# Rethinking pedagogic innovation in VET: Negotiating 'in between' spaces.

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## Abstract

In the increasingly competitive and turbulent vocational education and training (VET) environment, the imperative for educators to be innovative has never been greater. Bringing a sociomaterial perspective to bear (Fenwick, Edwards and Sawchuk, 2011), this paper investigates what it takes for educators to be innovative and what innovative practice looks like. It invites the reader to look at innovation in a different light; one that seeks to understand what occurs in a 'relational' way by following the webs of relations in which the practice occurs. This paper draws from a broader qualitative study involving five cases of innovative pedagogic practice in different Victorian VET contexts. The broader research question is: how might we create and sustain the conditions for innovative pedagogic practice in VET in times of change and uncertainty. The paper challenges the tendency for mono-causal explanations of pedagogic practice that underscore policy interventions aimed at driving innovation with empirical accounts that reveal the complexity of pedagogic practices and the difficulties educators face when innovating. Drawing on concepts from material semiotics and relatedly, poststructuralist theory, this study looks at the binaries that arise in the practice of one VET educator as he negotiates the uneasy 'spaces in between' to innovate.

## Introduction

In this paper I investigate the practice of an innovative VET educator working in a Victorian TAFE Institute through a socio material lens. The case is part of a larger project that seeks to better understand innovative teaching practice and how the conditions that encourage and sustain such practice may be created through five case sites in Victoria. The provocation for the study arises out of a fascination, indeed frustration, with how policy translates (or not) into teaching practice on the ground. Having worked in the sector for long enough to witness, and be party to, many changes and interventions designed to drive more innovation, I have questioned why they do not always translate into practice in transformative and sustainable ways. As Callon (1986) surmised when studying how markets work, economics in theory is very different to economics in practice such that there is a 'slippage' between what is intended and what is actually experienced. This may well be the case in education. If one recognises that educators are critical to the success of all efforts to improve education (Cochran-Smith and Lytle, 2009), then this 'slippage' between policy and practice is problematic.

The reasons for any slippage are complex and many. Innovation is a much hackneyed term in contemporary public discourse, particularly in mainstream economic and management literature where it is often portrayed as a panacea; a solution to the many challenges governments and organisations face in the global world such as competitiveness, workforce productivity, climate change, changing work practices (Commonwealth of Australia, 2009) and so forth. As such, governments worldwide are increasingly interested in the links between education (including skills development systems) and a nation's capacity for innovation with evidence to suggest strong relationships between the levels of workforce skills and the extent to which firms are innovative (DIUS, 2008, OECD, 2009, Skills Australia, 2011). The role of the VET system, from the point of view of innovation, is to provide people with the fundamental knowledge and skills for their vocation and the ability to learn and adapt as their world changes (Dalitz et al, 2011: 1-7). According to the European Commission (2009), this requires

> *. . . pedagogies that encourage learning by doing; by exchange; by experiments; by risk taking and 'positive' mistake making; by creative problem solving; by feedback through*

*social interaction; by dramatising and acting the part; by exploring role models; and by interacting with the outside/adult world*.

Yet, despite calls for more innovative pedagogies, the system in Australia has not, over time, systematically developed innovative skills and attributes in learners (Mitchell et al, 2003, Dalitz et al, 2011). This view was echoed recently by Skills Australia (2011) who described the system as not 'reaching its full potential' in positioning Australia among the ten top OECD performers for skills use and innovation by enterprises. My premise is that the 'unproblematic' and 'mono-causal' accounts of innovation driving interventions in VET may not adequately account for the complexities of innovation in practice. As Suchman and Bishop (2000) observe, most accounts of innovation are repetitive in their representation of innovation as 'universally relevant acts of individual genius', or 'mistakes or accidents with unintended consequences' or the result of 'highly planned research and development activities'. They pay little attention to the places, things, practices and complex relations that foster (or not) innovation, experimentation and change.

Drawing on concepts from Actor Network Theory (ANT) (Latour, 2005, Law, 2009) and, relatedly post structuralist theory, I investigate this premise through a 'sociomaterial' lens; a way of investigating innovative practice in a 'relational' way that follows the webs of relations in which the practice occurs. Set within a VET setting in Victoria, the study draws respectively on understandings of innovation drawn from the interdisciplinary fields of education and the sociology of science and technology[1] (STS) to contest the tendency for deceptively simplistic and unproblematic explanations of innovative practice with accounts that reveal how complicated, messy, unpredictable and political the practice can be. Using data from one case study, I look closely for the binaries or dualisms that arise in the practice of an innovative educator to see how he negotiates the uneasy 'spaces in between' in order to do so. I propose that these 'uneasy spaces' reflect the 'disconnect' between policy and its implementation in practice; a 'slippage between a technical/functional viewpoint intention that has driven the system's development over many years and the non-coherent[2] practices of the innovative educators themselves. While questioning the assumptions underpinning policy decisions in a context of educational reform may be contentious, it is important to the educational debate because, at all levels, policy frames and contextualises educational practices (Fenwick et al, 2011). It is also important to the wider discourse about VET's contribution to Australia's innovative capability, particularly to how policymakers measure the success of VET and how policy frameworks support or disrupt the system's ability to foster innovation (OECD, 2009).

The paper is structured in three parts. First, I attempt to explain the epistemological framework underpinning the methodology, drawing principally on the theoretical literature of STS, ANT and practice based accounts of innovation in the fields of science and education. I also briefly outline a 'sociomaterial' approach to investigating educational practice and provide a number of concepts useful to this study and to understanding a post-structuralist paradigm. Second, I provide a brief description of the research design and third, I give close attention to the innovative practice in one case to make visible the binaries and 'spaces in between' and discuss how they might be understood as sites or 'nubs' of innovation. Finally I discuss how we might think pedagogic innovation in a different way.

## *Clearing definitional ground*

Given the many definitions of innovation in the literature, I adopt a view that understands innovation as a function of learning and knowledge building. In particular, Schuetze's (1999) description of innovation as a process of learning involving 'absorbing knowledge, applying it to new uses and thereby creating new knowledge' accords with my understanding. I also favour practice-based accounts (Ellstrom, 2010,

[1] STS is also known as Science Studies, Science and Technology Studies, the Sociology of Scientific Knowledge and Social Studies of Science and Technology (Law, 2008).

[2] I draw the term non-coherent from Law et al's (2013) definition meaning that practices are always 'fuzzy' (but not in-coherent which has normative connotations with overtones of criticism) and not as 'pure' and coherent as modern society would prefer.

Gherardi, 2000, Sorenson, 2009) whereby people learn and innovate in the course of their everyday work through implicit work processes rather than in mysterious, isolated and highly structured research and development activities (although I am not discounting this way of innovating). As innovation in educational contexts means teaching in new ways (Rowan and Bigum, ND: 3), and educational practices are, among other things, knowledge building practices (Mulcahy, 2013), my interest lies in the practices that shift traditional thinking and result in transformative change in long standing work patterns.

## A relational view

The established discourses of VET and innovation are, I argue, located within a positivist epistemology driven by economics and a representational view of the world. Positivist leanings look to discover an objective, independent reality where facts are clearly distinguishable from values and the world can be reduced to a single logic (Peters and Burbules, 2004). They provide a way to find the truth and explain the world well enough to predict and control it (Goulding, 2002). The problem with universal truths and laws is they can cloud our vision of how things are in everyday life and don't always account for the emergent content and nature of practice (Pickering, 2008). Mulcahy (2000) argues that positivist leanings have underpinned VET's development for years, evident in the linear and sequential models of training and in the priority given to training products, productivity outcomes and in the neo-liberal language of 'training markets' and 'industry-led' systems. A 'means/end' logic is at work, Mulcahy argues, along with instrumental views of knowledge which have significant implications for educational practitioners.

A representational rendering of knowledge frames knowledge as something produced exclusively by people who are quite separate from the world in which they work and the things they work with (Mulcahy, 2013). Knowledge and learning are viewed as both independent of and (once acquired), contained within individuals and institutions (Pickering, 2005) so there is a separation, a hard 'cut' made between meaning and matter, subject and object where, in general, people are privileged (Mulcahy, 2013). Along with others, these separations, or problematic binaries (Fenwick et al, 2011), are the places of interest for this study – affording attention to the 'spaces in between' in the practice of VET educators. By adopting a post structuralist view, my interest moves away from human-centred theories to the socio-materialist perspectives such as that offered by ANT to take into account the materials and spaces that participate in teaching practices as much as the ambitions, desires, relationships and actions that also mediate and shape them. Through ANT, innovation is seen as a socio material practice enacted within distinctive sociocultural and physical locations with interest in the complex and often tenuous networks of people and materials. It is how the people and materials work together that is of interest rather than the one-directional cause and effect terms of an innovation. After all, teaching (in a broad sense) is not one-dimensional, or

> *. . . simply instrumental in the sense of figuring out how to get things done, but more importantly,. . . is social and political in the sense of deliberating about what to get done, why to get it done, who decides, and whose interests are served (Cochran-Smith, 2009: 121).*

By looking at educational practice in a relational way, the role, relationships and politics between all the 'actors' in the entangled networks of practice are considered - the teachers, technologies, timetables, workplaces, curricula, teaching resources, students, policies, managers, administrators and so on – with particular attention given to how they are assembled, reassembled and occasionally transformed (Fenwick et al, 2011). Knowing is connected with doing (rather than being understood as a purely cognitive activity)[3] and knowledge is no longer considered to be an inert 'stuff' (or commodity) that resides in individuals and is passed onto others (Gherardi, 2000). Learning is viewed as a relational web and a process of ongoing change that connects the learner to the world in an evolving way that changes both the learner and context.

[3] This view of knowledge and learning is also reflected in other theories of earning that are influential in VET such as situated learning theory.

ANT emerged from the work of the French philosopher and anthropologist Bruno Latour and his colleagues, Michael Callon and John Law during the 1980s (Blok and Jensen, 2011), all of whom are identified with the interdisciplinary field of STS and, importantly, the study of innovation. Latour in particular challenged the nature/culture binary through his anthropological studies of science in laboratories by claiming that scientific facts are constructed in a process whereby human interests are negotiated with materials and technologies to come together and work as one. According to Latour, 'nature' and 'society' have never been separate domains; they have always been interwoven in hybrid networks of human and non-human elements in, ". . . rather messy, non-coherent, heterogenous, pragmatic and fuzzy practices" (Law et al, 2013).

The attraction of STS is the opportunity to challenge traditional ideas and assumptions about universal truths and search for new interpretations better suited to experimental and innovative situations (Law, 2008). Because of its unpredictable and messy nature, innovation involves learning to act amidst uncertainty and ambiguity; negotiating the tensions inherent in transitioning from existing knowledge and practice to new ways of thinking and doing (Fenwick, 2000). If innovation in education, as Hillier (2008) describes, is more like the workplace – messy and uncertain - where practices do not occur in a vacuum and often don't go to plan, then traditional, positivist views may not suffice. Approaches such as ANT are able to accommodate the 'messiness' and make possible the exploration of strange and surprising links that may otherwise go unnoticed. In this way, ANT is particularly useful for analyses of educational contexts, in particular pedagogic change (Fenwick et al, 2011: 101) and of knowledge production (Mulcahy, forthcoming). The interest in socio-material networks is an emerging approach to educational research. Other socio-material perspectives (with different theoretical roots to ANT), including complexity theory, cultural-historical activity theory (CHAT) and spatiality theories, are all interested in explaining how the elements and relations within a system are produced, formed and stabilised (or not) in an activity (Fenwick et al, 2011).

## Concepts useful to a study of innovation

Two opposing theories emerge in the educational and STS literatures on innovation; the traditional and dominant perspective of diffusion and the other, less prescriptive perspective of translation. While concepts from both perspectives are useful to this study, the latter is critical to this study as ANT (as a set of conceptual and methodological tools) and is also known as a 'sociology of 'translation' (Hamilton, 2013).

### *Diffusion Theory*

Familiar representations of innovation draw on Everett Roger's (1995) diffusion model, a highly planned, sequential and predefined approach based on economic logic and the discourses of human capital and marketisation. This model, familiar in education, explains innovation (particularly technical innovation), as a systematic, sequential and time-ordered process where an idea/new product spreads across a social system. Diffusion theory looks at the human characteristics of an innovation - the people adopting it, how decisions are made about it, the stages it passes through, communication channels, the roles of people in the process and the degree of similarity between individuals in the social system. Also familiar is the language used to describe how an innovation moves through a social system starting with a slow rate of adoption (the first 10-25% of 'early adopters'), relatively rapid adoption by the late adopters and finally, the reluctant adoption by the 'laggards' (Rogers, 2005). The measure of success is the number of people who adopt the innovation in a given period of time. The 'fabled' tipping point is when the rate of adoption rapidly increases as more cautious people are pressured to join the majority.

For the management and economic theorists, diffusion theory provides a simple and practical framework for organisations to understand innovation and avoid or minimise the barriers to its diffusion (Rogers, 2005). For education, however, the model has limitations. In higher education, Bigum (2000) found that diffusion models proved of little value in guiding policy makers or practitioners in the implementation of innovations in online learning. In school settings, Perillo (2007) concluded that interventions based on front-end planning and back-end implementation worked to obstruct rather that encourage innovation,

a view echoed by Orlikowski (2002) who found that 'in-put, out-put' notions of innovation 'bog down' attempts at creativity and do not develop an enacted innovation capability throughout an organisation. In studies of science, Latour (2005) criticised the model's linearity and its inability to account for alternate trajectories, the temporary and unpredictable nature of innovation and the many inputs, changes and negotiations that occur along the way.

### *Translation*

As an alternative, Latour (1987) framed innovation as a fluid, knowledge practice that evolves through networks of people and materials, shaped, displaced and transformed by those it comes into contact with. From a translation perspective, an innovation does not exist as a stable entity from beginning to end but is continually made, remade, moulded and shaped by the needs and interests of the people and things it encounters along the way. Change (or translation) occurs at connection points in the networks as links are formed and new 'actors'[4] join the network (Fenwick et al, 2011). The fundamental principle of translation is that people need other people, objects and materials to transform or translate an idea or concept into reality (Ibid). Thus, a translation account of innovation refers to the many possible associations between actors that contribute to an innovation rather than a linear, mono-dimensional pathway of development (the input/output model). Thus, innovation is a process before it is a result (Callon, 1986) and an emergent, new and different performance rather than a deliberate, observable and calculable behavior (Perillo, 2007). The ontological claim that links translation theory to education is the 'performative', the notion that teaching practices – occurring in networks of people and things (in this case, teachers, curriculum, technologies, learning resources, timetables, management and administration, other teachers, students, government and organisational policies etc) - are brought into existence through performances (Bigum and Rowan, 2004). In other words, the act of teaching – planning lessons, choosing pedagogic approaches, dealing with students, assessing performance, solving problems, sharing and reflecting on practices, doing administration - involves many actors and is performed in different ways by different people in different places with different things, connected in a variety of complex and seemingly indeterminate ways. Learning and teaching practices are thus 'effects' of the networks of people and materials through which they are translated and enacted (Fenwick et al, 2011). Knowledge (and ideas) is translated at every point as it moves through networks and systems, modified and sometimes transgressed along the way.

### *Moments of translation*

Callon (1986) describes four 'moments of translation' in the innovation process that offer researchers 'slices in time' (Hamilton, 2013) that point to specific events for scrutiny about how the network is extended and strengthened, or alternatively, weakened or disassembled. The first moment, *'problematisation'* is the point at which an idea or problem is framed in a particular way and the actors in the network identified. For example, a teacher may have a challenge such as meeting the evidence requirements in a VET qualification (as occurs in the case study). Other actors are implicated by design or invitation in the problem such as the students, other teachers, Training Packages, CBT, learning resources, classroom spaces, pedagogies, organisational policies and politics, administrators and managers, quality requirements etc. and the network is defined (including those actors who are excluded from it). The second moment, *'interessement'* occurs when the network strengthens enough to work on the problem and withstand the rigors of the project or problem (Hamilton, 2013). If strong alliances and connections are formed (that is, everyone's interests are served), then '*enrolment'* occurs and all of the actors are engaged in the innovation (or new behaviours) and translated in certain directions. If the network becomes sufficiently durable, '*mobilization'* is achieved, the fourth moment, when the innovation can be extended into other locations and domains. At this point, previously questionable truths and meanings have been contested and accepted and a new (although often precarious) order or settlement is achieved. All of the 'moments of translation' must be realized if an innovation is to be

[4] Actors can people, technologies, 'natural' phenomena, documents, materials, knowledges, social facts, collectivities, and other non- human actors such as animals and plants etc

successful or a particular function or project achieved. While the moments of translation are useful to this study, they are associated with early iterations of ANT and criticised for being overly representational and reducing the complexity of practice to a fixed, linear model that tends to, "*distort the complexity it was intended to liberate"* (Fenwick and Edwards, 2013).

### *Dualisms and binaries*

Translation thinking seeks to abolish binaries or dualisms; the 'imaginary divides' such as that between people and the naturalised environment (Fenwick et al, 2011). In VET, these dualisms may include mind/body, work/learning, industry/education, theory/practice, people/things, teacher/industry professional and, as the current discourse has it, innovation as good/status quo as bad. The binaries exist in the 'taken-for-granted' categories used to conceive, think and act upon education policy, curriculum, learning, development, assessment, achievement and so on (Ibid). They are problematic, particularly for education analyses (and one would argue for practitioners) because they are treated as separate, distinct, real and knowable phenomena and, as such, necessitate a certain order of response and action (Suchman and Bishop, 2000). Further, these binaries can harbor issues and controversies and hide 'boundary-making' with respect to the policies and practices that define them (Fenwick et al, 2011).

## Research Design

In line with the precepts of STS, this paper draws on the data from case studies; in particular one case of five investigating innovative pedagogy that suggests a link between the notion of binaries and innovative practice. The case study is set in a metropolitan TAFE Institute in Melbourne where a VET educator is using problem based learning (PBL) to teach other VET educators. Through this case, I am looking for binaries and patterns or 'logics' (Law, 2013) regarding learning and knowing within the processes of innovative practice in order to gain insight into how innovative practices may be encouraged and sustained. The broader research includes a literature review, five case studies and an analysis of the data using ANT as an analytical 'toolkit'. A number of questions were considered throughout the research process:

- what is this a case of (Perillo, 2007);
- what happens on the ground when VET educators innovate;
- how is the practice innovative and how does it takes shape;
- how do the 'on the ground' innovative practices compare with the discourses of VET pedagogic innovation; and
- what does this tell us about how conditions for innovation in VET practice can be created and sustained?

Case data were collected using an online survey, face to face interviews and an observation of the educators in practice, with permission from both the participants and their organisations. Records and transcripts of interviews and observations were analysed using qualitative methods of content analysis and read a number of times to trace the actors, relations and associations that occurred in the pedagogic networks to make visible the processes and binaries at work and to determine patterns or 'logics' of innovation. The participants were selected for their reputation for innovative pedagogic practice in specific VET settings in Victoria.

### *Limitations of the study*

As this paper draws on empirical data from one case study of five (as yet incomplete) studies of innovative practice, I do not claim any representative value with respect to the empirical material, nor do I make any 'hard' conclusions from the analysis. Rather, I use the case to highlight points of interest emerging in the study that may not otherwise be visible through other methodological approaches. I do not propose that this methodological approach is the best and only way to study educational practice; I am more interested in exploring new ways of understanding educational practices so that different interventions concerning VET innovation and change (including even teacher development) may be considered. I am also aware that critics of ANT raise the tendency for scholars such as myself to

investigate the more visible networks at the expense of the less visible, and to describe concrete 'representations' of networks that defy the very purpose of STS and ANT (Fenwick et al, 2011). This is a challenging proposition that I constantly consider as I evolve through the study in ongoing reflection about how I undertake analyses informed by the fundamental (and often non-intuitive) theoretical premises of ANT and STS. My natural will is towards 'purity', reductionism, the formation of single logics and all-encompassing explanations that deceptively make phenomena such as innovation seem more manageable[5].

## A story of innovative practice

### *Problematising learning*

The case study in question is a story of an innovative VET educator using problem based learning (PBL) in a large metropolitan TAFE Institute. Tom, a relatively experienced educator, is teaching other VET educators in an upgrade of their teaching qualifications from a BSZ to the Certificate IV in Training and Assessment (TAE).

### *Prelude*

Tom has been an educator in TAFE for over ten years coming to teaching quite late in life after a long and successful career in industry. His drive to be innovative grew from observations (and frustrations) that the programs he was involved in delivering were not attuned with his understanding of the skills and attributes industry needed graduates to have. Teaching was then, *". . . so teacher centred. I was supposed to be the fountain of all knowledge. . . It was as if I was saying, "You are here to learn what is in my brain and I'm going to tell you".*

Tom discovered PBL while studying a Masters of Education. PBL, he said, resonated strongly with his professional identity. At the time, Tom was using industry to set real problems for the students.

> *All of a sudden . . . I didn't have to have this one way communication with students; I could engage them by setting problems - which is what I was doing in industry. . . . I was mirroring what was happening industry and trying to give the students a real perspective. . . I made it real. I brought the outside world in.*

Tom found his practice changing from one of 'disseminating information' to facilitating collaborative, participatory, experimental and explorative learning. It was the opportunity for collaboration, research, teamwork and analytical analysis of information that resonated with him - that was how he said he operated in industry. *"It involved real problems for the real world – problems that mirrored what happened out there. I was a reflection of industry. I was industry".*

By undertaking in-depth analysis of problems, Tom found that students slowly developed the ability to discuss, explore, think analytically and find solutions. For Tom, teaching was about

> *. . challenging them to think creatively . . . to bring others together to assist. . . . to challenge their own thinking and experimenting and exploring with ways to work smarter and not harder. Industry respects that I challenge the students to think- not around the norm- but around the abstract because there are so many different variables that will come into what they do. They need to be able to experience those variables to innovate once they get out there.*

At first cut, one might infer that translation work was occurring – transforming the teacher, students, resources, spaces, industry people, classroom practices and course into something new such that the roles, identities, relationships and pedagogies within the network of Tom's practice were changing.

[5] Here I draw again on the work of Law et al (2013) and the notions of 'modes of syncretism' and non-coherence. These refer to how we make sense of many different 'patterns' or 'logics' of practices and the tendency of modernity to seek a single logic to explain them (a will to purify). The authors draw on Latour's notion that, despite the seemingly consistent and glossy world, under the bonnet, the practices are non-coherent and messy.

> *I was no longer the teacher- I was their CEO. When they came through that door, they didn't come to school, they came to work. They worked in groups, they set their own agendas, regulations about behaviour, deliverables, consequences, learning contracts to each other and the power to hire and fire. It was high level stuff. This was not a classroom . . . this was industry.*

What is less visible in this reflective account is how difficult and messy Tom's innovation was. Time has filtered the experience, although when asked how other teachers viewed his attempts at new practice, he mentioned

> *I have been called not nice things in a lot of cases because of what I do and how I do it. . . There are institutional blockers that inhibit people to take on new pedagogic practices. I don't think I have ever seen a PD for teachers that talks about real pedagogic practice and hard it can be when you do something new.*

### *Innovation in practice*

Observing Tom's practice as it happens tells the real story. Returning to the educators undertaking the qualification upgrade, Tom's *problematisation* lies in how to engage them in a Certificate IV when many have higher qualifications, including university degrees. Some feel strongly that the Certificate IV does not reflect their professionalism and many years of teaching experience (in VET and other educational sectors). Engaging these teachers at the very start is a difficult and challenging task. Clearly, some do not want to participate as evident in their body language and, in some cases, overt challenges to Tom's explanation of the program and how it will be delivered.

To achieve the upgrade, participants undertake a combination of face to face training, recognition of prior learning (RPL), a work based project and class presentations. This program further problematizes Tom's practice with a complex array of pedagogies, resources, assessment requirements, timetables, quality regulations, policies and procedures and technologies, spaces and materials that he and the educators work with and within (a 'lash-up' towards securing '*interessement*'). The educators are clearly not enrolled even though they must, to meet regulatory requirements, complete the upgrade. As the program progresses, Tom works hard to persuade each educator to engage in the learning process, negotiating and translating conflicting 'interests' or tensions in the group and the different aspirations, objections and goals harboured by each individual. Tom wants the educators, through participation in the program, to change their practices.

> *I don't want them to change the world; I just want them to improve one aspect of their practice. And if they do - I have succeeded. I want them to put their own identity on it so they own it. There are people within every group that will implement some changes around a better way of doing things.*

The work for Tom is to 'displace' their interests; to convince them they want what he wants (enrolment) so that, as Latour (1987) says, the actions, debates, discourses and resources can come together in a temporary network. Slowly, Tom convinces the educators that their interests will be served so, in the terms of translation theory, enrolment begins. Tom introduces the work based project by posing a problem. The educators are required to design a training program for an industry client and, as he doesn't have the 'outside world' to bring 'in' to the classroom, Tom acts as a fictitious client. He puts a scenario to the group for which there is no right or wrong answer, breaking the educators into 'pods' or groups to work on their project. He circulates between the pods, answering questions and prompting and challenging each group with more questions. By doing this, he is teasing out misconceptions, misunderstandings and issues about CBT, Training Packages and even about industry so the thinking can be made visible and challenged and debated. As Tom self describes, he is pushing the educators 'out of their comfort zones'; challenging their views and assumptions and encouraging different thinking about practice. In 'translation terms', he is testing the strength of the network and, simultaneously working to strengthen and stabilise it.

As the groups worked, an animated buzz and energy started to build (enrolment). It was a messy business. There was stuff everywhere – power cords, cooking utensils, iPads, drawing pads, books, whiteboards and so on - as each educator brought their specific industry orientation into the network for their presentation. It was edifying to see how hard Tom worked to keep the network together. He changed and adapted his practices to what was happening in the moment, working hard to keep the educators enrolled and engaged. Even simple practices such as squatting down beside each group when talking to them, was significant in that it lessened the power differential between him and the learners, a differential he claimed that that can be problematic when teaching other educators. While PBL can be viewed as an innovative pedagogy, it is the way Tom translated his practice in the moment that is most innovative. Innovating here means working in the constant tension between exploiting existing practices and generating new knowledge and learning through continual transformation (Hager and Johnson, 2008). Tom's practice is elusive, problematic and complex as he explains:

> *What I do and how I do it is abstract. I get to a point [when teaching], go back, go off on a tangent to another point where sometimes, I go too far up there and I need to come down because I can see the people [students] aren't with me. I have a conceptual idea and how I want to cover it. . . Then there might be a change in the dynamics, a comment made and I can't go there anymore . . . so I explore that idea even further using the key points the students give me.*

Tom is enacting PBL theory through the materials, objects, people, spaces and things in the network to 'do' the learning as he switches between practices as he goes. The 'heavy lifting' in Tom's practice seemed to occur in the moments of translation, particularly during 'interessement' and 'enrolment' where it was touch and go as to whether the educators would 'buy-in' to his problem. What make it difficult he says, are the unexpected errors and mistakes that happen along the way and the anxieties associated with not knowing what will happen next.

> *I know it is working when it feels right; I can see there is comprehension by the educators when they respond to being challenged to think differently and barriers have been broken down to enable 'aha' moments. . . If that doesn't happen, I say to myself, I need to get out of this hole, and when I do - that is the 'A Ha' moment for me. That is when I learn.*

It was clearly insightful for the educators to experience PBL as learners and to understand the challenges learners face when learning in this way. When asked at the end of the program for feedback, the educators clearly valued the experience, particularly being part of (rather than removed from) the innovative practice of others. Mobilisation had occurred. This perhaps highlights the significance of 'doing' rather than 'theorising' in teacher education while not discounting the importance of theory in the process (Mulcahy, 2013). While the educators had little choice about attending the program, they did have a choice about how much they 'bought- in' to the deeper thinking that challenges and displaces established norms and practices. If the educators don't buy in, they become, as Latour (2005) describes an intermediary; one who transports an idea without transformation (translation) and thus preserves the status quo. While ideas abound, practices remain the same. One might argue that many in VET have been intermediaries over time; categorised as 'adopters' or even passive observers of innovation in a diffusionist model.

## Thinking innovative pedagogic practice differently

This slice of Tom's practice reveals how complex, messy, stressful and material innovative pedagogy can be. Rather than teaching content (that is the theory of how to teach), Tom was translating his innovative practice through relationships and materials within the networks that contained them. This is not a straightforward process and, like all innovation, is highly susceptible to failure. What is playing out in the data is a relational pattern of learning (and teaching) where knowledge and learning are circulating in relationships between people and materials through the process of pedagogies (Mulcahy, 2011). Therefore, pedagogies are not something that are made or prescribed (representations or theories off the shelf) but are practices that are done - continuously performed or enacted within the relations that produce them (Law, 2008). The binaries of interest emerging in these accounts of Tom's practice are

those of the 'inside/outside' world, 'theory/practice' and 'teacher education/teaching practice'. These binaries harbour controversies and problems for Tom and are worthy of further investigation as 'nubs' of his innovative practices. The inside/outside binary in Tom's reflective account is particularly powerful. On first cut, his pedagogy seemed to evolve in the 'spaces in between' as a way of bridging the gap or reshaping the boundaries of the inside/outside world to solve his problem. The problematisation was how to ensure his students on the inside (in the classroom) had the necessary working practices and understandings to succeed in the outside world of work, both to meet the competency standards and also to maintain his identity and reputation as an industry professional. To negotiate the 'space in between', Tom brought industry into the classroom making associations between the internal networks of the students, institution, curriculum and classroom and the external networks of industry and work, enrolling wide ranging interests in the problem and negotiating the politics involved to form tenuous and networks or assemblages of actors that transformed (translated) his, and the students' learning.

A similar dynamic appears to happen in his practice when teaching the educators. Rather than teaching the theory of PBL, Tom is enacting the theoretical and blurring the boundaries of the inside world of teaching and the outside world of industry. This, as Mossuto (2009) says, is a process of discovery in a joint learning journey between students and teachers where both are active and acted upon (Mulcahy and Perillo, 2009). By enacting PBL and a range of other sometimes overt, sometimes indeterminate and spontaneous practices, Tom is blurring the boundaries between theory/practice, teacher/student and new practice/old practice. His innovation is an 'indigenous' aspect of his everyday work (Suchman and Bishop, 2000) challenging also the binary between normal work and innovation where normal work (bad) produces the status quo and an innovator or change agent (good) brings about new practice and change. Perhaps, as Suchman and Bishop (2000) say, innovation is

> *. . . less about singular inventions than 'artful integrations' which emphasis the ways in which new things are made of reconfigurations and extensions to familiar environments and forms of action.*

## Conclusion

This case study describes pedagogic innovation as an everyday, politicised, contingent, messy and material practice, taken up by particular actors and made to work in particular ways. It is, however unwise to generalise from this case as the contexts, educators, students, curriculum, materials and spaces vary considerably from location to location. However, the findings are indicative of what is emerging in the larger research project. Rather than answering the research questions, this paper points the researcher to the less visible controversies and complexities in the innovation processes that might assist in better understanding how innovative practice can be encouraged and sustained. Using ANT as a guiding conceptual framework, it is fascinating to see how the practice of educators, as Hamilton (2013) says, is positioned and influenced by others, by social discourse and by cultural artefacts and materials. What may be concluded is that a relational, materialist, practice-based approach to innovative pedagogies is a convincing way of accounting for the messiness and difficulties educators have to negotiate in their daily practice. Clearly in this case, binaries exist as problems in Tom's pedagogic practice and his innovative way of dealing with them is to use PBL to span the 'spaces in-between' theory/practice, inside/outside, teacher/student and existing practice/new practice.

By using translation theory to frame learning and innovation in a different way, this study also challenges the representational view of innovation, knowledge building and learning underpinning many policy and management interventions driving change in VET organisations. Innovative educators, as 'artful integrators', have to navigate through a maze of problematic binaries in a stronghold of hegemonic teaching networks, and hold their nerve in the 'spaces in-between' in order to do things differently. The outcomes for learners are contingent on the translation of the innovation with all the uncertainty and complexity that it involves. These observations raise further questions about what does it takes for educators to do that and what support (from policy makers and organisations) is required.

## References


Bigum, C. (2000). Actor-network theory and online university teaching: translation versus diffusion, in B. Knight & L. Rowan (Eds), Researching future orientated pedagogies (Flaxton, Post Pressed), pps. 7 – 22).

Blok, A. And Jensen, TE (2011). Hybrid thoughts in a hybrid world. Routledge, New York

Callon, M. (1986). Some elements of a sociology of translation: domestication of the scallops and the fisherman of St Brieue Bay. In Law, J. (Ed), Power, Action and Belief: A new sociology of knowledge? Sociological review monograph 32. Routledge & Kegan Paul, London, UK.

Cochran-Smith, M. and Lytle, S.L. (2009). Inquiry as Stance. Practitioner research for the Next Generation. Teachers College Press, Columbia University, New York.

Commonwealth of Australia (2009). Powering ideas. An Innovation Agenda for the 21st Century. Department of Innovation, Industry, Science and Research, Canberra, Australia.

Dalitz, R., Toner, P. and Turpin. T. (2011). VET and the diffusion and implementation of innovation in the mining, solar energy and computer games sectors. Centre for Industry and Innovation Studies, University of Western Sydney for the NCVER.

Ellstrom, Per-Erik (2010). Practice-based innovation: a learning perspective. Journal of Workplace Learning, Volume 22, Issue 1, pps 27-40.

European Commission (2009). Entrepreneurship in Vocational Education and Training. Final Report of the Expert Group. European Commission Enterprise and Industry Directorate-General. http://ec.europa.eu/enterprise/policies/sme/files/smes/vocational/entr_voca_en.pdf Access date: 10 February 2013

Fenwick, T. and Edwards, R. (ED) (2013). Researching Education through Actor-Network Theory. Book complication, special issue of Educational Philosophy and Theory, Volume43, Supplement one. John Wiley & Sons, UK.

Fenwick, T., Edwards, R and Sawchuk, P (2011). Emerging Approaches to Educational Research. Tracing the sociomaterial. Routledge, UK, USA and Canada.

Gherardi, S. (2000). Practice-based Theorising on learning and Knowing in organisations. Organisation, Volume 7, pps. 211-223, Sage, London.

Goulding, C. (2002). Grounded Theory. A Practical Guide for Management, Business and Market Researchers. Sage Publications, London, UK.

Hager, P. and Johnsson, M.C. (2008). Working outside the comfort of competence in a corrections centre. Proceedings

Hamilton, M. (2013). Unruly practices. In Researching Education through Actor-Network Theory, Fenwick, T and Edwards, R (Ed). John Wiley & Sons, UK.

Hillier, Y. (2008). Innovation in teaching and learning in vocational education and training: International perspectives. Paper written by Yvonne Hillier, University of Brighton for the National Centre for Vocation Education Research.

Hodkinson, P. (2005). Learning as cultural and relational: moving past some troubling dualisms. Cambridge Journal of Education, Vol. 35, No. 1, March 2005, pp. 107–119. Access date: 13 December, 2012.

Latour, B. (1987). Science in Action. Open University Press, London.

Latour (2005). Reassembling the social: An introduction to actor-network theory. Oxford Press, Oxford; New York.

Law, J. (2009). Actor Network Theory and Material Semiotics. In: Turner Bryon, S. (Ed). The New Blackwell Companion to Social Theory, 3rd Edition, Oxford, Blackwell, pp. 141-158.

Law, J (2008). On sociology and STS. In the Sociological Review, pp, 564. Published by Blackwell Publishing Inc, Oxford, UK and Malden, USA. .

Law, J., Afdal, G., Wen-yuan, L., Moser, I and Singleton, V. (2013). Modes of Syncretism: notes on non-coherence. http://www.cresc.ac.uk/publications/modes-of-syncretism-notes-on-non-coherence Access date: 22 February 2013

McGregor, J. (2004). Spatiality and the place of the material in schools. In Pedagogy, Culture and Society, Volume 12, No 3, 2004, pps 347- 372

Mitchell, J; Clayton, B; Hedberg, J; Paine, N. (2003). Emerging Futures. Innovation in Teaching and Learning in VET. Australian National Training Authority, Melbourne, Vic.

Mossuto, M. (2009). Problem-based learning: Student engagement, learning and contextualised problem solving. NCVERRT, Adelaide, SA.

Mulcahy, D. (2000). Training for New Times: changing reactions for competence, learning and innovation. Studies in Continuing Education, Vol. 21, No. 2, 2000.

Mulcahy, D (2013). Turning around the question of 'transfer' in education: Tracing the socio-material. Educational Philosophy and Theory, 2013, Volume 45.

Mulcahy, D (Forthcoming). Doing interdisciplinary knowledge work within higher education: A relational materialist perspective.

Mulcahy, D. and Perillo, S. (2009). Performing curriculum change in school and teacher education: A practice-based, actor network theory perspective. In Curriculum perspectives, 2009, Edited by Colin Marsh.

OECD (2009). Systemic Innovation in the Australian VET System: Country Case Study Report. Report of the OECD/Centre for Educational Research and Innovation (CERI) Expert Team. November 20, 2008.

http://www.oecd.org/australia/42243354.pdf Access date: 15 March 2013.

Orlikowski (2002). Knowing in Practice: Enacting a Collective Capability in Distributed Organising. Organisational Science, 2002, Vol. 13, No. 3, May-June 2002. pp. 249-273.

Perillo, S.J. (2007-a). Innovating as network building: A case study of the relational complexity embedding innovation in Australian schools. Doctorate study, Melbourne University, unpublished.

Peters, M.A. and Burbules, N.C. (2004). Poststructuralism and Educational Research. Rowman & Littlefield Publishers, USA.

Pickering, A. (2008). New ontologies. In Pickering, A. and Guzik K. (Eds). The Mangle in Practice: Science, Society and Becoming, Duke University press.

Rowan, L. and Bigum, C. (ND). Innovation chains: Possibilities and constraints for critical perspectives on computers, difference and educational innovation. Quality Learning Research Priority Area, Faculty of Education, Deakin University, Geelong, Vic.

Rogers, E.M. (1995). Diffusions of Innovations. Fourth edition, The Free Press, New York, AUA.

Skills Australia (2011). Skills for prosperity. A roadmap for vocational education and training. Commonwealth of Australia.

Suchman, L. and Bishop, L. (2000). Problematizing 'Innovation' as a Critical project. Technology's Analysis & Strategic Management, Vol. 12, No 3, 2000, pps 327 – 333.