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Diffraction as an otherwise practice of exploring new teachers' entanglements in time and space

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Abstract:

In this paper, I propose shifts in perspective and practice in initial teacher education from the reflective to the diffractive practitioner as a productive way of supporting new teachers to prepare for the complex and non-linear nature of teaching. The reflective practitioner is a figure deeply embedded in humanist and anthropocentric discourses, aligned to standardised outcomes. Accordingly, reflection risks being a fixed, technical exercise that is predominantly cognitive and linear, ignoring the complex, uncertain and affective ways of knowing that emerge within teaching encounters. Here, I use theories from posthumanism to suggest diffraction as an otherwise means to explore teaching as non-linear and materially and affectively entangled through time and space, in ways that are attentive to difference and the complex world-making of education as an ethically engaged practice. In refusing simplistic, reductionist narratives about teaching, about 'what works' and about what it means to 'be' a teacher, diffractive practices are responsive to contemporary educational landscapes. I offer an example of thinking and practising diffractively, drawing on data from a creative collaging workshop for new teachers to illustrate how reconfiguration of spatial temporalities and an attention to entanglements in teaching encounters can offer generative ways to think about professional practice.

Keywords: diffraction, reflection, initial teacher education, posthumanism, affect, intra-action, assemblage, becoming, collage

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Introduction

The reflective practitioner, reflecting in and on practice (Schön, 1983), is a figuration deeply embedded in conceptualisations and discourses about what it means to be a teacher in the policies and practices of Western Initial Teacher Education (ITE). Closely aligned with the human-centeredness that has preoccupied research into the acquisition of a teacher 'identity', reflection is frequently used as a tool to measure and evidence teacher competence within standardised educational frameworks. This is apparent in a range of linear, cognitive reflective activities that have become ubiquitous in teacher education curricula. In this paper, I argue that this is an increasingly outdated perspective and one that is inadequate to address the contemporary realities of education worldwide.

Reflection is a dominant practice in ITE that has been shaped and institutionalised within neoliberal education movements. As such, it frequently offers a narrow means of reviewing teaching encounters that are disengaged from the socio-political forces in education, becoming a technical task orientated towards summative assessments of professional competency. As a predominantly cognitive and linear practice, reflection is disconnected from the affective and material encounters that are valuable ways of engaging with the complex, relational, multiplicitous and non-linear encounters that make up contemporary teaching. In this paper, I explore how an 'otherwise' practice of diffraction might reimagine and expand reflective practices and, in doing so, offer ITE new ways of thinking beyond the monitoring of professional competence.

Diffractive practices are tools of post-qualititative enquiry that do not take as their starting point the foundational logics of humanism and dualist dichotomies on which dominant educational discourse and practices such as reflection and reflexivity are built (Haraway, 1997). Instead, diffraction as a means of enquiry de-centers the human subject and includes the agency of the non-human and other-than human such as the material, animal,

discursive, technological, affective, (Barad, 2007) in teaching encounters. For ITE, diffractive practices are a means to review and think about teaching encounters in ways that may be incomplete, tentative and never the same. Diffraction is a way of thinking that allows teaching encounters to be 'read' through theory, through policy, through contemporary news, culture or literature, through specific local politics and contexts, through historical memories and sensory responses. It is a way for new teachers to make connections that are responsive to the diverse ecologies in which young people are entangled. Re-thinking solution-focused practices with diffractive practices engages neophyte teachers in ways that are responsive to the complexities of teaching encounters against an uncertain backdrop of geo, economic and socio-political global disasters that characterise the contemporary world in ways that are affirmative, creative and ethical.

However, I do not offer diffraction as a protocol to replace reflection and I avoid a recipe for its implementation within this paper. Instead, I offer it as a shift in thinking for teacher educators to unsettle the dominant practices of reflection and offer some concepts from posthumansim to begin this disruptive and productive work. As such, I suggest not an 'either/or' alternative but an 'otherwise', expanded way of thinking.

I begin in this paper by problematising reflection in its current form in ITE as an increasingly instrumental task put to use as a means of evidencing individual competence. I then explore theoretical perspectives and concepts from post-qualitative and posthuman enquiry that offer an intellectual resource to think beyond the limits of individual teacher subjectivities in order to situate diffraction as a relational approach attuned to multiplicities of meaning that emerge within teaching encounters. I conclude the paper with an example of a creative workshop as a particular materialisation of diffractive practices using non-linear methods of enquiry. From this, I generate a diffractive reading using the concepts of posthuman enquiry explored within this paper, where the focus on one teacher's experience

of time and space is less bound in conventional, linear temporalities. I use this reading to suggest that there are generative uses for diffraction that expand ways of thinking about professional practice for both new teachers and for teacher educators.

On Reflection

The reflective practitioner is a notion 'riddled with tensions' (Fendler, 2003 p.19) between an emphasis on practitioner based intuition (Schön, 1983) and the rational, scientific, problem solving traditions (Dewey, 1933) which strongly influence Western cultures (Houston and Clift, 1990 in Collins et al, 2012, p.111). Research into reflective practices' value for teachers reveals multiple inconsistencies. Despite its acceptance in ITE as a 'good' thing and therefore ubiquitous practice, Collin et al., (2013, p.113) suggest that 'many of the reviewed studies conclude that pre-service teachers show a low-degree of reflective thinking'. Indeed, reflective practice has acquired a ubiquity in ITE with little interrogation as to its ambiguous definition or its relevance for newly practising teachers. Whilst it may incorporate a range of terminology and models through which to enact reflection, as Collin et al., (2013) note, there remains no consensus or theoretical clarity as to how reflective practice should be conceptualised.

In many years working across a range of ITE provision and settings, I have likewise observed wide disparities in the ways in which reflection is both theorised and operationalised, including some theoretical approaches '…that appear somewhat questionable' (Collin et al., 2013:110) or indeed, absent. In the U.K., the delivery of initial teacher education increasingly operates within a 'training' modality, dictated by central government (this model is also applicable internationally in teacher education in this age of neoliberal educational policy). As a result, ITE is expected to be responsive to teacher shortages, austerity measures and provide efficient input-output curriculums, an 'economising narrowing skills agenda' (Gerwitz, 2001 in Maguire, 2002, p. 262). Further, the

delivery of initial teacher education is distributed across a wide range of providers. These include traditional providers within higher education and college settings, and in association with charities, private businesses plus various mixed models of partnership. As such, it is unsurprising that an already theoretically opaque notion of reflectivity and reflexivity should be operationalised in widely disparate ways. Despite this, the reflective practitioner remains an enduring figure and an emblem of progress in developing teacher effectiveness, and 'reflection' is a proliferate term within ITE policy and curricula, often with accompanying homogenised templates to 'evidence' its role.

My own interest in exploring alternative way of reflecting arose from the ambivalence and sometimes hostility to a practice treated by new teachers as a means to an end, who engage strategically to create 'evidence' of ever improving practice towards qualified teacher status. As such, reflection runs the risk of becoming no more than autobiographical accounts of practice, the focus and language of which is drawn from the standardised discourse of professional competencies and often used to confirm what is already known about oneself (Fendler, 2003). Reflective practices in ITE are almost always undertaken as a solitary exercise and a discrete curricular activity within a specific, goal orientated purpose of evidencing individual competence. The individualistic nature is problematic because individualistic insights can be confessional or introspective and exclude essential relational or contextual issues which are often invisible to new (and therefore inexperienced) teachers. Moreover, complex and emotional encounters in practice are challenging to think through and/or articulate within the limits of standardised discourses. As they reflect with de-politicised and narrow discourses, focused on themselves as the central actor, new teachers are often unable to see how different knowledges emerge within teaching encounters when multiple and heterogeneous human and non-human phenomena interact. This precludes them from seeing how, for example, the use of 'non-standard' voices in classrooms (Cushing,

2020) or hair-style policies (Joseph-Salisbury and Connelly, 2018) might function as an embodiments of inclusion and exclusion that reproduce 'classist and racial privileges' (Cushing, 2020: 432). Where macro-political and historical contexts are entangled within the micro-experiences of pupils and teachers in the classroom, effects and affects are produced that are not neutral but require teachers to recognise the agency of broader phenomena. When reflection is 'applied' to experience retrospectively, rather than emerging within the messy and material encounters of teaching, reflective practices become linear, representational and a-political.

In this paper, I further examine the limits of solely individual, human-centred reflective discourses and suggest these are worthy of close examination if teacher educators are looking to expand or diffract practices to offer new teachers ways of understanding and mediating their experiences that are proliferated and multiplicitous.

Reflection as a Linear, Product Orientated Practice

The tendency in ITE toward curricular and pedagogical approaches for reflective practices that are narrow and linear largely stems from an international educational policy move towards professional teacher standards (Clarke and Moore, 2013) as a means by which to define and measure the 'professional' labour of teachers. In the U.K., the Teachers' Standards (Department for Education, 2013) are the professional descriptors by which one attains the qualification to teach - the professional competencies of teaching. This professionalism is 'located in a complicated nexus between policy, ideology and practice', increasingly characterised by 'reductive typologies' (Stronach, 2010:109).

Standardised ways of measuring teaching 'competency' risk the compilation of linear and totalising narratives that can simplify difference and the complex nature of teaching and

the processes of teacher learning (Strom, 2015; Strom, Margolis and Polat, 2019). As such, reflection has become institutionalised, a nationally standardised 'evidence' gathering exercise towards high stakes standards' agendas on which the successful completion of an ITE programme and subsequent employment depend. Curricula requirements to reflect 'through' the teachers' standards in pre-designed, homogenous reflection templates is common, in my experience, across multiple ITE providers who are both time-poor and are themselves subject to evidencing their 'effectiveness' to regulatory bodies. The drive to frame, observe and assess makes reflection a 'project' in constructing one's own narrative as a teacher (Giddens, 1991), towards meeting a standardised set of competency descriptors. As such, reflection becomes a cognitive, linear and repetitive activity with a fixed 'hand – in' point, a professional journal of 'evidence' that can neglect the relational encounters within the contexts they emerge (Jones and Ellis, 2019), behaving in limited and reductionist (Haraway, 1997) ways towards a point of closure. This linear path dangerously neglects the joyfully disparate and diverse nature of our schools and young people and the rapidly changing demands of our contemporary world. Thus, the potential integrity of reflection as a transformative process for new teachers sits in tension with processes that are orientated toward assessment and course completion.

The afore-mentioned assessment pressures new teachers to suppress their responses to teaching encounters (Hargreaves, 2004) where they do not 'fit' with discourses of constant improvement. As such, standardised modes of reflection become tools for silencing or muting teachers who are conflicted by, or dissenting of, their teaching experiences, thereby ensuring the reproduction of normative discourses and practices. New teachers are more likely to operate strategically when their reflective and reflexive responses are high-stakes, bound-up with demonstrating solution-focused, measurable behaviours towards successful completion of their teaching qualification. Many ITE providers in the UK 'grade' performance against

the teacher standards, creating linear cause-and-effect temporalities (Barad, 2012) that compose a static trajectory to becoming a teacher. For example, the most current teacher education programme I worked with used a system of 'emerging', 'embedding' and 'enhancing' to measure teacher progress. Teachers' reflective accounts provided the evidence needed to move through these arbitrary descriptors in a linear manner. Other providers have used a set of descriptors aligned to the U.K. professional regulator for IT: *requires improvement, satisfactory, good, outstanding*. These descriptors speak to an imperative to essentialise an ever-improving, 'effective' teacher, one that can be managed (Larson, 2009) and understood as a coherent and singular human individual with a set of characteristics and skills that 'work' in the classroom. Further, the reflective process is bound up with the creation of a teacher résumé of achievement, the pre-packaged 'effective' teacher evidenced by a predetermined set of standards and competencies, shaped at the intersection of neo-liberalism and humanism (Kascak et al. 2011), rather than as a responsive, ethically attentive teacher to a rapidly changing global community of learners.

This has multiple consequences for teaching (including equitable and socially just pedagogies), curriculum content, policy-making, and teacher attrition, especially the ways in which teachers' lack of agency and autonomy to disrupt dominant discourses and practices factor into decisions to leave the field (Perryman and Calvert, 2019). For example, in Britain, recent high profile challenges in the media to the imperialist, colonialist biases and perspectives of the national curriculum (Leach et al., 2020), were brought to the fore by the Black Lives Matter protests and the disproportionate impact of Covid-19 on black and minority ethnic groups (Public Health England, 2020). This serves as an example of the kind of knowledge producing about racism as institutional and structural to which new teachers need the means and resources towards developing the racial literacy (Joseph-Salisbury, 2020) that can lead to transformative change. However, the response of the U.K government's

equalities minister was to invoke the 1996 Education Act and the Teachers' Standards in order to warn teachers about the legality of teaching white privilege as 'fact' without offering opposing views (Murray, 2020), and teachers' statutory duty to remain politically neutral. This approach risks silencing the voices and suppressing the experiences that young people bring into classrooms at times of upheaval. Teachers need an expanded agency and the tools to enact such agency in order to engage with topics which are relevant but sensitive and which necessitate a relational response. The positioning of the government as 'unequivocally against critical race theory' (Badenoch, in Murray 2020) was a move reminiscent of the 1988 Section 28 Local Government Act (repealed in 2003) which banned the 'promotion' of homosexuality, leading many schools to avoid discussions of homosexuality, suppressing the experiences of young people and teachers.

Initial teacher education has a vital role to play in supporting new teachers in regards to the contestability of knowledge (Furlong, 2009). Expanding reflective thinking into the engaged diffractive thinking needed to connect and locate new teachers' experiences within broader, multiple and complex contexts such as in the example given above. Without expanded or diffractive thinking, reflecting on teaching encounters risks becoming a strategic and individual affair that avoids complexity. Set-backs and challenges to new teachers become deviations to be solved, overcome or avoided rather than testaments to our complex, diverse school populations. In the often critical and judgemental environment of the performative contemporary classroom, with frequent observation and monitoring, challenges are framed as opportunities for the personal growth of the teacher, a resolve-and-move-forward narrative leading to linear and static practice (Lenz Taguchi, 2010). In such climates, guilt, fear, or anger towards the individual actors deflects blame from the individual teacher onto the 'deficient' other in ways that can be used to reinforce and justify existing beliefs rather than challenge assumptions (Fendler, 2003). Considering deficient pupils who don't

behave in directed ways, who do not learn in expected ways, whose bodies are too 'unruly', and parents who don't 'care' in expected ways, is at best simplistic and unhelpful and at worst, oppressive and potentially abusive (Braidotti, 2006). Deficit narratives are not uncommon from new teachers who find themselves in contexts where multiple socio-economic and cultural entanglements can make teaching encounters unpredictable, unexpected and emotionally charged. To resist such narratives, new teachers need the means to contextualise their 'messy' and troubling experiences (Larson, 2009). Decoupling reflective practice from standardised agendas and reconsidering its role as an individualised, institutionalised and linear practice is a key consideration for teacher educators towards more generative and ethical ways to think about professional practice.

Theoretical Perspectives to Develop Diffractive Practices

To explore how reflective practices can operate otherwise to linear operations of individual competence, I begin with an exploration of affect, before outlining the contribution of posthuman thinking to de-centering the human. I draw on four further key and interrelated concepts from post-humanist enquiry*: intra-action, becoming-with, assemblage* and *spacetimemattering* as ways for teacher educators to begin to think and practise more diffractively.

The Role of Affect

Integral to reflective practice is the role of affect, what Deleuze (referring to Spinoza) describes as our ability to affect and be affected by others (both human and non-human), a charge that provides movement and energy (Massumi in Deleuze and Guattari, 1987). However, there is little space for affect as a risky, messy and dangerous bodily knowledge within the summative assessment structures demanded by reflection-as-product described

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above. Our ways of knowing the world, as Ahmed (2004, p.171) notes, 'cannot be separated from the bodily world of feeling and sensation'. Colebrook, (2002:39) describes it as happening 'to us, across us', in divergent and unquantifiable ways, '…the light that causes our eye to flinch, the sound that makes us start, the image of violence which raises our body temperature'. Because of its embodied nature, the pedagogical significance of affect tends to remain unacknowledged or avoided.

I argue that neglecting affective moments is antithetical to transformative change for new teachers for three main reasons. The first is in the maintenance of good mental health for teachers and for pupils. While beyond the scope of this paper, it is important to acknowledge that having a means to recognise, value and respond to moments of affect contributes to the healthy emotional environments in which working and learning optimally takes place. A receptivity to affect would contribute to ongoing work in teacher education to understand the impacts of poor mental health (Day and Gu, 2007, Lightfoot, 2016), on teacher attrition (Perryman and Calvert, 2019) and teacher burn-out (Tapper, 2018).

The second reason that receptivity to affect is important, is its role in foregrounding issues of social and structural injustice. Affective responses are often powerful change-making agents towards more socially just practices. They foreground the things that matter for teachers and pupils, both in the moment and subsequently, and can transform ways of thinking and practising. There is rarely a neat solution to complex emotional encounters but affective pedagogies are connected to the '…intensity of engaging in socially just teaching (which) is not entirely safe but is full of ambivalence' (Chubbuck and Zembylas, 2008, p. 310). Thinking with affect allows a receptivity to moments of fear, uncertainty, frustration, and doubt. Not as negative characteristics of an encounter to be ignored or solved, but as moments of situated possibility thinking, moments where anything might happen (Deleuze and Guattari, 1994). These are moments which are 'a busy site of agency' (St Pierre, 2004, p.

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260), where different meaning-making can take place, and are entangled with fragments of histories and memories (for all those within the encounter, e.g. pupils, teachers, school histories, parents, communities), and within the material, socio-political locations from which they emerge. As such, thinking with affect means being attentive not to deliverable pre-determined content, but to the social and material conditions of pupils' experiences and the needs generated within these conditions.

Receptivity to affect is also important in that it makes teachers receptive to difference, to the joyful array of cultural, social, age-related, experiential differences within educational spaces that cause laughter, confusion, mis-firings, warmth and many of the sensory pleasures found in the interrelationships and intra-actions that matter in our diverse classrooms. There is an ethical imperative for teachers to be responsive to the experiences of young people in a rapidly changing world, characterised by multiple injustices. The complex human and environmental degradations and challenges young people face in an increasingly diverse and interdependent global context, needs educators who are attentive to what emerges when we talk, think, feel, learn and live with the complexities of the world from within the classroom.

In an otherwise practice of diffraction, teacher educators might foreground affect in their own practices and encourage new teachers to do so in their own encounters, to move beyond the privacy of individual subjectivities. Pedagogies where affects are acknowledged as potent forces in teaching encounters are already available for ITE: in drama and dialogic practices, in arts-based and creative encounters, in collaborative inquiry and communities of practice, in practice-as-research settings, such as the one used in the example below. These are diffractive, pedagogical spaces where new knowledges can emerge from within the encounter, rather than simply reflecting as an individual on what has gone before. Thinking otherwise with bodies, with affect, with other humans and with materials, with creativity and

with theory, has the potential to connect new teachers with ideas of difference and diversity and with the social justice agendas to which they have a responsibility.

Posthuman Enquiry, De-centering the Human

Reflection is an optical metaphor; its mirror or calm water representations suggest a strong subject-object divide. This 'Cartesian dualism' stems from a philosophical tradition of humanism that continues to maintain a strong hold in Western educational thinking and practices. In this dualism, the subject is a central and isolated thinking entity who pre-exists encounters with the world, rather than being produced through such encounters. Here, the subject examines the world with autonomy and detachment and their knowledge arises only through human thinking and language, with the ability to take on projects of self-improvement in rational and cognitive ways.

However, in post-humanist theory, the human is no longer the point of both arrival and departure, and the dualisms of subject/object, mind/body, human/non-human or all other marginalising and fixing identities are blurred. Barad (2007:185) tells us that that it is impossible to isolate our 'practices of knowing' given that the human and material are 'mutually implicated' (Barad, 2007, p. 185) with each other.

This challenges and displaces notions of the solitary figure of the teacher as she attains a singular professional teacher identity. There are few classrooms, staffrooms or institutional spaces where knowing is not produced 'otherwise' to this, in concert, as part of an *entangled* collective where the material and the affective play as much a part as the cognitive and social human interactions. *Entanglement* refers to the inability to separate entities from each other. Beyond a simple entwining (Barad (2007, p.52), this concept acknowledges that '(e)xistence is not an individual affair. Individuals do not pre-exist their interactions; rather, individuals emerge through and as part of their entangled intra-relating'. The idea that new teachers 'emerge through' their encounters and intra-actions is a radical

shift in thinking, but one which has potential to help teacher educators think about the

processes of developing professional practices differently.

Teaching as Intra-action

Intra-action is a Baradian (2007) neologism that sees things or phenomena as not pre-

existing the relationships in which they are enacted, (in contrast to *interaction*). Instead, intra-

actions take place in the middle, emerging through the dynamic relationships of entities rather

than being possessed by individual beings.

Let us take teaching encounters as examples of entanglements and intra-actions. The

phenomena that make up teaching encounters are multiple and ever-changing. In any

classroom, these might include pupils, computers, desks, teachers, heat, cold, laughter,

weather, memories, trauma, wall-displays, viruses, worry, interruptions from visitors etc. etc.

These are human and other-than-human elements that intra-act together and with the teacher

herself (Strom, 2015, Strom and Martin, 2017). In different formations, phenomena produce

different things. Non-human objects have agency, have a 'vital matter' (Bennett, 2010) in the

posthuman, and entangle with situated conditions – blustery days, mobile phones, recent

bereavements, fire alarms - to produce different effects and affects that shape teaching. These

processes of intra-action, then, require new teachers to be 'open and alive to each meeting' in

order that they recognise and respond to the responsibilities and 'ever new possibilities for

living justly' (Barad, 2007: x).

Teaching as Assemblage

It is productive to think of these entanglements as assemblages (Deleuze and Guattari,

1987, DeLanda 2006), where human, non-human, material and affective elements are part of

constellations of phenomena that intersect in dynamic and often unexpected ways, folding

and unfolding in multiple directions. As phenomena 'plug' into each other, they produce

different and unpredictable relationships. Assemblage is a process rather than an entity, although it can be helpful for new teachers and teacher educators to consider each new teaching encounter as an assemblage (Strom, 2015, Strom 2017). It is a process of making and unmaking, of seeing how things fit together, arrange and organise themselves (Jackson and Mazzei, 2013, p. 262). Teaching assemblages require us to, '…ask not only how things are connected but also what *territory* is claimed in that connection.' (Jackson and Mazzei, 2013, p. 262, my italics). This is teaching as political, as connected to the world-making that happens in classrooms with young people that is always changing and never the same. New teachers must find ways to work 'with, and deeply within, the intricate entanglements of global and local, sensual and intellectual, particular and general, and so on' Maclure (2006, p. 9).

As a counter-concept to the technical and linear structure of standardised reflective practice, assemblage offers a useful way of thinking of teaching encounters as always producing difference. This is difference not as a boundary between 'object and subject, here and there, now and then, this and that…' (Barad, 2014, p. 173-174), nor a threat or something to be 'solved', but as a necessary means towards developing and understanding equitable, inclusive and sustainable pedagogies that recognise the entanglement of complex ecologies of educational spaces. Further, thinking with assemblage is a 'multiscaler endeavour' in that teachers can explore 'big things and little things at once. And everything in between' (Fullagar and Pavlidis, 2020, p. 3). This allows for connections to be made through time, space and scale. This is useful for working with new teachers coming to practice with varying life experiences, expectations and perspectives. It also allows new teachers to focus on the aspects of practice pertinent/ that matter to their own stages of development at any given moment.

Teacher, Becoming-with.

Thinking with assemblage helps us think otherwise about the context of becoming teacher (Strom and Martin, 2017), not as a fixed point, but as an 'always becoming' (Deleuze and Guattari, 1987), as a site of process and multiplicity (Deleuze and Guattari, 1987, Schatzki, 2002). *Becoming* is a concept that disrupts the idea of an intentional human (the teacher) who acts upon the non-intentional human (the pupil). Becomings are fluid and constantly emerging through the intra-actions with different phenomena (Barad, 2014). Hence, 'becoming-with' (Haraway, 2008) is a useful concept as it resists the idea of professional identity as having an essence or attainability. A teacher, becoming-with figure is forever in process, an 'incalcuable subject' (Lather, 2018, p. 345) - radically different to the one measured by Teacher Standards.

Conceptually, becoming-with is productive to consider the multiple 'confrontations with self, others, ideas, ethics, dilemmas, conundrums and contradictions' (Clarke, 2009, p. 214) of professional practices. These are contingent and contextual sites of practice that are always under construction and in a state of process (Hall, 1997), unstable, temporal and uncertain. This runs counter to dominant contemporary neo-liberal conceptualisations of the practices of state education in the U.K. as elsewhere in the world, where policy discourse emphasises 'uniformity of delivery and outcomes (and) attempt(s) to repress the gaps and discontinuities out of which teaching, learning and research issue' (Maclure, 2006, p. 224).

At any given time, teaching is an assemblage of policies, politics, funding, weather, buildings, bodies, things, affects, technologies, memories, austerity, etcetera - all of which come to count in what is produced within the encounter. None of these components is necessarily more significant or privileged when we think with assemblages. Instead, attention is paid to what emerges when we live and work within the assemblage itself. Assemblage is

also useful for teachers, because, in re-thinking agency as being distributed among non-human as well as human agents, we begin to recognise the agentic contributions of locations, technologies, emotions, and so on, which are often dismissed or ignored in the reflective practices of teachers. Exploring the ways in which entities entangle within the assemblage, and what is produced within this entanglement, is a diffractive practice, a way of reading that re-orientates assumptions commonly found in traditional reflective, reflexive or analytical readings that treat agency as solely human.

These interrelated concepts of intra-action, assemblage and becomings are useful tools for teacher educators looking to diffract reflective practices by shifting thinking toward multiplicitous, entangled and relational practices.

Spacetimematterings

A further contribution helpful in understanding diffractive thinking is posthumanism's nonlinear conceptualisation of time and space, or *spacetimematterings* (Barad, 2014, p.168).

As I have outlined above, linear practices in education, within the frame of the professional standards, enact a temporality that is bi-directional and a spatiality that is narrow in scope. I argue that teacher, becoming-with operates in a more complex temporal spatiality. Spacetimemattering (Barad, 2014, p.168), refers to the entanglement of time, space, matter and what matters. From this perspective, time and space are no longer separate entities that operate in a hierarchical, linear or privileged manner, but are collapsed, flattened and co-create each other.

Spacetimemattering helps us reconceptualise teacher, becoming-with, as messy, multi-directional and 'untimely' (Barad, 2014:169), by, for example, drawing attention to the ways that entities, human and non-human, interfere with each other (Barad, 2007, Haraway, 1997). This is an example of diffractive thinking as pattern-creating rather than solution-

finding. There are multiple elements in teaching assemblages that do not operate with stable linearity but within flattened spacetimematterings. Memories, hopes, affects, traumas, dreams, past experiences and future projections are what makes any classroom lively and unpredictable (and fun and frustrating), intra-acting in ways that create multitudes of ever-changing temporal and spatial patterns.

If new teachers are given opportunities to think with spacetimemattering as a diffractive practice, then they can explore their teaching encounters from multiple perspectives. Encounters explored within theory, within local institutional politics, within wider policy contexts and so on, can produce different insights. Rather than cause and effect temporalities, a common feature of reflection, new teachers' enquiries into their own becoming-with, are enriched by diffractive practices that make it possible 'for entangled relationalities to make connections between entities that do not appear to be proximate in space and time' (Barad 2007, p.74). Such practices foreground the affective nature of *re-turning* (Barad, 2014). This is not a returning in the sense of going back over as one might do in reflective practices, but as in turning over and over, a process Barad (2014) likens to an earthworm moving through organic matter '…aerating the soil, allowing oxygen in, opening it up and breathing new life into it' (2014, p.168). This is a process of renewal, a productive way for teachers to mediate and think through their experiences and an ethical approach for teacher education to practices of reflection.

Current ITE has not yet, at policy level, embraced the thinking and research available around space, time and matter. However, thinking about the spaces in which new teachers practice offers a practical application of Barad's spacetimemattering. Traditionally, teachers practise largely in spaces of regulation, order and conformity, made up of the organised classroom: of walls and enclosures, of the lesson objective; the plenary; the review of progress; the target and the regulated teacher and pupil body. Deleuze (1994) calls these

'striated' spaces, spaces where reflection has a particular purpose to validate progress and 'success' as a teacher as outlined above. They are also spaces where guilt, shame and low self-worth also reside, particularly for new teachers who do not find their route through initial teacher education to be linear or as easy as attaining a set of Standards.

It is easy to see how teacher *identity,* as traditionally conceived and researched, might be a state evolved striated space (Strom and Martins, 2017). Teacher *becomings*, however, operate in spaces where teachers and pupils are multiply positioned, what Deleuze (1994) calls *smooth spaces*. In smooth spaces, time and matter are collapsed and thinking that is uncertain, hesitant and unsure can take place. For practices of ITE, this is not as radical as it seems, nor impractical. My proposal is not an either/- or, this or that situation where smooth spaces are able to replace striated ones, but one which is a this and this and this and... (St.Pierre, 2013). The relationship between smooth and striated spaces is dynamic and as such, it allows teacher education to work within the realities, demands and practicalities of striated spaces whilst maintaining a commitment to more diffractive ways of thinking and practicing. Smooth and striated spaces co-exist and are in constant translation and reversal into each other (Deleuze and Guattari, 1987). For teacher education, re-conceptualisations of how time, space and matter work are both an intellectual and a practical enquiry. The possibilities of 'smooth' spaces to think and practice within are multiple when the conceptual tools are made available to support new teachers to think with and plug into their lived experiences.

The Ethical Work of Teachers and Teacher Educators

The posthuman and diffractive practices I advocate above are ones that can listen to smaller stories and silenced or unheard voices as well as be attuned to the knowledge contributions of different times and the different agencies of the non-human. As such, they

are practices of equity, access and inclusion, through the detailed reading of experiences in the fine detail of how they come to matter for teachers (Bozalek et al., 2016), and pupils. Diffractive practices do not enact the disinterest of reflective accounts, but can bring 'inventive provocations' (Barad in Dolphijn and van der Tuin 2012, p. 50) as teaching and learning encounters are examined from multiple perspectives. Take, for example, an event that has had radical significance for young people, causing the kind of hurt, pain and disbelief that education must support young people to navigate. The Black Lives Matter movement and protests are entangled encounters of human experiences and histories with multiple other agents: toppled statues of colonial figures, smartphone-captured video footage of violence, threat and abuses of power, masks and memes. It is a movement that has provoked examinations of partial, exclusionary colonised curriculums within our education systems. In order to navigate complex encounters alongside young people (and this is an example that has occurred amidst a climate emergency and a global pandemic), teachers must develop pedagogies within an ethics of care and response-ability (Haraway, 2016) to be *responsive to* and *within*, not just responsible *for* what happens in educational spaces. This seems of vital importance if ITE is able to support new teachers to respond to the demands of contemporary societies, to social justice on a global scale, to ecological concerns that involve the human and the non-human, to the materiality of social inequalities, to a post-pandemic society in ways that are both creative and generative.

Being always engaged in ethical work is a key facet of teachers' professional practice and yet one ITE rarely makes explicit in terms of what this means for teachers beyond issues of safeguarding. Teaching is, however, a space of site-specific decision-making and responsibility (Koro-Ljungberg and Barko, 2012). Diffractive practices engage new teachers in response-able participation in that they require teachers to respond to 'the world's patternings and murmurings' (Barad, 2010, p. 207) as these happen. Teachers to be skilled in

responding flexibility, creatively and with consideration to ongoing uncertainty that touches young peoples' lives. The ability to improvise, a capacity integral to the development of teaching (Jones and Ellis, 2019), and notice chances in the present to help young people navigate 'troubling and turbid times' (Haraway, 2016, p.1), matters a great deal.

Putting Diffraction to Work

To give an example of diffractive thinking in practice, I offer a fragment of data from a series of creative workshops in which participants used creative methods (such as collaging) to explore their own practice and teaching encounters in diffractive ways. Participants had considered the concepts of affect, entanglements, and intra-actions as above and were invited to consider moments of their practice and experiences at the end of their first year of training as primary teachers in a predominantly schools-based model of training. Using collage techniques, participants (de)/ - (re) constructed, (de)/ - (re) assembled, and *mapped* these experiences using a range of crafting materials as well as 'trade' magazines (e.g., The Times Educational Supplement) which were available to use (or not). The conversations, movement and sensory engagement, recorded as field-notes by the author, were as productive in terms of data as the processes of making.

The fragment below is drawn from a larger project where new teachers engaged in exploring their encounters in practice. This diffractive approach made use of Hickey-Moody's (2015) practice-as-research as a non-linear means to create hybrid 'texts' from multiple sources. Drawing on creative methods, practice-as-research is often generative of innovative, nuanced and affectively engaged responses to complex teaching encounters. It encourages dialogic and multi-sensory approaches that pays attention to what *matters* to teachers, often in the moment.

The objective of this activity is to create 'text that is a site of praxis' (Hickey-Moody, 2015, p.191), whereby new teachers choose or are chosen by the moments of their experiences to interrogate and 'read' and respond to. I ask teachers to consider their teaching encounters as assemblages or sites where multiple phenomena intra-act. These are assemblages that can be revisited and re-mapped and examined through different and multiple theoretical, ethical or practice lenses.

The workshops were spaces to re-turn, to renew, to tell stories and share without judgement, designed as they were with an ethical, response-able care as described above. Below, I have 'cut' a fragment of this data and conducted my own diffractive reading in order to show how teacher becoming-with happens beyond conventional and normative understandings of time and space. I read the fragment using posthuman theory to foreground the affects and the effects of this teaching encounter on my own re-turning as a teacher educator.

Reading Diffractive Practices Diffractively

M (a new teacher and participant in the workshop), collages and tells her story simultaneously, often breaking off to make a point or to listen and respond to someone else's questions and comments. She produces a concertina of little people in a paper doll style. When the cutting of one shape finishes, an accordion of shapes emerges. She holds them and they become part of the story, dancing more or less energetically in time with her emotions. They are the choir she led during her year at a primary school in the U.K. M explains how she was encouraged by her school-based mentor to start a club as part of her professional development and how she had wanted to run a 'Black Lives Matter' club. She felt this was an important contribution to a school whose response to Black History Month had been,

...dire...just worksheets to fill in. Well meaning, I suppose, but there had been no

time really given to it and teachers clearly didn't know that much about it....so it

looks like it's done, but there is no space for any real discussion or sharing or

experiences. It's all hush. (M, field notes)

In my field notes, I write about how M physicalizes her descriptive 'hush', making her

body smaller and closing it in, before releasing it in a dramatic gesture of distain, rolling her

eyes. M's body performs an affective refusal of the school's response. What happens, I ask in

filed-notes, what emerges in the silent spaces and the gaps within teachers' encounters? I

record how other participants start up a discussion about who gets heard in schools – about

who speaks and who has the 'authority' to do so. What, and who get silenced? Participants

debate their own silencing, how their 'constructed' identity from Teach First (their ITE

provider) as dynamic agents of change and social justice, are unsettled by the power

dynamics within the institutions in which they work. Their schools demand autonomous

responsibility for pupil good behaviour, lesson outcomes, and curriculum delivery, but render

them naïve and unworthy as teachers in areas the participants believe to 'matter'. These are:

'creativity, dialogic practices, relationship building, innovation and "making a difference"

(Field notes). Instead, 'it's basically survival' (participant D).

There is much agreement but there are also moments of refusal, as participants share

alternative experiences across schools and institutions, of possibilities to become otherwise.

Their discussion evokes Braidotti's (2013, p. 163) process of 'disidentification', a process

whereby subjects dissociate themselves from those discourses with which they previously

identified. It is more subtle than a wholesale rejection of one's subjectivities but requires 'a

situating oneself both within and against certain discourses' (Braidotti, 2013, p. 163). Their

discussions are challenges to normative discourse and strategies for resistance. This is

something I have recognised myself in my role as teacher educator and in previous positions as a school teacher. Disindentifaction can be a lonely place and is rarely acknowledged by teacher education in spite of its sometimes radical effect, driving teachers from the profession.

M explains how she is 'not allowed' to run her 'Black Lives Matter' club. It is considered by her mentor as being too time-consuming, too much work. Time is such a weaponised commodity in schools to prioritise one thing over another, to determine what is more important. M's reading of the refusal for her club is about more than a lack of time – it is a taking up of 'too much' space. 'Too challenging, too Black, too me, just too much' (M, field notes). This is racialised space, gendered space, body space, liminal space. It is risky space, wherein power for different knowledge shifts from the institution to the teacher and her pupils. Here time is mobilised by the mentor to reduce space that could be used for difference and exploration.

M's response is to run a choir instead. M describes it as,

…one of the most positive experiences of my journey…when we were singing it was all worth it. It was a beautiful thing and all the stresses melted away and I even loved P (a child in her class) at that moment – even though he was the bane of my existence at all other times. It was the only harmony I reached with my mentor though...I chose the songs deliberately so that I got my first choice in the end! (written text by M, based on her collage).

In the assemblage of the choir space, bodies are reconfigured differently, even child P's otherwise disobedient body, and M chooses gospel songs that are rooted in Black experiences and traditions. This is her way of embodying the political and cultural space she had wanted to open up with the Black Lives Matter club and another gesture of refusal.

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M's encounter with being silenced leads the workshop participants into discussions about what is silenced and obscured in curricula as well as pedagogically, issues of colonisation. I write a prompt in my notes to remind me as teacher educator to consider where we address issues around colonising curricula in the ITE provision on offer for these new teachers. I know our curriculum is inadequate in this regard but I underline and circle it in my notes. Curricula are products of histories, of politics and cultures and in their intra-actions in the workshop, spaces open for participants to problematise how and why these are produced and reproduced. I have little knowledge at the time of these workshops as to how M's experience is one of many 'small' stories that will later scale up in light of the 'Black Lives Matter' protests in the summer of 2020, and expose a long history of silence and neglect.

M is keenly aware of the unspoken narratives within the school she works, an industrial city in the West Midlands, where Enoch Powell, a British member of parliament gave his 'rivers of blood' speech in 1968. This infamous speech criticised mass immigration, particularly that of the Commonwealth, into the U.K., and the Race Relations Act which made it illegal to refuse public services, housing and employment on the basis of colour, race, ethnic or national origin. In M's encounter, historical and contemporary discourses 'come to matter', they collide for particular bodies in new temporalities, in spacetimematterings (Barad, 2007). They collide and dis-locate M's body, to outside of a curriculum where there is no 'time' for a politics of race and social justice.

M's collage is testament to the messy and multiple experiences and pressures of teaching. Alongside her paper doll choir are other affective encounters: exhaustion and pressure collaged as a disintegrating body, eyeballs rolling across the craft paper. An octopus whose legs perform multiple functions of administration and teaching tasks. These are small and everyday stories of mundane task and sensual affect, mapped alongside

broader contextual stories of race, exclusion and politics. The collage tells a spatial story,
where, instead of cause and effect logics or coherent narratives, events and messy and
troubling affects are layered and overlap each other. The physical and sensual act of
creating gives materiality to experience and unstable and difficult ideas are stabilised as
image for a short time, that makes it possible to dialogue with the idea itself (Grushka, 2005).
A teacher, becoming-with multiple complex ideas, affects, contradictions and dilemmas.

Diffraction as an Otherwise Practice.

Diffractive approaches involve a 'mapping of interference, not of replication, reflection or reproduction' (Haraway, 1992:300). The example above maps the interferences in one teaching encounter that is simultaneously local and global, personal, collective and political, current and historical, experienced by the body as well as the mind. There are multiple ways to read this encounter that produce multiple knowledges, including how issues of race are taught in schools, about how belonging is experienced by new teachers, by Black teachers, about extra-curricula activities, about the traces of local histories. A single encounter that is rich with possibilities for new teachers to think about their professional practices.

Diffractive practices reject binaried and simplistic interpretations and meaning-making that characterise so much of reflective practice in ITE, and instead regard teaching as multiplicitous and relational and as always political and located somewhere (Braidotti, 2013).

These practices are not human-centred, but consider the agency of the non-human and other-than-human, including the affective, as agentic phenomena in teaching encounters. They ask new teachers to pay close attention to multiple agencies and moments of affect as sites of meaning-making and respond in an ethical and careful manner to the ways these intra-act and what is produced in their intra-action.

Thinking with intra-actions and assemblages are diffractive practices that explore what phenomena *do* when they intra-act, what is produced and what they are connected to (Grosz, 1994). Diffraction allows for connections between an infinite number of phenomena, allowing encounters to be worked through from multiple perspectives, a vital feature of equitable, accessible and socially-just educational practices.

Diffraction re-conceptualises time, space and matter, rejecting linear temporalities, instead, operating in smooth spaces where entities can be simultaneously separate and together, where the past, present and future fold and unfold upon each other (Barad, 2007, Barad, 2014). It is a way of thinking about complex and challenging encounters in nuanced and responsive ways and a way of thinking about who/what has power, and about how power emerges in educational spaces.

Across the globe, we are in uncertain times. Teachers and pupils need an agility to respond to situations that unfold in ways that disrupt predictable, linear patterns, familiar anchors and familiar rhythms. This agility is not always enacted in ITE practices. ITE is not a means of technical training and teaching is itself a diffractive practice, proximal and engaged, composite and affective, risky and demanding. Therefore, the means by which we engage with the processes of teaching and learning should be equally tentative and disruptive. Diffractive practices offer ITE institutions opportunities to reimagine reflective practices to something more responsive and intra-active where teachers can respond to the ways they and their pupils are always being made, un-made and re-made.

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