Body matters in vocational education: the case of the competently trained

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Over the last decade, a competency-based approach to education and training has become widely used in a broad range of education and training contexts, most particularly, vocational education and training (VET). Among other things, this approach emphasizes the importance of knowledge and skill that is portable, visible and expressive. Various products have been developed (e.g., competencies, competency standards, Training Packages) to enable access to this knowledge and skill and secure its foundational role. Other knowledge and skill – that is, knowledge and skill that is situated and not easily visible and expressive – is seemingly rendered redundant. This paper discusses the role and significance of situated practices in competency-based training (CBT), most particularly embodied knowledge and tacit skills. Using empirical material collected in the course of a recent research project on CBT, the argument is made that the body, as currently constituted in VET products, is understood more as a symbolic/informational than material/physical entity. This understanding gives rise to a ‘thin’ conception of vocational competence and, sometimes, a thin practise of developing this competence. More broadly, the body is a critical site of contestation between radically different goals (e.g. industrial/educational, global/local). Bodily specificity (e.g. tacit skills, experienced judgement) can be mobilized to challenge the universalizing impulses of CBT. Indeed, this specificity completes or is necessary to these impulses. It plays a constitutive role in the practice of vocational education and training and could, with profit, be more fully recognized and supported in its policy.

Introduction

It has become commonplace to argue that current trends in the economy, most particularly the global economy, have placed greater emphasis on the needs of the workforce to be able to change their skills. Adult educators and trainers who deliver programmes in workplaces directly face the challenges of changing structures of work and economy in, what has variously been called, post-industrialism, post-Fordism, fast capitalism, the learning economy and the knowledge economy, among others. For the purposes of this paper, I will use the term globalization to describe these changing structures, firstly, to convey a sense of the all-encompassing character of contemporary change and secondly, to explore the relationship between the global and the local in the context of vocational education and training in Australia. This relationship is of increasing importance to Australian vocational education and training (VET), which, as a matter of public policy, is committed to ensuring that the skills of the labour force


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are sufficient to support internationally competitive commerce and industry and relevant to the needs of local industries and enterprises. It is also important to consider the theme of the body in vocational education and training inasmuch as VET is crucially concerned with bodies which work (produce) and the changing conditions of this work, most particularly the changes brought on by globalization.

Globalization is a multi-dimensional concept that has been used to explain a range of economic and socio-cultural changes which seemingly cannot be explained by domestic or national events. As Brown (1999: 3) points out ‘Globalization is most often used to describe a process of change. The huge transfers of money around the world, the rapid development of information technology, new opportunities for international production and exchange of services and the declining role of the nation state are commonly presented as evidence of the impact of globalization’. Furthermore, it is used discursively – that is, following Foucault (1979) – to secure particular power/knowledge effects. Meanings attaching to the term globalization seek to suggest that this process is inevitable – independent of human decision-making and choice. ‘Used in this way globalization becomes not a set of material forces or outcomes but rather some sort of natural process operating outside the control or influence of human beings’ (Brown 1999: 4). In the VET policy literature, this usage of the term globalization is commonly employed to legitimate programmes of reform.

Like other countries affiliated with the Organisation for Economic Cooperation and Development (OECD), Australia is seeking to create an internationally competitive workforce by reforming its education and training systems. Taking changing structures of work and economy into account, it is seeking to provide a more universal system of vocational education and training, encompassing both initial vocational preparation for young people leaving school and continuing training for the existing adult workforce. Introduced in 1992 (Foster 1998), the Competency-Based Training (CBT) system is being implemented currently by all providers of vocational education and training in Australia and is defined by the Vocational Education, Employment and Training Advisory Committee as ‘training geared to the attainment and demonstration of skills to meet industry specified standards’ (VEETAC 1992: 5–8).

Competency-based training is the operational arm of a programme of reform being undertaken currently by the Australian government through the National Training Framework, an overarching policy structure which seeks to provide a consistent national framework within which States, providers and others can operate. This programme is firmly committed to the empowerment of industry to determine the outcomes of vocational education and training. As the Australian National Training Authority explains:

Competency based training is gradually replacing traditional time-based training. The focus is moving from ‘inputs’ (providers and their needs) to ‘outputs’ or ‘outcomes’ (what the client is competent to do, at work, on completion of training). These outcomes are the skill needs of enterprises, defined by the industry or enterprise and expressed as competency standards. (ANTA 1994: 9)

Unlike competency-based training, which emphasises ‘outputs’, ‘traditional time-based training’ (commonly, craft apprenticeships) depends upon ‘inputs’, for example, bodily knowledge or tacit skills which are transmitted from person to person, rather than impersonally. The outcomes of this type of training are person- and situation-specific: they are built up and passed on generationally, in a hands-on, in-practise fashion. They are not defined before and ‘outside’ the training event and do not take an
encoded form, that is, the form of written statements of knowledge and skill or competency standards.

The purpose of this paper is to explore the contribution that a standards-based training system which is founded on encoded knowledge (Blackler 1995) and skill is making to the achievement of embodied knowledge and skill, which, from all accounts, continues to be important in the contemporary world of work. Using empirical material gathered in the course of a recent national research project on CBT, this paper seeks to address the following broad questions. Can competency-based training and the products that have been developed to implement this training (i.e. competencies, competency standards, Training Packages) be regarded as a potential substitute for embodied practices of education and training? Do ‘competencies’ and the standards-based training approach lend themselves to the acquisition and transmission of tacit skills or bodily knowledge? What role is tacit knowledge playing in workplace-based VET today? What discourses and practices of competence are playing out in the provision of CBT? What worker and learner subjectivities are being produced through this provision and how embodied are these subjectivities?

Before addressing these questions, some general frameworks for understanding embodiment or, more specifically, bodily knowing and its role in contemporary processes of working, learning and training, will be discussed. As part of this discussion, a brief overview of the changing world of work is provided as a background to considering the role of vocational education and training in producing the kinds of worker and learner subjectivities that are apparently required at work today. Further to this discussion, I will touch on issues to do with the design of CBT, most particularly, the model underpinning the development of competency standards, toward an exploration later in the paper of the implications of this design for processes of competence development and the role of embodied skills or tacit knowledge – the tacit knowledge of both trainers and trainees – in this development.

**Body matters in vocation education and training**

In the past decade, there has been an enormous upsurge of academic interest in questions to do with ‘the body’. As Davis (1997: 1) relates, a whole series of ‘body’ books has emerged such that it has become increasingly clear that the body has captured the imagination of contemporary scholars. It is not surprising therefore that educationists are evincing an interest in what Scott and Morgan (1993) have aptly called ‘body matters’ and exploring questions of embodiment in education and training (see, in particular, Michelson 1998, O’Loughlin 1998, Mulcahy 1999). Despite this interest, embodiment remains a difficult term to define. Feminist theory on the body tends to focus up the particularities of embodied experiences and practises and understands embodiment as ‘experience or social practice in concrete social, cultural and historical contexts’ (Davis 1997: 15). More specifically, Davis (1997: 9) defines embodiment as ‘individuals’ interactions with their bodies and through their bodies with the worlds around them’.

The priority given by feminist scholars to particularities or specificities, is shared by social theorists working within science studies (see, in particular, Mol 1999, Mol and Law 1999). Here, however, embodiment need not take individuals (persons, humans, subjects) into account. In a non-humanist, or, better perhaps, performative move, embodiment is taken to be a socio-material practice that produces ‘knowing locations’
(Law 1998). These locations may be persons, bodies (human or otherwise), routines, texts, machines (e.g. computers), organizations, economies etc. Thus, in the design and development of competency-based training, embodiment is the practise of producing competencies or competency standards which ‘know’ in advance of practise what practitioners and learners will do (or ought to do) when engaged in vocational education and training. Competencies assume the ‘knowing subject’ position and educators, in turn, are ‘known’. In a more conventional framing, competencies are encoded in texts which seek to have educators act in particular ways – act as providers of training products rather than creators of these products.

However one defines embodiment, the old Cartesian distinction of spirit mind/physical body – the divided reality of ‘mental’ and material – has broken down. The notion of knowing locations is part of understanding these relations as not separable from each other. No a priori distinction between the subjects and objects of knowledge is made. For Law (1998: 15), ‘knowing … may be understood as an effect generated at a particular location by a heterogeneous array of materials’. Thus, knowing doesn’t simply reside in persons, but instead is made in networks of relations between persons, artefacts, texts, processes, and so on. More importantly, for present purposes perhaps, is the idea that bodies can act in knowing ways, that is, in ways that challenge or support legitimated knowledge, such as the knowledge encoded in industry competency standards. In feminist accounts of bodily agency, individuals (read women) can use their embodied experience for acts of resistance and rebellion in what some call a process of transgressive body politics (Davis 1997). In the realm of vocational education and training, this process commonly involves harnessing tacit powers or putting tacit knowledge (Polanyi 1967) to work.

The concept of tacit knowledge was developed by Michael Polanyi in the late 1950s and early 1960s as part of an enquiry into the nature and justification of scientific knowledge (see in particular, Polanyi 1958) and, more broadly, the character of human knowledge. It describes knowledge that is not easily visible and expressible. Polanyi (1967) draws a distinction between tacit (practical) knowledge and explicit (codified) knowledge. While there is debate about the differences between the two types of knowledge,¹ as well as about the ambiguity of the term ‘tacit knowledge’,² the contrast does useful analytic work, as will be shown in the next section, where the framework for developing competency standards (knowledge and skill standards) is considered.

Explicit knowledge is, above all, capable of being clearly stated. As MacKenzie and Spinardi (1996: 216) relate,

Explicit knowledge is information or instructions that can be formulated in words or symbols and therefore can be stored, copied, and transferred by impersonal means, such as written documents or computer files. Tacit knowledge, on the other hand, is knowledge that has not been (and perhaps cannot be) formulated completely explicitly and therefore cannot effectively be stored or transferred entirely by impersonal means.

In the case of competency-based training, competencies and competency standards are, *par excellence*, ‘information or instructions that can be formulated in words…’. Following Blackler (1995: 1025), this information can be called encoded (and competencies called the codes of competency-based training).

Human knowledge is now widely held to comprise disparate dimensions, those of most relevance to the purposes of this paper being called variously the tacit and the explicit, know-how and know-what, the embodied and the encoded, the material and
the symbolic, among others. The relation between the tacit and the explicit (know-how and know-what) is a complex matrix. It is relational, that is, there is no absolute explicitness, no absolute tacitness, no clear boundary between the two. As Nonaka et al. (1996: 835) explain: ‘Tacit knowledge and explicit knowledge are not totally separate but mutually complementary entities. They interact with, and interchange into, each other in the creative activities of human beings’. This relational view of knowledge is (ought to be) very relevant to the new world of work where knowledge and learning capabilities are regarded as strategic resources of economic development.

As Mansell and Wehn (1998: 51) relate, ‘the current phase of economic development is one in which knowledge and learning are more important than in any other historical period’. Moreover, in what Lundvall and Johnson (1994) call the ‘learning economy’, tacit knowledge is claimed to be ‘as important, or even more important, than formal, codified, structured and explicit knowledge’ (Mansell and Wehn 1998: 51). ‘In the learning economy all the different categories of knowledge are combined in the innovation process ... Entrepreneurial knowledge consists of know-what, know-why, know-how and, to a considerable extent, of know-who, when and where’ (Lundvall and Johnson 1994: 30).

Work is currently claimed to require ‘entrepreneurship’: workers who can deal with changing situations, or demonstrate ‘a situation-oriented ability to act’ (Buck 1997: 97). Entrepreneurship might be thought the new ‘know how’ for business success. As Blackler et al. (1993) argue, a renewed emphasis is being placed presently on the economic significance of ‘knowledge how’. ‘It is not codifiable, commodifiable knowledge alone that is the core requirement for business success in advanced capitalism, but also sophisticated “knowhow”’ (Blackler et al. 1993: 835). Contemporary understandings of working knowledge have it that knowledge is created through interaction between what can be codified relatively easily and what cannot, the continuous conversion of one into the other (Nonaka et al. 1996, Tomassini 1997). These understandings have clear implications for the design and development of curriculum in vocational education and training.

The encoded versus the embodied: the design of competency standards

The competency-based system of VET in Australia is founded in a particular approach to developing competency standards. Bailey and Merritt (1995) draw a distinction between two broad conceptualizations of skills: the skills-components model, where skills are thought of as a collection of tasks, and the professional model, where skills are integrated into critical aspects of the job and the relevant industrial and organizational contexts. The Australian system of developing skill standards tends to the ‘components’ conceptualization of skills (hence, ‘competencies’): ‘Without exception, the industry based training packages describe competencies in terms of task performance alone and this has led to competency being equated with checklists of tasks which in turn reinforce the status quo of industry practices’ (Griffin 1998: 8–9).

An issue that arises in the development of all systems of education and training which are based on competency standards concerns the location of competence. Is it part of the person, part of the job, or part of the setting? In Law’s (1998) terms, each might be thought a knowing location. Cockburn (1983: 113), in her study of (male) print workers, suggests that all three aspects need to be taken into account:
There is the skill that resides in the man himself, accumulated over time, each new experience adding something to the total ability. There is the skill demanded by the job – which may or may not match the skill in the worker. And there is the political definition of skill: that which a group of workers or a trade union can successfully defend against the challenge of employers and other groups of workers.

The Australian system of developing skill standards tends to resolve this issue in favour of jobs – the skills demanded by (task functions of) the job. Thus, the ‘official’ National Training Board (1992: 42) account of competency standards has it that they include ‘four components’, namely ‘task competencies, task management, contingency management, and the job/role environment’. In other words, policy represents skill as detached from persons and bodies as well as the social (industrial) relations of the workplace. It seems to deny the view that ‘skill-like knowledge travels best (or only) through accomplished practitioners’ (Collins 1985: 73). It also seems to deny the idea that tacit knowledge and explicit knowledge are essentially interactive and intertwined.

A standards developer for the vehicle industry, who is also a skilled worker familiar with many jobs in this industry, speaks about the process of developing competency standards in this way:

We were told right from the start that there was no such thing as experience. And we were sort of, in some respect, relating experience with knowledge. ... It was difficult in the area of trying to separate knowledge from experience. It was a headache and a half in that area. ... We were taking it that skills would improve with experience. And the way it was coming back was, [in the] Vehicle Industry Certificate there was no such thing as recognition of experience. It was skills and knowledge. (Interview, 20/3/1995, in Mulcahy 1997)

It would appear that the framework for developing competency standards is informed by the view that skills and knowledge are separate from each other and that experience does not serve as a potential basis for knowledge. In developing this set of industry standards, ‘experience’ and the body as a site of experiential learning, would appear to be discountable. A clear differentiation is being made. ‘Experience’ lies outside ‘skill’ and ‘knowledge’ as the defining characteristics of competency. Or, as I want to argue, a distinction is made between that which is important and that which is not: between universalistic categories (explicit knowledge) on the one hand and particularistic categories on the other (tacit knowledge, experienced judgment).

The standards developer continues to explain the process of developing standards thus:

We were at the position where, in the final stages, we had to try and rate all of the skills at levels. And you obviously got to the point, well if a person had been there five years, and they’d gone through that many multiple jobs and whatever, obviously they had to be experienced. That was where that problem was coming in. And the longer term person that had been there for quite some time and had developed all the additional skills which obviously included knowledge as well. With the knowledge obviously you couldn’t get it without experience. I disagree with the whole thing in that area. There was nothing much that you could do with it because others participated in making the decisions on behalf of the industry or whatever. (Interview, 20/3/1995 in Mulcahy 1997)
In this worker’s view, skill, knowledge and experience are equal and mutually dependent parts of the process of producing standards. This worker seems to understand that ‘tacit knowledge cannot be transformed into information, at least not without changing the content of the knowledge’ (Mansell and Wehn 1998: 51). Competence is taken to be incorporated: it appears to reside in working bodies and embodied practices. A tension is established between the encoded knowledge of competency standards and the embodied knowledge of workers in workplaces. In principle (i.e. the design of CBT), this tension is resolved in favour of encoded knowledge. Whether such a resolution is achieved in practise is an empirical matter. Thus, it is to the empirical material that I now turn, in order to further explore the question of the role of standards-based training approaches in the advancement of tacit skills and the enhancement of ‘know how’ in VET.

Data and methods

The case vignettes which follow are composed from field notes, interviews and observations made in 1998 over the course of conducting eight intensive case studies of the practise of CBT. Set within a project whose purpose was to undertake a comprehensive and multi-dimensional evaluation of competency-based training, case studies of competency-based VET programs were undertaken in companies from different industry sectors (Manufacturing, Services, Construction and Agriculture, Forestry and Fishing) and of different size (by number of employees – small: 1–19; medium: 20–99; large: 99+). These companies were also geographically diverse: located in metropolitan and regional areas of each of the States and Territories of Australia.

Each case study involved participant observation of a competency-based training programme, analysis of curriculum documents and in-depth, semi-structured interviews with a range of individuals with an investment in training: company manager, training manager, supervisor, trainer(s) and trainees. For the purposes of this paper, empirical material from three case study companies only is used. These companies were selected because each provides evidence of complex interactions between tacit knowledge and explicit knowledge and ‘lessons’ for vocational education and training in the management of these interactions. The comparison of the case material is made for analytic purposes only. I take it that nothing in any of these training situations is immutable: each enactment of competency training could be otherwise given different elements and events (e.g. different trainers; different trainees; different training modules; different cultures of workplace training; different occupational cultures etc.).

Tales from the field: the tacit in competency-based training

Timberco: ‘The training is designed to produce conformity’

We are at ‘Timberco’, a large timber processing plant in a regional centre of Western Australia. Timberco ‘basically takes logs, cuts them up into planks, dries them, kiln dries them, processes them and then sells them’. The company has substantial investment in high technology plant and equipment which it seeks to make good through high volume production. The work is potentially quite
dangerous due to the sheer bulk of the materials involved and the size of the cutting machinery. Training is directed at the safe operation of this machinery as well as the achievement of quality product. More specifically, it focuses on work instructions which ‘detail how operators go about their jobs’.

At Timberco, issues around quality and safety tend to drive the organization of everyday work, including the organization of training:

As a result of the quality objectives that we have got, there are work instructions for operating each and every machine so that every operator has a work instruction detailing how he goes about his job, what the salient points are, the safety features, what he has got to watch out for and that will run to maybe a dozen pages. And he’s trained to that and tested with a questionnaire to make sure he understands it. (Training Co-ordinator, Timberco)

Work instructions are written representations of work procedures – the codification of these procedures in ‘maybe a dozen pages’. They can be understood as Timberco’s term for industry competency standards.

Training is oriented towards the transmission and acquisition of the information contained in these work instructions, towards achieving the company’s quality objectives. Competency is conceived as ‘perform(ing) the task that is set’, ‘being able to do the job’, a conception which conforms to the ‘standard’ definition of competency (as discussed in relation to competency standards above):

Being competent means being able to do the job properly, safely and productively. So we are getting our production, they are doing the job safely, and properly, the way it should be done. (Trainer, Timberco)

Defined in this way, competency has to do with securing specified skills towards obtaining reliable results:

The training is designed to produce conformity. … The reasons are frequently to do with safety because it is a dangerous environment. (Training Co-ordinator)

Competency training is delivered directly to work instructions and provided on the job – ‘one-to-one, hands on’. Conceived as ‘hands on’ training, it is conducted in ways that limit social interaction and consequently, the transmission of tacit competence. The practise of training is a matter of rule following where rules are written representations of work procedures rather than traditional ‘rules of thumb’:

What I am saying is that they [supervisors] have done the train the trainer course, they have got all these good ideas about involving people to improve the learning skills but then when it comes to the shopfloor you get the guy sitting down, you give him the work instructions, read through this, and in ten minutes time I will give you a test on it. (Training Co-ordinator)

The primary focus is on the mechanics of learning – ‘read through this’ – rather than the negotiation of meaning. Work instructions appear to act more as a substitute than support for the education and training process.

A contrast is drawn between present and past training practises. Before the introduction of competency-based training, machine operators developed their competence in the traditional ‘bodily’ way:

You started off doing a very simple job and the only way you learnt, you didn’t have any procedures, you basically learnt from someone else … learnt how to take shortcuts. In fact that’s shows part of a thumb from the shortcuts. (Manager)
Clearly, in circumstances where work is potentially quite dangerous, tacit sharing of ‘competence’ is to be avoided. Priority is given to encoded knowledge such that safety can be maintained and trainers can ‘qualify’ operators ‘to the work instructions’. Competence emerges as the almost exclusive outcome of symbolic and discursive processes. The benefits sought from such a formalized training approach have to do with securing consistency of results (e.g. quality product, safe working environment) and, ultimately, competitive advantages for the company – ‘Our lost time injuries have gone right down’.

Training is defined largely in technical and economic terms. The consequence of such a definition is that social and cultural resources – for example, the tacit powers of workers – are not mobilized and used. Structuring job training around work instructions means that prior experience and tacit knowing play little part in training:

Because of the work instruction right, it has set a guideline for me as a trainer right, whereas it says what’s written in this is what you’ll train them to and that’s it. … I can change it the [instruction], yes for sure … but it has to be changed before I can train them. They have to change the work instruction before I can train them different. … If I am training someone, it has to be to that work instruction there and any changes to be done must be done before I train those people. (Trainer/Leading Hand)

Work instructions are both defined and used as given guidelines or plans. Neither trainers, nor trainees, are encouraged to change the contents of the instructions. Changes are made outside training and prior to its provision. The ‘trick’ in training to work instructions is to get their content ‘right in the first place’:

You know that one person’s training is going to be exactly the same as the next person’s training and all you have to do in that scenario is get it right in the first place. (Supervisor)

Innovatory activity apparently occurs ‘outside’ formal systems (both the quality system and the competency-based training system):

If there’s one thing that they [production staff] are brilliant at it’s not doing something that’s not essential. If the procedure lays down half a dozen steps and they can get to the result and miss out two of the steps they do. (Training Coordinator)

If you come up with a better idea, yeah you try. Not to do with the grading or all that because that’s specified. But something with the machine, like the outfeed where the timber comes out, think [of] a better way to make work easier. … With the machine once you dock it up, it comes out whatever size and wherever, but sometimes you just experiment where it is better off coming out and things like that. (Employee/Trainee)

Little use is made of workers’ subjective insight, intuition, experimentation and hunches – the product of workers’ practical, everyday experience with the machines. Training at Timberco seems to support the idea that workers are (and ought to be) known rather than knowing subjects. That is, people who do the job ‘the way it should be done’. While this positioning is challenged, at least in part, by some – ‘If there’s one thing that they are brilliant at it’s not doing something that’s not essential’ – it is not necessarily unacceptable to others: ‘I’m quite happy just plodding along doing what I am doing. … Yeah, I just plod along. I just do what I am told to do’.
The image contains text from a document discussing a small construction company named Buildco. The text is about the company's approach to training and education, emphasizing the importance of passing on skills and knowledge to the next generation. Buildco is described as a company that values traditional apprenticeship training, passing on skills informally to their employees. The text highlights the company's commitment to training and education, especially the value placed on hands-on experience over formal education.

Competency-based training was introduced around 1994, and the company's manager and supervisor discuss the implications of this shift. They acknowledge that while paperwork and formalities have increased, the core tradition of training through on-the-job experience remains intact. Buildco strives for continuity with the traditional apprenticeship model, where experience is gained through practical work.

The document also touches on the political dimension of competency standards, their industrial relevance, and the challenges faced by companies like Buildco in a restructured industry. It reflects on the importance of formal education and the retention of traditional training methods.

The language used in the text is clear and concise, reflecting the professional nature of the discussion. The context is rooted in the Australian construction industry, and the text is rich with examples and anecdotes that illustrate the company's approach to training and education.
trade, never done any formal training. We started talking about CBT to him and asked him if he wanted to have his skills recognized and recorded. That’s where it all began. … He’s a gem. He’s one of the best at site set out, he’s great at tiling, brickwork, a whole range of things. We started to look at the skills he had already and matched them up against competency standards. If he let us go on and on, I’m sure he’d end up the most qualified construction worker in the country. He’s now got a record of his skills, he’s on a higher wage and he’s now training our workers. (Manager)

The company manager who ‘sets the tone’ at Buildco and acts as a ‘training champion’ is particularly enthusiastic about the opportunities for skills recognition that CBT provides: ‘Seeing someone be recognized for what they can do really gets to me. People who have never had formal training, or have missed chances through their life – seeing them achieve through CBT just gives me that great feeling’.

Other changes experienced by the construction industry have meant that workers are increasingly becoming more ‘multiskilled’. Multiskilling is not only a way for small companies like Buildco to survive but also a means of ‘encourag[ing] … workers to explore a whole range of skills’:

I can’t see why some people are thinking that multiskilling is bad or dangerous for the industry. It’s just a way of tapping in to the collection of skills that someone already has, or can develop through training. Think about it. How many people really just focus on one skill and work that all day? I would argue not many at all. CBT helps us to encourage our workers to explore a whole range of skills, not just be pigeonholed into one set of trade skills. (Supervisor)

‘Paperwork’, or competency standards, which, in this case, give priority to ‘multiskills’, provides a number of distinct advantages. It makes visible what is wrongly invisible – ‘He’s now got a record of his skills, he’s on a higher wage and he’s now training our workers’ – and encourages the exploration of a ‘whole range of skills’. The multi-purpose nature of paperwork at Buildco, where both political and learning dimensions are taken into account, provides a different sense of the practise of training than was provided at Timberco where paperwork tends to drive practise. This difference is noted by one of Buildco’s trainees in this comment on the training programme:

The time we are with [Buildco] gives us really great training. I’ve spent some time working with other companies where I haven’t even been trained at all. At another place all they did was tick off boxes in my paperwork. At [Buildco] it’s really different. I get asked about why I do things the way I do, how I do things. I can ask questions without feeling stupid and we only ever tick the boxes at the end of a day, or a week. It’s a good feeling. I know I’m learning the skills and I’m learning about the construction industry.

Here, priority appears to be given to embodied knowledge – ‘I know I’m learning the skills’ – rather than encoded knowledge – ‘At another place all they did was tick off boxes in my paperwork’.

At Buildco, the tacit dimension of competence is in evidence, most particularly in the accounts that Buildco’s trainers give of training. These trainers are not averse to exercising experienced judgement, which, as MacKenzie and Spinardi (1996: 230) relate, in the context of technological design, is ‘the “feel” that experienced designers have for what will work and what won’t, for which aspects of the codes can be trusted and which can’t’:
As a trainer and someone really involved in training I have problems with competency standards. I really do. The language is hard and you have to spend a long time thinking about what the standards mean before you can even start to think clearly about them. So we take a different approach. We start with skills and real jobs and life experiences, and all of that. When the trainee is comfortable with a skill or job or some knowledge, we then start to link it to relevant competency standards. We’ve got to use our own language though, if it is to make sense. (Team Leader/Trainer)

Here, VET system specifications in the form of competency standards create a complex boundary between industry and education. These specifications do not act as an absolute prescription. Priority is given to using situated knowledge and craft skills which emphasize the significance of people’s interpretations of the contexts within which they act and their actions in relation to these contexts, for example, their use of foresight with regard to the consequences of action. Unlike the situation at Timberco where work instructions are taken to be prerequisites for purposeful training and to provide few opportunities for interpretation, at Buildco, the curriculum grows from ‘skills and real jobs and life experiences’. In other words, there are multiple starting points for curriculum, providing a more multi-faceted and complex picture of the potential practice of CBT:

Before we start any type of CBT we look at the people being trained. We look at the level they are at with their skill and their knowledge, we look at what they already can do at work, and we look at the quality of their work. Another important thing we do is to ask our workers where they want to go, you know to get an idea about what they want from CBT. We know what we want from training at (Buildco), but we need to know that the people we’re training are getting what they want. It’s gotta work for everyone. (Manager)

This approach to CBT is somewhat different from the ‘norm’. As Law (1998) might say, the locations of knowing (paperwork, persons) and the materialities of knowing (texts, human bodies) have shifted and changed. Unlike ‘normal’ CBT, where the starting points for programme development tend to be competencies and the ‘clients’ of competency training (e.g. individual enterprises, employers), workers and trainers at Buildco report that the company would lose about 70% of its workers in training if training meant a strong focus on competencies.

Carco: ‘I want people at the end of it to come out being proactive’

‘Carco’ is a medium size manufacturing company which builds cars for the sports end of the market. More specifically, it designs and makes modifications and enhancements to cars. These enhancements are complex and comprehensive and major modifications are launched as new models. The thrust of competency-based training at Carco is learning: ‘being able to use your mind to … learn new things and basically pick those new things up and carry them through into the job’. A clear distinction is made between learning and training. Training concerns the skills that operators use on the shop floor. Learning concerns the knowledge and awareness that operators need in order to ‘relate to decisions, questions, issues that arise’.
All workers at Carco are understood to be problem-setters and problem-solvers and training is the mechanism for learning how to set and solve problems. It appears to be working successfully:

They’re finding the problems a lot earlier…. They’re solving those problems before the model starts up as job one…. They seek people to help them, they come up with ideas, new ways of doing things. (Supervisor)

A programme of workplace change is underway which, in the Managing Director’s words, means breaking down the barriers between the ‘office’ and the ‘shop’. One of the driving ideas behind organizational change at Carco is to foster interaction between engineering staff (the office) and production workers (the shop). This interaction is understood to be a matter of expanding each group’s awareness of the other.

What counts as competence at Carco is knowledge of a range of work tasks and functions such that workers interrelate and make decisions for the benefit of the company and themselves: ‘We’ve a big deal going down now where we’re trying to determine where we’re going to live for the next ten years, so [I’ve] encourage[d] people from the workshop to come and join that group’ (Managing Director). The design and development of training at Carco is informed by a definition of competency quite unlike the ‘standard’ definition:

I would say we do [competency-based training], only if you can accept my definition of competency. My definition of competency goes something like the way in which we can effect through the training program a group of individuals who can be proactive within their company and therefore can achieve a better workplace for themselves... for the benefit of the company and themselves…. I want people at the end of it to come out being proactive… and that’s my definition of competency. (Trainer)

The starting points for training in this enterprise are ‘individuals in context’, including issues arising for individuals from this context. Competencies, as given to trainers in training packages, are consulted after the programme has been developed and after the issues identified in the workplace have been addressed:

Well, actually we discussed the sorts of issues that they [the company] thought were important, concerns they had about development of people on the floor and those sorts of issues, then developed a training program on the basis of that. So, we really developed a training program looking at the floor, at work and the issues, rather than starting with the curriculum. We developed our own curriculum on the basis of our understanding of the needs of the workplace and later... we linked that through to the competencies and the VIC [Vehicle Industry Certificate], at a certain stage, after the curriculum had been developed, and after we felt satisfied it was addressing the key issues. (Trainer)

Here, competencies are ‘reporting and accountability requirements’, rather than training or assessment requirements. In what I will call a situated approach to training, it is contexts, rather than competencies, that count in training:

My belief is that I sort of respond to the company and to the needs of those individuals and to the context and I’ll account for them [the competencies]. It seems to me the competencies as written are my reporting and accountability requirements…. The people to whom I am really answerable are the individuals participating in the program and the company. And, those other stakeholders such as the union. (Trainer)
Like the trainers at Buildco, this trainer too is not averse to exercising discretionary judgement when it comes to interpreting and using (or not using) competency standards. In all likelihood, her curriculum knowledge would suggest that it would be an infinite task to attempt to specify all processes involved in producing occupational competence, assuming at the outset that this specification could be achieved. Thus, it might be better to work with those who have local knowledge of these processes and from one’s own experience, insight and intuition, or, in other words, make use of tacit powers.

The training conducted at this company has a broad scope: it emphasizes the necessity to provide the skills, knowledge and attitudes that the company requires and to critically question these requirements:

If you look at [the programmes at] Toyota or Ford, or the traditional materials that are around, they’re much more in terms of ‘These are the core values and this is what you will repeat back to me and you will repeat back to me in the order in which I give it to you’. Whereas I believe what we do in our programme is discuss some of those issues and listen to diverse views. We certainly accept and even encourage people to have their own point of view in relation to those things even though they may not be the sort of thing the company would encourage them to have. So I guess we provide an opportunity for people to express and explore their own relationship to those values and I think that’s really important. (Trainer)

Competence curriculum at Carco includes a values dimension. Somewhat like the situation at Buildco, the training programme is not abstracted from its social and cultural contexts. Competence curriculum at Carco gives particular attention to tacit skills and knowledge, most particularly through opportunities provided by the company for trainees to go out into communities and ‘expand their horizons’ by ‘shar(ing) ... with the community’. The Managing Director tells the tale thus:

One of the things we hit on in the first session was in fact to make billycarts. We obviously couldn’t make cars but billycarts was a good idea and we managed to develop a fairly simplistic product that enabled us to indicate most of the lessons, or illustrate most of the lessons they learnt, but deliver something that was akin to a car. The fact that it’s got no engine, brakes, didn’t run on petrol was not really relevant. The fact was that they had to use the skills that generally were available, or required in the company, to actually design, finish a product, and meet some deliverables. And I think that was a fairly good initiative and I think it was enjoyed. Now the second time we did that, we had to make it a little bit different. And so we varied the project slightly but then we were able to say: ‘Hey you guys, let’s have some volunteers and go and share that with the community’, and so we were able to take the car to the community too. And that sharing was with an Aboriginal group up near Brisbane but also when the guys were going through the project we were using schoolkids from (a particular) school and so there was some community delivery too. And I think that’s important. It expands the horizons of the people you’re working with, the people on the shop floor.

Competence in this workplace is understood to be materially and socially organized: a process that can be used by workers to ‘achieve a better workplace ... for the benefit of the company and themselves’. It relies on creative learning where ‘the learner is free (subjectively and objectively) to question the definitions of tasks and problems posed by the environment (e.g. colleagues or management), and to act to transform institutionalized solutions’ (Ellstrom 1997: 271–272). It also relies on a vast array of
socio-material practices (e.g. building billycarts, sharing this building with communities) that belie the singularity and centrality of competencies. Competence at Carco might be thought to be more a textural than a textual performance: less a matter of representing it in one knowing place – the competencies of competency standards – than enacting it through multiple knowing locations (competencies, curriculum, communities, trainers, workers, billycarts, building, sharing, etc).

**Policy matters in VET: education for industry and education through industry**

In the case of the competently trained, interesting political things happen at borders – specifically, the borders of industry and education and training, and policy and practise in VET. In the previous case vignettes, I was concerned to explore boundary work or boundary management, most particularly what gets left out or left over when a particular definition of competence – that is, competence as industry outcomes – comes to be the definition. Definitions lend themselves to specific ways of doing things; they bring forth certain possibilities. Thus, defining competence in terms of industry outcomes promotes the process of documenting the types of knowledge that industry currently demands rather than focusing attention on the practises through which people achieve this knowledge and the processes through which new knowledge may be achieved (e.g. work, learning and training processes). Following Dewey (1916), one consequence of such definitional work is that vocational education can come to mean education for occupations, rather than education through occupations.

More specifically, I was concerned to investigate the effects on working knowledge and skill of introducing a rationalized approach (i.e. the competency standards approach) to defining and documenting this knowledge and skill. Among other things, I was interested to explore the kinds of work affected by such an approach. In the view of Star and Strauss (1999: 11), the kinds of work ‘especially affected’ by structures that are in some sense rationalized ‘include tacit and contextual knowledge, the expertise acquired by old hands, and long-term teamwork’. Thus, using three narratives of the practise of competency-based training, I investigated the relationship between different modes of knowing (tacit knowing, explicit knowing) and different knowing locations (competencies, incorporated skills, communities) and the consequences for competence development of these differences.

In brief, I found that a dynamic interplay exists between the tacit and the explicit. Far from being a simple opposition, these knowledge practises depend on each other. Each carries the other’s possibilities within itself. At Buildco, for example, a highly complex, dynamic and developmental relationship exists between the encoded knowledge of competency standards and craft skills:

He’s one of the best at site set out, he’s great at tiling, brickwork, a whole range of things. We started to look at the skills he had already and matched them up against competency standards. If he let us go on and on, I’m sure he’d end up the most qualified construction worker in the country. He’s now got a record of his skills, he’s on a higher wage and he’s now training our workers.

Competency standards and craft skills might be thought to be co-implicated or co-produced. Each extends the other. On the one hand, giving recognition to this worker’s
skills engenders opportunities to expand these skills. On the other, expanding skills provides the possibility of further recognition.

The relationship between embodied knowledge and encoded knowledge is relational, that is, there is no absolute boundary between the two. As Nonaka et al. (1996: 835) suggest: ‘Tacit knowledge and explicit knowledge... interact with, and interchange into, each other in the creative activities of human beings’. Where a clear boundary between these knowledge exists, it is the product of boundary work as evidenced at Timberco where the training was designed to produce particular knowledge effects (procedural effects in relation to product quality and workplace safety).

The process of developing occupational competence is not as rational (rationalized) models of the development process would have it. As previously discussed, the competency-based system of VET in Australia is founded in a particular approach to developing competency standards which, following Bailey and Merritt (1995), was called a skills-components approach. In rational models of standards development, boundaries are drawn around the sites of development and use. The empirical material would suggest however, that competence development is not a matter of simple correspondence where, once developed, competencies are somehow ‘applied’. Nor is it a matter of ‘simple’ ideological imposition by standards developers of competencies on training practitioners and participants.

The intricacy of these relationships is well illustrated in a further example from the case study enterprise Buildco where the trainer, ‘hav[ing] problems’ with the language of competency standards, uses her own language, or the local language of the company, to supplement the official language; ‘I have problems with competency standards. I really do... When the trainee is comfortable with a skill or job or some knowledge, we then start to link it to relevant competency standards. We’ve got to use our own language though, if it is to make sense’. In this example, competence can be said to have increased only insofar as this trainer translates meanings within and between the different languages – or, in other words, the different sites of development and use. The links between national industry requirements (competency standards) and individuals’ local requirements (‘our own language’) are more partial than complete. The boundary between the different language/knowledge practises of CBT, as well as between the sites of its development and use, is more fluid than fixed.

The empirical material suggests that relations of competence and training can either (i) support or challenge, or, in a more complicated formulation, (ii) support and challenge, training policy in VET. Arguably, the latter strategy is more tactical in the face of the ‘universalistic’ impulses of this policy. Thus, for instance, national industry standards seek to suggest that they are the only standards by which workers (including educators and trainers) can perform their work and, in so doing, deny the place and sometimes the possibility of other standards (personal standards, educational standards, professional standards). Differences among standards are obscured, while one difference is overstated as the only one which counts.

The case material reveals that competence is a complex outcome or, better perhaps, event. Competence development in its ‘richest’ sense involves a number of processes – discursive and material – which are only partially assimilable. Rather than regarding competence as something individuals or organizations have, it might be better to regard it as something that they do and provide products which can assist training practitioners and participants to analyse the dynamics of the processes through which competence is achieved. Perhaps we should think more in terms of competence through work than
competence for work. Or, better again, regard it as both product and process and provide strategies for managing the tension between this double reality.

**Embodiment in education and training: multiple knowing locations**

New approaches to understanding the multi-locational and interrelated processes of knowing and doing need to be created in education and training and new definitions of human competence devised. One attempt at this task could involve loosening the grip of old concepts such as the divide between education and work, knowledge and action, the explicit and the tacit, know-what and know-how, among others. At Carco, competence not only involves manipulation of ideas and exploration of values but physical, manual and interactional actions as well (through, for example, the billycart project). The close relationship between ideas, values, actions, artefacts, interactions and settings illustrates the point that we are mistaken in education and training, most particularly adult education and training, if we assume that these processes can be usefully conceived as separate one from the other.

Neither learning, nor, more arguably, training, is the simple process of agreeing organizational goals and making plans (e.g. competency standards) for how they are to be applied. Rather, each is a form of movement which involves the transformation of one kind of knowledge into another (Nonaka et al. 1996), for example, transformation of the explicit knowledge formulated in competency standards into the tacit knowledge that is an integral part of creating something new or significantly improved. In other words, this movement concerns knowing locations which can chiefly involve machines (‘With the machine once you dock it up, it comes out whatever size and wherever, but sometimes you just experiment where it is better off coming out’), chiefly involve bodies (‘We start with skills and real jobs and life experiences’), and/or take texts as their ground (‘Because of the work instruction right, it has set a guideline for me as a trainer right, whereas it says what’s written in this is what you’ll train them to and that’s it’).

Other knowing locations again take persons – and particular personal identities – as their focus of attention: ‘My definition of competency goes something like the way in which we can effect through the training program a group of individuals who can be proactive’. In my view, more complex competence is produced when multiple and different knowing locations are mobilized such that they contest or support, or contest and support, each other. Of the three case study enterprises presented, Carco and Buidlco provide most evidence of this multiplicity and complexity.

In the policy plan for CBT, competencies are specific outcomes required by a specific body (industry) but not specifically embodied. In the ‘good practice’ of CBT, competence is both a process and an outcome, or better, processes and outcomes, and thoroughly and specifically embodied. It is a matter of a range of materialities like machines, bodies, texts and settings which interact and interfere with each other. Or, a range of socio-material practices which produce what I have called above complex competence. Education and training is learning the socio-material practises which accomplish this complexity. Practises that involve the displacement from one set of materials to another. Practices that involve the translation – always partial, never complete – of one location of knowledge into another. In other words, moving between one mode of knowing and another and using both.
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Notes

1. For a review of recent discussions on tacit knowledge as compared to codified knowledge, see Senker (1995).
2. Hager (1998: 531) argues that the term tacit knowledge is ‘multiply ambiguous. Amongst other things, it can mean: knowledge that cannot be put into words; knowledge that can be explicated only with difficulty; craft secrets; intuition (intuitive knowledge); bodily knowledge’. In the design of competency-based training, none of these albeit ambiguous meanings is taken into account.
3. Completed in January 1999, the study, ‘Evaluating the contribution of competency-based training’, grew out of a proposal for a major project in a key priority area identified for the national research and evaluation strategy for Australian VET. Funded by the National Research and Evaluation Committee of the National Centre for Vocational Education Research, the empirical component of the study involved conducting (i) 195 telephone interviews with training managers (or equivalent personnel) and (ii) eight intensive case studies of competency-based VET programs, throughout Australia. Based in the Department of Vocational Education and Training (DVET) at the University of Melbourne, and led by Dr Dianne Mulcahy and Dr Pauline James of the DVET, the purpose of the project was to investigate the contribution that CBT has made to outcomes in VET, most particularly the extent to which it has met the requirements of various stakeholders and contributed to the development of more flexible and adaptable skills at work. See Mulcahy and James (1999) for full project details.

References

Griffin, P. (1998) Address to Graduation Ceremony, June 5th. (Department of Vocational Education and Training, University of Melbourne).


MULCAHY, D. (1997) Designing the user/using the design: of competency training and vocational education practices. Unpublished PhD (History and Philosophy of Science Department, University of Melbourne).


