ABSTRACT

Identifying and understanding the bases for workplace pedagogic practices is central to developing workplaces as effective learning environments. This paper reports initial outcomes of an investigation of guided learning in a workplace. It illustrates how contextual factors determine the quality and kind of workplace pedagogic practice that afford and inhibit participation in workplaces, and hence shapes the kinds of learning that arises. It aims to contribute to elaborating a pedagogy for workplaces.

Workplace pedagogic practice

Learning through guided engagement in everyday work activity constitutes a pedagogic practice that draws upon a complex of contributions. Principally, these contributions comprise participation in work activities, guidance provided by more expert coworkers and those arising from interactions and observations that are a product of everyday engagement in the work place. The use of intentional guided learning by more expert coworkers is intended to enrich the learning in workplaces by making accessible understandings, values and practices that would not be learnt alone through everyday engagement in the workplace. It aims to provide learners with opportunities to participate in workplace activities that both complement and extend the contributions to learning derived through participation in the workplace. These include engagement in activities, accessing practice, observing and listing to other workers and interacting with them and also the artifacts and physical and tangible objects that are observable in the workplace. All these have been proposed as contributing richly and persistently to the development of vocational knowledge in the workplace (see Billett 1999). Nevertheless, individuals' access to workplace activities and guidance is not benign, uncontested or equally available to all in the workplace. Consequently, it is important to understand how access to these contributions is shaped by work practice. Together, these bases both shape and constitute workplace pedagogic practices.

This paper reports the initial findings of a year-long investigation of the implementation of a model workplace learning in a large processing plant (Billett & Boud 2001). The model comprises three interdependent levels: (i) everyday participation at work; (ii) guided learning for work; and (iii) guided learning for transfer. The first level comprises individuals’ access to activities and the direct and indirect guidance that workplaces afford through everyday work activities. The second comprises the use of guided learning strategies (e.g. modelling, coaching, questioning, explanations, diagrams) that aim to develop the kinds of knowledge that would not be learnt through everyday experiences alone. The third focuses intentionally on making individuals’ knowledge more transferable to other circumstances and tasks. Here, questioning dialogues and group discussions are aimed to assist individuals appraise the scope and limits of their existing knowledge and extend its applicability to novel tasks and to new circumstances.

These three levels of participation and guidance are intended to occur synchronously and as part of everyday activities in the workplace. The investigation identified how the elements of this model contributed to individuals’ learning in the workplace. Also identified were differences in how the workplace afforded opportunities to engage in activities and have their learning supported and the consequences of this across three work areas in the plant. Situational factors determined the kinds of participation in work activities and how the guided learning was enacted. These factors provide bases to understand how participation at work proceeds and how work practices can facilitate engagement with and guidance at work, and individuals' learning. Moreover, they shape individuals' engagement in the goal-directed actions that influenced the kinds and quality of learning realised through workplace experiences. Consequently, the findings tentatively contribute to understanding the scope and complexities of workplace pedagogic practices and assist understanding how individuals learn throughout their working lives.
Learning through and for work

A workplace pedagogy is needed to establish a basis that can account for how learning occurs at and through work, and how that learning can be maximised. This pedagogy needs to be premised on bases that refer to workplace practices and exigencies, rather than those of educational institutions. The salience of this pedagogy can be located in the central role that learning through work plays in developing and maintaining individuals' vocational practice (Boud & Garrick 1999). For many sectors of employment, the workplace presents the only place to learn the knowledge required for work, because vocational courses are unavailable, inappropriate or inaccessible. Furthermore, for most workers, the workplace is the location where they will maintain and develop further their vocational knowledge throughout their working lives. Therefore, a robust, empirically-based and well-theorised workplace pedagogy constitutes an necessary and worthwhile project.

Earlier investigations formed the basis of the present study. These focussed on understanding how workers learn through everyday engagement in their workplaces across a diverse range of industries. These investigations identified workplace contributions that support the development of vocational knowledge, as well as those factors that might inhibit or limit this development (see Billett 1996). Following these, investigations into the use of guided learning in workplace settings (Billett & Rose 1999, Billett, McCann & Scott 1998) identified the potential of guided workplace learning to overcome some of limitations of learning through everyday activities alone, and also extend the contributions of workplace experiences. This included the potential to develop the kinds of knowledge likely to be adaptable to new vocational tasks. However, these studies used strategies that aimed to develop adaptable outcomes through the development of capacities that underpin adaptability, rather than explicitly promoting adaptability during learning. The differences in these approaches are central to current deliberations of how adaptable thinking can be generated. For instance, the cognitive view focuses on developing individuals' capacities as skillful thinkers. However, the effectiveness of this approach has been questioned (Raizen 1994). Instead, anthropological (e.g. Lave 1991) and sociocultural views (Suchman 1997, Engestrom & Middleton 1996) identify how situational factors constitute performances requirements and the prospects for adaptability from initial learning (i.e. the prospect of learning in workplaces transferring to other and different places or work tasks) (Billett 2001). Moreover, in the studies of everyday and guided learning, and anthropological accounts of work (e.g. Darrah 1996), have shown that opportunities to engage and the provision support are distributed asymmetrically across workplaces. Workplace factors distribute opportunities to engage in activities, practice and the access to the support and guidance that is essential for robust learning. That is, workplace practices shape the invitational qualities of the workplace. Furthermore, how individuals elect to engage in the workplaces also comprises a component of a workplace pedagogy. These dual concerns lead to consideration of reciprocal process comprising the invitational qualities of the workplace and how individuals elect to participate in the practice of work.

The conceptual bases of a workplace pedagogy are located in diverse disciplines. Their common core is their illumination of relations between individual cognition and the social sources of knowledge and contributions to learning: that is the combined contributions of social and cognitive experiences. These relations are central to understanding learning in workplaces that are sites for the constitution of knowledge and learning by individuals who participate in them. Both the cognitive and sociocultural constructivist perspectives propose learning as being through engagement in goal-directed activities constituted through social practice. The reciprocity between individuals' development (ontogenetic) and social sources are articulated by accounts within cultural psychology (Valsiner 1994, Valsiner & van der Veer 2000). Anthropology (e.g. Lave 1991; 1993) provides bases to understand learning and identity formation as participation in culturally-derived practices such as vocational tasks. Activity theory (Leontiev 1981; Scribner 1988/1997) also inform about the cultural-historical genesis of the activities that individuals engage in and their socially-derived cognitive consequences. How activities are shaped situationally by the division of labour, the rules and norms for practice (Engestrom 1993), as well as the local ordering (Engestrom & Middleton 1996) and negotiations (Suchman 1996) helps understand the kinds of interactions and access that workplaces afford particular learners or groups of learners.

Procedures

The investigation, whose initial findings are reported here, aimed to appraise the model of workplace learning outlined above. It also identified how situational factors (e.g. local orderings and negotiations) shape the
Three forms of reporting are briefly presented here. Firstly, findings of the overall effectiveness of the guided learning model. Secondly, how workplace affordances were manifested in the three work areas is identified as were, thirdly, factors associated with individual workers’ engagement in the workplace. Patterns arising in initial analyses illuminated differences in the affordances of each work area being constituted by local orderings that shaped the opportunities and access to guidance being afforded.

Utility of model and its components

The findings suggest that the contributions of the three levels of the model of workplace learning varied over subjects and work areas. Also, different kinds of contributions are being provided by the model’s elements. Firstly, there are those readily accessible in the workplace through everyday participation. These comprise Observing and listening, Everyday activities, Other workers, Support of guide and the Workplace itself. Other contributions were those provided through guided learning strategies whose use aimed to develop understanding or procedures that would not be learnt through participation alone. These require opportunities and intentional use and comprised initially Coaching, Modelling, Explanations, Questioning, Diagrams, Group discussions and Questioning to extend knowledge. Later, the use of Group discussions and Questioning to extend knowledge were used. In combination, the everyday and intentional strategies are aimed to complement and augment each other in the development of vocational knowledge.

From the critical incident interviews, firstly, some contributions are consistently valued highly across work areas and workers. Strongly supported are: Observing and listening; Everyday activities and Other workers – contributions that the workplace affords workers as part of everyday participation. This was anticipated and was consistent with earlier studies. Of the intentionally used strategies, Questioning, Explanations and Extending knowledge were reported as having high levels of efficacy which are of a different kind than the contributions of everyday activities. The correlation between the guided learning strategies relative levels of utility and frequency of use is noteworthy. There is an association between statements of utility by both the guides and the learners and the frequency of their use. These findings aggregate perceptions of the value of the strategies to secure the knowledge required to accomplish work tasks. However, the ease by which strategies can be used was also a factor in the frequency of their use. Secondly, some contributions fluctuated in their relative weighting over the period of the trial (e.g. Workplace, Modelling, Extending learning). Over the year, some contributions were elevated in the relative weightings (Questioning, Support of guides) while others have declined. Supported by the qualitative data, this can be taken to suggest that some contributions are valued in different ways at different times. The decline in the standing of Everyday activities and Workplace may
represent a shift from requiring a dependency upon situational factors in new tasks, as in development of greater independence of action. This illustrates the particular utility of strategies at particular points in individuals' development, a conclusion supported by the qualitative data. Thirdly, some contributions remained consistent in their relative weighting (e.g. Observing and listening, Other workers, Diagrams), that may reflect their enduring level of contribution. Observing and listening was consistently reported positively across the three work areas, whereas Diagrams enjoyed only limited utility (and low frequency of use). These patterns of relative weighting reflect different bases. These could include changing needs for learning, developmental changes being reliant on particular contributions at particular stages of change, enhanced competence with the use of the guided learning strategies, enhanced interest to engage in interaction by the learners or even data gathering interference. These kinds of measures need to be considered in conjunction with other data that refers to their utility. In the progress and summative interviews, learners and guides provided statements about the effectiveness of the guided approach to workplace learning and individual strategies. Overall, these were positive (with the exception of Diagrams) thereby reflecting the critical incident interview data. Statements about the efficacy of the approach and strategies were provided justifying their contributions.

Data from these interviews also identified the kinds of contributions that each component of the model provided. Table 1, presents a synthesis of the learners' data gathered during the Progress interviews about the utility of the strategies. The responses are categorised into those referring to either learning processes or outcomes. These data suggest that the contributions, which include both the intentional and everyday, make different kinds and complimentary contributions to the development of the workers' knowledge, thereby augmenting each others' contributions. For instance, it suggests that everyday participation without guided learning, and vice versa, may be limiting.

<table>
<thead>
<tr>
<th>Processes</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engaged</td>
<td>Questioning</td>
</tr>
<tr>
<td>interactions and accessing alternatives</td>
<td>Observing and listening</td>
</tr>
<tr>
<td>accessing knowledge not able to be learnt alone</td>
<td>Other workers, Explanations</td>
</tr>
<tr>
<td>context-rich environment</td>
<td>Workplace</td>
</tr>
<tr>
<td>practice, access</td>
<td>Coaching</td>
</tr>
<tr>
<td>assisting access to processes</td>
<td>Diagrams</td>
</tr>
<tr>
<td>assistance, guidance and support</td>
<td>Support of guide</td>
</tr>
<tr>
<td>authentic practise, engagement in activities</td>
<td>Everyday activities</td>
</tr>
<tr>
<td>goals for and insights for performance</td>
<td>Modelling</td>
</tr>
<tr>
<td>generation of insights from other people</td>
<td>Discussion groups</td>
</tr>
<tr>
<td>engages in thinking and acting</td>
<td>Extending knowledge</td>
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</tbody>
</table>

Collectively, from these data, an initial analysis suggests that the model of workplace learning demonstrates some potential to achieve its goals of developing and extending knowledge, such as that reported in the critical incident interviews.

However, the evidence of its potential was not uniform across the three work areas. Despite this, it was evident that the frequency of the strategy varied across the three work areas, and it was optimum in none, and factors other than perceptions of utility were determining both their use and the bases for reporting their utility.
Moreover, over the duration of the investigation, the reported frequency of strategy use declined. While the preparation time for workplace guides was shorter than desired, the qualitative data from both the guides and the learners referred to valuing the use of the guided strategies and detailing their utility. This suggests the need to consider the factors that determine the bases for strategy use in the workplace, support for their use and also factors that shape how these contributions are valued.

**Participatory factors**

Although intended to be used as part of everyday activities in the workplace, the guided learning strategies require intentional deployment, they take time and effort to use. The press of production goals limited the time and effort to be expended by the guides. It was reported that opportunities to use the strategies (e.g., as new tasks arose) often coincided with heightened production demands and it was inexpedient to proceed with the guided learning strategies at these times. A lack of time to use the strategies, replacement staff, and options for pausing to use the strategies were proposed generally as impediments to their use. These concerns were common across the three work areas. However, there were variations in terms of the frequency of use and also factors that determined how the learners and guides interacted and how the learners decided to engage in the workplace learning process. That is, there were factors in each work area that shaped how individuals constructed what the workplace afforded them and consequently how they elected to participate. From the progress interviews, about what encourages participation at work, individuals constructed their views of the affordances or invitational qualities of the workplace in terms of its capacity to provide:

- Access to other workers
- Time to practice and learn
- Inclusion in knowledge sharing
- Discussion groups
- Access to knowledge
- Implementation of training programs
- Encouragement
- Attitude and skills of coworkers
- Opportunity to practice

However, it was apparent from data and observations, that there were differences in how these participatory bases were constituted and accessible in each work area. Situational factors determined how the workplace invited participation in both the intended and everyday contributions. The data indicated a relationship between frequency of strategy use (and measures of their utility) and positive accounts of the work areas' affordances.

**Different bases for participation across the work areas**

The three work areas have quite distinct work practices, shift arrangements, continuity of work, team size, technologies and focus. An elaboration is not possible here. However, some illustration is warranted. In the customer service area, all workers are on the same day shift, they enjoy collegiality within and outside of their work area. They are all female, many of whom are long-term employees in this area and who work in close proximity to each other. Regular team meetings and briefings are held in this area. Their work is homogenous and the workers share common concerns in addressing and responding to customer concerns. During the project, the role of this work area expanded and became more complex. Towards the end, a new data management system was introduced. Both of these changes made particular demands upon the workers.

The manufacturing area has three rotating shifts, its workers, all males, were drawn from other, now disbanded, work areas. Throughout the year, there were periods of discontinuity in their work when product sales declined and the work teams were found work in other area. There was no opportunity for promotion from undertaking additional training because all the allocated senior positions were occupied. There is limited prospect of staff movement in this area. The environment is very noisy (requiring ear protection to be worn at all times) making direct communication difficult.

The packaging area work teams have been recently formed as a result of its enhanced mechanisation. It is also a noisy work area, requiring ear protection to be worn at all times. The small teams worked on three shifts and comprised combinations of male and female workers. There was a positive perception of and attitude towards 'management' (at least initially) and interactions between higher classification workers and other workers in
this work area. There remained the prospect for promotion based on the demonstration of workplace competence, as the quota for higher level positions was not complete. Table 2 presents summaries of data from the progress interviews that reported factors that encouraged or inhibited participation in work activities and what motivated the workers to learn. One distinctive different is whether the motivation to learn arises from contributing to the work team, the tasks it faced or individual need. The data depicts qualities in each work area and presents different bases for participation — affordances. For instance, whereas opportunities for promotion and increases in remuneration were seen as key motivators in manufacturing and packaging, it was not raised as an issue in the customer service area.

<table>
<thead>
<tr>
<th>Area</th>
<th>Work practices encouraging/inhibiting learning</th>
<th>Motivations to learn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client Advisory Centre</td>
<td>Encouraging — training schedule, positive feedback, demanding work, support from manager and coworkers, team support and feedback Inhibiting — changes to work through legislation, products and procedures. Time and reports</td>
<td>Interest, perform work effectively, valued team member, work effectively</td>
</tr>
<tr>
<td>Extrusion</td>
<td>Encouraging — team work, management’s plan, Inhibiting — Doesn’t encourage participation, support from supervisor (level 4), lack of training, lack of incentive, management’s attitude</td>
<td>Learn as much as possible quickly, personal achievement, adequate training and recognition for achievement, like learning new things</td>
</tr>
<tr>
<td>Packaging</td>
<td>Encouraging — management support and interest, team meetings, circulates and asking of questions by production manager, opportunity to train, management support Inhibiting — rotating shifts, product and packaging not organised enough, inequity in access to opportunity to train, not enough trainers to support learning, focussed ongoing training lacking, shortage of staff</td>
<td>Pride in work, job security, effective work practice, promotion and increased responsibility, enhanced understanding of work, job satisfaction, promotion and job security</td>
</tr>
</tbody>
</table>

**Individuals’ Engagement**

The other dimension of participation at work and the reciprocal process of learning (Valsiner 1994) is how individuals elect to engage in the workplace. Bases for engagement identified in the progress interviews included:

- Satisfaction with performance
- Improving performance
- Self-interest
- Self motivation
- Advancement

These illustrate differences in bases for individuals’ engagement in their work and, consequently, how they engage in the effortful process of learning new knowledge. Self-interest was sometimes directed towards securing employment or promotion (Self-advancement). Others were concerned to improve their own work performance. Satisfaction with performance is illustrative of how individual factors’ mediate participation. For instance, workers in the customer service area were keen to be working collaboratively and supportively. Consideration of others in the team was a key factor. In the less ‘public’ environment of the packaging area, workers’ efforts seemed were also to be directed to be seen as a competent team member and also for the team to be effective. For instance, workers would move quickly to overcome production blockages or faults in the packing equipment. If a fault occurred that required the plant to stop, workers began to perform other tasks with direction or request from the team leader. Key goals were for a hand-over to the next shift’s team with production targets met and without them having to fix up problems left by the departing team. In the
manufacturing plant, performance was often more focussed on individual goals, as the teams appeared less formed and there were tensions between workers in the teams. There were also examples of individuals who were pursuing quite pragmatically personal and promotional goals.

The workplace environments and the workers perceptions of the invitational qualities were not fixed, they transformed over time. Towards the end of the year, the packaging and manufacturing areas were informed that funds for training and overtime were being curtailed. Although not directly effecting the provision of guided learning, it effected workers’ views about the invitational qualities of the workplace and their participation in the guided learning activities. This resulted in more belligerent views from the previously benign responses from the packaging area workers. Almost universally, they questioned whether the company was really interested in improving production and productivity if they were curtailing training.

The key point here is that engagement by the individual is selective to a degree. Certainly, the construction of what constitutes workplace affordances is a product of individual agency, which also accounts for relations between the individual and the work practice.

Workplace pedagogic practices

Consistent with earlier work, the use of guided learning strategies when embedded in everyday work activities have been shown to develop the kinds of knowledge required for current workplace performance. Also, although less strongly founded, the evidence suggests the prospect for developing adaptive learning of the kinds required for responding to novel tasks and circumstances through guided workplace learning. This suggest that workplace pedagogic practice needs to press for the integration of the everyday contributions and those intentional contributions provided by expert coworkers in making accessible to and engaging learners in constructing the kinds of knowledge needed for current and potential future workplace requirements. It is not useful to present prescriptions given the different kinds and stages of individual development and the dynamic workplace requirements for performance. However, a combination of everyday and intentional learning experiences that can provide models for, access to, support in, and the development, reinforcement and refinement of these requirements can be identified as useful bases for workplace pedagogic practices. The scope of what comprises these practice needs to extend to consider the factors that shape what the workplace affords individuals to encourage and support their participation (and hence learning) and how these intersect with the learners’ perceptions of and interest in engaging with the workplace. Central to the former are the situational or contextual factors (i.e. local, ordering and negotiations) that shape work practices, including its norms and values. These are what constitutes how the workplace invites participation. This affordance is also shaped, in part, by cultural factors, such as those that place a particular value on particular work (e.g. the standing of vocational activities). These local and cultural factors represent one side of the reciprocal relations that determine individuals’ engagement, with its consequences for learning and participation.

The workplace is the site where the dynamic and evolving social practice comprising the work practice intersects with individuals’ unique personal histories as tasks are generated and actions needs to be taken. More than the completion of work, this intersection shapes participation and learning (development) and perhaps identity formation and transformation. However, the interdependence that constitutes this intersection is as likely to be contested as it is benign. Therefore, it is necessary to account for these contextual factors and consider them as being constructed through this intersection. In procedural terms, this includes understanding the readiness of the social practice to be highly invitational and to encompass the affordance desired by learners above and the readiness and interest of individuals to engage in the work practice. Therefore, work place pedagogic practice need to encompass the interplay between the cultural and situational factors that constitute the context in which the activities and interactions of the workplace proceed, as well as the goals and aspirations that are a product of individuals’ personal histories (ontogenies).

Perhaps there is nothing new here. The findings seem commonsensical. That is a relationship between a supportive yet demanding set of learning experiences and measures of individual growth. Nevertheless, some bases by, which to understanding how learning might proceed in workplaces are advanced tentatively.
References

Billett S (2001) Knowing in practice: Re-conceptualising vocational expertise Learning and Instruction


