

Fuzzy/focused ethnography: Applying diffractive analysis to the intensive, multi-modal data of focused ethnography

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Focused ethnography in education

The development of short-term ‘focused’ ethnographic approaches is outlined in Muecke (1994), who reviews the practice in health-related fields where the aim is usually an exploratory study of a “...fairly discrete community of organization” (p. 199). Handwerker (2001) details a similar methodology, dubbed ‘quick’ or ‘rapid’ ethnography, that advocates a swift and multi-modal approach to data collection and a broad application of analytical strategies centred around a particular cultural practice or area. Knoblauch (2005) re-adopts the title ‘focused’ for short-term ethnographies characterised by time-intensive collection of multi-model data in familiar situations, and places such methodologies as a counterpoint to long-term time-*extensive* strategies employed in ‘conventional’ ethnography. The naming is important, as ‘focus’ rather than ‘speed’ emphasises that in familiar settings “...far from being a ‘quick and dirty’ route to doing qualitative research, short-term ethnography is characterised by forms of intensity that lead to deep and valid ways of knowing.” (Pink and Morgan, 2013:351).

Whilst claims of ‘making the familiar strange’ may be somewhat trite in research circles, Knoblauch’s recognition of existing expertise in an area circumvents some aspects of ‘cultural shock’ (Irwin, 2007) seen in more anthropological approaches to ethnography, and suggests adopting ideas of *alterity* rather than strangeness. Knoblauch’s framework describes the possible uses of short-term, time-intensive ethnographic methods, and suggests a shift in attention to “...not necessarily groups, organisations or milieus but rather situations, interactions and activities” (¶28). Pink and Morgan (2013) build on Knoblauch’s work to bring to the fore guiding ideas around intensities in the focused ethnographic research encounter, a close attention to detail in post-fieldwork analysis, and an ongoing ethnographic-theoretical dialogue, further emphasising the specific traits and value of focused ethnography.

Given that ethnography in education is frequently employed to seek rich understandings of a specific element of practice in context, it stands that concepts from focused ethnography

have much to offer educational research. Whilst some efforts have been made to demonstrate the effectiveness of focused ethnography in specific educational ‘situations, interactions and activities’, for example investigations of library use of teachers and pupils in Nigeria (Oyelude, 2013), experiences of violence and hope in Palestinian school pupils (Akesson, 2015), and social comparison in high school students (Tholander, 2011), such approaches are uncommon.

One a possible reason for a lack of popularity of focused ethnography is the onerous workload involved in managing and analysing the large quantity and variety of data collected on-site. Whilst Handwerker (2001) advocates a mixed-methods and early analysis approach, Knoblauch (2005) recognises that technically recorded data “...demands a method of analysis which is exerted intersubjectively” (¶18), embracing a multiplicity of relations that may be found. This suggests that any approach to analysis should be sensitive to multiple understandings and “possess a high tolerance for ambiguity” (Handwerker, 2001:261). Additionally, any analytical framework must be capable of drawing insight from the multi-modal nature of focused ethnographic data, including audio-visual, numerical and digital sources alongside more familiar qualitative interviews, questionnaires, field notes etc. As such a wide range of analytical tools may be deployed, and in some cases specially developed, to help moderate the workload in handling large volumes of incompatible data.

However, to dwell on novel or interesting analytical tools is to miss some of the power of focused ethnography. Indeed “...it is useful to go beyond observation to create short-term research engagements that benefit from the production of forms of intensity, empathy and an ongoing ethnographic-analytical-theoretical dialog.” (Pink and Morgan, 2013:353). The strength here is the potential of intensive data collection and ongoing analysis to put theory and practice in conversation in new ways. I disagree with Pink and Morgan somewhat, as I do not acknowledge focused ethnography as a way to ‘go beyond observation’. Rather, I consider that we might enhance the investigative and analytical repertoire of focused ethnography to include non-representational insights from observation without sacrificing observational components. Taking a lead from Donna Haraway (1997), Karen Barad (2007) and others, I consider this an extension of the optical metaphor common in research, and will label it a form of *diffractive* methodology (rather than one that relies on reflection/reflexivity or a refractive use of lenses). Here I propose a model of ethnography that maintains the useful practicality of focused ethnography whilst embracing materiality and the plurality of understandings offered by New Materialist thinking.

An overarching theme of New Materialism is a blurring of boundaries, creating an entangled worldview of transient delineations. This forms the basis of the moniker ‘fuzzy’

applied in the title of this paper. The blurring of human-object boundaries seen in Latour's work on actor-network theory (and beyond) shares similarities with Barad's agential realism (2007), which also challenges distinctions around/between subjects and objects, creating not just an epistemic but also an ontic 'fuzziness'. This conceptual fuzziness is central to my reading of much of Barad's and Latour's work, and offers a useful shorthand for a range of concepts. The resulting fuzzy/focused ethnography is non-essentialist, recognises post-human agency, and may offer understandings outside of representationalism.

It bears clarification that I am not advocating for the primacy of diffractive methods: "Welcoming [diffraction] does not signal the desire to be adopted by the sciences. Rather, it indicates the openness to affirmative-critical devices that disrupt, intervene and cut-together-apart (diffract) meaning-mattering processes..." (Kaiser and Thiele, 2014:166). Instead, I pose the questions: What space might there be for non-representative approaches in short-term intensive 'focused' ethnography in education? How might 'fuzzifying' methods allow for different, productive and insightful avenues of enquiry? Through an example of work carried out in high-school science lessons in the north west of England I hope to demonstrate the use and validity of this approach.

Diffraction and a 'fuzzification' of focused ethnography

In *Meeting the Universe Halfway*, Karen Barad (2007) presents a theoretical framework for social and interdisciplinary research based on the Copenhagen interpretation of quantum mechanics. An overarching consequence of this approach is the breakdown of boundaries due to the entangled nature of socio-material phenomena. Indistinct but perceivable boundaries are commonplace in the physical sciences, as the surface of any matter comprises a cloud of electrons there is a complete lack of solid and distinct boundary that both problematises ideas of 'subject' and 'object' and distorts the concept of 'touch'. Taken more broadly the ontological implications for this distinction are significant, painting the world as an entangled web of matter and meaning rather than a collection of separated individuals and objects. Hence, rather than consider essentialist identifications, Barad draws on the work of Judith Butler (1990) and describes separations as occurring performatively. Such 'agential cuts' that iteratively allow perception of subject and object out of entangled realities also enact other dichotomies. This approach "...is consequently also transversal to a range of social theory dualisms such as structure/agency, reason/emotion, human/non-human, animate/inanimate and inside/outside" (Fox and Alldred, 2015:399). It is this blurring of boundaries that I have come to consider as

‘fuzziness’.

In his presentation of actor-network theory Bruno Latour outlines a similar eschewing of boundaries, this time in the delineation of social groups. To Latour any definition of a social group must be continually remade; the group only exists performatively and will cease to be identifiable without repeated efforts, which “draws attention to the means necessary to ceaselessly upkeep the groups and to the key contributions made by the analysts’ own resources” (2005:35). The result of this fuzzy understanding of groups is an acceptance that our observations as ethnographers are only snapshots of a given setting at a given time interpreted in a particular way rather than a fixed example of a concrete ‘culture’. In moving away from representative snapshots of social groups we can begin to seek traces of potentiality and multiplicitous ways of knowing. A major implication of applying fuzziness to focused ethnography is that it allows for an emergent ‘ethnographic-analytical-theoretical dialog’ without a requirement to ascribe boundary conditions. Rather than identifying groups in practice, we instead seek to identify the multiple practices sustaining the *appearance* of groups.

A blurring of boundaries can also be considered temporally, as seen in *Quantum Entanglements and Hauntological Relations of Inheritance* where Barad (2010) considers Frayn’s ghosts of Heisenberg and Bohr as

...iterative materialisations, contingent and specific (agential) reconfigurings of spacetimematterings, spectral (re)workings without the presumption of erasure, the ‘past’ repeatedly reconfigured... the continual reopening and unsettling of what might yet be, of what was, and what comes to be?”

(Barad, 2010:264)

This quotation demonstrates how entanglement can span across time, with reworked understandings which, far from giving a representation of a past that has already passed, rather offer insight “about the entanglement of past-present-future here-there, that is, about responsibility and justice-to-come” (ibid.: 268). What results from a ‘queering’ of time is an embracing of potentiality, of experiences entangled with multiplicitous understandings. Painting events in singular and isolated ways is a misleading simplification, that can be addressed by an attention to diverse temporal elements as we look at practice; it is not just that practices evolve over time, but are reinterpreted over time, remade differently and enfolded into the ongoing. Although this seems an abstract construction there is scope for tangible benefits to this mode of thought as I hope to demonstrate later.

One consequence of a temporal entanglement is that an observer may never be considered consistent. Latour emphasises the triviality of attempting to remain an objective, highlighting the issue in terms of frames of reference. Rather than assuming our fixed researcher reference frame and peering out and ‘measuring’ that of a research subject, researchers can move *between* reference frames and “...leave the actors free to deploy the full incommensurability of their own worldmaking activities.” (Latour, 2005:34). Any methodology therefore becomes emergent at the site rather than being predefined, and in adopting this approach as researchers we may “Be prepared to cast off agency, structure, psyche, time, and space along with every other philosophical and anthropological category, no matter how deeply rooted in common sense they may appear to be.” (Latour, 2005:34–5).

Whilst Barad’s agential realist stance departs a little from Latour’s slightly flippant relativity, there is a recognition that the ‘knower’ and the ‘known’ are inseparable. This is a move away from the ideas of reflection or reflexivity, and towards what Barad dubs an onto-epistemology; “the nature of the observed phenomenon changes with corresponding changes in the apparatus” (Barad, 2007:106). The idea that who we are as researchers and the tools that we use in research should impact upon observations is unsurprising, but in making connections with the two-slit diffraction of electrons Barad reaffirms that, onto-epistemologically, the instrument effects not just the measured results but the *reality* of those results. Photographs are an obvious example here, where the camera apparatus captures the classroom as a “measured object” and operates as a “measuring agent” achieving a ‘realisation’ of a particular permutation of the classroom assemblage, dependent upon additional agential cuts of timing, framing, lighting etc. The resulting momentary image captures one fleetingly fictional possibility in sharp clarity at the loss of much surrounding potentiality, that during replay we see as a single collapsed moment. Mjaaland utilises this standpoint in an anthropological study of houses across the globe (Mjaaland, 2017), and exemplifies the use of the camera as a diffractive apparatus, where subject and object are not separate entities but co-constructively “emerge through intra-actions” (Barad, 2007:89).

The concept of diffraction is central in agential realism, so much so that Barad considers diffraction as “an overarching trope” (p. 71). Like Haraway (1997) before her, Barad eschews the metaphor of reflection in social research, instead embracing diffraction as a mode of enquiry that involves “reading insights through one another in attending to and responding to the details and specificities of relations of difference and how they matter” (Barad, 2007, p. 71). From the perspective of physical sciences diffraction presents as seemingly different phenomena, including as an interference and recombination of light to create patterns when

passing through a grating, as an example of the entangled duality of electrons that behave as waves and particles, and as a process that causes aberrations in images created with lenses if we look too in too fine a detail. Taking these three diffractive effects one can see why seemingly different approaches in a social sense may fall under the umbrella of ‘diffraction’, be that the details of patterns from reading and passing phenomena through one another, the acceptance of indeterminacy, or the impossibility of representation, all effects can be taken into account in coherently ‘fuzzy’ ways. This requires that we recognise the multiplicitous and overlaid nature of matter and meaning in social situations, which undermines the validity of reflective renderings and representations of knowledge that seek to accurately portray a society, culture, or physical reality. Instead, diffractive approaches are non-representational, and consider “...socio-natural practices in a performative rather than a representationalist mode” (Barad, 2007, p. 88). To return to Mjaaland’s example, the ‘reading through’ is through the apparatus of the camera, where the entangled nature of the photographic process produces different conceptions of houses and homes. For others (and more usually) diffraction occurs where data or theirs are ‘read through’ a(nother) theory, producing new and varied understandings (see, for example, Mazzei, 2014). In both cases (as in all) diffraction is generative, producing understandings rather than representations.

That understandings may be inherently material further stems from the entanglement of matter and meaning. Although consideration is sometimes given to the material and environmental conditions in focused ethnography, particularly in a healthcare setting where items and places may impact upon outcomes, the assumption to this point has been that “...things and ideas constitute qualitatively different phenomena.” (Handwerker, 2001:5). Whilst this separation is at odds with fuzzy understandings, materiality is frequently missing from education research, since researchers have “...largely ignored this material dimension of education and focused on interaction and discourse” (Kalthoff and Roehl, 2011:451). An attention to ‘things’ becomes particularly important if we recognise core cultural practices in education such as ‘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). New Materialist ontologies such as Barad and Latour have a particular sensitivity to material conditions and ambiguities, where “Instead of a distinction between subject and object, one obtains nuances along a gradient in which human and nonhuman figures are mixed.” (Latour, 2017:54). A result of the breaking down of subject/object boundaries is a form of posthuman agency, in which objects, through their intra-actions with people and surroundings, can exert a

form of agency in a situation. The implications for focused ethnography should be clear, and should attempt to avoid falling into myopic anthropocentrism.

The preceding discussion leans heavily on New Materialist frameworks, and in return risks distorting the utilitarian strengths of focused ethnography with waves of fuzzy multiplicities. Let me assure you that this is not the case. The multi-modal nature of focused ethnographic data can withstand an eschewing of determinate boundaries in favour of a performative understandings (and an interest the efforts required to maintain those performative boundaries), an awareness of potentiality and temporal multiplicities, an attention to entanglement of ‘knower’ and ‘known’, a consideration of posthuman agency, and an allowance for diffractive analyses. I consider this collection of guidelines not as a replacement for focused ethnography, but as a complementary expansion to interpret the ‘results’ of focused ethnographic data in a fuzzy way. With the advent of advanced digital tools for processing audio-visual recordings, conversations and documentation, such tools can be leveraged to draw to the fore previously unseen or various potential phenomena. In many ways this constitutes an example of what Patti Lather dubs ‘post-qualitative’ research, as it is “Framing theories of subjectivity within intra-actional, post-human, relational entanglements” (Lather, 2013:639).

In the remainder of this paper I hope to demonstrate an application of fuzzy/focused ethnography in a three-month study that involved weekly visits to eight student teachers placed at three secondary schools in the North West of England.

Exemplifying fuzzy/focused ethnography

The ‘focus’ in this study is a group apprenticeship model of initial teacher education placements being trialled at Manchester Metropolitan University. Dubbed the University Schools Model, and based on research carried out in Finland (Cockerham and Timlin, 2014) pre-service trainee teachers on the Postgraduate Certificate in Education are placed in trios and team-teach for the duration. They are also given increased in-school contact time with university tutors, the anticipated benefits of this being an improvement in university-school links and better integrations between university ‘theory’ and teaching ‘practice’. Additionally, multiple trainee teachers at experienced schools also helps to minimise the detrimental impact to trainees of the well-publicised teacher shortage (Dunk and Haniak-Cockerham, 2018). The model has been run in the Mathematics Education department in Manchester Metropolitan University for some time, and is currently in the process of being trialled with trainees in Science Education.

The purpose of this study is to better understand the training experience on this specific model of practicum. Making the assumption that professional becoming is an ongoing (Dall’Alba, 2009) and material process (Introna, 2013), the chosen methodology must be sensitive to open and material conditions in order to draw out the multiplicity of ‘becoming teacher’, whilst considering the ways that colleagues and pupils intra-act alongside non-human agents and material conditions to shape trainee teachers’ developing pedagogical practice.

The blurring of boundaries continues with the explication of my role. Not only am I there in the role of researcher, observing and collecting data, but I also have several responsibilities as a course tutor. Notably I am both a source of support and feedback, and an assessor. This entangled researcher-tutor-examiner identity has practical and ethical implications for the research process, and a diffractive approach helps to track this, encapsulating objectivity as “...accountability to marks on bodies, and responsibility to the entanglements of which we are a part” (Dolphijn and van der Tuin, 2013:52).

When following a focused ethnographic approach there is a requirement for intensive multi-modal data collection and continuous emergent analysis. In this case data sources included systematic and serendipitous photographs, field notes, transcriptions of WhatsApp digital multimedia conversations, emails, a weekly questionnaire, co-produced teaching resources and lesson plans, written reflections, student university assignments, formal assessment documents and paperwork, and an ‘end of course’ unstructured group interview. As is typical in focused ethnography much of the data collected is already produced during practice, and additional data sources were optimised so collected data could be analysed digitally where possible. This vast and multi-modal corpus of data required the development of novel tools of analysis, as the volume and variety of data made it difficult to employ the usual time-extensive forms of analysis concurrently with data collection (such as codification or a detailed narrative analysis, for example). Fortunately, the data were largely digital, so not only could simple algorithmic searching strategies be utilised, but also more advanced analytical or machine learning tools.

The flexibility to be responsive stems from the concurrent collection and analysis of data, resulting in a situation where “...the methodology is not predetermined and imposed upon the site, but is largely directed by what emerges at the site” (Fenwick and Edwards, 2010:154). In this instance initial observations and analyses suggested several subsequent analytical methods, many of which produces contradictory or ambiguous results. The multiplicitous understandings such an approach affords renders direct representation impossible, hence we must seek viable ways to share insights outside of the common chronological ‘research story’.

It is beyond the realms of this paper to present the study in full, instead I have selected a series of data points and described their collection and repeated diffractive analysis in the hope that it may demonstrate what I believe is the power at the confluence of focused ethnography and fuzzy analysis.

The first data source is a series of photographs taken during lesson observations¹. Given the many responsibilities I had in the classroom I could not devote all of my time to image capture, and instead aimed to take a photograph every five minutes during a lesson observation. Rather than impose a predetermined aim for my images, the focus of my photograph was dependant upon the focus in the room, described by Goodwin as,

Rather than wandering onto fieldsites as disinterested observers, attempting the impossible task of trying to catalogue everything in the setting, we can use the visible orientation of the participants as a spotlight to show us just those features of context that we have to come to terms with if we are to adequately describe the organisation of their action. (Goodwin, 2000:1508–9)

However, considering the agency of non-human things the visibly orientated participants were not always people, and as a result many photographs featured material assemblages resting on desks, walls, and windowsills. Applying visual analysis in a ‘traditional’ sense to these photographs, particularly considering their compositional and social modalities (Rose, 2001:17), provided an initial viewpoint of the situation. In this compositional framing the teacher desks are a tangle of laptops, tablets, wires and computer cables, surrounded by untidy deposits of books, papers, and teaching resources. Even those ‘tidy’ teacher desks have some level of visible disarray, or an incoherent collection of accumulated and distracting objects. This is in stark contrast to the photographed pupil desks, which displayed an uneven but clear order. This order is clearly sustained by the practice of an enforced tidying regime, indicating a performative element to this ‘order’.

Considering the social modalities behind these images in a fuzzy performative sense raised questions about the processes by which this difference was sustained, and the implications for trainee teachers developing practice. Is there some ‘othering’ here as a result of the visible difference between teacher and pupil spaces? What agency, if any, is the ‘mess’

¹ Although Knoblauch and others advocate for the use of video recordings in focused ethnography, this proved impossible due to ethical concerns. A considered and varied use of still images became an acceptable alternative.

assemblage exerting on pupils and teachers? Are individual items within the mess play a more prominent role than the collective? The mess on teachers’ desks is often not caused by trainees, but they are being pushed to ‘become’ teachers in that situation. What lessons or boundaries does this force? How are these lessons, boundaries, of the mess assemblage itself iteratively sustained? It should be evident that such questions flow from a fussy framework and may have incongruent answers, but may provide an intensive insight into a small part of practice.

Seeking further traces of mess and boundaries, the same images they were then diffracted through two distinct ‘machine learning’ automated image recognition tools; Google Cloud Vision (Google, 2017) and Amazon Rekognition (Amazon AWS, 2016). Each machine learning tool ‘looked’ at the 166 lesson observation photographs and allocated a set of labels based on the image content. The top 10 labels from each tool are displayed in Table 1.

Cloud Vision Label	Frequency	Rekognition Label	Frequency
institution	89	furniture	112
classroom	63	indoors	104
product	62	room	90
technology	61	electronics	79
job	52	human	77
communication	50	person	77
electronic device	44	people	73
office	39	paper	68
seminar	31	table	63
design	29	clothing	63

Table 1: The ten most frequent labels for ‘observation’ photographs

The first and obvious observation is that several of the labels are somewhat generic at best, and patently incorrect at worst, but this would be an unhelpful starting point. Just as the pattern created when light passes through a diffraction grating can give us an insight into both the properties of the light and the diffraction grating itself, this selection of words represents the entangled diffraction pattern left behind as the lesson observation images were passed through the ‘black box’ of machine learning and recognition algorithms. The aim is not to judge the accuracy of the ascribed labels – if that was the goal I could have labelled them all by hand – instead the aim is to see what insight may be garnered by the process.

It is interesting that forms of electronic technologies sit above humans in both lists, and whilst this may reflect the composition of the images it may also suggest that these algorithmic machines take a technocentric standpoint in a similar way to human observers frequent

anthropocentrism, raising the profile of the technological content of the pictures artificially. Nevertheless, with the various references to furniture, electronics, and paper it would not be difficult to reconstruct a convincing ‘classroom’ or ‘seminar’ from these nouns, suggesting some merit to the labels.

Diffractionally reading the questions of mess and boundaries through this list of words emphasises the digital nature of the assemblages, but offers little else. Perhaps to the ‘digital eye’ an assemblage of ‘mess’ is too complex for categorisation, is seen in terms of component parts, or perceives the assemblages not as messy but as differently ordered. Therefore, rather than trainee teachers learning that teacher desks are usually messy, perhaps they are learning different, unusual ways of sorting and organising the collection of ‘furniture/tables/paper/electronic/people’ in ‘classrooms/rooms/indoors’, ways that are functional rather than visually appealing. Although this is slightly in conflict with previous suggestions, it highlights a potential for new understanding of practice generated from diffraction.

It is fascinating to see Cloud Vision recognising the abstract and invisible concept of ‘communication’, and raises questions around what visible traces of communication are present in the images (and therefore classrooms), or what machines might *perceive* as visible traces of communication. Whilst reading the digital mind of Cloud Vision is impossible, going back and searching the images in person seeking hints of the sources of ‘communication’ may open up new avenues insight around classroom communication as depicted and interpreted.

Noticeably lacking in the list of labels are words that may be deemed ‘scientific’, such as ‘lab’ or ‘experiment’. Given that some photographs were taken during experimental work, this is surprising. I offer three possible suggestions for this lack of science-specific identification; either the school science lessons photographed did not contain any assemblages that could be recognised as representing the scientific labels available to the machine learning tools (so we may question the scientific content of the material conditions of the lesson), the machine learning tools do not have the capability or word list to recognise scientific assemblages, or (perhaps most interestingly) it is not the visual properties of assemblages in the lessons that may be taken to have an scientific bent, but some invisible component instead.

Elements of fuzzy interpretation do not just stem from the diffractive reading of questions through the image labels, a further fuzziness is as a result of the timing of the label generation. Every image analysed by an algorithm also feeds new data into the algorithm, so every image processed leaves traces of itself in future analyses. Machines learn, and as such the labels that would be generated by passing the images through the algorithm again will

change over time. This is a further example of complex entanglement, and traces of my agential cuts in taking photographs now reside in the machine learning algorithms, where they may leave traces on future analyses.

At the end of the course both the classroom images and the generated labels were diffracted through the trainee teachers as prompts during an unstructured group interview. The purpose was to strengthen the participant voice in this work, lending authenticity to understandings and to give participants a chance to challenge my thinking. In their discussion they were less concerned or aware of the ‘mess’ displayed, but felt severely limited by the technology available. They shared stories of emphasising the way technology negatively shaped their experience; stories of a lack of hardware compatibility preventing a showing of videos in lessons, of not feeling like a ‘real’ teacher as they were never given a software login that allowed them to take a register of names at the start of the lesson, and of being unable to move freely around the building as they were not provided with an ID card. In each of these cases technology is acting as a perceived barrier to professional development, and exerting a form of agency over trainees. The nature of these barriers is not visual, but they were uncovered through a use of images and diffractive methods. A consideration of the lesson observation photographs through different diffractions has allowed the building up of an intense and multi-faceted picture of a small element of teacher practice.

Later in the data collection process photographs were taken in lessons via a time-lapse process from a fixed point during classroom observations. In total, 621 photographs were produced in this way, resulting in a catalogue of images too large for analysis via standard means. Instead, each lesson’s images were diffracted through the ImageMagick command-line processing tool (ImageMagick, 2018) to produce a compound images consisting of the combined colour channels of all images taken in this lesson.

In Figure 1 we see one such image, composed of the mean value of colour channels across a lesson. Rather than a stark representation of a snapshot in lesson time, we are able to visually ‘queer’ time to indicate potentialities available throughout the lesson. This image shows classroom activity accumulating into a complex event. Reading this image through Barad’s ‘hauntology’, we might consider that the teacher has vanished, spread too thinly in their movements and leaving behind poltergeist-like traces of their presence; a pile of books de/materialising on the teacher’s desk, the projector screen an incoherent overlay of slides, the door in a quantum superposition of both open and closed. Pupils appear ghost-like on their stools, condensed by their more stationary lesson experience.

Figure 2 and Figure 3 show the maximum and minimum values of colour channels for

a different set of time-lapse lesson photographs. In the first we see the ghostly teacher return to sight, transitioning between specific nodal points such as the laptop, a pile of books, and student desks, commanding attention and enacting small but visible changes on the classroom assemblage. Figure 3 presents a more oppressive image of the classroom, as the dark blazers worn by pupils presents an smothering cloud of collective presence. An ominous observer appears in full at one side of the room, and is reflected as only a head and shoulders at the other side.

Taking a lead from Parisi and Terranova (2001) trainee teachers were presented with this interpretation in the group interview in an attempt to draw out any affective implications and consider the positioning of these images in the “cybernetic loops of the networked society” of the classroom (Parisi and Terranova, 2001, p. 125). The teachers seemed shocked at the dominance of the pupils in the darker images, and reflected on how an anticipation of this dominance altered their pedagogical choices and shaped lessons before they had even begun. A viewing of these images also painted participants as unreliable narrators, as a teacher standing passively in one image claimed to be lazy that lesson, but recalled being incredibly active and busy when a later image implied increased motion. This example of entangled meanings over time emphasises the ongoing nature of becoming teacher, and some of the ambiguities.

A final set of data consists of the transcripts from a WhatsApp conversation between a group of three trainee teachers and me as their tutor. Spanning almost four months the group chat contained over 1,800 messages totalling more than 16,000 words, 400 emojis, and 20 images, and constitutes a rich source of multimodal data produced outside of physical and temporal boundaries. The suitability of WhatsApp both as a tool for support and a source of data is expressed by O’Hara et al, who suggest looking at “...relationship ‘doings’ in WhatsApp and how this togetherness and intimacy are enacted through small, continuous traces of narrative, of tellings and tidbits, noticings and thoughts, shared images and lingering pauses.” (O’Hara et al., 2014:1131).

One trace of narratives that can be drawn from the large body of data is a sentiment analysis of emoji use, a tool which has been used across various platforms (Walther and D’Addario, 2001; Derks et al., 2007; Hu et al., 2017). Applying the scoring library provided by Kralj Novak et al. (2015), each emoji seen in the WhatsApp chat was provided a positive and negative sentiment score, for example the SMILING FACE WITH SMILING EYES emoji 😊 has a positive sentiment score of 0.704 and a negative score of 0.060. The average

sentiment score aggregated weekly can be seen in Figure 4.

Although pleasing to see the process overall as a positive experience, of more interest was the discussion prompted by diffracting this graph through participants. They agreed that overall the experience had been positive, but were surprised that there was not more variation. They highlighted two key incidents as a result of the graph shape. The first around 30 October, a dip in both the positive score and the overall volume of messages, was a result of a ‘telling off’ they had received from me that caused them to create a second WhatsApp group without my presence to discuss how they might circumvent the requirements I had put in place. This shows the tension arising as a result of my multiple roles, and the traces such roles may leave on a professional becoming. The second incident was 22 January, where the morning that all three trainees in the group were going off to teach in different schools resulted in a flurry of good luck messages reaffirming the communal nature of this group teaching experience. We all remembered word-for-word the last message which read “Don’t worry, you’ll always be my trio. ♡”.

Conclusions and Implications

I opened this paper asking by asking: What space might there be for non-representative approaches to short-term intensive ethnography in education? How might ‘fuzzifying’ methods allow for different, productive and insightful avenues of enquiry? The techniques demonstrated here have shown that some insight can be drawn from non-representative methods which, far from usurping ‘conventional’ ethnography serves to enhance it by shedding light on previously unseen possibilities. The rich multi-modal data of focused ethnography lends itself well to novel forms of analysis, which in turn offer additional opportunities for fuzzy presentations that embracing entanglement, a performative approach to boundaries, and posthuman agency. Adopting a fuzzier approach to focused ethnography creates space for potentiality, which may allow broader links to be drawn without standard representation.

I previously argued that focused ethnography is underused in education research, despite its obvious suitability. This project not only presents an example of how focused ethnography may be applied in education settings, but also outlines a strategy for utilising diffractive methodology to engage with focused ethnographic data. Such an approach coupled with the application of novel technological tools can ease the burden of analysing rich, multi-modal data, and gives a further applicability to focused ethnography.



Figure 1: A superposition of images from a school science lesson showing the combined mean value of each colour channel. The more 'blurred' an item appears, the more it moved during the lesson.



Figure 2: A superposition of images from a school science lesson showing the combined maximum value of each colour channel.



Figure 3: A superposition of images from a school science lesson showing the combined minimum value of each colour channel.

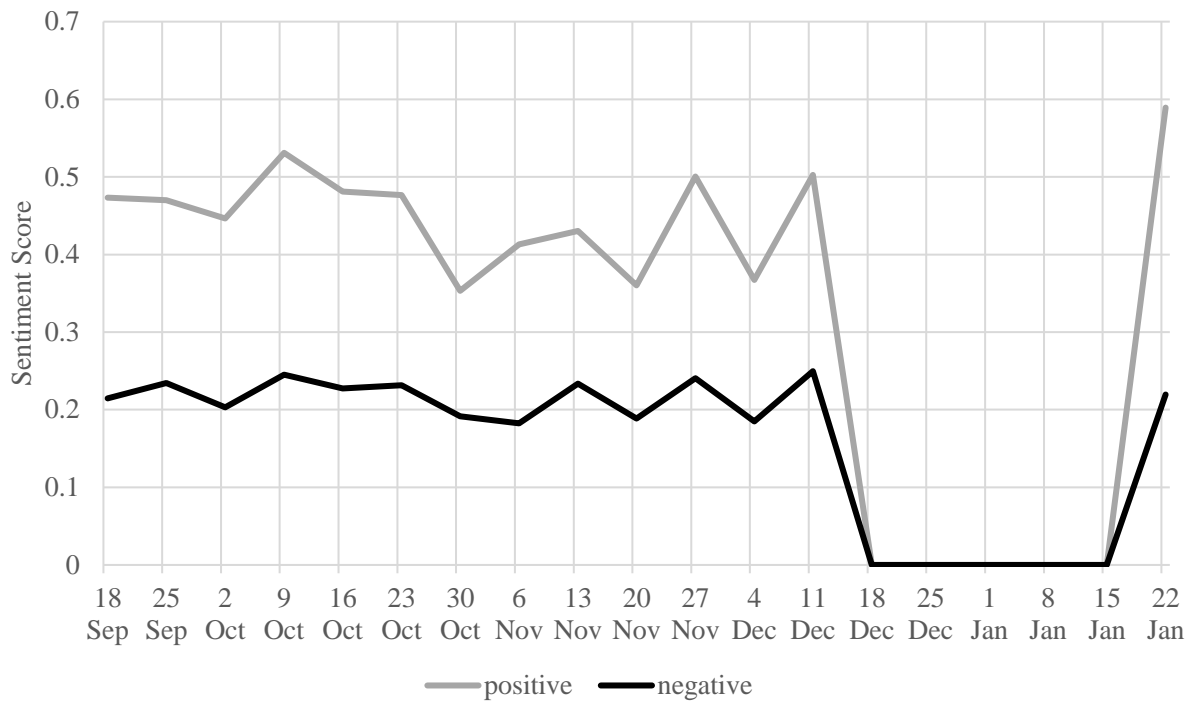


Figure 4: A graph showing the mean weekly sentiment score for WhatsApp emoji sent by all participants in conversation regarding teaching practicum

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