Knowledge, Practice, and Workplace Learning

58

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Contents

Abstract

This chapter examines conceptualizations of the relationship between vocational knowledge and practice and explores implications for workplace learning suggested by contrasting approaches. A distinction is drawn between theories that foreground practice as a site of vocational learning through participation and those which have tended to highlight the acquisition of systematic knowledge as the basis for expertise in occupations. It is suggested that these divergent approaches assume different conceptualizations of practice itself and involve distinctive treatments of issues of vocational knowledge and identity. It is argued that greater attention needs to be paid to the differentiation between specialized and nonspecialized aspects of vocational knowledge, and this provides a basis for differentiating forms of vocational practice in terms of the specialization of underpinning knowledge and through the extent to which that knowledge is acknowledged, recognized, and foregrounded in workplace curricula. This then provides a means for evaluating the potential for learning profitably from aspects of workplace activity and for considering what constitutes full participation in an occupational practice.

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Introduction

Debates around the importance of vocational knowledge in vocational education are often framed around unresolved questions concerning the relationship between theory and practice in vocations. On the one hand it can be argued that the systematic knowledge produced by academic research and represented by academic disciplines is the most reliable and durable form of knowledge (Young 2006; Wheelahan 2010) and therefore must be represented in all forms of education including that which takes place for vocations and in workplaces. Such arguments for the prominence of systematic knowledge also draw on theories of expertise (Winch 2010) that suggest that propositional, inferential, and procedural knowledge are interdependent elements in the constitution of expert practice. This argument is also supported by research into the knowledge requirements of certain occupations, for example, that which examines the needs of occupations in sectors such as engineering, construction, or health, where forms of "applied theoretical knowledge" (Clark and Winch 2004) are seen as indispensable for vocational activity.

On the other hand, it can be argued that forms of systematic disciplinary knowledge are remote from the actuality of vocational practice and largely irrelevant to much of what occurs in workplaces, and therefore vocational education needs to focus to a greater extent on forms of situated know-how attained in the context of practice (i.e., Markauskaite and Goodyear 2014). Studies have shown the considerable potential for learning in workplaces, particularly where certain "environmental" conditions exist (Fuller and Unwin 2004). Furthermore, research examining the relationship between work practices and learning (i.e., Orr 1996; Lave and Wenger 1991; Fuller et al. 2007) demonstrates the potential of occupational practice to generate forms of situated knowledge that are adapted and refined in processes of exchange among bodies of practitioners deeply immersed in their work. The works of Lave and Wenger (1991) and Brown and Duguid (1991) suggest that it is the dynamics of practices that generate requirements for forms of knowledge and knowing which are therefore learnt by practitioners as they participate in the practice. As practice requirements change, thus knowledge requirements change – and therefore change is often seen as stemming as much from the practice itself as from advances in systematic knowledge produced externally to the practice.

This chapter examines the relationship between vocational knowledge and practice and explores the implications for how we think about workplace learning. First some arguments for the centrality of vocational practice for workplace learning are addressed, and some objections are raised to approaches that suggest that all valuable learning can be achieved through practice immersion. These objections relate to how practice is conceptualized in such approaches, the difficulties with sustaining quality

in practice, and the lack of connection to systematic knowledge production which may thus quickly render practice knowledge ephemeral. It is suggested instead that greater attention needs to be paid to the differentiated nature of vocational knowledge, drawing on the arguments of Bernstein, Young, Muller, and Winch, and in particular the relationship between the systematic or "specialized" and the non-systematic or "nonspecialized" forms of knowledge.

This also suggests, following Winch (2010), that greater attention needs to be paid to the relationship between the propositional, inferential, and procedural forms of knowledge, in addition to acquaintance knowledge, when identifying the knowledge base and the curriculum for an occupation, and the development of workplace expertise. Moreover, scrutiny of the differentiated nature of vocational knowledge indicates that greater attention needs to be paid to the sources of this knowledge and the processes of selection, appropriation, and transformation (Bernstein 2000) that they undergo as they move from their original source into a vocational curriculum, whether classroom- or workplace-based. It is suggested that a more acute differentiation of vocational knowledge provides a basis for differentiating forms of vocational practice, as practices can be differentiated in terms of the extent to which they are "purposive" (Rouse 2001, 2007; Hager 2011), the extent by which they are underpinned by a form of specialized knowledge, and by whether they provide the affordances and environmental conditions (Billett 2004; Fuller and Unwin 2004; Winch 2010) that enable the acknowledgment and recognition of those (and other) forms of knowledge in practice. It is argued that this approach has considerable implications for how we evaluate the potential for learning profitably from aspects of vocational activity.

Foregrounding Practice to Understand Vocational Learning

There is a considerable amount of academic literature on learning in occupations that suggest that how we understand practice is central to how we understand vocational learning/workplace learning. The works of Lave and Wenger (1991) on Communities of Practice, Brown and Duguid (1991) on networks of practice, and Argyris and Schön (1996) on learning in organizations served to orientate much research on vocational learning toward the analysis of work practices as sites of learning. It has been argued that practitioners develop the most important aspects of their expertise in workplace contexts and that fluent practice does not rely much on declarative knowledge, including in quite complex specialized expert practices (Dreyfus and Dreyfus 2005). It can be argued that knowledge and learning should be seen as "culturally and socially situated" (Markauskaite and Goodyear 2014, 80) and that expertise should increasingly be understood as co-constructed through collaboration with others (Guile 2010), distributed socio-materially among and within practice contexts (Fenwick 2014), and "relational," involving boundary-crossing and "understandings of the work problem as an object of joint activity" (Edwards 2010, 13).

These arguments suggest that vocational knowledge and learning are best understood through analysis of work practice and that valuable knowledge and

opportunities to learn are in essence constituted through the character of the practice. This line of thought has led to many researchers on workplace learning to conduct detailed practice fieldwork in different occupations in attempts to profile the nature of knowledge and learning in that occupation and to garner insights that have resonance across occupations. For example, the work of Billett (2004) draws on fieldwork on hairdressers and coal mining and Eraut (2004) on studies of teachers, nurses, and midwives among others. While many of these theorists acknowledge a role for formal systematic knowledge, they often foreground workplace contexts as central sites of occupational learning, echoing traditions that have long advocated considering forms of "knowing" in practice (and practical wisdom) as much as "knowledge" as key elements of expertise (Duguid 2005).

However, it is important to note that much research on learning at work, including much of the work discussed above, is often implicitly working with a view of practice that is "regulist" or "regularist" (Rouse 2007) suggesting that practices are defined by the rules or regularities by which they are characterized. This view of practice is often complemented by a focus on phenomena such as "shared embodied know how," "shared practical understandings," and "tacit knowledges and presuppositions" (Schatzki 2001, 11–12) that are said to underpin any given practice and provide its regularity, rules, and character. This view frequently extends to the claim that all forms of human activities that possess rules and some form of regularity can be considered practices, with "domestic tasks," "parenting," and the "practices privileged in educational institutions" (Billett 2004) not categorically different as all have routines and their own characteristic "sayings" and "doings" (Schatzki 2001). Such arguments often also suggest that practices often overlap and influence each other, but each has an "architecture" (Kemmis et al. 2014) that shapes the activities that are appropriate to the practice. To unpack the "architecture" or regularities of a practice is therefore vital to understand its character and the forms of knowledge and learning therein.

In such theories learning is conceptualized as the process of engaging with and becoming part of a practice – all "practitioners" learn in order to become more fully adept and to move from novice to expert (Lave and Wenger 1991) – and this can be as true of the most everyday practices as the more complex and specialized (Nicolini 2013). Learning becomes about socialization into the rules and regularities of the practice and identity formation, "the simultaneous development and performance of a practitioner identity" so that "coordinated activities" can be undertaken more competently in accordance with the rules of the practice (Gherardi and Perotta 2014, 142). Learning as participation is thus seen as a more appropriate metaphor than acquisition (Sfard 1998), with the community or "collective subject" rather than the individual foregrounded as the locus of learning (Gherardi and Perotta 2014, 144).

The focus on practices as sites of learning enables theories to emerge which attempt at general conceptualizations of workplace learning that bridge above the nuances and characteristics of specific vocational practices. In essence the notion of practice *participation* can be said to translate fruitfully across multiple practices – learning as participation can be seen to have some fundamental tenets. Learning in workplaces can

be understood through examining "affordances," "dispositions," and the "workplace curriculum" (Billett 2004, 2006), and therefore there needs to be a focus on "informal learning" and learning from others (Eraut 2004), coupled with a focus on practice induction (Gherardi and Perotta 2014). While some theorists develop frameworks that continue to see an important role for systematic knowledge, often identified as "propositional" or "declarative" and as "formal" and "explicit" (i.e., "codified academic knowledge" (Eraut 2004, 263)), other frameworks of vocational learning imply that there is nothing distinctive about systematic knowledge that might warrant its necessary inclusion in a process of occupational preparation. If cognitive learning at the individual level is displaced by a focus on ideas of legitimate participation, community, and distributed expertise (i.e., Gherardi and Perotta 2014; Markauskaite and Goodyear 2014), then knowledge and learning in formal settings cannot claim to be categorically different from learning processes in organizations or occupational groups. Thus systematically produced propositional knowledge can be drawn on selectively to meet the perceived requirement of the practice, including at the behest of the practitioner. It is drawn upon where relevant to task or problem in hand and then may be discarded when tasks are completed or problems solved.

Systematic knowledge developed in disciplines and by rigorous research practices thus is often seen as *just another* form of knowledge that will be judged alongside other forms of knowledge and understanding in terms of its efficacy or utility in the practice context. It may or may not have something to offer. This view of systematic knowledge can be seen as instrumental, perceiving this knowledge as useful only in terms of what it can do for a practitioner or organization in a specific scenario. An individual proposition or set of propositions may be selected, appropriated, and relocated outside of its original context of production without an ongoing connection with other propositions that provide it with its meaning and allow it to be fully understood (Bernstein 2000; Winch 2010; Hordern 2014). The result is that it may be difficult for a practitioner to make inferences from that proposition as its accompanying propositions have not been seen as worthy of selection because they have no obvious bearing on the context at hand (Winch 2010).

For example, building work is safer if builders are aware of the relationship between types of material and how these materials respond to different forces. If a material is selected specifically because of its ability to withstand a specific force (i.e., compression) but the builder is not conscious of the different natures of tensile forces and how these impact such materials, then a building may collapse (e.g., in an earthquake). Similarly, a plumber with a working understanding of chemistry of metals will be more likely to diagnose whether two metals in close proximity are a potential cause of corrosion and whether environmental conditions may contribute. If she possesses only partial knowledge of the relevant chemistry, there is a greater chance of a misdiagnosis of the problem. Thus propositional knowledge becomes fully meaningful only when understood together within other related propositions, as this allows meaningful inferences to be made from each proposition (Winch 2010) and a more rounded impression of the problem to emerge. The implication is that many vocational occupations require a systematic knowledge base that enables

practitioners to exercise well-founded judgments in the contexts in which they work, as will be discussed further below.

Additionally, as Rouse (2007) points out, if we follow the "regularities" or "regulist" conception of social practices which underpins much writing about workplace learning, there is "no good way" to identify how practice is "maintained across multiple iterations of the practice" (2007, 47), as there is nothing that sustains the practice regularities or rules other than those regularities or rules themselves. Essentially, we are missing an understanding of the basis for the persistence of habitual action, as will be discussed below. This omission may lead to assumptions about learning processes that do not adequately differentiate between the types of knowledge learnt or differentiate between the types of practice (or human action) within which that knowledge is constituted. If knowledge and learning in vocational practices is determined by what practitioners consider makes sense for the routines and regularities that currently characterize that practice, then there is also no necessary relationship with the changing nature of knowledge external to the practice. For example, new developments in scientific research that could potentially transform a work practice can be dismissed as irrelevant if not considered to relate to the existing practice dynamics.

Differentiating Knowledge to Understand Vocational Education

While the ideas discussed above have considerably advanced understandings of learning at work and the variable contexts in which participation in a practice occurs, it can be argued that the role of systematic knowledge is unwisely downplayed or sometimes disregarded completely. The disciplinary knowledge produced in universities or research bodies has been criticized by some for its perceived irrelevance to practice, redundancy, excessive generalization, or inherent bias (i.e., Whitehead 1989; Schon 2001). If all knowledge is situated, the argument goes, how can a researcher in higher education claim a particular value or "power" for her or his knowledge? How can research communities claim a particular authority over knowledge and also therefore over the processes by which that knowledge can be acquired? The argument of some, in response to such questions, is to turn attention to the conditions in which knowledge is produced and made available to future vocational practitioners and to claim that "specialized" forms of knowledge are important for the vocational curriculum (Wheelahan 2010; Gamble 2016; Young and Muller 2014, 2016).

Rather than suggesting that vocational knowledge should emerge directly from vocational practice, Young and Muller (2014) draw on a sociohistorical analysis of the development of knowledge to show how knowledge used in occupations draws on higher education disciplines and that knowledge has increasingly been produced that takes account of the purpose of an occupation or field of practice (i.e., health, engineering). Some forms of knowledge (i.e., the pure disciplines such as physics and chemistry) develop specialized concepts, while other forms (i.e., applied disciplines such as engineering or architecture) develop knowledge that is specialized to a

contextual purpose (i.e., construction of a bridge or design of a building). Over time these two forms of knowledge have interconnected in an "irreversible twist" (Young and Muller 2014, 9) which has led to the applied disciplines drawing on the knowledge produced by, and influencing ongoing work within, the purer disciplines. As part of this, organizations and professional bodies involved in (for example) engineering and health, and their practitioners, have become more conversant with conceptual advances and used these to develop technologies and frameworks that have shaped the development of work. What makes this specialized knowledge reliable, and therefore useful in the ongoing development of technology and work practice, is its connection to certain disciplinary processes of evaluating truth claims which are maintained by academic and professional communities (Young and Muller 2014). Thus advances in engineering rely on the disciplinary processes in the physical sciences and the engineering community – the recontextualization of knowledge between the "pure" and "applied" disciplines – and the adaptation of knowledge to meet the purposes of the occupational practice (i.e., physics for engineers or technicians). This connection back to disciplinary sources, and ultimately to commitments to discovering truths about the world, enables new knowledge to be brought to bear on problems encountered in the occupational practice, but also means that the practice is not static as new knowledge can be fed into technological and process developments, resulting in new learning requirements for practitioners in the field.

Underpinning this argument is an important differentiation between specialized knowledge, as produced in disciplinary communities of a "pure" or "applied" nature, and everyday knowledge, which tends to be "local" and "context dependent" (Bernstein 1999), fluid, and unstructured. Whereas specialized knowledge is characterized by a disciplinary "sociality" that is in some way rule-bound and orientated toward the pursuit of truth and truthfulness, at least in its ideal conception (Young and Muller 2016), everyday knowledge is exhausted in the context of its application while remaining useful for the specific purpose to which it is put. In occupational contexts specialized knowledge might be knowledge relating to health and disease (for a nurse) or construction techniques or chemicals (for a builder or engineer), whereas nonspecialized everyday knowledge might be organizational procedures or "rules of thumb" developed by individual practitioners that may or may not have broader applicability. Indeed, the notion of individual practitioners developing and putting into practice their own solutions to problems may, in certain cases (i.e., in health and engineering), be highly problematic due to heightened levels of risk, whereas in some vocational areas (i.e., in craft or information technology) less problematic. Importantly, knowledge becomes specialized for the occupation when it meets the disciplined requirements of the occupational knowledge base – when it is tested for its validity and reliability and (in many occupations) its successful applicability in a variety of contexts. While everyday forms of knowledge are vital for undertaking many occupational tasks, they are not subject to the requirements of specialized knowledge and are often highly contextual to specific organizations or workplaces – and therefore there must be question marks around their inclusion in the vocational curriculum.

It is important to emphasize that specialized knowledge is not simply propositional (or "know-that" forms of knowledge). As Winch (2010) discusses, expertise is built not only on "know-that" but also on strongly related forms of "know-how" which are often less easy to identify. Individual propositions only make full sense when considered together with related propositions. A practitioner needs to know how to draw inferences from propositions based on an understanding of the relation between these propositions and others. Expertise in any domain is therefore reliant on inferential capabilities and understandings of the relations between propositions which are husbanded by disciplinary communities, including in applied disciplines. Strongly associated with the inferential dimension is knowledge of how to use procedures for judging new claims to knowledge. This procedural capability enables experts to assess whether a new proposition has bearing on the existing knowledge base and whether it meets standards of rigor appropriate to the discipline. Both the inferential and procedural capabilities can be seen as significant for vocational practitioners, who need to be able to understand how an aspect of vocational knowledge relevant to their practice relates to their knowledge and to be able to evaluate new ideas or techniques which may be introduced to them by a variety of sources.

However, none of this means that specialized knowledge can be used unproblematically in the vocational curriculum. A requirement to prepare practitioners for work in an occupation is distinctly different from a curriculum that prepares for further study – a vocational curriculum has to have some relation to the circumstances of the occupation and the work encountered (Muller 2009; Billett 2006) – and this may vary in terms of the extent of certainty and risk involved (Gamble 2016), but also in terms of the level of discretion and control that employees enjoy over their practice. Knowledge thus needs to be "selected, appropriated and transformed" (recontextualized) in accordance with the problems (Barnett 2006) and "supervening purpose" (Muller 2009, 213) of the occupation. However, those problems and that purpose are often subject to ongoing debates between various stakeholders (i.e., practitioners, professional associations, employers, education institutions, government) around definitions as to what aspects of work and task are "in scope" for the occupation, leading to different views as to what knowledge should form the basis of the curriculum. What Evans et al. (2010) call "content recontextualization" is therefore often a fraught process, with multiple actors engaged. Some may call for a curriculum based solely around current workplace practice, while others may see value in a more formal institutional period of preparation.

In professions as diverse as human resource management and chartered surveying, there have been debates around whether accreditation processes are responsive to employer and practice requirements (Cook and Chatterjee 2015; Gilmore and Williams 2007; Hordern 2014). While chartered surveying has decided to reinvigorate its connections with higher education institutions, HRM has opened up new work-based routes to qualification (Hordern 2014). Gamble (2012) notes how knowledge requirements brought about by technological change are increasing the need for formal educational involvement in intermediate-level apprenticeship programs in technical fields. However, even if forms of specialized knowledge are

valued, the process of recontextualization may result in individual propositions becoming more isolated from other propositions that provide greater meaning and from procedures that enable the evaluation of new claims to knowledge. The vocational curriculum cannot be excessively reliant on knowledge as produced by "pure" disciplines, as this is too remote from the concerns of practice. Therefore it seems a new knowledge base appropriate to the occupation must be worked through, transforming purer forms of knowledge so they relate to the practice context, so that there is a degree of coherence to the curriculum, and for most vocational occupations this will involve a degree of coherence both to the conceptual structure of a disciplinary body of knowledge and to the contexts in which practitioners work (Muller 2009; Barnett 2006).

The claims of Winch (2010) on propositional knowledge also suggest that vocational knowledge and expertise requires a form of curriculum that pays particular attention to sequencing, as new knowledge can only be properly understood in the light of knowledge previously acquired – propositions only make sense in the light of other propositions. Therefore curriculum designers need to pay special attention to how propositions are sequenced so that novice practitioners can make full sense of new ideas introduced to them. If the sequence is jumbled or confused, then practitioners will not gain from the process (Muller 2009; Gamble 2014). The structure of the knowledge base matters enormously for curriculum design in vocational fields and has implications for how the workplace aspects of vocational curricula are organized.

From Differentiating Knowledge to Differentiating Practice

However, conceptual work that has asserted the importance of differentiating knowledge has not often extended this differentiation into the actuality of vocational practice. Young and Muller (2014) draw a distinction between the work of Schon (2001) on reflective practice and that of Bernstein (and also therefore their work). They discuss Schon's "epistemology of practice," which suggests that practitioners' knowledge is comprised of a "store of experience" consisting of "certain types of situations and examples" (Young and Muller 2014, 12) which practitioners can draw upon analogically to handle real-world problems as they experience them. Using Bernstein they observe that the work of Schon neglects the use of disciplinary specialized knowledge that has bearing on practice and is limited in how it relates practice to knowledge production. Bernstein's (2000) work is seen as offering the opportunity to develop a deeper understanding of the relationship between the production of knowledge (in pure and applied forms), occupational curricula, and "fields of practice" (Young and Muller 2014). Young and Muller (2014) point to the risk of collapsing distinctions between knowledge types and the practices associated with them that is inherent in Schon's work, as Schon's work posits a generic experienced-based model of reflection that transcends the specialized character of an occupational practice, as defined by its knowledge base. Effectively the disciplined nature of specialized knowledge is downgraded and its specialized character left unacknowledged – considered less significant

than that which is interpreted through experience. For Young and Muller (2014), this amounts to overlooking the distinctive propositional, inferential, and procedural aspects of expertise (following Winch 2010) and instead mistakenly elevates undifferentiated knowledge by acquaintance as the primary source of occupational knowledge (see also Hordern 2016).

However, the argument for specialized vocational knowledge implies that certain forms of (specialized) practice are concomitant with that knowledge. Specialized knowledge forms are products of particular forms of sociality or disciplinary community (Young and Muller 2016; Muller 2009). While the practices of academic and some professional communities are relatively bounded and specialized, undertaken by academics or professionals with defined identities and disciplinary guidelines around what is appropriate practice (Muller 2009), the practices and identities of saleswomen or a photocopy technicians are more fluid and flexible, influenced and shaped by other practices and encounters (i.e., see Orr 1996). Academic physicists and historians, along with doctors or engineers, are working extensively and perhaps exclusively with specialized forms of knowledge in their practice or at least interpreting events and claims in specialized terms that might appear opaque to the layman (Shalem 2014; Hordern 2016). In essence, highly specialized occupations and their practitioners are constantly in the business of seeing in sacred terms that which might be considered profane by others (Gamble 2014) and developing diagnostic frameworks in order to manage problems encountered in the occupation (Shalem 2014). On the other hand, in some occupations very little specialized knowledge is needed, although it could be argued that if more was used that might enhance the practice. Much vocational practice is however somewhere in between the highly specialized and the unskilled, characterized by an admixture of specialized and nonspecialized knowledge forms in order to complete tasks and activities (Muller 2009; Gamble 2016).

But how can these differences in occupational practice be understood? Rouse (2007) contrasts the view of practices as habitual or rules-based activities with a "normative" conception that suggests human activities are only practices if they can hold together purposefully due to something being "at stake" (Rouse 2007, 50) in the conduct of the practice. This view of practice suggests that a practice is held together by "interactions among its constitutive performances that express their mutual accountability" (Rouse 2007, 48). Participants engage in the practice through mutual interest – the pursuit of the issues at stake in the practice is meaningful to them – and therefore they stay involved. Hager's (2011) refurbished account of MacIntyre's (2007) conception of practices similarly highlights "purposiveness" and contributions to wider society (though a "balance of internal and external goods" (Hager 2011, 554) as important characteristics of certain types of practices (e.g., occupational practices). Actors and their actions are bonded together in the meaningful pursuit of some objective in such practices or because of a sense of duty or perceived obligation to the practice and the community of practitioners (Young and Muller 2014).

Such strongly purposive practices tend to have achieved a certain level of societal recognition and some autonomy in developing a license to practice, underpinned by forms of knowledge specialized to the practice purpose and its contexts (Young and Muller 2014). Indeed, this category may cover to a greater or lesser extent

professional groups and other skilled occupations, including many that would be considered established vocational occupations (i.e., building trades, emergency services, etc.). Furthermore, it also seems reasonable to suggest that those occupations that involve complex tasks over which practitioner have considerable discretion are likely to require more specialized knowledge in use than other occupations. Nevertheless, some occupations have limited direct use of such knowledge and a greater reliance on everyday forms of knowledge such as organizational routines, procedures, and locally developed ways of undertaking the work involved (Muller 2009; Fuller et al. 2007). In essence, in some occupations there is more clearly something "at stake" over which the practitioner has some control than in other occupations.

In this alternative normative definition of practice knowledge and learning processes become qualitatively different in different types of work. In other words, what it means to know and learn within a purposeful occupational practice where a practitioner has some discretion over their work activity is distinctly different from what it means to know and learn in "everyday" contexts. However, when we consider the learning processes for practitioners in actual workplace contexts, a further set of dimensions come into play. For example, the expansive or restrictive characteristics of learning environments (Fuller and Unwin 2004) have considerable bearing on the potential for specialized forms of knowledge to be encountered and expertise developed. Equally, the existence of affordances within workplaces that provide opportunities to encounter knowledge and recontextualize it for specific contexts is shaped by power dynamics in organizations and workplaces (Billett 2006; Hordern 2014). Specialized forms of knowledge may or may not be recognized and acknowledged through pedagogical processes in workplaces – with more experienced practitioners drawing novice practitioners' attention to opportunities for the development of expertise. In some workplace environments, such opportunities to learn specialized knowledge may be (i) unavailable because of local workplace or organizational factors and/or (ii) considered unnecessary because of the assumptions of managers, occupations, or local supervisors (Eraut and Hirsh 2007). Other workplace environments may go to considerable lengths to structure workplace curricula so that new practitioners have opportunities to learn requisite forms of specialized knowledge in a structured manner, ensuring that workplace experiences relate to the knowledge encountered and offering time away from work for practitioners to organize and make sense of the learning they have undertaken. Thus the workplace curriculum, and associated workplace pedagogy, may differ not only by the occupation but also by the workplace.

Concluding Remarks: Implications for Workplace Learning

So what are the implications of the above argument for how we think about workplace learning for vocational practice? Work can be seen to be strongly influenced by the extent to which the vocational practice makes use of forms of specialized knowledge, by the extent to which the differentiated nature of knowledge is acknowledged and recognized in that practice, and by the workplace curriculum and pedagogy that results. Without a recognition and acknowledgment of the

differentiated nature of knowledge, novice practitioners can be misled about the value of ideas, techniques, and practices introduced to them. The time-limited, ephemeral, or organizationally/occupationally specific nature of certain types of knowledge can be obscured without such recognition. Valuable forms of workplace learning can therefore thrive if we maintain a focus on the conditions in workplaces for valuing specialized forms of knowledge – and this needs to stem and be reinforced at an occupational practice level (i.e., through the institutional conditions that shape the purpose and character of the occupation).

Workplace learning in vocational practices that rely on forms of specialized knowledge is thus as much about acquisition as participation (Sfard 1998), and it is important to maintain a balance between the two. The notion that socialization and "induction" into a practice is a learning activity is important (as Gherardi and Perotta (2014) emphasize), but this should not neglect the importance of encounters with specialized knowledge and the acquisition of individual expertise. This learning inevitably takes place through participation, but participation needs to be understood as involving not just activities within workplaces and organizations but participation in the occupational sense – drawing on resources and expertise that are offered by the occupation and by experienced practitioners. This in turn suggests an important role for bodies and associations that represent practitioners and the standards of excellence considered important by the occupations in providing resources and support for practitioners in development and for connections between these bodies and educational institutions and academic communities involved in producing specialized knowledge and recontextualizing it for occupational education (Hordern 2017).

For full participation in an occupation, it is not however enough just to "learn effectively" in a given organizational or occupational context, in the sense of simply acquiring knowledge and becoming socialized into workplace practice. Participation in occupational practice also requires some sense of commitment to the quality of the practice, to its "internal goods" (MacIntyre 2007), to "supervening purpose" (Muller 2009), and to whatever is "at stake" (Rouse 2007). A degree of commitment to whatever is driving the practice suggests that learning is about voluntarily making a commitment to improve practice in the light of new claims to knowledge that will improve service to clients, customers, or the general public. It also entails a form of participation in the politics of the practice, to engage in internal debates and to feel as sense of responsibility for the vocation and for the quality of work undertaken. When such commitment is generated and sustained, opportunities to learn are not only made available but fully explored, to the benefit of individual practitioners, the occupation, and wider society.

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