Chapter 3
Agentic Behaviour at Work: Crafting Learning Experiences

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Abstract A key priority for research on professional development is elaborating how employees become and remain high-performing workers who are able to effectively respond to the changing requirements of their work. This chapter focuses on how workers develop such high performance at work. It is proposed that current accounts of professional expertise development lack a consideration of the variety and breadth of work-relevant experiences necessary to generate expertise, including employees who deliberately contribute to that development. Although deliberate practice as originally conceptualised by Ericsson et al. (1993) may not be readably identifiable in work contexts, certainly analogous processes and other agentic efforts shape the quality of workplace learning. It is illuminated how employees can deliberately influence their expertise development by seeking additional work experiences and proactively securing information and feedback.

3.1 Professional Development at Work

A key priority for research on professional development is elaborating how employees become and remain high-performing workers who are able to effectively respond to the changing requirements of their work. This outcome is of interest from both individual and workplace perspectives. Employees who are occupationally competent and effective in their daily work activities often enjoy high levels of work satisfaction and well-being (e.g. Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Ryan & Deci, 2000). Also, high levels of work-related skills and occupational

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knowledge are most likely to secure long-term employment and employability (OECD, 2012a, 2012b) and promotion and work-related progression (Eby, Butts, & Lockwood, 2003; Ng, Eby, Sorensen, & Feldman, 2005). So, individuals have much to gain from sustaining their occupational capacities through professional development activities. From the workplace perspective, a skilled and adaptable workforce that is responsive to such changes is central to sustaining its continuity. Global economic developments over the last few decades in combination with steadily decreasing product and process life cycles have led to increased competition and emphasised the need for skilled work forces (Green, 2007). Market shares are not only product of long-term technological advantages but high levels of organisational flexibility that permits and supports adapting to changing demands for goods and services. Consequently, highly competent employees can offer a sustainable competitive advantage for their workplaces (Barney & Wright, 1998). Hence, these factors emphasise the importance of employees' professional development from both the enterprise and workers' perspectives.

Based on both cognitive and sociocultural accounts of learning, empirical evidence suggests that ongoing engagement with domain-specific activities, such as those comprising an occupation, is necessary to become and remain competent in work-related activities (Ericsson, 2006b; Ericsson, Krampe, & Tesch-Römer, 1993; Dreyfus & Dreyfus, 2005). Hence, given that workplaces are the key sites for the provision of these experiences, it is important to understand how such occupational capacities can be secured by workers through their work-related activities. However, within cognitive accounts, investigations into expertise have mainly been concerned with identifying what distinguishes novices from experts and how individuals can reach an above-average performance to advise how these qualities can be learnt and developed further by individuals (Ericsson, 2006a; Gruber, 1999). Many of these investigations conclude that expertise can be conceptualised as an outcome of experiences encountered within particular domains of activities, such as an occupation (Ericsson, 2006b). Although concerned with learning as an inherently social process, Lave and Wenger (1991) came to similar conclusions. They observed how individuals come to participate in domain-specific practices and progress towards playing increasingly central roles as their developing capacities permit. However, in their account, domain specificity refers as much to the circumstances of practice as to the abstracted conception of an occupation, as Billett (2001a) identified empirically. Occupational expertise and competence development are, therefore, commonly seen as arising through engagement in domain-specific practices in which novices progressively become more competent through active learning processes, within particular set of circumstances of practice.

Although lengthy periods of experience in specific domains of activities are necessary to attain expert performance, the provision of such experiences alone is not sufficient to develop these capacities. It also requires deliberate efforts and engagements by individuals to excel in a specific domain of activities (Ericsson et al., 1993). These authors hold that only through the identification of and engagement in tasks that are beyond the individual's current performance levels qualities of expertise can be engendered through extending the scope of their domain-specific

knowledge. Such developmental activities are referred to as engaging in 'deliberate practice'. This suggests that beyond what experiences are afforded to individuals, how they elect to engage with them is central to the development of expertise.

Not surprisingly, some studies (Dunn & Shriner, 1999; Sonnentag & Kleine, 2000; Van de Wiel, Szegedi, & Weggeman, 2004; Van de Wiel & van den Bossche, 2013) have tried to transfer findings about deliberate practice into workplace activities. Although the results are ambivalent, most findings indicate that employees do not report engaging in deliberate practice at work (cf., Van de Wiel & van den Bossche, 2013). This finding might mostly be associated with workplace activities and interactions being ordered through different means than ideally structured domains as in textbooks (see also Strasser & Gruber, 2004), and therefore, the problem-solving activities individuals engage in such environments may well constitute what in other circumstances would be taken as having the qualities of deliberate practice (see Sect. 3.2 for a deeper discussion of these claims). Certainly, research on expertise and deliberate practice arose mainly from empirical studies of well-structured domains of activities, such as sports, chess and music. Such activities have clear performance standards, and the tasks comprising those activities are relatively idealised: constrained and rule-bound (Strasser & Gruber, 2004). In many workplaces, however, performance standards are aligned with the actualities of work activities and outcomes that can be highly situated. High performance at work, therefore, is likely to be characterised through the capacity to meet a range of situated work demands that define the task and what constitutes its successful completion. Hence, experts can be characterised as individuals that demonstrate above-average work performance reliably over a long period of time (cf., Ericsson, 2006b; Gruber, 1999) in the whole range of work-relevant activities, but whose performance measures are highly situated.

It follows that this chapter focuses on how workers develop such high performance at work. It is proposed that current accounts of professional expertise development lack a consideration of the variety and breadth of work-relevant experiences necessary to generate expertise, including employees deliberately contribute to that development. Although deliberate practice as originally conceptualised by Ericsson et al. (1993) may not be readably identifiable in work contexts, certainly analogous processes and other agentic efforts shape the quality of workplace learning (e.g. Harteis & Goller, 2014). In making this case, this chapter is structured as follows: The next section overviews research on expertise development. It proposes that concept and enactment of deliberate practice as it was originally found in games and activities abstracted from situated performance requirements might not easily be transferred into work domains. The following section then clarifies the characteristics of work domains and the kinds of work experiences likely to be necessary to meet the requirements of workplaces' daily demands. Following these considerations, it is explained how some workplaces can afford particular practices as part of their everyday activities, yet others might not. The next two sections are used to illuminate how employees can deliberately influence their expertise development by seeking additional work experiences and proactively securing information and feedback. The chapter concludes with a summary of these factors.

3.2 Work Experience as Foundations for High Work Performance

As noted, extensive and intensive experience is necessary to establish high performance in professional occupations (Gruber, 1999). Neither training activities nor favourable predispositions, such as high general intelligence, explain expertise development as convincingly as effortful engagement in domain-related experiences. Although those factors may help individuals to build expertise, it can take years of extensive and varied experience in a certain domain of activities to reach high performance or expert levels. However, the duration of experiences alone is an insufficient measure. Instead, it is the quality of experiences individuals have and how they respond to them that is central for developing domain-specific expertise (Ericsson, 2006b). That is, the kinds of work activities and social interactions individuals engage in during this time are central to this development. Empirical results about insurance agents, for instance, show that the scope of insurance cases handled in the past explains expertise levels far better than tenure, i.e. years of work experience (Sonnentag & Kleine, 2000). Similar findings have also been reported for nurses (Benner, 2004) and software programmers (Sonnentag, 1995).

Typically, novices do not have access to all domain-relevant practices when they commence in a workplace. Lave and Wenger (1991) presented accounts across different domains in which newcomers start by engaging in activities that need only a very restricted skill set and where possible failure contains less risk. Only after novices have learnt to accomplish those peripheral tasks are they allowed to engage in more demanding practices. To reach the core of the community, these novices have to take over and effectively perform activities that are increasingly central to the performance of the workplace. Expertise, therefore, develops incrementally through participation and gradual mastering of work practices (Billett, 2001a, 2001b).

Dreyfus and Dreyfus (1988, 2005) propose a five-stage linear model to explain expertise development as the gradual transition from one stage to another through ongoing experiential learning, as described above. In the first stage, *novices* actions might be mainly based on rules learnt through instruction. Like a computer, novices follow simple step-by-step activities perhaps without fully understanding the reasons behind their actions. After encountering a sufficient number of similar situations, *advanced beginners* (Stage 2) learn to recognise certain contextual cues that characterise the situation. Based on those cues, learners come to regulate their actions based on maxims. Such maxims are contextualised rules that use the already constructed knowledge about the task and the situation as in ‘shift up when the motor sounds like it’s racing’ (Dreyfus & Dreyfus, 2005, p. 783). Ongoing experience allows learners to refine already learnt maxims and to construct new maxims. At Stage 3, *competent individuals* have experienced an extensive range of different domain-relevant activities and situations. Because these individuals may still not have comprehension of relevant situational characteristics, they may experience difficulties remembering relevant cues to identify similar situations they subsequently encounter. To manage those cues, competent individuals adopt approaches

to progressing with their work and learning and may consciously seek to differentiate situations and discern appropriate actions. However, the confinement to a constrained set of situational aspects and features can lead to misjudgements or misclassifications in their work activities. Individuals then apply actions and problem-solving strategies that may be suited to similar but different problem situations. At Stage 4, *proficient performers* have learnt to discriminate amongst sets of domain-specific situations and accompanying responses. 'Action becomes easier and less stressful as the learner simply sees what needs to be done rather than using a calculative procedure to select one of several possible alternatives' (Dreyfus & Dreyfus, 2005, p. 786). However, proficient performers have still to rely on rules and maxims in deciding how to respond to particular situations. Only at the fifth and final stage individuals develop *expertise* allowing them to act seemingly intuitively to problem situations without using rules or maxims. Hence, experts activate appropriate knowledge and problem responses not by relying on rules or maxims but rather on the fast retrieval of scripts connected to special situations or cases they have encountered earlier. Although this model of development is idealised and simple in its linear form and has been criticised (Dall'Alba & Sandberg, 2006), it offers a representation of how such progression might be realised in occupations such as nursing (e.g. Benner, 2004). What it may require is being located in a particular circumstance of practice.

The issue remains about how and what individuals learn through domain-related experiences. Using a cognitive approach, Gruber (1999) explains expertise development as acquisition of episodic knowledge through engagement in domain-related activities and the subsequent construction of procedural knowledge. Hence, expertise development is the incremental construction of knowledge of and meaning about the domain that arise as a legacy of engaging in these kinds of experiences. In the past, different cognitive models have been proposed to explain aspects of this process. Kolodner's (1983) dynamic memory model has been offered to explain how individuals store experienced situations and how information to appropriately react in certain situations is later effectively retrieved from memory. Anderson (1982) almost conversely explains how the repetitive engagement with similar tasks leads to a gradual honing of problem-solving capacities within a certain domain. In another model, Boshuizen (2004) explains how conceptual knowledge about a domain gets encapsulated within daily work experience allowing seemingly spontaneous and effective responses to daily work problems. Taken together, those models offer explanations of how individuals build up expertise through ongoing experience within domains of activities.

In her model of dynamic memory, Kolodner (1983) proposes that experiences are encoded in memory as script-type knowledge. Those scripts are retrieved in stereotypical situations and determine the individual's actions. Generalised scripts (the so-called episodic memory organisation packets) are constructed through recurrently encountering of similar episodes. Based on the similarities of those episodes, prototypical reaction patterns are formed. However, sometimes it is necessary to recognise the idiosyncrasy of situations to act appropriately. That is why significant deviations from previously encountered situations are indexed based on

the significance of their differences from previously encountered situations and activities. These indexes permit the fast retrieval of appropriate behavioural patterns for the encountered situation. Kolodner's model, therefore, explains how the ongoing experience of both similar and novel situations supports the construction of episodic knowledge that can be used to construe and respond to what is subsequently experienced.

Anderson (1982) describes the effect of experience on learning in a three-stage model. In the first stage, an individual encounters an episode and constructs declarative or conceptual knowledge about the situation. Through further engagement with situations comprising similar activities or problems, this conceptual knowledge gets compiled into procedures (second stage). In the third stage, this conceptual knowledge is refined through further experience. This proceduralised and refined knowledge permits fast and ultimately automatised reactions to familiar problem situations. This model, therefore, explains how repeated experience of analogous problems permits the individual to seemingly automatically respond in new domain-relevant situations.

In her knowledge encapsulation theory, Boshuizen (2004) explains how medical professionals develop expertise through the combination of conceptual knowledge and daily work experience. The repetitive treatment of similar medical cases requiring the application of certain clinical knowledge leads to the construction of encapsulated forms of knowledge. Those forms of knowledge combine conceptual and clinical knowledge to the so-called illness scripts that allow direct activation when patients with similar problems are encountered (see also Boshuizen & Schmidt, 1992; van de Wiel, 1997). Again, this model explains how domain-related experiences are stored in memory through episodic means and can later be retrieved to respond to new problem situations. However, this model also explains the role of conceptual and procedural knowledge constructed through experiences in educational and work settings can be combined and leads to procedural capacities of the kind required by experts.

So, across these accounts, the combination of experience iteratively and actively being engaged with is used to explain the incremental development of expertise. Although slightly different in all three aspects, these three models make the same final point: ongoing domain-related experience leads individuals to construct domain-specific knowledge that permits the quick application of appropriate actions to problem situations (Table 3.1 for a summary of the three models). Drawing on representations of episodic knowledge permits the recall and utilisation of what is known to similar, and potentially, dissimilar situations (Kolodner, 1983). The appropriate script-type knowledge permits individuals to a seemingly spontaneous reaction to current situations (cf. also Boshuizen, 2004). Through this process, working memory capacity becomes freed up and higher levels of relevant situational characteristics can be processed (Ropo, 2004). So, experts cannot only appropriately react to domain-related situations because of their extensive experience, but they can also interrogate the characteristics of a problem situation at a considerably deeper and wider level and fashion appropriate responses.

Table 3.1 Summary of models explaining learning from experience

	Kolodner	Anderson	Boshuizen
Cognitive structure	Episodic memory organisation packets; indexes	Declarative knowledge; procedural knowledge	Integrated network of conceptual knowledge; illness scripts
Cognitive processes	Storage of encountered episodes; formation of prototypical reaction pattern Indexing of significant deviations; retrieval of appropriate reaction pattern	Declarative encoding (storage of declarative knowledge); compilation of declarative knowledge; tuning (refinement of procedural knowledge)	Accumulation, validation and integration of conceptual knowledge; knowledge encapsulation; integration of conceptual and episodic knowledge to illness scripts
Explanatory power	How experiences are stored in memory, how they are cognitively processed, and how they are used to react in problem situations	Repetitive engagement in tasks lead to gradual improvement of problem-solving skills	Conceptual knowledge is indirectly utilised in encountered problem situations through the activation of episodic knowledge (illness scripts)

However, the plain experience of episodes at work may not automatically lead to knowledge recall and reconstruction. In particular, Kolodner's (1983) model emphasises the important role of reflection or introspection in the knowledge construction process. Experiences have to be cognitively analysed about their causes, their differences from earlier experiences and the outcomes of those experiences. Without cognitive engagement (i.e. introspection) with the experienced situation, learners can neither generalise scripts nor construct indexes permitting the retrieval of appropriate behavioural patterns for subsequent situations.

After a number of years of experience within a domain of activities, most people accomplish reasonable performance levels (Ericsson, 2006b). However, not all individuals reach the expertise stage that allows them to exhibit continuing superior performance within the domain (Dreyfus & Dreyfus, 1988; Ericsson, 2006b). For instance, just being engaged in domain-related activities and practices does not ensure the transition from stages 4 to 5 or even from 3 to 4. This lack of transition might, for example, be the case if individuals do not engage in introspection. Other reasons for this lack of transitions might be that the engagement in rather repetitive and routine activities does not allow further competence improvements (Ericsson, 2006b). Such activities may not secure rich learning outcomes of the kind required for expertise in the long run. Access to activities that allow individuals' further progression on the expertise ladder may even follow the 'Matthew Effect' (e.g. Rigney, 2010). Organisations often fill positions that afford sufficient learning opportunities with high performers or employees with potential for high performance. On the other hand, high performers may deliberately look out for challenging situations

and positions that allow them to engage in learning-relevant activities and practices. In this way, such individuals that already have high levels of expertise are provided with experiences that permit them to further improve their performance.

Through their inquiries, Ericsson and colleagues (e.g. Ericsson, 2006b; Ericsson et al., 1993) found that high-level performers have been significantly more often engaged in domain-relevant activities compared with their less expert counterparts. However, high-level performers may also have invested more time and effort into qualitatively more demanding activities. Concentrating consiously on activities that have been still outside their current performance may permit them to gradually improve their domain-relevant skill sets. Such deliberate practice, therefore, comprises these individuals' intentional and effortful engagement in challenging activities in ways directed to improve their performance. In its narrow definition, a key element of deliberate practice is learners engaging in activities to consciously improve performance and secure a desired level of performance. The important point here is individuals' conscious efforts to go beyond their existing levels of knowledge and skills to further develop their performance (Bereiter & Scardamalia, 1993).

As foreshadowed, some studies (e.g. Dunn & Shriner, 1999; Sonnentag & Kleine, 2000; Van de Wiel et al., 2004; Van de Wiel & van den Bossche, 2013; Van de Wiel, van den Bossche, Janssen, & Jossberger, 2011) investigated whether employees engage in deliberate practice at work and whether this engagement can be used to explain expertise development at work. The empirical results are highly ambivalent and provide an equivocal picture. For instance, Van de Wiel et al. (2004) investigated the impact of deliberate practice on the expertise development of strategy and organisational consultancies. They interviewed 23 consultants about their engagement in deliberate practice and self-regulated learning activities (e.g. reading professional literature, participating work-related courses) at work. The interviews quantified the number of participants that engaged in each activity and the time spent and/or the frequency of engagement in those activities. The participants were then grouped regarding their expertise level (top vs. average). Although a range of activities were classified as deliberate practice, the only activity that distinguished average from top performers was the amount of intentional reading of scientific literature (Cohen's $d > 1$). Apart from this single factor, the study found no other evidence that intentional practice at work influences the development of expertise. However, in another study on insurance agents ($n = 100$, interview study with the following quantification of current and cumulative time spent on activities), Sonnentag and Kleine (2000) identified a significant positive relationship between time spent on deliberate practice and performance ($\beta = .29$) after controlling for years of experience, the number of insurance cases handled, and time spent on activities supporting daily tasks ($R^2 = .24$). 'Above-average' performers reported engaging more often in intentional practice than average counterparts. The cumulative amount of past deliberate practice seemingly had no significant effect on performance. In their more recent study of competent physicians ($n = 45$), Van de Wiel and van den Bossche (2013) found no evidence that they engaged in activities that could be classified as intentional activities expressly aimed to develop further their medical competence. Similar to earlier studies, Van de Wiel and van den Bossche used

semi-structured interviews to obtain information about the activities these medical practitioners engaged in at work. These interviews were later analysed and each reported activity was classified as either deliberate practice or not.

Apart from the ambivalent outcomes of the efficacy of engaging in deliberate practice on professional development, it is questionable how the activities investigated in the studies above really qualify as deliberate practice in its original definition. Dunn and Shriner (1999), for example, mitigate their positive findings by indicating that school teachers ($n = 136$) do not deliberately engage in practices that are repeated to improve performance. Instead, they engage in activities that are necessary for their normal teaching duties. Van de Wiel and van den Bossche (2013) arrive at the same conclusion: medical practitioners are more concerned with delivering high-quality medical care instead of investing time in intentionally learning through practice. Work-related learning emerged from medical practitioners everyday engagement in work tasks rather than from activities that could be categorised as the kinds of intentional learning activities referred to by Ericsson and his colleagues. It is, therefore, questionable whether deliberate practice in its original narrow definition has explanatory power for elaborating the development of expertise at work. However, these findings do not mean that employees lack the potential to affect their own professional development. Based on the analysis of the characteristics of workplaces as domains of activities and interactions, in the following sections, we will show that intentional efforts that influence the development of expertise are enacted quite differently as proposed in Ericsson's concept of deliberate practice. Certainly, workplaces are ill-structured and complex domains that require a variety of responses to complete tasks, and these responses may well serve similar purposes to deliberate practice, albeit in analogous ways.

So, as foreshadowed, many findings of expertise development and the relevance of deliberate practice come from research in well-structured domains of activities (e.g. Ericsson, 2006b). Those domains, such as chess, music or sports, (i) are characterised by clear comparable performance standards and (ii) comprise a small number of well-defined activities, and (iii) the exhibition of high-level performance is often constrained to relatively infrequent occurring situations like tournaments, concerts, etc. Time that is not spent in performance-relevant situation is usually used to prepare for such rather singular events or to relax from the efforts of the last performance. Activities in workplaces often differ from such domains in significant ways.

First, in many forms of work, clear performance standards (i.e. set goals or solutions) are missing (Van de Wiel et al., 2011). Although failure to accomplish a task is often obvious, the evaluation of the quality of completed tasks might not always be that straightforward. For instance, in professional work such as teaching, consulting, etc., comparable cases may not occur frequently (Strasser & Gruber, 2004). Another problem is the division of labour that can make interindividual comparison at work difficult. Without clear performance standards and tangible and appropriate role models, employees may not know about their current performance level or skill deficits that might need improving. Furthermore, many employees experience a certain role ambiguity at work (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964; Katz & Kahn, 1978). So, even if performance standards are existing and known about, they

might differ across working roles and circumstances. In such a case, employees may receive conflicting information about their performance levels at work.

Second, employees often face limited time frames at work requiring constant engagement in performance-relevant activities (Van de Wiel et al., 2011). Work activities structure around deadlines and externally set requirements. This is why daily work life may quite often lead to a 'its good enough' attitude (Jensen, 2007) because of the pragmatic rationale that work tasks have to be completed and within resource and time constraints. It is usually not possible to set aside special time that is only reserved for professional development purposes or relaxation. Instead, these need to arise through work activities in which they engage.

Third, workplaces are often defined by their situationally particular activities and practices. Being a software developer, for example, means that everyday work activities may consist in using different programming languages, participation in work meetings, planning for new projects and coordination with customers and other departments (e.g. Sonnentag, 1995; van den Berg, 1998). Work domains and their requirements for performance are not so narrowly defined as the typical domains investigated in expertise research (Ropo, 2004). They can rather be conceptualised as complex of interrelated subdomains (Strasser & Gruber, 2004; van den Berg, 1998).

At work, performance is characterised as the capacity to meet the whole range of work demands of a certain workplace. As such the nature of expertise is quite situated (Billett, 2001a). Hence, development of expertise requires extensive experience in all relevant domain-related practices and even possibly in the circumstances where they are enacted. Empirical results confirm this proposition. Sonnentag (1995), for instance, could show that the variety of past experiences of programmer could significantly explain their work performance. Experts seem to have a greater variability in their professional expertise. Studies on nurses and medical practitioners make similar conclusions (Benner, 2004; Van de Wiel & van den Bossche, 2013). As noted, the characteristics, i.e. the variety and complexity, of experienced cases are highly relevant for the quality and pace of competence development.

Using the arguments made above, we can advance the following propositions. Workplace activities are not wholly comparable to well-structured domains (e.g. music, sport, chess) that have been used extensively in expertise research. Workplaces, instead, are best characterised as ill-structured domains (e.g. Strasser & Gruber, 2004). It is, therefore, not surprising that employees do not engage in deliberate practice at work as per the definitions advanced above that refer to well-structured domains. As clear performance standards are often lacking, many employees might not be aware of own performance deficits that prevent to reach the next expertise stage. However, even if employees know their performance gaps, limited time frames and pragmatic demands often prevent the engagement in activities not part of their daily work life. Another reason might be the heterogeneous activities that employees have to engage in at work. At work, it is usually not enough to perfectly master a single activity. For employees, it is more important to excel in a range of activities and repeatedly. Hence, rather than a conscious process of engaging in deliberate practice, the nature of work tasks provides what elsewhere is seen as the need to construct activities through which deliberate practice can be enacted.

Such a demand to engage in a diverse set of tasks and activities prevents the identification of both performance gaps and appropriate activities that can be characterised as deliberate practice.

3.3 Workplaces as Learning Environments

As noted, extensive engagement in domain-specific work activities is necessary for developing occupational expertise at work. Both the variety and the complexity of activities shape the form of that development.

The kind of workplaces and how they are defined depend on the purpose and function of the specific organisation, the organisation's structure and the particular requirements for division of labour (Billett, 2001b). Another important factor is the social and cultural practices prevalent in a particular workplace (Billett, 2001a). The practices and activities within a workplace are unique to some extent. Factors like the local economic situation, specific market demands, available personnel or workplace rules affect how social and cultural practices are shaped (cf., Billett, 1995). Work domains are, therefore, not abstract entities that are easily comparable over different situational contexts (Billett, 2001a). Instead, they are highly situated practices that afford particular kinds of activities and interactions to those who work in them.

However, the access to work affordances that permit engagement in certain activities and practices is also likely to be governed by several other factors. Quite often a set of competences or qualifications and tenure are necessary preconditions to carry out certain tasks. Lave and Wenger (1991), for example, describe tailors that are only allowed to engage in sewing of high-quality clothes after the skills of fabric cutting, sewing clothes with lower requirements for finish and cleaning processes are mastered. Such task restrictions often have a pragmatic rationale. Only experienced workers are allowed to engage in activities where mistakes in work processes can have serious financial or in certain situations even health consequences in order to avoid them (see also Gherardi, Nicolini, & Odella, 1998).

These affordances are also distributed on the basis of personal factors like race, gender, employment status or personal relations with other employees or customers (Billett, 2001b; Tanggaard, 2006). In certain work contexts, the engagement in certain practices is a privilege reserved for managers or supervisors. In research on hairdressers, Billett (2001a), for instance, observed that even senior personnel were denied the experience of managing stock, if it was a practice within the salon for this task to be restricted to the owner. In this instance, employees were explicitly denied to engage in activities concerning inventory management whereas that occurred routinely in others.

On the other hand, workplaces often provide employees with certain degrees of freedom regarding their daily work life. Not all work processes are wholly predefined. Apart from very constrained workplaces (e.g. assembly lines), employees have autonomy to decide how to handle tasks or how to tackle problems. How those degrees of freedom are utilised to gain work experiences depends mainly on the

employees themselves. Gustavsson (2007) illustrates the scope of decision-making that permits employees to elect how they engage in certain activities or not. In her study, she found evidence that industrial operators 'create access to participate in events and problems. The operators emphasize that they can, if they want to, learn more by participating in problem situations in their work' (p. 459).

For understanding expertise development in work domains, it is also crucial to note that workplace practice often restrict the access to work practices and activities (Billett, 2001a). Although some workplaces afford a rich set of activities that permit them to engage in a wide range of activities that are typical for a work domain, others may not. In such cases, employees that engage only in those work practices and activities afforded by the workplace might be constrained in their development process.

3.4 Taking an Active Approach Towards Expertise Development at Work

As has been proposed, situational and contextual factors shape to a large degree what activities and interactions employees engage in at work. However, following from the above, we also have to account for the personal agency that affects how individuals elect to engage with them (Billett, 2001b, 2004). This agency can be understood as individuals' general capacities and dispositions to make intentional choices, initiate actions based on these choices and exercise control over their sense of selves and work environments (Harteis & Goller, 2014). Exercising agency at work, therefore, means taking initiatives and seizing opportunities as well as taking control over work situations and resisting external forces (Eteläpelto, Vähäsantanen, Hökka, & Paloniemi, 2013). At work, personal agency might, for example, be manifested by decisions to participate in or reject certain work practices (Billett, 2004; Gustavsson, 2007), to deliberately change workplace descriptions (Wrzesniewski & Dutton, 2001) or to intentionally seek feedback about own performance (Ashford & Cummings, 1983, 1985). Certainly, exercising personal agency at work permits employees to influence their own professional development processes (cf. also Harteis & Goller, 2014) through active engagement in activities and interactions and the degree and direction of their intentionality, which extends to introspection.

Workplace affordances need to be understood as shaping individuals' engagement with the available activities and practices. Whether and how individuals actually engage with activities and interactions afforded by their workplace depend both on their motivation and energy to engage in demanding activities (cf., Greeno, 1994). In what way individuals exercise their personal agency may well be strongly aligned to their professional identities and subjectivities (e.g. Billett, 2006; Holland, Lachicotte, Skinner, & Cain, 2003). Some of Gustavsson's (2007) industrial operators, for example, may have decided to engage in problem situations because they needed to learn how to handle similar problems in the future. Other operators, conversely, may elect not to engage in similar activities because they have not accepted them as part of their responsibilities or professional identity.

So, the exercise of personal agency can lead to a greater array of learning opportunities at work (Harteis & Goller, 2014). Individuals can – to a certain extent – intentionally or deliberately elect what kind of experience they engage in at work. This engagement is perhaps at its most crucial when there is a need to learn demanding knowledge that is effortful, such as engaging in activities with which employees are unfamiliar (i.e. nonroutine). So, efforts to craft new learning experiences might be manifested by adding new tasks or activities to individuals' work schedule, by deliberately participating in problem situations that are not primarily part of one's own work or by deliberately changing one's own approach to tackle familiar work problems and activities. Jensen (2007) calls this behaviour a 'move beyond the necessity' (p. 497) of the daily job. Although such efforts are deliberate in their intent, they do not qualify as deliberate practices as originally defined.

To give an example of such activities, consider a car mechanic working in a local garage. The mechanical repair work is usually divided between all mechanics working in a shift. Most of her colleagues prefer to repair certain kind of cars (make, type, etc.) if possible. Instead, she intentionally uses every opportunity to repair unfamiliar types of cars as well as such those with which she is familiar. In another situation, she volunteered to temporarily replace a sick colleague at the garage's storage facility. This opportunity allowed her to get insights into the processes behind ordering spare parts that were needed to replace broken car pieces at the garage. Her agentic behaviour allowed her to build upon a broad range of work experience. It is not only that her variety of experiences helps her to adequately react on new situations at the garage, but she also came to understand why certain parts for replacement are difficult to source. This knowledge sometimes helps her to order parts from different manufacturers or to explain to customers why the repair process will take a little bit longer.

Empirical evidence about such deliberate efforts to craft learning experiences is mainly based on qualitative studies. Based on 15 semi-structured interviews with viticulture workers, Bryson, Pajo, Ward and Mallon (2006) claim that agentic and proactive employees can shape and maximise the developmental potential afforded by workplace activities. Both employees on lower and higher hierarchical levels created learning opportunities by taking initiative. At management level, such efforts, for instance, consist of initialising new projects. Manual workers used more individual-specific strategies to craft new experiences. Bryson et al. (2006) report a case where a worker took the opportunity to work in another department for a short time to broaden their knowledge similar to our example.

Similar findings have been reported for nurses (Berings, Gelissen, & Poell, 2005, 2007). The authors found nurses regarded activities labelled as 'job rotation' and 'broadening tasks' as highly relevant development opportunities. Both categories were extracted from interviews with 20 Dutch nurses. The first category comprises activities that aim at temporary job changes. Examples here include temporarily working in other departments or taking over other employees' work. The second category comprises more general changes connected to the individual's own work. Examples are the long-term adoption of other employees' work or the general search for new challenging situations. In a quantitative follow-up study, the authors

found that learning by adding new tasks (i.e. combining both categories 'job rotation' and 'broadening tasks') has a positive effect on perceived development of nurses ($\beta = .18$) controlling factors like years of nursing experience, searching for information and learning through cooperation ($R^2 = .12$) (Berings, Poell, Simons, & van Veldhoven, 2007).

Similarly, Berg, Wrzesniewski and Dutton (2010) interviewed employees from for-profit and non-profit organisations about their job crafting behaviour. In some of their 33 interviews, they found evidence of some employees deliberately seeking out opportunities for learning by altering the scope or nature of tasks as well as taking on additional tasks or establishing new relationships with colleagues in other departments. In one interview, for instance, a customer service representative explains: 'I have taken initiative to form relationships with some of the folks who fulfill orders. … That's not my area but I was really interested in how that worked and wanted to learn. … I have learned a lot from them, and that's helped me in my job' (p. 166). Focusing on their self-regulated learning, Slotnick (1999) interviewed 32 medical practitioners about their everyday workplace learning. Based on these interviews, he found evidence that medical practitioners deliberately scan their environment for possible situations to participate in and learn through. In particular, such situations with the potential to secure new learning are considered most worthwhile. These situations offer opportunities to prepare for future situations at work.

Most studies described here explicitly link experience with developmental purposes. Nevertheless, the motivation to engage in the intentional learning referred to above can also be linked to motives such as asserting control over their own job to avoid alienation from work, creating a positive self-image, to fulfil the need for social relatedness or to fulfil the need to experience causation and to be self-determined (DeCharms, 1968; Deci, 1980; Deci & Ryan, 1985; Wrzesniewski & Dutton, 2001). Other possible motives are the fight against daily boredom (Berg et al., 2010; Dikkers, Jansen, de Lange, Vinkenburg, & Kooij, 2010) and hopes that additional professional experience helps to stimulate one's own career progression (Fried, Grant, Levi, Hadani, & Slowik, 2007).

However, the personal motives behind the agentic efforts might not be highly relevant for its effect on expertise development in the first place. As argued in Chap. 2, the recurrent engagement in mundane and repetitive activities does not allow further expertise development. In order to get professionally competent, the employee needs experience in the whole range of activities that define a workplace. If the workplace does not afford access to relevant activities, the individual has to become agentic and proactive. It is, therefore, not important whether individuals focus intentionally on their development in the first place. It is more important that the individual gets the chance to be involved in relevant practices. However, we have also argued that introspection is necessary to learn from those experiences. The next section describes how individuals can deliberately foster their learning processes.

3.5 Proactive Information and Feedback Seeking

Successful engagement in new activities may require certain kinds of information about these activities and how to become competent with them. For engaging, individuals may need information about what is technically required to perform well at the new tasks and practices (e.g. technical information) as well as what performance expectations and standards are connected to the activity (e.g. referent information) (Morrison, 1993b). During the engagement with new practices, individuals may want more information on how they are performing (e.g. appraisal information, feedback) (Ashford & Cummings, 1983; Morrison, 1993b). However, it is reasonable to assume that not all workplaces afford access to necessary information without a certain initiative from employees themselves.

If the kinds of activities and interaction needed to learn the knowledge required for work are not provided automatically, employees have to take initiative to secure them. In general, individuals can engage in two different information-seeking strategies. First, while *monitoring* their environment, individuals try to deliberately obtain informational cues from the situation. Such cues can arise from behaviours of others as well as directly from work tasks (Ashford & Cummings, 1983; Morrison, 1993a). Supervisors might, for example, nod in approval while reviewing the outcome of a task. The failure to accomplish a task, on the other hand, might be directly visible through an inappropriate outcome. Second, the individual can engage in *inquiry* strategies by directly asking other individuals about their work behaviour or by directly looking for information in written material (Ashford & Cummings, 1983; Morrison, 1993a).

Technical and referent information are of particular significance in situation that are new and unfamiliar for the individual. To accomplish new tasks, individuals have to obtain information they require, what constitutes successful completion of the task and what relevant standards concerning time, quantity and quality apply for the novel tasks. Knowledge about such information should, in general, permit them to reach higher performance levels at work and quicker mastery of new tasks. Particularly in situations where that kind of information are not easily accessible, employees that are engaging proactively information seeking should be better off than more passive colleagues. Empirical studies confirm this proposition. In her longitudinal study on accountants ($n = 240$), for instance, Morrison (1993a) found significant evidence that both the deliberate inquiry about technical information ($r = .18$) and the deliberate monitoring of referent information ($r = .23$) are positively related to performance. In another study on accountants ($n = 135$) engaging in tasks for the first time, Morrison (1993b) found additional evidence that task mastery is significantly positively related to the frequency of inquiry about technical information from supervisors ($\beta = .19$).

After the comprehension of the procedures and quality standards behind the new task, the employee needs information about its efficacy and mastery of the new activity. Such feedback or appraisal information is crucial to understand how well standards are met and how actions are perceived from others (Ashford & Cummings,

1983). Furthermore, feedback provides information about the progress of mastery as well the current level of performance (Ilgen, Fisher, & Taylor, 1979).

Feedback is especially important because it inherits the potential to initiate introspection. As proposed above, introspection on new experience is a fundamental condition for learning. Although novel situations can act as starting points for introspection, it can be initiated through external feedback (Høyrup, 2004). Certainly, in situations where performance standards are not obvious and criteria to judge performance are not easily visible, feedback from other individuals can assist trigger introspection. As such, when feedback is not automatically provided, individuals deliberatively engaging in feedback-seeking strategies should have advantages regarding their professional development when compared with individuals not actively seeking feedback. However, even in situations where feedback is constantly provided by external sources, self-sought feedback has higher development potential. As Ashford and Cummings (1983) are arguing: '…it may well be that the implications for acceptance of feedback and the desire to respond in line with the feedback are different in the case where feedback is actively sought than if it is information passively received' (pp. 379–380). The proposed relationship between the tendency to seek feedback and performance as well as task mastery has been empirically confirmed. Feedback seeking is a good predictor of high work performance and task mastery (Ashford & Tsui, 1991; Morrison, 1993a, 1993b; Renn & Fedor, 2001).

3.6 Summary and Conclusion

Drawing mainly on results of expertise research, this contribution argued that work experience is a fundamental precondition for expertise development. Through the ongoing engagement with work-related activities and practices, individuals are able to construct well-organised, goal-oriented and quite often highly proceduralised knowledge about a certain domain. This knowledge allows individuals to act seemingly intuitive, fast and highly adequate to encountered problem situations and therefore to appropriately meet the demands of their domain.

Workplaces can best be described as being ill-structured domains. At work, performance is characterised as the capacity to meet a heterogeneous set of work demands. To build expertise, employees require intensive and extensive experience in all those relevant domain-related practices across a high variety of circumstances where they usually are enacted. However, not all workplaces provide access to the range of domain-related practices required to be learnt for effective performance. In this case, employees might be constrained in their development process.

To overcome such limitations, employees have to exercise agency. By taking initiatives, seizing opportunities and taking control over work situations employees are able to take an active approach towards their professional development. Individuals might, for example, craft new learning experiences by deliberately participating in problem situations that are not part of their daily work, by deliberately

changing work routines or by deliberately changing their job descriptions. Other agentic strategies that affect the professional development are proactive information and feedback seeking. Both strategies provide information about work-related activities as well as the individual's current performance with those activities.

Although those activities are deliberate in their core, they can hardly be termed intentional practices in the concept's original meaning. Ericsson (2006b) described deliberate practice as unpleasant, repetitive activities that aim to improve domain-relevant skill sets by concentrating on current performance sets. Empirical evidence about the effect of deliberate practice on expertise research mainly originates from research in well-defined domains. However, as noted, workplaces have to be characterised as complex and ill-defined domains. It is, therefore, not surprising that some studies found that employees do not engage in any kind of deliberate practice and other studies found highly ambivalent results of the effect of deliberate practices on expertise development at work. Hence, further research is required on the effect of deliberate efforts on professional development. However, such research should not use the concept deliberate practice in its original narrow definition. A focus on efforts like experience crafting behaviours or information and feedback-seeking activities seems to be more promising. Rather than being deliberate epistemological practices on the part of the workers, such practice opportunities arise through the very nature of the workplace itself. Instead, using precepts and methods associated with learner initiating deliberate practice may underestimate or entirely miss the kinds of agentic efforts occurring in workplaces.

Although many studies confirmed our propositions about the effect of agentic efforts of employees on their professional development, a stronger empirical foundation has to be built up. We need empirical insights why employees engage in such efforts, what situational and/or individual factors affects the crafting of experiences as well as the information and feedback seeking and what situational and/or individual factors mediate or moderate the effect of agentic efforts on professional development processes. A triangulation approach using a mixture of qualitative and quantitative methods might be best suited for this task.

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