Workplace pedagogic practices: Participation and learning
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Abstract
   This paper advances conceptual tentative bases for understanding workplace pedagogic practices. It proposes that whether arising through everyday work activities or guided learning in workplaces, learning is shaped by workplace participatory practices. This learning is held to be co-participative: the reciprocal process of how the workplace affords participation and therefore learning, and how individuals elect to engage with the work practice (Billett 2001b). In order to make a space to understand workplaces as learning environments it is necessary for them to be discussed and conceptualised on their own terms. Describing learning through work as 'informal' is negative, imprecise and denies key premises about participation in and learning through work. Access to workplace activities and guidance, and the distribution of opportunities to participate are structured by workplace factors. Much of this structuring has intentionality associated with the continuity of the work practice through participants' learning. Workplace experiences (activities and interactions) are, therefore, not 'adhoc' or 'informal', they are a product of the historical, cultural and situational factors that constitute the work practices and its enactment, and individuals' engagement in those practices. These factors shape the activities, goals and interactions afforded by the work practice and how individuals construe and learn through them
   Learning is conceptualised as arising inter-psychologically through participation in social practices such as workplaces. It is not reserved exclusively for or peculiar to particular experiences. However, particular kinds of experiences (e.g. routine or non-routine activities) are likely to have particular learning kinds of learning consequences. However, learning through participation needs to be considered critically. Although intersubjectivity (shared understanding) is seen as an important goal in the development of vocational practice, it offers a limited conception of goals for learning, as it is largely reproductive. The appropriation of individuals' knowledge through workplace practices needs to be seen in terms of its worth and adaptability, not just its salience at time and place of learning. Therefore, in considering the kinds of processes adopted and outcomes arising from participatory practices in workplaces a critical stance is warranted.

Learning through work
This paper discusses and proposes bases for understanding workplace participatory practices as learning experiences that are constituted in the activities and interactions, in which individuals engage. It aims to contribute to a larger project of developing a workplace pedagogy. Learning through participation in a social practice, such as in workplaces, is described in Vygotskian (1987) derived sociocultural theories of learning and development, as being an inter-psychological process -- those between the individual and social partners, artefacts, symbols and the physical environment. That is, learning occurs as a product of interactions within the social world from where the knowledge to be learnt is sourced (Scribner 1985, Rogoff 1990, 1995). The knowledge required for vocational practice has its geneses in historical, cultural and situational sources (Billett 1998). It does not emanate from within individuals. Therefore, this knowledge must be accessed through social sources. However, the knowledge required for work performance is not always easy to access as it may be hidden and also there are impediments that inhibit learning as workplaces are far from benign environments. A key focus then becomes how individuals' or cohorts of workers participate in workplaces and how opportunities for participation and, therefore, learning are accessed. This includes the kinds of activities individuals are able to engage in and the interactions they can access through these experiences. It seems that regardless of whether the contributions to learning through everyday work activity or those from guided learning in the workplace are being

considered, how the workplace affords opportunities is central to the kinds of learning that arises (Billett 2001a).

Reciprocally, the degree by which individuals view that what is being afforded them as being invitational will shape how they engage in the workplace (Billett & Boud 2001) and, therefore, how inter-psychological processes proceed. Given that learning is mediated by both the social practice and individuals' personal histories, the outcomes of participation in workplaces are unlikely to be uniform or without contestation between these two sources. This leads then to a consideration of how we should value what is learnt in workplaces. More than learning reproductively to secure inter-subjectively the vocational practices constituted in the workplaces, it is necessary to consider how more adaptable forms of learning might be encouraged. These themes of participation, learning and the kinds of learning that arises from learning in the work place are discussed to inform the development of a workplace pedagogy.

Workplace participatory practices
Workplace participatory practices are central to understanding learning through work. A key tenet is how the workplace invites individuals to participate in workplace activities and provides them with access to the guidance that is central to individuals' learning. These affordances (Gibson 1969), which individuals construe by degree as being invitational, shape individuals' engagement in goal-directed activities in workplaces and the guidance from others in the workplace (Billet 2001a). Both of these kinds of contributions have consequences for individuals' learning. For instance, engagement in routine work activities may reinforce and refine existing knowledge, whereas engaging in new tasks may develop new knowledge. Also, the access to guidance by more experienced co-workers is likely to be important for the development of understanding and procedures that would otherwise not easily learnt alone. This guidance can extend to the sequencing of access to activities and monitoring performance and progression. It can also extent to the use of intentional guided learning strategies that aim to develop procedural capacities (*e.g. modelling, coaching*) as well as those associated with conceptual development (*e.g. use of questioning, diagrams, analogies*) (Billett 2000, 2001a). Individuals only able to access routine activities and/or who are denied support may have more limited learning outcomes than those able to participate in new activities supported directly and enthusiastically by experienced coworkers. However, rather than being benign, workplaces, can be highly contested environment in which to participate and learn (e.g. Darrah 1996, Hull 1997).

Work practices may want to limit or stage access to prized work, for pragmatic reasons of avoiding the need for everyone to learn (and be paid) to perform prized activities. Also, judgements about individuals' competence or readiness to engage in activities may also be used to determine how they are invited to participate in workplaces. However, and in addition, the participation and guidance afforded individuals is also shaped by workplace hierarchies, group affiliations, personal relations, workplace cliques and cultural practices, as well as the kinds of activities in which individuals are able to engage (Billett 2001b). This local constituting of vocational activities is a product of historical and cultural practices (Scribner 1997/1988, Billett 1998) shaped by the micro-social processes at the situational level. These processes include local orderings (Engestrom & Middleton 1996) and localised negotiations (Suchman 1996) of workplaces. These localised processes shape and privilege the activities and requirements for what constitutes effective performance in the particular workplace, as well as relations in the workplace. Consequently, opportunities to participate in and access support and guidance are distributed in ways that reflect workplace norms and practices.

Accordingly, individuals and cohorts of individuals may be advanced quite different affordances by the workplace depending upon their standing, means of employment, status or degree of inclusion in workplace affiliations or cliques. For instance, in a study of learning in a large manufacturing workplace (Billett & Boud 2001), it was shown that there were quite different affordances across the three work areas that were the focus of this study. The diverse bases of these affordances were the product of a complex of situational factors. For instance, in one areas --- a consumer advisory centre --- there were very close relations between staff founded in part of their shared concerns, working on the same shift together and relationships that were formed in collaborative workplace ventures. While there were some tensions among staff, overall it was a supportive environment for participating and learning the skills required to be an

effective team member. However, in a section of the manufacturing plant, the affordances were construed to be less invitational. This area was subject to fluctuations in production levels that incited concerns about the continuity of ongoing employment. Workers began to position themselves to secure employment in other sections of the plant. Also, this work area had reached its level of senior (higher paid) positions. So individuals could learn more about the plant and become more effective, but the prospects for securing positions with higher remuneration were simply not available. At one point during the study, the manufacturing plant's management announced a cessation of funds for training and overtime. This action merely reinforced these workers' perception that the workplace was not very invitational. It also reinforced cynicism about the company's practices, including enhancing productivity through training. In the packaging area, the workers initially reported the work environment as being highly invitational. There were opportunities for advancement premised on the demonstration of individual performance, opportunities to train and access to information in the workplace. Like the customer service centre there was a strong sense of teamness in this area. In each of the three shift teams there was a concern even competitiveness for the team to meet its production goals and for any problems to be resolved prior to the next shift taking over.

However, because of the dynamic qualities of work practice, these affordances and indeed work place tasks, goals, interactions, participants and relations are likely to be constantly changing. For instance, during the study, the customer service area took over corporate-wide responsibilities for consumer advice. They also acquired new equipment and software, and an expanded team of workers. In the packaging area, the impact of the curtailment of overtime and funds for training did much to transform the workers' perception of the invitational qualities of the workplace. Like the production workers, they became more cynical about the workplace and its affordances, which became viewed as les invitational. So in different ways, the participatory practices changed, across the three work areas. However, not only the participatory practices, but also the requirements for performance can change, as with the consumer cal centre. In a separate study that examined the work and participatory practices of three workers, over a six-month period, each work practice and each of the workers experienced considerable changes in their work and the requirements for work place performance (Billett, Barker & Hernon-Tinning 2002). These changes included the transformation of a work practice, a shift in the strategic significance of work and changes to the bases for workplace decision-making. So over the duration of the six-month of the study, key goals for work requirements changed as did participatory practices. Therefore, and importantly, rather than being a once-off source of knowing, individuals' participation needs to be enduring in order to remain current with the requirements for practice. Hence, the participatory practice that comprises individuals' working life are likely to be dynamic constantly changing, including negotiation and re-negotiation with the work practice. Consequently, the kinds of experiences and support for learning that individuals' experience throughout their working lives will be central to their capacity to participate, learn and maintain the currency of their vocational knowledge.

Engagement, agency and subjectivity
While the contribution of the workplace is important and can be gauged in terms of its invitational qualities, the agency of individuals is also an important basis for engagement and learning through work. Individuals' learning is not socialisation or enculturation determined by historical, cultural and situational factors, despite the solid contributions arising from participation in workplaces. Individuals' agency determines how they engage in work practice, which then has consequences for individuals' learning. That is, effortful engagement is probably required for rich learning. Superficial engagement in workplace activities likely leads to shallow outcomes. The bases for individuals' engagement in social practice are likely to be differentiated and overlapping. Firstly, individuals participate simultaneously in a number of social practices (Lave & Wenger 1991). However, the quality of their engagement in these practices is unlikely to be uniform. Individuals' interests and priorities temper participation (Glassman 2001). Full bodied participation in one social practice (e.g. workplace) may be mirrored by reluctance in another (e.g. school tuck shop roster). Secondly, individuals' engagement with what is to be learnt is likely influenced by their values and beliefs. This is evidenced by workers of South Vietnamese heritage rejecting team work in an American manufacturing plant, as they believed that this kind of work organisation reflected
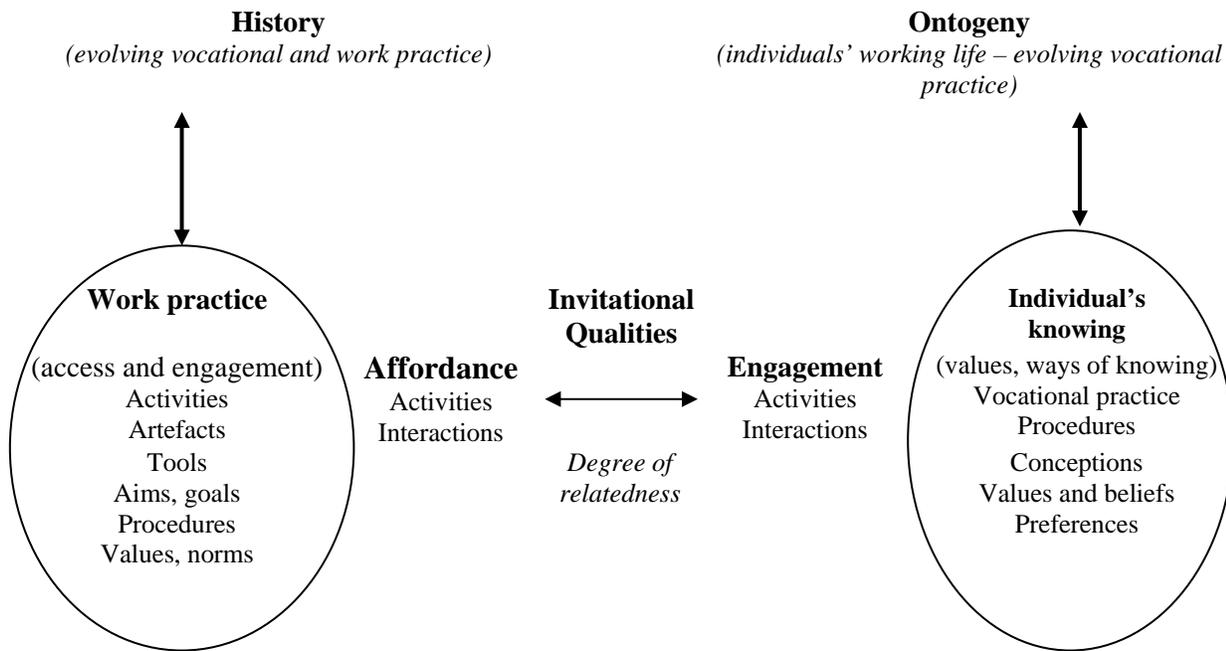
communistic values and practices (Darrah 1996). Similarly, coal miners and aged care workers engaged in practices in ways that reflect a gendered identity (Somerville & Bernoth 2001). This permitted them to accept workplace injury and accidents as an inevitable consequence of their participation in their work practice. So individuals' engagement at work is premised on and can be understood by their personal histories or ontogenies (Cole 1998, Scribner 1985), that have resulted from and in particular ways of understanding and engaging with the social world (Billett 1997) and is shaped by their subjectivities --- sense of identity and purpose --- that arise through social experience (e.g. Somerville & Bernoth 2001). It follows that individuals' subjectivities determine what is invitational, not the source of the affordance. For instance, underground coal miners view open cut coal mining as not real mining. Given the kinds of identities that are developed through participation in underground coal mining, where dangerous and potentially life-threatening working practices are a daily reality their evaluation of open cut coal mining is easily understandable. Similarly, Hodges (1998) rejected the approach to teaching children which she encountered in a university teacher education course because it clashed with her views on how children should be treated. So more than her values being subject to the social practice, her agency and subjectivity served to reject what was being afforded. These subjectivities appear social in origin in at least two ways. Firstly, they arise from societal conceptions of masculinity or femininity or to the requirements of particular vocational practice. Secondly, individuals' subjectivities are likely to be the unique outcome arising from their personal histories (Billett 1997), as we engage in different ways in different and overlapping ways in social practice throughout our lives. In sum, individuals use their subjectivities to determine what is invitational, not some objective view of workplace affordances, and these same subjectivities shape how and what individuals learn through their engagement in workplace activities and interactions.

So when considering the process and outcomes of learning through workplace experiences, the reciprocity between social practice and individuals' agency is a key determinant. Inter-psychological processes --- those between/among social partners, artefacts, symbols and the physical environment --- are reciprocal with individuals making judgments about, and potentially transforming their perceptions of the source of learning. Valsiner (1994) describes this process of knowledge construction as the co-construction of knowledge --- the reciprocal act of knowledge construction through which both the object and the subject are transformed. That is, learning is not the mere acceptance of knowledge from an external source. Instead, individuals are active and discerning in how they deploy their cognitive experience and processes, making judgements about what they encounter and how they respond to what they experience. Analogously, the relations between individuals and social practice are also held to be reciprocal and interdependent between how the workplace affords participation and how individuals elects to engage in and learn from the work practice. Therefore, engagement at work is co-participative (Billett 2001b): a relationship constituted between the affordance of the work practice and how individuals elect to engage in the work practice (see Figure 1). In describing the relations between the social and cognitive experience, Valsiner (1994) refers to the degree of 'relatedness' between the individuals' values and the norms of the social practice, as a consideration of what kinds of interactions and learning that will likely arise through these interactions. When considering the qualities of learning that is a product of these reciprocal inter-psychological processes, Wertsch (1998) proposes distinguishing between the intra-psychological attributes described as 'mastery' --- that is knowledge constructed without commitment or enthusiasm and 'appropriation', in which the learner constructs knowledge --- 'taking it as their own'. So there can be no situationally determined or uniform outcome to inter-psychological processes or intra-psychological attributes. These are negotiated reciprocally between individuals' subjectivities and the social practices in which they participate.

This reciprocity underscores the point that what a social practice (albeit an educational institution or a workplace) affords an individual can only ever be an intention or invitation. Learners ultimately determine how and what they construct from the situation. Indeed, the degree by what is afforded is viewed as being invitational is not a given. Individuals construe it through an interaction between their cognitive and social experiences (Valsiner & van de veer 2000). Figure 1 attempts to depict these co-participatory practices. On the left-hand side is the evolving social practice of the workplace, and on the right hand side the evolving personal history of the individual, their ontogeny. The intersections that constitute the

interactions in workplaces are those encountered through participation in work. Changes in work practice are brought about by historical factors (e.g. changes in tools and technologies), cultural (e.g. needs for particular products services) and situational factors (e.g. the goals, practices and participants in the workplace).

Fig. 1 Co-participation at work (2001c)

History	**Ontogeny**
(evolving vocational and work practice)	*(individuals' working life – evolving vocational practice)*

Work practice

(access and engagement)
Activities
Artefacts
Tools
Aims, goals
Procedures
Values, norms

Affordance
Activities
Interactions

Invitational Qualities

Degree of relatedness

Engagement
Activities
Interactions

Individual's knowing

(values, ways of knowing)
Vocational practice
Procedures
Conceptions
Values and beliefs
Preferences

The conceptual significance of co-participation at work can be seen as illuminating relations between the social world and the mind at intersections between the trajectories of the transforming social practice of the workplace and individuals' evolving ontogenies and subjectivities as they engage in work activities. It proposes that to understand relations between social practice and individuals' thinking and acting requires delineating and identifying the invitational qualities of the workplace and how individuals elect to engage in social practice.

Therefore, the conceptual premises advanced through a consideration of reciprocal processes focus on key current debates about human cognition. For instance, having proposed that there are relations between the mind and society, (Cole 1998, Wertsch 1998). It then becomes imperative to understand further these relationships. Central to these are the origin and sourcing of knowledge that has historical and cultural geneses (Scribner 1985). Also understanding the degree of social embeddedness of knowledge – the degree by which learning is embedded in and to its source (e.g. Hutchins, 1991, Pea 1993, Resnick et al 1997), and therefore, the relationship between individuals' thinking and social practice (e.g. Cobb 1998) as well as the consequences of those relations (e.g. Billett 2001a), are all issues that now required to be understood more fully. Therefore, through understanding: (a) the affordance of social practice, and (b) how individuals' engagement influences knowing and the interdependence between (a) and (b) can make useful contributions to understanding the relations between social practice and individuals' knowing (thinking, acting and learning). Central to these concerns are the kinds of learning or intra-psychological outcomes that arise through participation social practices and socially-derived activities, such as those in workplaces. In the next section the relations between shared understanding (intersubjectivity) and the kinds of learning that occur through participation in work are briefly discussed.

Intersubjectivity, appropriation and extending knowledge
Within sociocultural constructivism, a key goal for learning in social practices workplaces is intersubjectivity --- shared understanding between the learner and the more experienced and the novice. It constitutes shared understanding based on a common focus of attention and some shared presuppositions that form the ground for communication (Rogoff 1990). Newman, Griffin and Cole (1989) propose that because humans construct meaning idiosyncratically, the key purpose of communication is to develop shared understanding. They argue that if humans developed understandings in a uniform way, there would

be no need to communicate. However, they do not and therefore there is need to work towards achieving intersubjectivity because it is central to everyday human activity and human interaction in processes such as living, working and communicating. In terms of learning a vocational practice that is historically and culturally constituted, intersubjectivity is seen as means of achieving shared understanding and a capacity to perform vocational practices through interactions with experienced coworkers and accessing an understanding of workplace requirements. This is a purposeful goal for learning in workplaces and in the development of much of the vocational competence and the expertise required for work performance.

However, such an approach to learning and indeed intersubjectivity can be seen as being largely reproductive. That is, it merely reproduces what is already known. As noted, Wertsch's concepts of mastery and appropriation (1998) as well as empirical work (Billett 1997) indicate that even when faced with a strong social pressure as can exist in workplaces, individuals' learning will not be wholly or uncritically intersubjective, because of the centrality of their perspectives or subjectivities. Indeed, it may be necessary to use the kinds of intentional guided learning strategies to achieve the level of intersubjectivity required for effective work practice. This is because much of what is required to be learnt (e.g. understanding and procedures) cannot be learnt alone through engagement, trial and error, observation and imitation. Also, individuals subjectivities may direct learning in inappropriate ways (e.g. wishing to identify with peers, leading to a rejection of concepts and practices that are important for effective practice). So the concept of appropriation, as defined by Wertsch (1998) and others should be treated problematically. Appropriation is seen as desirable in so far as the individual making the new learning 'their own' because they agree with and understand it. However, such a conception of learning outcomes is also problematic. For instance, workers might appropriate bad or dangerous practices, because they seems to be efficient, saves them time or effort. There could be deleterious implications for such learning for the individual or the workplace. Therefore, intentional guided learning might be required to assist the development of individuals' procedures and concepts required for shared practice. However, beyond this there is need to consider the development of novel solutions to problems not yet encountered.

Consequently, there is a need to consider approaches to learning and goals for participation in workplaces that extend knowledge and attempt to be generative of vocational practice that is robust enough to transfer elsewhere. In the study of the manufacturing plant, (Billett & Boud 2001) strategies of questioning dialogues and group discussion were used to intentionally extend learning arising from workplace activities and interactions (experiences). Although supportive of achieving its intent, the findings at best provided some tentative evidence of the efficacy of these approaches. However, this study's findings again emphasises the key role that the workplace's affordances play in assist and support the development of these kinds of attributes, as the frequency of the strategy usage was highest in the work area that had the highest invitational qualities. So it is important to consider critically about the intra-psychological concepts that arise from learning through inter-psychological process.

Participation and learning
In conclusion, a consideration of participation in and learning through work learning necessitates an analysis of relations between learning and engagement in the work practice. Workplace experiences shape individuals' construction of their vocational practice through their participation in the workplace. It has been proposed that these experiences are structured by the workplace's participatory practices, from which individuals construe and make judgments about their invitational qualities, and hence how they participate in and learn from these experiences. The outcomes of learning, as much as the process themselves, are socially shaped. This learning can be seen as being directed towards securing the appropriation of inter-subjectivity with the knowledge required for workplace tasks and interactions. However, central to all these debates is the significance of the relationship between the social practice and the individual. Whether referring to the construal of affordances (the workplace's invitational qualities), the kinds of interactions that occur and the learning processes and outcomes that arise, the reciprocal and negotiated relations between the individual and the social practice remains a predominate consideration. Understanding these relations in terms of reciprocal participatory practices is central to the development of a workplace pedagogy, yet also extend to learning more generally. Here, a tentative way of illuminating those relations

has been advanced as co-participatory practices. This view may be useful to understand individuals' learning throughout working lives.

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