Examining work-education intersections: the production of learning reals in and through practice

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Abstract

Working within an assemblage analytic, this paper examines work – education intersections using the notion of learning reals. The learning real examined is learning as mastery and skills development. The concepts of embodiment and performativity guide the exploration. The paper draws on interview and observational data collected during a three year research project exploring the everyday learning (of employees) in a post-secondary education institution in Australia. The project was an industry-university collaboration between a group of professional developers from the organisation and a group of workplace learning academics. The assemblages making up learning as mastery are traced through examining the enactment of this real by a group of trade teachers, one of the workgroups participating in the project. I propose that this learning real was produced and made durable in and through the practices of the trade teachers. Furthermore, the ongoing performing of mastery produced particular effects, including the separation of theory and practice in the trade school. The notion of learning reals enables an exploration of the way particular ways of conceiving learning are made durable in particular workplaces as well as opening up the space to examine the partial connections between workplaces and educational institutions.

Keywords: learning reals; work practices; assemblages; work-education intersections

Introduction

The organisation of education (and learning) has arguably always been a matter of concern. However, now that knowledge production is understood as no longer residing only within the academy (e.g. Garrick & Rhodes, 2000; Gibbons et al., 1994; Nerland, 2012), now that spaces other than educational institutions have been identified as sites of learning (e.g. Argyris & Schön, 1978; Gherardi, 2006; Lave & Wenger, 1991), now that learning is 'lifelong' and no longer confined to childhood and early adulthood (Andreas Fejes & Nicoll, 2008; Field, 2006; Jackson, 2013), and now that practice is

increasingly used as a lens for examining learning at work (e.g. Gherardi, 2000; Green, 2009; Hager, Lee, & Reich, 2012; Wenger, 1998), this matter of concern seems ever more pressing. Yet, as Fenwick (2010, p. 80) has pointed out, learning tends to be understood as 'a single object, self-evident and mutually understood'. In other words, what learning *is*, is generally taken as a matter of fact.

Taking up Latour's call to get closer to 'matters of fact' rather than moving away from them (2004, p. 246), this paper examines assemblages that work to produce and maintain particular learning reals (Fenwick, 2010; Fenwick & Edwards, 2011). This is connected with a broader concern with who and what are able to be present in research accounts of workplace learning, the performative practices of both researched and researchers, and the politics of learning at work (e.g. Andreas Fejes & Nicoll, 2008; Fenwick & Edwards, 2013). Rather than learning being singular, it may be multiple, take different forms and be 'made up' from both human and non-human connections.

The notion of multiple learning reals links with Mol's concept of ontological politics (1999). Ontological politics enables a shift beyond thinking of multiplicities as multiple perspectives on a single object to the more provocative concept of multiple reals, which Mol argues are produced through the enactment of different practices. Mol discusses the production of different reals in relation to medicine and health practices, and Fenwick (2010) has suggested this may be a fruitful concept for examining the heterogeneous field of workplace learning. The notion of ontological politics enables how learning is 'made up' to be examined, rather than assuming learning always takes the same form. what counts as learning might be different depending on how it is enacted (or performed) in and through different practices.

The learning real examined in this paper is learning as skills development and mastery. This is a commonly held conception of learning at work and workplace learning is frequently represented in this way (Harman, 2014; Mulcahy, 2012). For example, this view of learning is expressed in a community of practice perspective, whereby learning is understood as the movement from peripheral to full participation in a community of shared practice and transition from novice to master (e.g. Wenger, 1998). While this view of learning has received critique (e.g. Gee, Hull, & Lankshear, 1996; Hughes, Jewson, & Unwin, 2007), it has become a popular model for theorising learning at work (e.g. Jawitz, 2007; Köpsén, 2014; Mittendorff, Geijsel, Hoeve, de Laat, & Nieuwenhuis, 2006).

The exploration of how learning is 'made up' as mastery and skills development is an ambitious project, and well beyond the scope of a single paper, as arguably this particular learning reality is enacted in multiple sites, including HE, FE and other workplaces. And indeed, that is the point. That is, the magnitude of the assemblage and the apparent durability of the connections is what makes this a particularly powerful way for knowing and organising learning. However, rather than being overwhelmed by the scale, an attempt is made in this paper to begin tracing a learning as mastery real. This learning real is understood as the assemblage of 'people, techniques, texts, architectural arrangements and natural phenomena' (Law, 2004, p. 56) that work to bring into effect 'mastery' as a prevailing mode of experience in particular workplaces.

In the first part of the paper, an overview of and justification for a sociomaterial approach for exploring learning at work is provided and the concepts of embodiment and performativity are introduced. Next, I turn to Stengers (2008) and discuss her contribution to researching workplace practices. I then introduce the Workplace Learning project, a research site for the exploration of the everyday learning of various occupational groups working in a post-compulsory educational institution. An analysis

of interview and observational data from the project is undertaken, to examine how a learning as mastery real was 'made up' in and through workplace practices. The effects of this way of knowing and ordering the world are also explored. Finally, the possibilities the approach opens up for examining work and education intersections, as well as for researching practice, are discussed.

Sociomaterial accounts of learning at work

The conceptual and analytic framework used in this paper draws on and contributes to an emerging body of literature providing sociomaterial accounts of learning at work (see Fenwick & Edwards, 2011, 2013; Fenwick , Nerland, & Jensen, 2012). The sociomaterial literature goes beyond a focus on the social (and a privileging of the human) by drawing attention to both the *social* and *material* relations of practice. This links with a renewed emphasis on materiality in the social sciences and provides a way of moving beyond a Cartesian cogito/material dualism. Coole and Frost (2010) argue that in the prevailing Cartesian view, only the *cogito* is understood as having agency, matter is necessarily conceived as passive.

Many theories of learning tend to take the centred subject of humanism as pregiven and the starting point for theorising learning (Harman, 2008). However, a focus on materiality 'helps to avoid putting human actors and human meaning at the centre of practice' (Fenwick et al., 2012, p. 6). Instead, the focus shifts to the ways 'knowledge, knowers and known (representations, subjects and objects) emerge together with/in activity' (Fenwick et al., 2012, p. 7).

This paper follows in close conversation with the work of Mulcahy (e.g. 2007; 2011, 2012) who has employed an assemblage analytic to examine the professional learning of teachers. Through tracing the production of teacher learning in two different spaces she concluded that: 'What teacher professional learning is depends on how participants in it (persons, texts, technologies and bodies) performatively accomplish it as a practice' (p. 134). The existence of multiple learning reals leads her to argue that: 'we need different versions of teacher learning and that policy around this practice could reflect this 'versioning' – not mandate any one version' (p. 134). Mulcahy's work directs attention to the politics of learning and who and what are visible in particular accounts. She argues for a move from best practice, the approach typically driving educational policy and the professional development of teachers (Malcolm & Zukas, 2001), to a recognition of multiple practices.

Sociomaterial accounts enable a very different view of learners and learning and raise difficult questions for researchers of learning in and through practice as they draw attention to notions of embodiment and performativity. Embodiment is understood here as the ongoing realisation of subjectivity in and through practice (McNay, 2008), and performativity as the repeated performances in and through practices whereby particular reals are produced (Butler, 1999; Lloyd, 2005). If we start from the position that knowledge, knowers and known co-emerge within practice, knowing can no longer be understood as separable from practice, thus opening to question the objective, researcher-knower.

How then might we researchers approach practice without assuming the position of 'knower'? It is here, Stengers (2008, p. 54) cautions, that we (researchers) need to act with care: 'are we not insulting all practitioners with the kind of questions which we address to them, and which imply the claim that we know how to define a practice'.

Furthermore: '...that to diagnose alienation, or identify actions as hidden resistance or subversive counter-strategies, when the people concerned do not characterize their situation in these terms, is poor, and also dangerous crafts' (p. 53). She reminds us to consider:

> Who in our modern milieu would profit from practitioners accepting an objective, demystifying interpretation of their practices? Who profits from the kind of vulnerability that defining such interpretations as normal and legitimate both exploits and induces? (p. 54)

So how then might we researchers of learning in and through practice direct attention to the enmeshing of workplace practices, knowledges, learning and relations of power? Stengers' answer: in ways that provide the researched (both human and non human) with the opportunity to speak back. This may set alarm bells ringing for poststructuralists concerned with the structuring work performed by discourse. However, this is not a naive approach that slips back into a human-centred understanding of subjectivity and agency. Rather, it is an approach that foregrounds the realisation of subjectivity in and through practice and hence the materiality of subjectivity. Following Stengers (2011), Latour (2005, 2013) and educational researchers working within an assemblage analytic (e.g. Mulcahy, 2012; Sorensen, 2013), I propose that this is an approach that contributes to more democratic representations of learning in and though practice in terms of who and what are able to be present.

Stengers (2008) proposes that the researcher remove themselves from the position of 'knower', to a position of being open to connection (and other ways of being). While Stengers' focus is on the practices of scientists, the questions she asks provide a useful guide for the study of practitioners more generally: 'what situates them, what 'forces' them to think and feel and hesitate in a way that marks them as belonging to *this* practice, experimental science?' (p. 47). In other words, what matters? She proposes a focus on subjectivity producing events and 'the coming into existence of something that has got the power to produce agreement among competent colleagues...'(p. 47). The event is the site for connection and the production of subjective experience.

In summary, exploring the realisation of subjectivity in and through practice, is a way we (researchers) might approach practice without falling back into accounts that take the centred subject of humanism as pre-given. It is also an approach that enables the researcher, amongst other people and things, to be present in accounts of learning at work.

The workplace learning project

The paper draws on interview and observational data collected during a three year research council funded project exploring everyday learning (of employees) in a post-secondary education institution in Australia. The project was an industry-university collaboration between a large public-sector organisation, named PSE in this paper, and a metropolitan university, referred to as City University. The research team comprised workplace learning academics from a Faculty of Education and a representative from the professional development unit at PSE. We worked with four employee work groups during the project: a group of senior managers, a group of trade teachers, a group of business teachers and a group of administrators. The workgroups were selected in terms

of the variation they contributed to the research design in the areas of: workgroup occupation, location of college (although all were from a metropolitan area), and levels in the organisational hierarchy. An additional dimension was provided in terms of relations of power as the trade teachers were under the jurisdiction of the senior manager's workgroup at a particular college.

The project ran between 2001 and 2004 and while some time has elapsed since the collection of the data, the analytic approach illustrated in this paper for exploring the realisation of subjectivity in and through practice remains topical (Fenwick, 2010; Fenwick & Edwards, 2013; Fenwick et al., 2012).The project provided a site for the practices of various workgroups, including the practices of the research group, to intersect. Furthermore, these intersections were made possible through broader contextual factors. For example, our encounter with the trade teachers (and other groups participating in the project) was enabled through a government funded industry-university partnership, part of a reconfigured higher education assemblage working to produce new modes of academic/researcher subjectivity, including academics as knowledge partners and professional developers (Harman, 2014; Nicoll & Fejes, 2011).

The project was conducted in two stages. In Stage 1, interviews exploring the challenges and changes of work were conducted with individual members of the participating workgroups. The findings from Stage 1 were discussed with the participating groups in feedback sessions where a learning theme was developed for further exploration with the workgroups during Stage 2. The interviews and meetings were recorded and transcribed. In this sense, the methods of the project can be understood as following a conventional qualitative research approach where interview data is collected, analysed and then used to produce knowledge (and 'the truth) about workplace learning. However, rather than employing a representationalist approach in the analysis in this paper, where words are understood as simply reflecting reality, the focus is on the performative practices of the trade teachers (and at times the researchers) and the reals produced in and through practice.

Following Stengers (2008, p. 46), the analysis explores the 'subjective attachments that situate us' in particular practices. Questions guiding the analysis include: Who and what did the trade teachers connect with at previous worksites? Who and what did they connect with at PSE? What modes of subjectivity were produced in the connections of practice? What did these modes of subjectivity make possible and what did they exclude? What happened when the trade teachers and the researchers connected? Did the connection demand possibility or surrender?

While the guiding questions open up ways of exploring the human and non-human relations associated with practice, the analysis is still quite anthropocentric. This is largely the result of the nature of the data collected during the Workplace Learning project, that is, transcripts of interview data where the trade teachers spoke about their learning at work. And this is yet a further illustration of sociomateriality. The research tools used by the researchers were not neutral, rather they worked to cast a particular grid of visibility over the way learning and learners might be 'known'. With this in mind, I point to potentially fruitful areas of ongoing exploration in terms of human and non-human connections throughout the paper.

Moments of enactment

From my account of the Workplace Learning project

It was Melbourne Cup[1] day when I first met the trade teachers. There were crowds of hatted people on the bus making their way to the racetrack. But I was not going to the races. I was on my way to interview the head teacher from one of the workgroups that had agreed to participate in the Workplace Learning project. After months of working with the research team on developing the interview schedule and finetuning the research design I was at last going to do some real research in the field and commence the interviews.

I passed through the gates of Green Campus and followed the signs through the endless blocks of brick buildings to the trade school. I was interviewing the Head Teacher, Jim. As I entered the large building, I noticed a group of apprentices working in individual work-bays, rendering walls and applying tiles. After getting directions from a man in blue overalls, I made my way upstairs to Jim's office. He had not arrived yet, so I sat down outside and waited.

The place where I was sitting looked like a classroom. There was a whiteboard with a drawing of a plum-bob and some measurements and calculations. Table and chairs were organised in a U-shape facing toward the whiteboard. There were some grey metal cupboards which lined the walls. But the detail of the room and its furnishings were obscured under a thick layer of pale grey dust that enveloped the building, and those working within it. A strange kind of 'grey' unity was created by this shroud of dust and nothing was spared from its relentless infiltration. Have you ever tried washing cement dust out of your hair?

After waiting for Jim for some time, I decided to find another member of staff and establish if there was a problem. Perhaps Jim had phoned to say he was running late? The offices upstairs were deserted but I eventually heard voices. After locating the source, I came into a small room where two men were sitting at a table and chairs, drinking cups of tea, 'dunking' biscuits and reading a newspaper. I was in the staff lunchroom, a room we workplace learning researchers later established as a significant learning space for the trade teachers. The two men were looking at the form guide and discussing which horses they had backed in the Melbourne Cup. Each was dressed in casual but neat attire – shorts and short sleeves, one wearing knee-hi socks.

'Do you know where Jim is? I was supposed to be interviewing him this morning for a research project I'm working on'.

Neither knew where he was but both were surprised that he had not arrived for the interview: ' It's not like Jim to not turn up for appointments'. We chatted for a while and it transpired that Bruce and Tom were both teachers in the department. I described the research project to them and Bruce suggested that I might like to interview him instead. He needed to get back to his class but, if I was happy to interview him while he supervised his students, we could proceed. I gladly took up the offer as I did not want to go back to City University empty handed. I was the doctoral student on the project and demonstrating my research finesse to my supervisors, who were also the chief and co-investigators on the project, mattered. Into the grey cavern we trekked, where the apprentices were building walls, then pulling them down, putting them up again, then pulling them down, and with the constant 'chink', 'chink', 'chinking' of trowels against tiles, I turned on my audiorecorder and interviewed Bruce.

Excerpts from Bruce's account of learning at work

I started working here in 1992, teaching students wall and floor tiling. My wife saw an advertisement for a tiling teacher in the paper. And I wasn't all that keen but I came in, applied, took a test and was accepted. I wasn't particularly excited about it and I'd never done anything like that before. I'd actually retired as a tiler and I'd taken on the position as manager of a plumbing department at [name of company]. And that was a sixty hour a week type job. And the teaching was thirty hours a week. Although that's a bit of a con because when I started to teach, and I had to do teacher training, I was so busy that I didn't get to play golf for two years.

For the first couple of years I used to feel like a, not an imposter, but now I feel more like a teacher than I felt initially. I didn't know if I even wanted to stay here. It was that strenuous, stressful. It's only the fact that most of the teachers were very supportive and the students were fine and I get along fine with them. It wouldn't have taken much for me to say 'oh, this is really not me, I'm out.' But I stuck by it, and I'm quite happy I did. I had to learn a new skill. And it is a lot harder than it looks. Now that I've kind of learned a few tricks I can see how that's made me more effective as a teacher. Rather than what I tried to do initially... [pause] trying to structure. Now I know a lot more now about eliciting responses that might seem accidental but have an underlying ulterior motive... [pause] getting them to learn something painlessly…

['chink', 'chink' – sound of a trowel tapping on a tile in the background]

There's not a lot of time to talk with other teachers at work because you're either teaching, or they're teaching if you're not teaching. It's very difficult to spend any significant amount of time with fellow teachers in the section. I think there should be probably more thought given to having a mentoring type system with new teachers where an experienced teacher could be on hand. You know, give them a bit of guidance, a bit of help, a bit of feedback. I think I got more feedback and help from teachers in teacher training. We became quite a close-knit group and whenever we had free time at university we'd discuss views on what we were doing and what problems we were having and the difficulties…

[scraping noise of shovel mixing concrete]

I was an apprentice over forty years ago. In those days we often worked for a different firm, we didn't always have the same job. There were two firms in [name of city] that employed something like about 40 apprentices. A lot of their tradesmen worked for wages and they always had at least one apprentice with them and they were big companies. They employed thirty or forty tradesmen and as I said, a large number of apprentices. It was a different culture then. It was actually a cultural thing. A bit of encouragement. There was a strong sense of unity and comradery. It was a way of life. And it's all gone. Those people now are sub-contractors and they only employ one or two apprentices. When I got out of my time, there was a large influx of Italian migrants came in and they kind of, they were prepared to work for less than Australians, they'd work harder. And now it's the Koreans, the Korean tilers. They're actually working for less than... [pause] the Italian's forty years ago came out and worked hard for nothing, for a lot less than the Australians were prepared to work for. And they're now at the top of their trade if you like. They're well established.

…

[high pitched scratching noise of a tile cutter]

People ask me what I do and I say ' I'm a tiler'. Really, I haven't been a tiler for about fifteen years. Because I've retired from it. I shattered my left knee in a motorcycle accident in 1980. Because my knee was so bad, tiling was really difficult and that's one of the reasons why I got an office job. But I still tend to think of myself as a tiler. I started tiling when I was fourteen. It's been a very good trade to me. I'm quite comfortable financially. Yeah, actually, I bought a house up at Hawks Nest a couple of years ago and I got different tradesmen in to do renovations and they'd say 'what do you do for a living?' and I'd say 'tiler'. It didn't occur to me to say 'I teach tiling'. I still think of myself as a tiler. Even though I teach tiling…

['tink', 'tink', 'tink']

Things have changed since I started here. There used be eight teachers here and four technical assistants. Now there's six teachers and three techies. And one's a part-time techie. One teacher just transferred to another section, voluntarily, and another teacher took a redundancy and they haven't been replaced. One of the technical assistants retired. Another one was given a medical retirement, so we're down to two. And we have a temporary and two permanents. So cost cutting is making a bad, not a bad situation, but the situation could be better…

[sound of a wooden trowel smoothing concrete]

As well as the downsizing there's the changes to the curriculum. The curriculum's been changed to accommodate the competency based training which is supposed to incorporate a lot of generic skills, which is all bullshit. In the new curriculum we're supposed to spend lots and lots of time teaching them working on scaffolds and workplace communications and a lot of other stuff that I haven't even looked at but I know the amount of time we're actually supposed to be teaching them tiling is, kind of been halved. Whereas most of the stuff in the first year is all about the cross-generic type stuff: using explosive powered tools; using antiquated levering devices that are supposed to be generic with plastering and bricklaying and gyprock fixing. It's getting to the stage where, if I was employing an apprentice, I wouldn't send them to [PSE]. Because it's rubbish. They're not being taught what they need to be confident early on in the trade. Spending hours teaching them or expecting them to achieve competence in things that are either antiquated or irrelevant…

[noise of concrete being tumbled in a concrete mixer]

There have been staff development meetings where we were told what had been decided upon as curriculum content. But we said 'this is'bullshit, it's rubbish. It's not relevant' and they said 'well that's what you have to teach'. That's it. End of story. There's a whole bureaucracy out there that comes up with this stuff and they all have a vested interest in making it as complicated as possible and generating as much paperwork and as many... [pause]. Yeah, they're very busy, and they create a lot of paper with a lot of writing on it but it's all pretty useless. We spend more time finding ways around it than actually performing with it. As long as we can give them a tick in whatever stupid skill they're supposed to allegedly need, we'll find ways of doing that, quickly, and spending more time on what does matter. But it's 'why should we have to do that?' and entering it all into a system, back into the system, it's time consuming. I haven't spent a lot of time, in fact I haven't spent any time looking at the new curriculum because I'm teaching third year, and have been for the last couple of years. They'll be the last people to get affected. And I'm fifty six now and certainly by the time I'm sixty I'll have retired.

'Making up' the master tradesman

Bruce's account can be examined in terms of the multidimensionality of practice as well as to the ongoing realisation of subjectivity in and through practice. Amongst other things, there are bureaucrats, trade teachers, a wife, broken bones, curricula, immigrant tilers, concrete mixers, trowels, shovels, spirit levels, trainee teachers at university, apprentices, technical assistants, sub contractors, Training Packages, tile cutters, concrete dust, administration systems, and so on represented in his account. And I propose that all of these people and things might be understood as making up 'the master tradesman', and that this way of being 'the trade teacher' mattered in this particular workgroup.

Bruce provided an account of a cohesive community of shared practice forged through participating in the tiling trade. For example, he spoke of a 'strong sense of unity and comradery' during his apprenticeship, tiling 'was a way of life'. Indeed, Bruce still identified as a tiler, even though he had not worked as a tiler in over fifteen years. The notion of unity and homogeneity was a recurring theme in the interviews with the trade teachers. Another member of the workgroup summarised the trade teachers in the following way:

> Vince. We all like each other…we go through a trade together, we do the same things, we talk about the same things, we think in the same [way] [my emphasis]

While it might not be clear as to what the 'same things' that the trade teachers do are, Vince's comment hints at the importance of the trade teachers having all practised the same trade and evokes 'the coming into existence of something that has got the power to produce agreement among competent colleagues...' (Stengers, 2008, p. 47).

Similarly to Bruce, many of the other trade teachers also identified as 'the tiler' when talking about themselves and their work. For example, when asked by one of the researchers if he thought differently about himself to when he first started working at PSE, Frank declared:

> Not really I always see myself as a tiler – mind you others at home have said I had changed but I don't think so.

It seemed doing tiling (rather than theory) is what mattered for Bruce (and his colleagues) and his account suggests that this was how apprentices would achieve mastery in their trade. For example, Bruce spent some time discussing the current curriculum for the apprentice tilers and was unhappy that the amount of time that could be spent on teaching tiling had been significantly reduced. He also commented on the introduction of new, generic curricula in the Training Packages, which he succinctly described as 'bullshit'. The Training Packages formed a component of the National Training Framework, which was a set of principles and guidelines formulated at a national level in Australia during the 1990s with the aim of creating a national training system relevant to the needs of industry. While the Training Packages were meant to provide students with the skills and knowledge needed to perform effectively in the workplace, Bruce's account opens this to question.

Bruce's clear articulation of what did not matter in the new curriculum suggests that there were other things that did matter and points to the struggle over the curriculum in that particular educational site.

For Bruce and the other trade teachers, learning was the mastery of tiling skills and this was to be achieved through practising tiling. The 'other stuff' in the curriculum was 'rubbish' and doing tiling was what mattered. And it is in this sense that Bruce could be understood as embodying an apprenticeship discourse. An apprenticeship discourse is understood here as a way of thinking, talking about and organising learning that takes the notion of mastery and skills development, acquired in and through practice, as foundational. An apprenticeship discourse produces masters (experts, knowers) and apprentices (novices, learners).

Being 'the master tradesman' was a mode of subjectivity that the trade teachers were attempting to produce in their students as well as a mode of subjectivity (way of being) the trade teachers performed in their everyday practices at PSE. For example, the trade teachers measured themselves, and others, in terms of how many metres of tiles they had laid in their careers. At a group meeting Vince described one of his colleagues in the following way:

> Brad's a good tiler, he's laid a lot of metres over the years. I've learnt a lot from working with him.

However, another of the group (jokingly) disagreed:

> Tom: Brad's pissweak. I've laid more metres than him.

Furthermore, when tilers were no longer able to 'lay metres', they needed to move on from practising their trade. It seemed construction sites needed active, supple bodies. Broken bodies needed to move to other spaces, including offices and trade schools.

While requiring further investigation, it seemed the assemblage producing 'the master tradesman' extended to the connections that 'made up' the trade teachers' experience before working at PSE. This might include: tiles that stay stuck, straight lines, neat cuts, apprentices, water that runs away, walls that don't fall down or leak, tile cutters, trowels ... And if one considers the practices of managing a small business, the assemblage continues to grow: quotations, telephones, tax returns, accountants, advertisements, bank statements... but perhaps that is when 'the master tradesman' becomes 'the entrepreneur'?

Performing mastery

In contrast to 'the master tradesman', Jennifer, a part-time female teacher in the school did not have what mattered (for most of the trade teachers). According to Jim, the head teacher, many of the trade teachers had complained that: '…she shouldn't be here because she hasn't laid as many tiles as we did'. And perhaps unsurprisingly, Jennifer remained invisible throughout the project. It was by way of a chance remark in an interview with the head teacher that we (researchers) discovered that she existed. She had not been asked to participate in the project, she was rarely mentioned by her colleagues, she was never present when we visited their workplace and was thus not present in the account of learning provided in the final project report. It seemed construction sites were not for female bodies, nor were trade schools.

Nor did government bureaucrats have or do what mattered. They 'create a lot of paper with a lot of writing on it', but this writing was not important for Bruce and the other trade teachers, who in the main resisted adopting the new curriculum. They

considered the skills included in the new curriculum redundant and not what tilers needed to do their job well:

> Frank. I used to be very proud of the fact that I had been a tiler and I was teaching tiling, now I am teaching students a whole lot of other generic subjects in the course. Students tell us that their bosses tell them that what we're teaching here is not the right stuff – you see at work they do it differently and we have to teach them all these additional subjects and employers are not happy.

Nor did the senior sections of the organisation do what mattered. For example, in referring to senior management, Vince said: 'It's like us and them…I've had no support from them'. Jim spoke metaphorically about a 'suit of armour' that he kept at the front door of the building in which he needed to dress each time he went out to do battle with 'them' (the senior managers in the college). Management was viewed as an obstacle to be sidestepped rather than a group with which to align:

> Frank. We are all over fifty, and we're doing the job that we're supposed to be doing fairly well. We're disillusioned with the system…

> …I do whatever I can for our section. As far as [PSE], it's just depositing on us. Our section is what's important…That's where it starts and ends for me.

The subject position of 'the master tradesman', and an associated apprenticeship discourse, enabled the trade teachers to resist both bureaucratic and managerial directives. It also provided a position to resist a more traditional teaching discourse, which privileges disciplinary knowledge produced in the academy. At times, Bruce and the other trade teachers positioned themselves in relation to 'the teacher' rather than as 'the teacher'. This was evident in Bruce's comment that: 'It didn't occur to me to say 'I teach tiling'. I still think of myself as a tiler', and was reinforced throughout the interview. For example, he claimed: 'I wasn't particularly excited about it' when he was offered the post at PSE, suggesting he had no desire to be a teacher.

Being a teacher appeared to have little appeal and taking up the position of 'the teacher' often appeared to produce tension. However, this tension was often reconciled by constituting 'the other teachers' as different from who they were. For example:

> Frank. Most people consider that teachers live in a different world, because they never leave school. Whereas a [trade] teacher, or a person in a technical situation has been, quite often a large experience in the workforce, and then becomes a teacher as well and has the opportunity to see both sides of it.

The trade teachers understood the other teachers as out of touch, particularly in regard to matters of work – they lacked workplace experience. This was a recurring theme:

> John. I think teachers are very... haven't got a lot of common sense, most teachers; mainly because they haven't been in the workforce…

> … because they've talked to professors, they're fantastic about what they're talking about, but you give them a hammer and they can't even put a nail into butter.

Again, we hear about tools and doing. Academic practice did not appear to count as relevant experience and the trade teachers, it seemed, had an ambivalent relationship with the position of 'the teacher'.

'The master tradesman', which I have suggested was intricately connected with the previous practices of working in their trade, also provided a powerful position for the trade teachers in relation to the position of 'the apprentice', which was available to the students. The master tradesman were 'the knowers' (and experts), the students were 'the learners' (and novices). During the Stage 2 meetings the following comment from Vince illustrates the take up of this position:

> Vince: When I've got students around me, I don't seem like I'm learning now, I'm the one doing the teaching. As far as I'm concerned I'm the one in control. I'm the one with the knowledge that's being passed over. I've got the experience...

Vince was much younger than the rest of the trade teachers and was employed part-time at PSE. When he was not teaching he was still doing what mattered most, that is, he was 'mixing mud' and 'laying metres' (of tiles).

It seemed the practices of the trade teachers were integrally entwined with the notion of skills development acquired in and through practice, and what I refer to in this paper as a learning as mastery real. Their approach to administration, their workplace conversations, the layout of their workplace (for example, a large section of the building was dedicated to practising tiling), the concrete dust, the curriculum (they actually used), their relations with students (and others); all worked to produce 'the master tradesman' and make this way of being the trade teacher durable.

Moreover, the ongoing enactment of mastery by the trade teachers in the PSE workplace worked to produce (and maintain) particular divisions. As discussed, the trade teachers actively constructed themselves (and their practices) as separate from and different to other sections of the organisation (particularly management) and other PSE teachers. It enabled the ordering of particular practices and encounters in the trade teachers' workgroup including the separation of: theory and practice, master and apprentice, knower and novice, and tradesman and teacher. And as I propose below, these modes of ordering also worked to shape the encounters with the academic researchers throughout the project.

Practice as a site for connection

While I connected with the trade teachers at various moments while preparing and reading their interview transcripts, my next face to face meeting with the trade teachers was at a feedback session at the completion of Stage 1 of the Workplace Learning project. At this event, following what might be called 'typical' qualitative research methods, the findings from the initial individual interviews were 'fed back' to the workgroup for discussion and comment. While these research practices might be understood as neutral, I have proposed elsewhere (Harman, 2014) that these interactional encounters (or events) can be understood as providing a site for examining the ongoing realisation of subjectivity in and through practice. In other words, the research project was a site for the intersection of the practices and learning reals of the trade teachers with the practices and learning reals of the research team (and a potential site for reproduction/ transformation of both trade teacher and academic subjectivity).

From my observations of the meeting

> The feedback meeting was conducted in one of the college classrooms near the trade teachers' school. It was an uncomfortable re-union, with 'the researchers' on one side of the room and 'the researched' on the other. The trade teachers frequently drew attention to our difference during the session and at one stage one of the group (jokingly) pointed out that he had no idea what one of the research team was talking about as he could not understand the language she was using. They also referred, deferentially, to the chief investigator of the project as 'the professor' throughout the meeting. We were 'the academics' and they were 'the master tradesmen'.
>
> I felt uncomfortable at this meeting and this was connected with my 'contaminated' past. I had been married to a tiler for a number of years and had even on a few occasions mixed mud and laid metres. The ghost of this unsuccessful union haunted my relations with the tillers and I was certainly not a pure, objective, transcendent researcher (knower) able to separate myself from lived experience. And just as the trade teachers were embodied subjects, moving through space and time and reconfiguring their subjectivity in and through the lived relations of work, so were we researchers.

One way that we academics positioned the trade teachers during the Stage 2 meetings was as 'the workplace learner'. Many of the trade teachers accepted this positioning but some vehemently resisted. For example, when Frank was asked if participating in the Stage 1 interviews had triggered any thoughts about learning, he simply replied 'no'. Another member of the group, Vince, was able to take up the position of 'the learner' in relation to his colleagues, but he was not able to think of himself in this way in the classroom, in the classroom he was 'in control' (see page 21).

The researchers sought the participation of the trade teachers in the co-production of knowledge about everyday learning at work. However, it became apparent during the feedback session that the collaborative relationship that we researchers wanted to foster was going to be more difficult to establish than anticipated. For example, toward the close of the meeting, one of the researchers asked:

> What can we build upon that there is consensus about amongst the staff group that they agree that this is a problem that we can get our heads together and work on and fix? So it's driven by something that people want to fix, [rather] than some external solution. Are there some of those things sitting there at the moment?
>
> The response from the trade teachers was……………… [SILENCE]

For most of the trade teachers, a collaborative model of research about their everyday learning at work had little appeal. As far as the trade teachers were concerned, they were masters rather than learners and it could be argued that what mattered to the researchers was not necessarily in alignment with or of interest to the trade teachers.

Contradictions, ambivalence and uncertainty

The Stage 2 meetings could be read as a site of struggle, with the trade teachers attempting to renegotiate the traditional power associated with the academy and expressed through our ongoing positioning of the trade teachers as workplace learners. However, Stengers' caution of the danger of labelling actions as 'subversive counter strategies' leads me to be cautious here.

For example, it would be easy to provide an account of the trade teachers as uncomplicated, blue collar workers, acted on by the top-down power of the State, their senior managers and the academics. I (initially) desired simplicity in respect to how the exercise of power in workplaces might be understood, and the trade teachers frequently obliged by constructing themselves and the world in this way. They conveyed the impression that there was no pretentiousness in their group – no artifice – and that they were 'authentic' (pure) tradesmen subjects. For example:

> Jim. We're tradies, we tend to call a shovel a bloody shovel. Speak our minds, and very clear and plain, whereas some of our colleagues in management that you've been looking at might be more inclined to have a more academic approach to their interpersonal relationships.

However, contradictions abounded in the Workplace Learning project. Neither I, nor the trade teachers, were autonomous subjects, disconnected from networks (or assemblages) producing particular power effects. For example, rather than thinking of the trade teachers as passive and only acted on, being 'the master tradesman' provided a position to resist the top-down implementation of the training packages. Instead of aligning with the broader goals of the State through implementing the Training Packages, the trade teachers ticked the necessary boxes on assessment documents and then got on with doing 'what does matter'.

Both researchers and researched might be better understood as bodies moving through time and space and at times our respective practices enabled particular connections . For example, Bruce's account can be read for different positionings produced through his movement from working as a tradesman to working as a teacher. It exemplifies the interplay of the dual positionings as 'the master tradesman' and 'the teacher' and the tensions this created for Bruce in his post at PSE:

> For the first couple of years I used to feel like a, not an imposter, but now I feel more like a teacher than I felt initially. I didn't know if I even wanted to stay here. It was that strenuous, stressful.

While the above quote might suggest that Bruce had reconciled these tensions, with the implication that he had established a unified and cohesive identity as 'the teacher', Bruce's ongoing struggle with multiple tradesman/teacher positionings and the tensions these created echo throughout the interview text. For example, at one point he claims emphatically that: 'I still think of myself as a tiler' and then quickly qualifies this statement with: 'Even though I teach tiling'.

Furthermore, it became apparent during the project that the trade teachers used what might be understood as more traditional teaching techniques. At the completion of Stage 1 of the project, Jim (the head teacher) mentioned he was eager to change existing teaching practices in the trade teachers' workgroup. He wanted to shift from 'everybody teaching the same lesson notes' to 'new and innovative teaching styles' such as 'having small group work, have the students solve the problem'. While the trade teachers embodied a discourse of apprenticeship, which was enacted in their teaching practices (for example, in respect to their failure to take up the curriculum in the Training Packages), it seemed lesson notes, white boards and classrooms were also part of their teaching repertoire.

Moreover, the privileging of an apprenticeship discourse raises a potential paradox for the trade teachers: if learning is understood in this way, what is the role of

educational institutions such as PSE in teaching trades? What do they add to the on-the-job learning of apprentices? And was teaching in fact so strange? Was teaching tiling at the trade school different from teaching apprentices while working in their trade?

Partial connections

While the trade teachers pointed to differences between being teachers and being tilers, it is also worthwhile considering the partial connections between 'the teacher' and 'the master tradesman'. Law (2004), drawing on Strathern, speaks of partial connections where "this" (whatever "this" may be) is included in "that", but "this" cannot be reduced to "that"' (p. 64). Partial connections between construction sites and PSE may work to hold 'the master tradesman' together and places of work and post-secondary education may not be as different as conceived by the trade teachers and others.

Mulcahy's (2011) exploration of interstitial space is generative for ongoing research in this area. Working with the concept of partial connections, Mulcahy explores the connections between work and learning as new teachers move from (institutional) education spaces into work spaces. Rather than conceiving these spaces as necessarily different, she proposes 'a *relational* conception of their connection' (author's emphasis) (p. 203). Mulcahy argues that a relational approach enables a shift from dominant notions of 'transfer', 'integration' or 'boundary crossing', which are common themes for conceiving work – education relationships (e.g. Berner, 2010; Vähäsantanen & Eteläpelto, 2009).

In relation to the trade teachers and their pedagogic practices (Unwin, Felstead, Fuller, Bishop, Lee, Jewson, & Butler, 2007), the concept of partial connections raises an interesting set of questions for ongoing research on learning in VET (Colley, James, Diment, & Tedder, 2003; Niemi & Rosvall, 2013) and the professional development of trade teachers in FE (e.g. Fejes & Köpsén, 2014): What pedagogical practices do tilers perform working in their trade? And what learning reals are produced in these practices? How is 'the master tradesman' fabricated on a construction site? And is this a different assemblage to that producing 'the master tradesman' in the trade school? And if so, through what mechanisms are the pedagogical practices of the workplace translated to FE?

Durability

The above account of partial connections draws attention to the materiality of subjective experience. An assemblage of people, things, concepts, architectures, technologies and texts, made up 'the master tradesman' at PSE including: students, lunchrooms, trowels, metres of tiles laid, senior managers, the National Training curriculum, tiling bays, other teachers, and the workplace learning researchers. And this assemblage, which connected previous workplaces and the PSE workplace, worked to hold together 'the master tradesman' as a way of being the trade teacher at PSE, as well as contributing to the durability of a notion of learning as skills development and mastery.

The inseparability of knowing, doing and being implied in the notion of assemblage suggests that changing the practices of trade teachers in FE may be much more complicated than 'best practice' accounts suggest. The top-down approach to curriculum change at PSE whereby new curriculum was introduced without

consultation overlooked the fact that the knowledge the trade teachers taught was deeply embedded in the practices of their trade. Simply introducing new curriculum in the Training Packages assumed that the trade teachers were deliverers of knowledge rather than knowledge producers. Furthermore, the trade teachers understood that mastery was developed in and through practising their trade. This was their learning real. An assemblage analytic suggests that attempts to change employee practices through the introduction of new knowledge overlook the relational aspects of practice and how particular reals are fabricated and made durable.

Taking care

In providing an account of the trade teachers' practices as intricately interconnected with their embodiment of an apprenticeship discourse and ongoing enactment of a learning as mastery real in the PSE workplace, I have attempted to heed Stengers' caution and proceed with care. The analysis directs attention to the relational aspects of practice, both human and non-human, and the ongoing realisation of subjectivity in and through practice. For example, the ongoing constitution of others by the trade teachers, which was enabled through the ongoing connections in and through their workplace practices, contributed to making the position of 'the master tradesmen' durable.

This is an account that directs attention to the materiality of experience and grounds learning in the social and material world. Rather than agency (or capacity to act) being understood as 'the property of a discrete, self-knowing subject' (Coole & Frost, 2010, p. 20) 'the master tradesman' was made up in a dense network intricately connected with practice. Through tracing the assemblages that 'make up' subjects and objects, the paper makes an important contribution to the exploration of learning in and through practice as it moves beyond an account of experience and learning at work that takes the centred subject of humanism as its starting point.

The paper also illustrates how the ongoing enactment of learning as mastery in the trade teachers' workplace had very real effects. I have argued that the ongoing performing of mastery by the trade teachers worked to produce a seemingly natural separation in their workplace of: practice/theory, master/apprentice, knower/novice, and tradesman/academic. However, the necessity of the ongoing enactment of these divisions in order for them to remain durable suggests these distinctions may not be as natural as assumed. It is in this sense that the paper opens up a different set of questions and areas for exploration than available in much of the literature on work and learning. The detail of how mastery plays out in specific 'events' (or connections) provides a rich seam to be explored by those researching work-education intersections.

While a view of subjectivity as realised in and through practice directs attention to durability, it also opens up the possibility of being 'made up' in ways other than, for example, 'the master tradesman' or 'the objective researcher'. Practices and the reals they produce are *not* necessarily fixed and can be open to reconfiguration. Each node in the assemblage and each event provides a point where renegotiation might occur. Stengers refers to this as being open to connection. Hopefully this text has drawn attention to other possibilities, particularly the possibilities for workplace learning researchers to move beyond an approach that assumes mastery. It is not easy, though, to remove oneself from the position of 'knower' when writing research.

When I began this paper, I proposed tracing assemblages that work to produce a learning real of mastery and skills development. I was interested in examining the

effects of the ongoing enactment of this learning real in various sites and practices, and this was connected with my concern about who and what are excluded from accounts of workplace learning if learning can only be understood in this way. I traced assemblages making up a learning as mastery real in a group of trade teachers and in so doing have suggested that learning as mastery spans both workplaces and educational institutions. While further empirical exploration is required I propose that this way of understanding and performing learning is also present in higher education institutions and academic practices. As Latour argues (1993), the separation of theory and practice may never have been as pure as some academics and practitioners may think. And while remaining critical of a notion of learning as mastery, there may be times when mastery is appreciated. After all, I like that the tiles stay stuck on my shower walls.

Notes

[1] The Melbourne Cup is a nationally celebrated horse race in Australia. Many people attend Melbourne Cup parties and most people stop work to watch the race on television.

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