Teamwork, collective competence and team-based assessment in action: critical reflections on industry-based vocational educators

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Within most assessment systems, it is individuals that are deemed to be competent or incompetent. Yet in many workplace contexts, it is the performance of groups or teams of people that is most significant. This implies a notion of collective competence that incorporates the range of skills within a group and the group's ability to identify and harness effectively the particular skills, or clusters of skills, applicable to particular circumstances. This might also be considered as a form of strategic competence. Team-based approaches to assessment can be used to identify and assess the features of collective and strategic competence in action. However, such approaches highlight the social and collective nature of competence and raise questions about how and where such approaches sit within Vocational Education and Training (VET) systems and providers. This paper explores these questions through the critical practice of a group of VET teacher-researchers engaged in enterprise-based training.

The focus on teams and teamwork in many modern workplaces raises a number of questions about competence, performance and the nature of work itself. Such questions lead us to consider the ways we conceptualise work, teams and skills, and reveal the contradictory discourses that live alongside each other in industry.

The origin of our intellectual construction of workplace activity and workplace structures is interesting to ponder. How do we frame our understanding of work in manufacturing industries and why do we accept this framing? Marsick had some thoughts on this:

Much of the early theory came from military experience prior to guerrilla warfare, and was well suited to organisations whose predominant mode of operation might be described by the metaphor of a machine (Morgan, 1986). Characteristics of the social organisation of the workplace included logic, rationality, linear cause-effect relationships, clear demarcation of responsibilities, hierarchical control and forged unification of the movement of parts into a whole, which minimises duplication and overlap. (Marsick, 1991: 84-85)

The military model had a number of advantages, not least of which was that authentication was vested in science. Fredrick Taylor's 'scientific management'

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1The notion of 'team' itself produces conflicting discourses. The Japanese discourse speaks of small organisational units with no autonomy and controlled responsibility in keeping with lean production systems. The German discourse describes teams or work groups that operate with considerable autonomy (Hampson et al, 1994). The reference to teams throughout this paper is framed around the latter.
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(1947) held certain attraction in its title alone:

If one school of thought has been a thread to link the others, it is Taylorism with its claim that management can be a true science and that 'science' can be universally applied. Even though other schools appear to humanise the conduct of management, the Taylorist emphasis on control and efficiency in the interests of an organisation and of a country has survived as an essential piece of management wisdom. (Rees, 1995: 17)

The advantages of approaches beatified with scientific affiliations were considerable. They delivered the mechanisms for control and organisation into the hands of management and provided logic and system to activity, making it intelligible to observers. They provided control and authority over the expertise of groups of skilled individuals who might otherwise be operating independently and unchecked. Scientific approaches also allowed managers to better control the affective aspect of work. Blackmore (1993: 40) makes these observations:

... not only because science was seen to be a more 'objective' form of knowledge production during the post war period but also because scientific knowledge promised those who practised administration and policy development predictability, comparability as well as objectivity, thus imparting greater authority to administrative experts. The epistemological foundation of the view of administration as neutral, rational and value free enterprise in the period after the Second World War was positivism. Underpinning emergent organisational and management theory since the 1950s, positivism made privileged claims to objectivity, predictability and universality, claims which separated means from ends, facts from values.

And, we might add, knowledge from knowers.

So it is the values of dispassionate objectivity and rational control that have preserved the status of science in industry. Positivist science purports to create hard, provable truths that then devolve into economic inevitabilities. The role of management is to impartially deliver the inevitable. While some schools of thought have indicated a new age is dawning in post-Fordism and new capitalism, the economic imperative may hold traditional values in place for some time yet:

The claim to moral neutrality and scientific objectivity suits an age in which economy has come to be regarded as more important than society and in which a brand of economics has claimed scientific qualities. (Rees, 1995: 17)

In matters of training and skill development, the culture has remained consistent. When industry restructuring introduced formal training for shopfloor employees, the Taylorist model was so entrenched as part of the dominant discourse, that the dissection of jobs into sequenced portions was the 'commonsense' approach. This provided teachable tasks, each one able to be tested and measured.
In modern efficiency, that which is efficient is defined as that which is measurable as efficient. Consequently whatever is not measurable is not efficient and does not exist. (Solondz, 1995: 214)

Much of manufacturing industry is structured and managed around modular controllable bit-size pieces. They provide the units for quality measurement and rectification, the basis for benchmarking and performance indicators, the components for line balancing and of course the means to organise learning and assessment. The most significant modular unit is however the individual worker. It is he/she who is measured and matched as a neutral set of standardised skills, who will repeatedly reproduce the output in measured time.

These premises are so comfortably established within the dominant discourse of industry, that other constructs are received with bewilderment. The question this leads one to ask is: how useful is this construction of work? Does this describe the way people really work?

A number of theorists and industrial educators (Darrah, 1994; O'Connor, 1995; Stevenson, 1996) would say that the investment in skill development within the individual, and the modular construction of skills analysis, deflect our attention from the way work is actually achieved in the workplace. Their empirical studies tell us that much work knowledge is team-based and constantly evolving, that work outcomes are collaborative and that daily activity is adaptive and responsive to the workplace context. We understand what to do and how to do it by becoming part of the 'community of practice' (Gee, 1997).

Let us look briefly at the work conducted at a company where we are training. Let's call it Manfred Engineering. The company designs and modifies vehicles to enhance them for high performance motoring. The current work on the shopfloor includes lowering the suspension to increase road purchase when cornering, adding inlet manifolds to allow for more air intake (thus increasing the power of the engine), changing wheels and tyres, adding body kits to create a sporty appearance and other options. The company also produces some short-run models that cover a full range of options.

A project team is involved in designing and developing each model. The design engineer attempts to create an appropriate sporting image, the mechanical engineer ensures that the capacity of the car lives up to this image and the manufacturing engineer edits the enthusiasm of the others by ensuring that their ideas are buildable on the line. The quality engineer sets standards for the parts and processes, the purchaser finds parts that meet the quality requirements as well as the engineering requirements, and the finance officer makes sure the ideas meet the budget. Everyone has an integral part to play. They need to work with an understanding of the company's market and within the capacity of the company's physical, skill and financial resources. No single role is the exclusive province of the one individual, as ideas are contested and refashioned to meet the constraints.

When the new model arrives on the line, shopfloor employees work in consultation with the manufacturing engineers, designing processes and refining parts. Once in production, shopfloor employees need to work cooperatively with others on the line.
to ensure the smooth movement of the vehicle through its staged development, sharing knowledge on the most efficient and effective means to achieve a quality job in the allocated time.

The expertise of each individual is an important facet in the achievement of the product, but individual contributions are virtually invisible. The productivity, processes and errors are everybody's responsibility. Operators understand the criteria upon which quality is judged. They interact with engineers, supervisors and colleagues, sometimes adapting and modifying their practices to maintain the standards.

This is not unique to Manfred Darrah (1992: 270), as a result of his empirical investigations, came to the following conclusions:

A narrow focus on individual job skills is inadequate. Rather analyses that place people in the actual contexts in which their activities are shaped and given meaning are needed. Such analyses must recognise context as a dynamic component of a larger system. If context can be so analysed, we may then not only seek to improve the skills of individuals to work in extant workplaces, but also improve workplaces as arenas in which learning for improvement is facilitated.

In the messiness of everyday work, skills are not evenly distributed, and while the special talent of certain individuals advantages the team, some members have to pick up on the gaps and errors of others. The timeline is always almost beyond the team's capacity; the customer changes specifications while the job is already underway, parts are sometimes unavailable and resources are inadequate. However, the due date is not negotiable. The quality of the interaction between team members, their willingness to share skills and help each other, their creativity in overcoming obstacles, their bond of common purpose, their intimate understanding of the standards and their identification with the project are the qualities that will deliver a quality job on time.

Where is the impartial analysis of modular bit-size pieces now? It started off tidy - clear job delineation, defined goals and a non-ambiguous project plan - but the end is a fortuitous, sometimes desperate struggle over the finish line. The modular pieces have merged into an interplay of skills, many of which have never been named as competencies - creativity, skill sharing, managing group dynamics, adaptability, redefining the workable, changing pathways. The key capacity is one of strategic competence - doing the best you can with what you've got. It looks more out of control than measured science can process.

The shopfloor is not all that different. Automotive parts are meant to be standardised, but the parts manufacturer has constant problems with a few of them. The operator struggles to reshape them so that they fit correctly. Maybe a moulded jig would provide the answer. The problem has been reported to the engineering department, but they are flat out with the new model. The shopfloor operators improvise and play with ideas to achieve consistency.
Sometimes there is an urgency to achieve a higher number of cars for the day. The operators know that the glues need to be cured for five hours. How can the productivity level be achieved while preserving the curing time?

If these are normal ways of working, what are the major considerations for training and assessment? It seems that:

- team and company identity are essential in achieving the energy and in setting the direction of a project
- a holistic understanding of the customer needs, the market and the mechanisms of design and production is integral to ensuring product viability
- effective communication is key to achieving product output
- coping with change and adaptability are essential qualities for success
- strategic competence is deeply contextualised and not reducible to a set of skills
- individual skill levels are only part of the story

If training is to reflect and facilitate effective workplace practice and change, then traditional modularised skills training that is assessed individually does not go far enough.

In the past, these characteristics may have only described the work of company specialists. But with the advent of the team as the primary organisational unit and with the devolution of quality control, training, safety and scheduling to the shopfloor, these features increasingly describe the work of factory operators as well.

With Manfred anxious to move into self-managing team-based production on the shopfloor, the training provider designed a program to begin the development of new skills. In the first stage, it seemed necessary to build a better understanding between the major work groups. In keeping with the traditions of Taylorist scientific management, the shopfloor had been quarantined from the office activity of vehicle design and development. Most shopfloor operators came into contact with new models and new options when they arrived on the factory floor for the final stages of product development. Operators adapted their experience to the new jobs, reapplying the basic principles and processes to meet the new requirements. However, they had little significant understanding of the design, development and production planning process that preceded the job’s arrival on the floor. The divide between the shopfloor and the office was considerable. They identified themselves as coming from different work cultures. Each regarded the other as ‘getting it easy’, and different pay and working conditions made for contradictory expectations in behaviour, work and attitude - and of course - pay.

The training program was funded by the Office of Training and Further Education and the company responsible for conducting the Vehicle Industry Certificate, a level II Australian Qualifications Framework course for production workers. The client group for training was therefore composed of shopfloor employees, but we designed a program that would involve the whole company – designers, engineers and quality and finance people - in an effort to build bridges and unite the subgroups. The nub of the program was the simulation of the company’s design and development processes applied to building billy carts. ‘Mancart’ teams duplicated the roles and functions of each of the players in the product development teams. They would
develop and test a prototype then build another two duplicates. For us, the trainers, the program design involved tracing the processes, defining the players, developing job descriptions, following the paper-trail and making it transparent to the ‘Mancart’ teams. The trainees grouped themselves into four teams. Each team member had a different role. Corresponding people from actual project teams worked with the Mancart teams, helping them to understand their work. Each team was given a budget of $60 per cart. A group of school children became the customers. An alliance was built with a local school, who assisted us with market surveys to determine some of the specifications. Later, the children tested the prototypes and finally joined in the carnival day. The finished products were donated to charity.

There were some important critical features captured in this program that beckoned the new era of teams-based shopfloor production:

- the accountability factor – teams had to find their own way of meeting the budgetary and time specifications, with an immovable deadline
- the competitiveness – one team would be a winner, and the win represented an aggregate of scores across a range of complex criteria
- the achievement depended upon teamwork, creativity, skill sharing, strategic and collective competence
- the end goal and quality requirements were clearly specified, but the ‘how’ had to be determined by the group
- the groups developed a strong team allegiance, which provided the energy to strive for excellence
- they unconsciously took on an ambassadorial role, in defining the identity of the company as a socially responsible community entity involved with schools and needy groups

Assessment was divided into three stages. The first was a self-assessment process, where the teams compared and assessed their carts alongside that of other teams. The second involved the whole company in a billy-cart show, a bit like the motor show. Each team displayed their products, describing the development processes and providing a full set of paperwork. Experts from project teams within the company and from Ford were asked to assess the achievement of each team using the criteria they would apply in judging their own work. They assessed design, strength and durability, quality, financial accountability and innovation. Team members explained the processes they used and the rationale behind their decision making. The third stage was the celebratory day at Calder Thunderdome. The billy carts were tested for speed and handling by professional race car drivers and the customers announced their favourite cart.

Another level of assessment took place in investigating the growth of key competencies. This was done informally, through discussion and observation. We built in challenges that provided opportunities for growth in these areas and allocated them to individuals as we saw fit. We found opportunities for reticent individuals to speak in public, for others to explore the alien genre of writing Process Control Plans and for others to explore technical questions with the engineers. No individual had a full exposure to all of the learning experiences, but across the team, members watched and assisted each other, dealing with tasks that stretched their capacities.
The assessment process was entirely team-based. While team members complained that the load was not evenly dispersed, and many an educationalist has taken issue with this method of assessment, the managing director was fully supportive. As he saw it, there is no value in non-specialist skills and knowledge locked away within the heads of individual workers. The skills that could be pooled to achieve a team output were the skills that interested him. In his view it will be team projects, controlled by the group within the bounds of company standards, that will give the firm viability in the future.

This fits with Drucker's (1993: 46) notion of knowledge:

The knowledge we now consider knowledge proves itself in action. What we now mean by knowledge is information effective in action, information focused on results. These results are seen outside the person — in society and economy, or in the advancement of knowledge itself. (author's emphasis)

Team assessment builds on the notion of collective expertise put forward by theorists, who have redefined knowledge within the context of globalised fast capitalism:

The business world, as part and parcel of massive global economic, technological, and social change, now sees knowledge as its primary 'value'. Contemporary, global competitive businesses don't any longer really compete on the basis of their products and services per se. They compete, rather, on the basis of how much learning and knowledge they can use as leverage in order to expeditiously invent, produce, distribute and market their goods and services, as well as to innovatively vary and customise them. Such knowledge is made up of both highly technical components and components dealing with communication, motivation and social interaction. (Gee et al, 1996: 5)

Based on these values, relevant industry training is primarily concerned with providing resources and support in work projects that are problem-based and contextualised. Such training defines the outcome within the context, but leaves the trainees free to explore the options and to generate knowledge to deal with issues concerned with people and the practical. The trainer’s role is one of facilitation. The outcome and hence the assessment is a group achievement.

To us, the Manfred trainers, team assessment and training reflected the legitimacy of real workplace practice. The trainees and the management named the learning as team experience. The achievement did not belong to the individuals. One Mancart team leader remarked:

Leadership is not about the leader. Leading is about putting the whole group together to work together.

Team training and assessment fits with Gee's notion of a community of practice, where knowledge and work practices are located within the company culture rather than within the individual:
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Tacit, extensive, distributed, dispersed knowledge, dynamically developed in a coordinated network of people, tools and technologies serving multiple, integrated and overlapping functions - that is what I mean by a community of practice ... people are bonded to each other only secondarily through their primary cognitive and affective allegiances to the practice. When the practice changes the teams change. The community of practice is like an organism that is not identified by its ever growing and dying cells (team members), but by the trajectory through space and time of its efforts and endeavours - its ever changing and improving practice. (Gee, 1997: 79)

Our task as trainers then is to identify the community of practice, to name it and find learning opportunities to share and extend it. Contrary to 'scientific' approaches, every attempt was made within the Manfred project to observe the way values were embedded in facts, and the means influenced the ends. Trainees needed to recognise that engineers were expressing the Manfred identity in the vehicles they designed. Their billy carts needed to respond in a similar way to a different market. Team members needed to determine excellence within a subjective context. The quality of relationships within the team would fuel the creative and practical energies of the group to achieve the best cart.

The context and the team were therefore central in our assessments. Individual assessment is imposed by outside forces to indicate a learner's ability to meet a minimum generic set of criteria. Team-based enterprise-context assessment judges achievement on internally negotiated criteria. The assessment indicates the ability of the group to achieve a collective competence that exceeds their individual competences combined. One form of assessment is closed and finite. The other is contextually bound, self-analysing and ongoing. One has transparent and limited criteria. The other has changing and adaptive criteria. One is focused on the demonstrated duplication of skills, the other on strategic competence and the ability to achieve synergy. Team-based assessment fits with the knowledge economy referred to by Gee et al (1997). It appears to be the way of the future.

This is not to say that there is no place for individual skills and assessment, but we defined our project in different terms. This program needed to address workplace change and the uncharted 'competencies'. To stimulate change in behaviour and perception, we needed to concentrate on identity - that of the group and the company, and the relationship between them.

Should we therefore conclude that this company has abandoned the scientific orthodoxy of industry? It is not so simple. Many areas of the company activity remain highly controlled and 'scientific'. Quality is one such area, but there is also an affective aspect to quality management. Quality depends upon a set of shared values, a continuous striving for improvement. It includes caring about production, being involved, sharing information and skills, as well as objective measurement. It is a cultural, company-wide endeavour as well as a 'scientific' activity. It is that part of new capitalism that asks employees to offer not only their labour, but also a part of their identity. The scientific discourse has not gone away, but it now sits alongside and sometimes competes with the discourse of globalism and managerialism. Issues
of worker identity and commitment emanate from the discourse of the new workplace:

The corporate designers of the new organisational structures know ... that these new structures will not succeed without the creation of a culture of feeling, attitudes, beliefs, habits and behaviour that correspond with the forms of organisation embodied in the new structures ... It (the new culture) seeks also to eliminate the allegiance of employees to external solidarity forms in the remnants of class and union formations. (Casey cited by O'Connor, 1995: 75)

The building of trust, mutual support, loyalty and pride is of great interest to Manfred management. The managing director is frustrated by the fact that few shopfloor employees are willing to join the social club. He wants the company identity to override the class divide.

Manfred employees are expected to act as ambassadors for their company in their interaction with the public. The company held an open day recently, at which employees (shopfloor and office) guided groups around the factory and answered questions about the displays of technical wizardry on show. It was hoped that they would express pride in the company's achievements and volunteer at least part of their Sunday to attend. Another group of shopfloor employees went to Queensland to work with a group of Aboriginal children building billy carts - a project that emerged as an unexpected consequence of the training program. Once again, their role as company ambassadors was established in their thinking: not overtly, but each individual understood that they were carrying the good name of the company on their badged hats and t-shirts and in their behaviour.

The recent Ford badge reads 'Ford. Live it!' The Nike managing director, when interviewed on the radio, recently declared with enthusiasm 'Nike, it's a way of life!' This is the nature of modern everyday work - yours and ours as well as that of Ford and Manfred.

And what's it about? It's about identity, commitment and control;

... the presence of a strong culture and shared internalised values provide control and co-ordination in place of authority relations and direct supervision. Most of the control processes are consenting and unobtrusive. (Deetz, 1995: 147)

Manfred looks forward to the day when supervisors will no longer be employed on the shopfloor. Teams will be self-managing and sufficiently enculturated to understand the company values and the community of practice, in order to act in concert with the company ethos without conscious forethought. It is therefore not surprising that the company values team assessment.
If we probe the ideology that underpinned our team assessment, we would find that:

- group endeavour overshadows individual contribution
- training and assessment experiences closely reflect authentic workplace processes

If we overlay this with the primary role taken by company personnel in training and assessment, we can further elucidate the ideology behind their involvement:

- the company objectives are borne out in the judgements of enculturated members of the company
- company values and ethos are modelled in the work processes
- training achievements are showcased, demonstrating the mastered level of company consistency

The dynamics of the company's ownership of training is further played out in their role as assessors and contributors:

- the involvement of office employees gives them a stake in shopfloor training
- training is legitimated and acclaimed as significant by management involvement
- the contribution of certain trainees is observed by management, particularly those taking leadership roles

In short, we are dealing with an important tool for enculturation:

Limerick and Cunnington (1993: 114-119) describe a process of collaborative individualism where the relationship workers develop in the team is a commitment to the collaborative mission of the central agency. Individuals collaborate with each other primarily through agreement of values related to the mission. Their relationship (and therefore mobility) within the organisation is negotiative on their commitment. This thesis dovetails with the Post Fordist concept of perpetual adaptability and with the premise of enterprise bargaining. (Toms, 1995: 57)

The process is therefore neither bland nor benign. It places industry teachers in the invidious position of being tools of company enculturation. Where education is meant to be emancipatory, instrumental in exploring and expanding one's personal identity and capacity, here education is about shaping and pruning the identity to fit a company mould.

But then, let us not be naive. Foucault, and more recently Fairclough (1989), laid bare the processes by which education functions as a most effective moral, social and political enculturation. Participation within the education system, let alone success, demands submission to its values.

Objective assessment pretends the impartiality of science. It is supposed to demonstrate authenticity, reliability, fairness and validity, but who makes those decisions? They will probably vary with gender (Jackson, 1991) or with ethnicity (Mawer and Field, 1995) or social class. Edelsky (1991) has demonstrated parallels between literacy and mathematics scores and family income levels in American...
primary schools. The unpalatable fact is that any judgement of assessment sits within
a discourse and can only have recourse to validity within that culture. Pretending
objectivity leaves teachers and students vulnerable to exploitation through self-
deception.

Therefore 'objectivity' is not the problem, but 'whose subjectivity' is!

The culture of the company represents the powerful dominant discourse. Employees
who wish to be successful need to reconcile themselves with it sufficiently to survive.
Training programs should encourage trainees to contest the values, but should also
show how to make such values work for them.

Our program at Manfred helped learners to locate where and how the powerful
decisions were made, and to build the networks that allowed them to interact with
key communicators. It attempted to make the culture more apparent and to find a
pathway for shopfloor employees to enter it.

Fortunately at Manfred, the management takes a radical, humanist approach to
labour management. It encourages educational endeavour among employees and
rejects mechanistic, minimalist training. While it expects commitment and company
identification, it expresses a belief in the capacity and integrity of its employees. It
seeks to offer an accessible, caring management willing to listen and support
individuals and to find opportunities for them to be creative and express initiative.
While it is not all joy and light, the company is striving for a better world for its
employees, as well as a secure level of profitability.

Blessed by the power of globalism, we have moved into the age of the enterprise.
Systems for national control of training, industrial relations, wages and even markets
are breaking down. We (companies, educators and communities) are told this is the
pathway to economic survival, and it appears that we have no choice. The ANTA
Training Packages have provided the training response that allows the enterprise to
define its needs in terms of its own cultural interpretation of knowledge, skill and
opportunity. Most enterprises have moved to a team-based organisational structure,
whether autonomous or not, but have still maintained a focus on the individual for
training and assessment. This paper argues that workplace endeavour is better
contextualised at the level of team, where expertise is collaborative and outcomes are
collective. If this is the case, then team training and assessment has to at least gain
parity with individual training and assessment, as an authentic reflection of real
workplace skills. As a powerful and therefore dangerous tool for company
enculturation, questions of integrity arise for both educators and trainees, but we
need to acknowledge that these questions have always been there. Maybe the new
system will confront us with issues we have skirted around in the past.
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References


