inter-governmental conventions and by supranational organisations’. Reading these and similar studies not only convinced us of the suitability of the method to our research, but also demonstrated the spirit of what we intended the study to be. Researchers who have drawn on the work of Deleuze and Guattari seemed to do so for personal and educationally political, as much as pragmatic, reasons, seeking out alternatives to neoliberal structures in education and creativity disallowed by striated discourses and hegemonic power. St. Pierre (2004, 293) demonstrates this sentiment when discussing her hopes for education and research: ‘We live in a time out of joint, a time of conservatism that

threatens to overwhelm us at every turn, yet Deleuze helps us imagine a time to come in which the struggle may change'. Deleuzian research, as described by (Martin and Kamberelis 2013, 673), has 'political teeth', providing concepts that work in crossing established disciplinary borders.

We are in desperate need of new concepts, Deleuzian or otherwise, in this new educational environment that privileges a single positivist research model with its transcendent rationality and objectivity and accompanying concepts such as randomization, replicability, generalizability, bias, and so forth – one that has marginalized subjugated knowledges and done material harm at all levels of education, and one that many educators have resisted with some success for the last fifty years. (St. Pierre 2004, 286)

We took these points as an indicator of the opportunities that Deleuzian methodology might bring to the study. Rather than describing the data, or looking within it, we were interested in its generative properties. Additionally we required a methodology which would allow a degree of flexibility to connect diverse points across *LfS* as becoming and teacher education practice.

(Non)methodology: rhizoanalysis

The second part of this paper intends to explore 'barriers and opportunities' to teacher education practice provided by *LfS*, as conceptualised through an ontology of becoming. Martin and Kamberelis (2013, 670) express effectively Deleuze and Guattari's conception of reality as 'becoming':

Reality is viewed as a continual process of flux or differentiation even though this fact is usually masked by powerful and pervasive illusory discourses of fixity, stability, and identity that have characterized most of western philosophy and theory since at least the Enlightenment.

Deleuze and Guattari (2004) set about to provide both a vocabulary and a way of seeing which encourage these 'pervasive illusory discourses' to be tackled; however research implementing this ready conceptual framework has been limited. As we have stated, Gough (2006, 625) embraces Deleuze and Guattari (2004) to enact a deterritorialisation of science education demonstrating how rhizomatic assemblages formed by nomadic theory may 'generate questions, provocations and challenges to dominant discourses and assumptions'. Indeed a Deleuzian perspective is particularly well suited to disrupting (deterritorialising) and creating (reterritorialising) knowledge by acknowledging an a-centrality of epistemology. Claims of legitimacy, validity, and striated and structured conceptions of knowledge are rendered open for novel lines of flight to 'become'. Gough's article *Shaking the tree, making a rhizome: Towards a Geophilosophy of science education* is typical of Deleuzian inspired enquiries⁴ in that it highlights an approach in contrast to the hierarchical 'tree of knowledge' (arborescent) assumption prevalent in positivistic and much interpretivist research. Masny (2013, 339) notes the manner in which creating Deleuzian rhizomes can disrupt prevailing qualitative research approaches (thus informing methodological practice) highlighting how:

a rhizome has horizontal shoots that take off in unpredictable directions. It has no beginning, no end. It spills out in the middle. For Deleuze, a rhizome functions to disrupt and to create change/becoming. In this article, the rhizome disrupts (deterritorializes) methodology and literacy in order to reconceptualize them ... thus opening up potentialities for thinking differently about qualitative research.

Masny's (2013) description of the purpose of rhizoanalysis as producing 'change/becoming' of the topic under question should highlight its usefulness in the present study as a mode of subverting staid discourse in teacher education, however, it also raises points for methodological consideration. For instance St. Pierre (1997, 175) demonstrates the contrast of rhizoanalysis to prevailing qualitative methods, suggesting that data are not to be read as evidence, but rather as nonrepresentational and 'transgressive'. The aim is to describe data as an assemblage, a rhizome, in order to allow change/becoming. The purpose is neither interpretation, nor the identification of significance in data as, 'in truth, significance and interpretation are the two diseases of the earth or the skin, in other words, humankind's fundamental neurosis' (Deleuze and Guattari 2004, 127). Rather, Deleuze and Guattari (2004) proffer the creation of a rhizome, an assemblage, combined with 'pragmatic experimentation in which sense emerges through power and affect' (Masny 2013, 342). Power and affect emerge through freedom and creativity in reading data. In a similar fashion to Jackson and Mazzei (2011) the 'analysis' at work here is 'post-humanist', and we should acknowledge that we are imbricated in the assemblage of the research, in the same way that *you* are now, reading this. The only research question is, what is produced? Traditional positivist standards of validity and reliability, and constructivist strongholds of rigour and authenticity are rendered obsolete, for the task is not to uncover, code, eke out or represent some transcendental truth, but to consider the research generatively, to ask: How does the research work? What does it create? Waterhouse (2011, 142) demonstrates how a move from considering research transcendently, to considering it immanently allows:

a move towards a place where research is not judged in relation to an external set of criteria, rather research is assessed immanently according to its creative, affective powers. What does research produce? What hitherto unthought-of lines of flight does it open? What does it make possible to think? (Waterhouse 2011, 142)

Masny and Waterhouse (2011, 292) suggest that this approach overcomes requirements to interpret and 'ascribe meaning; it avoids conclusions'. This notion may be at once liberating and unsettling for a researcher, as whilst the stripping away of established qualitative research approaches creates opportunities for new roads to be forged, established handrails are removed. However, this is both the ontological realm from which immanence and becoming spring *and* the means by which validity is attained in respect of an ontology of becoming. There is a clear distinction then between rhizoanalysis and more holistic discourse analysis approaches. Breeze (2013, 494) critiques Critical Discourse Analysis (CDA) as instrumentalising the theory and reports 'how CDA researchers may fail to integrate context and audience satisfactorily into their analytical framework, leading to naively deterministic assumptions about the workings of discourse and social reproduction'. This is very different from the more experimental, un-bounded and creative rhizoanalysis which looks to *multiple* co-productions rather than linear, deterministic and unidirectional cause-and-effect structures (as if there was a hidden truth waiting to be discovered by anthropocentric interpretations and meaning making). However, we acknowledge that it really depends on the inquirer as to the depth of use of rhizoanalysis.

Whilst procedural approaches are inappropriate, precedents of Deleuzian inspired research suggest themes of practice. For instance, both the cartographic construction of a rhizome as a 'map' and the placing of the 'map' on the 'tracing' of current striated discourse are encouraged by Deleuze and Guattari (2004). The creation of a

rhizome is an act of empirical geophilosophy, literally the constructing of a philosophical map. The rhizome is described in non-hierarchical terms, each aspect as worthy as the next. The description, drawn from a plane of immanence, is thus a horizontal one; a map.

In sum, a rhizome becomes a map to analyze and report data. Data analysis is governed by Deleuzian transcendental empiricism, positing a role for a decentered subject and anti-representation. Sense emerges, a result of an assemblage reading, reading of the world and self. (Masny 2013, 342)

The ‘findings’ presented below are thus a map, an assemblage, brought together by considering lines of flight connecting teacher educators’ voices and modes of practice with *LfS* as considered ‘becoming’. As Masny (2013, 341) states:

An assemblage can be constituted by teachers, classmates, researcher, computers, classrooms, and more [sic]. The subject is in the assemblage no more, no less important than the other elements in the assemblage. The elements in the assemblage construct relationships to each other once they come together in the actual. There is no a priori or pre-given relationship among elements in the assemblage.

Masny’s (2013) description of a rhizomatic map as an assemblage make the practicalities of engaging in rhizoanalysis more apparent. Any elements can be brought together, considered, connected, *assembled* in a fashion allowing new lines of flight between them. Our approach most closely reflects Strom’s (2013) study of teacher practice in that ‘immanence’ is central; there is nothing in the data ‘to be found’. Rather ‘findings are produced through a mapping activity – drawing lines that connect the multiple acts, actions, activities, events, and artifacts that constitute the data-set’ (Martin and Kamberelis 2013, 676). The assemblage thus articulates the real in new ways, it tells a story in the manner after Ingold (2011), crossing the boundaries that classification and categorisation create. What is described is a story, or what Masny (2013) refers to as a ‘vignette’. Masny (2013) stresses that, although rhizoanalyses contain an empirical component, they are not empirical in the conventional way. Importantly our research sought to explore how teacher education could ‘become’ when combined with *LfS* as perceived through ‘becoming’. The assemblage thus presented is a reflection of some aspects of the landscape of teacher education practice combined with *LfS* as becoming.

An assemblage of teacher education and *LfS* as becoming

Limitations of the size of the study meant that teacher education practice had to be considered from a manageable perspective. It was decided that to focus on courses or modules of programmes within an established Scottish teacher education institution presented the best opportunity to consider the potential influence of *LfS* and becoming. A third and fourth year course of the same undergraduate teacher education programme were selected with one course focusing on issues specifically linked to sustainability education and one course focusing specifically on issues of equality, access and social justice in education. These will be referred to as the ‘Sustainability Education course’ and the ‘Equality Education course’ respectively as a means of maintaining anonymity, although these terms should be considered as labels rather than thought of as anything other than loose descriptions of the courses’ content and aims. The two courses were chosen to give some comment on both the current practice for teacher education for sustainability and allow discussion of a course not

currently perceived to incorporate sustainability rather than as a means to generalise across courses. One specific instance is always already a multiplicity of a rhizomatic process, as is two or three, etc. The terms Programme, School (or School of Education), and University are used to refer to the various contexts to which the courses relate. Data consisted of a one-hour semi-structured interview with each course leader (or co-leader),⁵ and course documents including course or module descriptors, copies of course assessments, reading lists, course content delivery timetables, lecture hand-outs and lesson PowerPoints, and other teaching materials. These teaching materials were accessed via the student virtual learning environment (VLE) portal with the participants' permission. The semi-structured interviews were designed to allow a picture of the aims of the courses, the content and teaching and learning approaches taken, the course leaders' role in developing the courses and to establish if the interviewees were aware of *LfS* and the way they thought it might impact their practice. Additionally, the interviewer followed up initial questions so as to better understand the impetus for decisions regarding teacher education practice. Interviews were transcribed and sent to the interviewees so they could clarify points or omit comments if they so chose. The praxis described by the lecturers in the examples given are not representative of educators dealing specifically with the implementation of *LfS* but are drawn from a wider spectrum of arising topics in teacher educator practice.

One of the authors, who also conducted interviews, carried out the 'reading of the data for sense' whilst considering what opportunities or barriers arose for the elucidation of *LfS* through becoming. To do this, the interview transcripts were read while the interviewer considered which sections of the text related well to allowing lines of flight (new thoughts about the topic) to become and while also considering the elements in *LfS* and becoming. In this way 'each reading of "data" texts and each selection of vignettes is an event wherein sense emerges; an immanent event suggesting not what data is, but rather, how it might become'. (Masny and Waterhouse 2011, 293). Following Deleuze and Guattari's (2004, 12) instruction to 'write, form a rhizome' the interviewer wrote as he went, attempting to experiment with the writing process in the same manner as Gough (2004), writing a narrative rhizomatic experiment to assemble teacher education practice and *LfS* as becoming. One line of flight through the data is presented, though there is scope in the data for much more to be said on the topic. St. Pierre and Jackson (2014) describe how each reader of Deleuze and Guattari will take their own line of flight through their work, making their own connections and thus working with the concepts in unique ways. Martin and Kamberelis (2013, 677) suggest that Deleuze and Guattari would consider the establishment of procedures for rhizoanalysis 'ludicrous'. Honan (2007, 268), in her rhizoanalysis of teachers' reading of policy texts suggests that 'turning against method is a thread that connects the work of many who have written about attempts to translate Deleuzian theory into some kind of methodological action'.

The assemblage: teacher education and LfS as becoming

The assemblage does not begin, but will rather 'pick up a thread' in a middle that may lead to a rhizomatic tuber by discussing the aims of the two courses and the course leaders' knowledge of *LfS*. Adrian's overriding hope for his third year Equality in Education course is that student teachers will realise the social barriers facing learners in their schools:

so it might be the curriculum, it might be assessment, it might be teaching, it might be the physical layout of the school, it might be the timetable, but these things impact on learners in negative ways and you need to be aware of that and think about that in your teaching. So that's what I want them to learn at the most basic level.

Mary describes a broad aim for the Sustainability Education course:

we're trying to get them to get a broader and deeper understanding of what active citizenship, social justice, sustainability, we even try to get them to become more aware of the three pillars of sustainability too because it's always been a bit surprising that students seem to think of it as being about the environment only.

Specifically, Mary describes how her hope is that those taking the course will develop more than just propositional knowledge in students, stating that 'quite a bit of the reading we ask them to do, is to try and get them into a frame of mind, so the aims are very, they're very broad, um, but it's kind of interdependency [and] systems thinking'. However, Mary stresses that students enrolled on the BEd programme should 'provide clear evidence that they have understood where *LfS* fits into their professional responsibilities, because it's a core disposition and it's a core competence for the GTCS registration'. It is clear throughout our discussion that the *LfS* initiative is important to Mary and she sees it as a positive and significant development in Scottish education. Adrian, contrastingly, was not aware of *LfS* before he had been contacted for the research.

Learning

Remembering to attempt to 'avoid interpretation' and instead ask 'what does the research create?' in terms of *LfS* as becoming, it is important to consider the lines of flight open for seeing how teacher education might become animistic in regards the aims of the courses. The aims of both of these courses, and indeed courses in the wider programme, school and university, are stated explicitly in a policy document⁶ which describes not only the aims, but also the 'content', the learning 'outcomes' and other information regarding the contact hours and modes of assessment and delivery to be used in the courses. Reading these documents and wondering about the generative forces the text creates, led to a consideration of the narrative style used within the policy. The research did not look to analyse the content of the document, but to consider what the text might create in teaching practice through its implicit assumptions. Reflecting on the findings from our second research aim (how *LfS* might be conceptualised through becoming) it seemed there was a transcendental quality to the policy documents. These documents, whilst compartmentalising important information about the structure and mechanisms by which the course operates within the larger institution, also act to affirm and authenticate the conception of communication as *transfer of information* rather than *immanent expression* in the manner described by Roy (2004). However, as explored by Sellers (2010), rather than curricula outcomes or content existing within themselves, they are brought into existence through milieu(s) of becoming in curriculum performativity. That is, there is a meeting/becoming of the materiality of educator/text/text-reading/learner/place that is inherently expressive, but may be implicitly understood as transcendent. The term performativity is used by Sellers (2010) to demonstrate the very 'eventing' nature of the learning interactions that make curricula come alive (actually happen). In particular Sellers (2010, 563) describes what children do and say about curriculum

as their ‘curriculum performativity’. We agree with Sellers and take our understanding of performativity from the deconstructive (after Foucault and Derrida) work of post-structural/post-humanist feminist authors such as Butler (2011) and Barad (2003):

Performativity, properly construed, is not an invitation to turn everything (including material bodies) into words; on the contrary, performativity is precisely a contestation of the excessive power granted to language to determine what is real. Hence, in ironic contrast to the misconception that would equate performativity with a form of linguistic monism that takes language to be the stuff of reality, performativity is actually a contestation of the unexamined habits of mind that grant language and other forms of representation more power in determining our ontologies than they deserve. The move toward performative alternatives to representationalism shifts the focus from questions of correspondence between descriptions and reality (e.g., do they mirror nature or culture?) to matters of practices/doings/actions. (Barad 2003, 803)

There is an opportunity then, for the making of this expressive/immanent understanding of curriculum reading in teacher education (educating) a more explicit aspect of the process of teaching and learning so as to overturn transcendent assumptions implicit in language. The purpose of this would be to demonstrate the animate and intra-relational nature of the educator/learning/learner/place to help promote animistic ways of seeing. Whilst the dominant institutional apparatus may resist change in policy document style (i.e. an attempt to move from transcendent to expressive/immanent language in documents and learning outcomes), there is a case for curriculum making as expression based on educator interaction with existing documents, as advocated by Ross and Mannion (2012) and Mannion, Fenwick, and Lynch (2013). Whereas Ross and Mannion (2012) draw largely on Ingold (2000, 2006) to highlight the learner and educator as ‘points of growth’ within this expression we draw our understanding from Ingold (2011) who stipulates that people are the lines they make in the world, not points of growth, dwelling. We will return to this point shortly in discussion of the ‘subject undone’, but for now we will discuss how our emphasis differs from that of Mannion, Fenwick, and Lynch (2013) concerning curricula as expression. Whilst their paper also works from the basis of a process ontology, recognising its importance across all forms of environmental education, their approach suggests it will have the most impact for place-based pedagogies ‘particularly in outdoor, natural environments’ (Mannion, Fenwick, and Lynch 2013, 805). Our suggestion would be that all education move to a place-responsive pedagogy of expression, regardless of the site of education, but that ‘outdoor’, (possibly *bio-diverse*) heterogeneous (rather than the problematic concept ‘natural’) environments may offer exceptional *opportunities* for the perception of the world as a human-environment process. With this point in mind a line of flight opens up to consider how the course leaders in this study consider the learning environments in their delivery so as to make some comment on ‘places becoming’ as discussed in our answer to our application of Deleuzian thought to *LfS* above.

Place

Mary carefully considers the environments that her student teachers experience and suggests that others who teach on the course do this also. She makes explicit links between the environments students experience and the aims of the course:

you can't really be teaching about sense of place, understanding about reconnecting with nature if you're sitting in a classroom, within the four walls. We want the students to be able to, I mean they are fourth year, they're senior honours students, we want them to be able to take leads and responsibility for their own learning, but at the same time we need to scaffold their critical thinking, so we need to give them a wide variety of experiences and we also need to help them understand the different ways they can involve these kind of strategies in their own approaches too, for those that are going into teaching.

Mary discusses her reasoning for her approaches to teaching the course:

we want people to really engage at the deepest most spiritual level at what it is that they're trying to learn, so, sitting, just listening to somebody, is not, it's not going to cut it, and when you want people to engage at looking at things from multiple perspectives, so you want people to realize that value-based and value judgements are part of it, then you need to be engaging with discussion and debate and controversy, you're going to be talking [about] what you get from emotional sense of place, or being able to critique and having the confidence of suggesting challenge and change, you need to be out there sniffing and scratching and seeing what, what the planet has on our doorstep. So you can't do any of that from watching a video and listening to a lecture.

Given the views we described previously (and reasserted above) on outdoor learning from a perspective of becoming⁷ there seems great potential for expressive and immanent practices in the current delivery of the Sustainability Education course. However, Mary's point of view also highlights a problem in the prevailing use of language, which perpetuates dualist understandings, such as 'nature' as distinct from human 'being' and action.⁸ Although Mary considers that not all of her lessons are 'outside', (or 'in' the planet, which, apparently, is on the human 'doorstep'), we would argue that all her lectures, without exception, are 'in' the world, or more accurately, becoming *of* the world, and that if animistic ways of seeing are to prevail in teacher education, then practice would need to reflect this. Whilst there are obviously cultural barriers in attempting to tackle this issue with teacher educators (such as the language used), there are also practical barriers that mean that teacher educators and students of other courses cannot easily experience 'outdoor' learning.

For instance, Adrian describes how his practice is constrained by institutional forces whilst describing his approach to delivery:

Um, it's a very common-or-garden lecture it's um, a single lecture usually with a PowerPoint, um, talking to 200 hundred students in a very top down sort of way.

It's basically it's cost saving, you know, workshops, we've got 10 workshop tutors so workshops are made up of 25 students, um, which is far too many,

I mean the one hour workshops are silly, you can't do anything in an hour, but we can't do two hour workshops because of a) pressures on accommodation and b) pressures on tutor time, um, so they have to be an hour, um and, what other constraints, yeah just, I mean just constraints in getting staff, um, I need ten staff to teach on [the name of the course], um, it's starting in January, I don't know who those staff are going to be yet.

'Outdoor' learning may appear a more difficult prospect for Adrian. Whilst in our discussion Mary suggests the possibility of working in diverse ways with large groups by giving students opportunities for unsupervised 'outdoor' learning, it remains practically difficult for teacher educators to attempt 'outdoor' learning with large cohorts. Whilst it is the case that discussion of the materiality of learning as an immanent expression (animate) is conceptually challenging, it is relevant regardless

of the prevailing cultural conception of the environment (i.e. indoor/outdoor) and there is, therefore, an opportunity for engaging with large groups to participate with the animate lecture theatre/room. This does, of course, forgo the visceral experiences of the animate ‘outdoors’, but importantly it may allow a levelling of the ontological distinction between indoor and outdoor, and may be used in conjunction with traditional (as in culturally prevailing conceptions of) outdoor experiences, rather than having the lecture theatre/room held apart as a lifeless, sterile environment of learning – on the contrary, lecture theatres and classrooms and the people and learning that go on there, are animate becoming(s) also.

The subject undone

The issue that St. Pierre (2004) refers to as the ‘subject undone’ is relevant here as it forms a significant aspect of describing an environment, whether ‘outdoors’ or a lecture theatre, from a perspective of becoming. Deleuze and Guattari (2004) remind us of the centrality of the haecceity to animistic ways of seeing:

You will yield nothing to haecceities unless you realize that that is what you are, and that you are nothing but that ... You have the individuality of a day, a season, a year, *a life* (regardless of its duration)-a climate, a wind, a fog, a swarm, a pack (regardless of its regularity). Or at least you can have it, you can reach it ... It should not be thought that a haecceity consists simply of a décor or a backdrop that situates subjects ... It is the entire assemblage in its individuated aggregate that is a haecceity. (Deleuze and Guattari 2004, 289)

What opportunities and barriers does current practice generate in helping/hindering student teachers to see themselves/their practice/their learners as haecceities? This question was pondered whilst, trawling through the VLE of each course, the interviewer began to reflect on his sense of ebbing subjectivity in the becoming milieu(s) of the online environment.⁹ Gough (2004) reflects on the subject in this manner in his article ‘rhizomANTically-becoming-cyborg’¹⁰ which describes how he was led to consider the assembled (including the subject) performativity of teaching and learning. His thoughts reflect something of how the interviewer felt whilst engaging with the VLE and considering his subjectivity:

ANT had a decentering effect on my thinking, helping to shift my attention from more individuated notions of cyborg subjectivities and corporealities towards the relations that produce them. Now, the idea of rhizomANTically becoming-cyborg signifies my desire to imagine teaching and learning as material-semiotic assemblages of sociotechnical relations embedded in and performed by shifting connections and interactions among a variety of organic, technical, ‘natural’, and textual materials. (Gough 2004, 255)

Once again, for us this statement by Gough (2004) is evocative of animistic ways of seeing in teaching and learning and we are keen to see how this way of understanding may be made explicit with student teachers. Gough (2004) takes care to point out a slight distinction¹¹ between his ‘rhizomANTically-becoming-cyborg’ and the cyborg pedagogy of Angus, Cook, and Evans (2001) and it is a distinction of use here as it both deals with the ‘subject undone’ and highlights the centrality of a storied world. Gough (2004) cites an example in Angus, Cook, and Evans (2001) cyborg manifesto in which the authors describe in exhaustive detail the connections that went into creating a cup of coffee. These include the miles of piping and human made reservoir that provide the water and the ‘wires, pylons, transformers, power

stations and their fuels' that provided the power for the kettle; all of which allowed the coffee to be brewed, and thus the individual who brewed it to be who s/he presently is (Angus, Cook, and Evans 2001, 195–196, cited in Gough 2004). This, Angus, Cook and Evans argue, makes the individual a cyborg, not a subject within their own skin, but dissipated throughout the material/technical relations that allow them to be. Storying the world as it currently constitutes us in this manner makes the dissolving of the subject more comprehensible. Gough's (2004) distinction though, is that researchers, theorists and, we think, practitioners must be sure to create rhizomes in their mapping of these relations, and not tracings.¹² The difference he suggests, and we are inclined to agree, is that, where tracings simply describe the emplacement as real, rhizomes *experiment* with the real, allowing each describer to tell their own story of the lines that constitute her/his individuation. We return¹³ to the notion of people as lines of becoming here (rather than as points of growth) and wonder what experimental learning practices might be developed to allow the becoming that is the learner/educator/VLE/place/curriculum to be 'imagined as the line of its own movement or – more realistically – as a bundle of lines' (Ingold 2011, 13).

That is how we need to feel ... A haecceity has neither beginning nor end, origin nor destination; it is always in the middle. It is not made of points, only of lines. It is a rhizome. (Deleuze and Guattari 2004, 263)

The middle

In this study we entered into a creative assemblage that was useful for exploring the points we raised initially against current teacher education practice. This assemblage can continue proliferating indefinitely, however, the word limit on this paper is not indefinite so we will leave (as always) in the middle. We have taken the policy *LfS* as a starting point for considering how dominant conceptions within sustainability education discourse may be questioned and provoked through an Ingoldian construal of a Deleuzo-Guattarian ontology of becoming. We have argued that this ontology may be useful to sustainability education as it offers a means to overcome the 'crisis of perception' of a disconnection with the 'natural' world by promoting animistic ways of seeing. These ways of seeing eschew dualisms of nature/culture and subject/object and, we claim, may directly result in actions of care, judgement and sensitivity to the flux of the world (Clarke and Mcphie 2014). We then described how *LfS* may be conceptualised through animistic ways of seeing suggesting that notions of communication as expression rather than transfer of information, the notion of the learner/teacher as a subjectless individuation (as haecceity) rather than an individual subject, and the prevailing distinction of 'nature' as 'other', are of particular significance to *LfS* as becoming. We have begun to explore current teacher education practice in light of these areas of interest by creating a rhizomatic assemblage of teacher educator practice, teaching materials and *LfS* as conceptualised through an ontology of becoming. This assemblage creates some lines of flight for considering practice including the making explicit of the expressivity of communication in course descriptor/teaching/learning relationships; the making explicit the place/becoming assemblages of both 'indoor' and 'outdoor' teaching environments; and storying the world with learners through haecceity description/experimentation.

We believe the approach articulated here has great significance for both educational practice and academic endeavors in environmental education. It is important

to note, however, that work to come must build on, rather than attempt to erode, the accomplishments of scholars and practitioners who have tirelessly laboured for the inclusion of environmental and sustainability education in the curriculum. As a result of hard work gone before, we find ourselves at a critical and opportune juncture in environmental education research. Policies like *LfS* create a mandate for creative experimenting, rigorous thinking and generative questioning of practice and what is offered with this paper is one small attempt to improve understanding of environmental education along critical and exciting lines of reasoning.

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Notes

1. E.g. how does the term work? What does it allow to become? What other lines of flight does it disallow or subjugate?
2. As opposed to the Deleuzo-Guattarian subjectless individuation.
3. United Nations Educational, Scientific and Cultural Organization.
4. Termed 'rhizoanalytic' or implementing 'rhizoanalysis'.
5. The course leaders were assigned pseudonyms.
6. The course specification or descriptor.
7. That it holds great potential for demonstrating the animate nature of the world, but that care needs to be taken not to set up, or perpetuate, illusory boundaries such as a distinct 'nature'.
8. In the text above, for example, Mary refers to 'out there' and 'what the planet has on our doorstep', suggesting a human/planet dualism.
9. VLE – The online portal that the course leaders use to communicate with students and deposit course readings and other learning materials.
10. Inspired by the 'actants' of Bruno Latour's Actor Network Theory and Donna Haraway's posthuman cyborg feminism.
11. Whilst stating that the distinction is not intended to diminish their work in any way (Gough 2004).
12. Deleuze and Guattari (2004) stress how tracing is a method which replicates, or represents, a transcendental plane. Tracings are arborescent conceptions of materiality and language. 'Tracings are based on phenomenological experience that is assumed to be essential, stable, and universal. Defined thus, the findings from most research projects are tracings' (Martin and Kamberelis 2013, 670). Tracings describe a world pre-conceived as structured and hierarchical. Description that implements tracing will locate itself against, and within, arborescent, tree-like models of knowledge. The roots of the rhizome, however, work against this tree logic.
13. As is the case with rhizomes.

Notes on contributors

David A.G. Clarke lectured in Outdoor and Environmental Education at Plumpton College, UK, from 2009–2015. He is currently readying himself for a new role. His research interests lie in outdoor learning and post-structural thought in environmental and educational theory and practice.

Jamie Mcphie is a lecturer of Cultural Landscapes and Aesthetics in the outdoors at the University of Cumbria, UK. His interests currently lie in creative approaches for research in education and well-being. His PhD research focuses on locating where and when assemblages of mental health might be (come) using process-(intra)-relational ontologies.

ORCID

David A.G. Clarke  <http://orcid.org/0000-0002-4330-0818>

Jamie Mcphie  <http://orcid.org/0000-0001-5290-1685>

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