

Chapter 2

Learning Through Practice Across Human History

Abstract This chapter uses historical and anthropological sources to account for how the learning of occupations has occurred across human history before and outside of schooled societies and educational institutions. It provides accounts from Mesopotamia, Hellenic Greece, Early Imperial China and other countries and eras in an attempt to identify and describe the processes that supported the learning of occupations across human history. In particular, the process of teaching appears largely to be a product of modernity and, in particular, a consequence of the formation of modern nation states and the requirements of industrialisation and the advent of mass schooling (i.e., education). Up until that point, the development of occupational competence was centred very much upon the learning rather than the teaching process. This chapter offers the beginnings of a framework and set of bases through which a comprehensive account of learning through practice can progress.

Keywords Learning through practice • Learning for occupations • Historical accounts of learning occupations • Anthropological accounts of learning occupations • Education and modernity • Schooled societies and schooling

Whatever the origins of the didactic mode, it has always been a minor mode of knowledge acquisition in our evolutionary history. In the West, however, the didactic mode of teaching and learning has come to prevail in our schools to such an extent that it is often taken for granted as the most natural, as well as the most efficacious and efficient, way of going about teaching and learning. This view is held despite the many instances in our own culture of learning through observation and imitation (Jordan 1989, p. 932).

2.1 Learning Occupational Practice Across Human History

This chapter sets out an account of learning occupations across human history and proposes that it stands as fundamentally a process of active learning on the part of those who are positioned and position themselves as learners. That is not

something that is taught. Certainly, learning in the circumstances of practice stands as the commonest and most enduring means by which occupational capacities have been learnt across human history (Billett 2011a). Yet, from a contemporary perspective, it is often assumed that most learning for occupations arises through teacherly-like processes in practice or educational settings. Even contemporary accounts of apprenticeships emphasise direct guidance of apprentices by more experienced trades workers. However, this is not the case historically as the conception of apprenticeship associated being taught is fairly recent (Webb 1999). Therefore, in proposing a case for learning through work and the role of mimetic learning processes, it is necessary to consider what has occurred across human history and outside of circumstances where teaching occurs. In particular, the means by which demanding, intricate and complex occupational knowledge that has served humanity well gets learnt is important to elaborate. This requires drawing upon historical studies to identify how learning of occupational practices occurred before it became the focus of programs in educational institutions. Importantly, beyond identifying what occurred earlier, it is also necessary to appraise whether the ways in which learning arose in earlier societies are appropriate for the kinds and complexities of knowledge required for contemporary purposes. Again, it is important to not view this account as offering an ideal or non-problematic approach to how human learning of occupations progress. It seeks to be explanatory in order for an evaluation of its characteristics and qualities can be used to consider the ways it is engaged in contemporary work situations and how it might be supported and sustained to meet the requirements of contemporary work.

It follows, therefore, that the concern of this chapter is to offer an account of how learning for occupations has arisen and been enacted historically. That is through work and within the settings where work is undertaken in order to inform how to organise, promote and evaluate this learning in contemporary times. This task includes taking account of the particular complexes of cultural, societal and situational factors that shape the purposes and character of this learning. Yet, in advancing this account, it is also necessary to avoid the constraints of the discourse of schooling and orthodoxies of schooled societies, as these distort considerations of learning through practice on its own terms. A key distinction here, as foreshadowed in Chap. 1, is the emphasis on individuals' processes of learning and how these are promoted in the circumstances of practice, rather than on teaching or instruction, which are often privileged in the discourse of schooling and schooled societies. Such a distinction runs deep and has consequences for both understanding about and efforts to promote and improve learning through practice.

In advancing this account, this chapter commences by outlining some contributions to human progress that are realised through learning in the circumstances of practice. Then, some distinct premises and practices for work and its learning are briefly outlined by comparing European and Sino traditions. Drawing on a review of literature, largely from anthropological, historical and sociological sources, the bases for an understanding of the foundational elements of learning through practice are then delineated and these are advanced in the following chapter.

2.2 Learning Through Practice

Humans have lived in settled communities for up to 10 000 years and in cities for 5 000 years. Across that time, the scope and complexity of occupations serving the needs of humans, their communities, societies and cultures have grown, as the demands and complexities of the knowledge required for work. Yet, over the vast majority of that time, the development and learning of these occupations has occurred in the circumstances of their practice (i.e., places of work) (Billett 2011a). That is, not only have innovations associated with establishing and advancing those occupations largely occurred through practice (Epstein 2005), but also all of their learning. Only for the last, and relatively, few generations of ‘schooled societies’ has the preparation for many occupations come to be undertaken in hybrid educational institutions and programs. Before then, across a wide range of countries, cultures and continents, the circumstances of practice were also the places where the vast majority of people learnt their occupations and the vast majority of occupations were learnt about. Yet, despite its longstanding contributions to advancing societal and personal needs, a detailed comprehensive account of this process of learning through practice remains incomplete. Advancing such an account necessitates identifying and elaborating factors that inform it on its own terms, not those of educational institutions and their discourses, which it pre-dates. Perhaps the majority of humans now live in ‘schooled societies’ (i.e., those in which schooling is comprehensive and ubiquitous) where educational institutions are legitimised, and their discourse, precepts and practices are pervasive and often taken for granted. As foreshadowed in the previous chapter, the educational discourse is often limited in its explanatory reach. It privileges particular accounts of learning and knowing, and overly emphasises declarative forms of knowing (i.e. those that can be stated and written down) and the didactic or teacherly transmission of knowledge.

However, importantly, the discussion here is not anti-schooling or against educational institutions and the vital contributions that “schools” and “schooling processes” make to individuals’ learning and development and societal progress. Instead, other premises are emphasised here. That is, much worthwhile and adaptable learning occurs outside of those institutions and programs. As proposed in Chap. 1, there is no separation amongst doing, learning and the remaking of (occupational) practice. When humans engage in intentional goal-directed activities, such as those at work, the legacies are twofold: (a) changes within individuals (i.e., learning), and (b) contributions to the ongoing remaking and transformation of cultural practices that comprise occupations. As individuals engage in activities shaped by particular circumstances and points in time they are both learning through these experiences and contributing incrementally to the evolution of occupational practices, albeit enacted in particular circumstances of practice (Billett et al. 2005). Prior to the advent of schooled societies and mass schooling, this form of learning through and remaking of occupational practice was almost solely responsible for ensuring much of human progress and continuity (Billett 2010).

Across human history, innovation and development (Epstein 2005) constantly arose within and through practice, and not in hybrid institutions such as those that predominate today. Moreover, individuals' learning of those occupations was largely through practice-based experiences. As noted, even now, within schooled societies, learning in workplaces is central to individuals' employability, including sustaining it across lengthening working lives through realizing personal learning and innovations within their work. Tertiary education provisions preparing graduates for specific occupations across countries with advanced industrial economies routinely and increasingly are providing practice-based experiences (Organisation for Economic Co-operation and Development 2010). Given these contributions to meeting human needs, a comprehensive account of the processes of learning through practice across human history is now warranted, so they can be understood and used effectively in contemporary times for the initial and ongoing development of workers' occupational capacities.

2.3 Historical and Cultural Perspectives

As noted, across human history learning and, seemingly, consistently across continents, regions, and cultures, learning through practice has been the most common and central means for developing the occupational capacities that have been essential for the existence and progress of societies and communities (Billett 2010). Moreover, there appear strong similarities in how this learning occurred across Europe, Asia and, likely, elsewhere. Family or local workplaces stand as the commonest site for that learning in Europe, Scandinavia, and Asia. For instance, when referring to learning to make pottery in India (Menon and Varma 2010), Japan (Singleton 1989) or China (Barbieri-Low 2007; Ebrey 1996; Ledderose 2000), localised family and community settings were the common sites of this learning and much of the processes of learning appear to be consonant. In Europe, this mode of occupational preparation that had lasted a millennium and prepared skilled workers across a range of European countries was largely destroyed by industrialisation (Greinert 2002). This change in the mode of work saw family and small community businesses being displaced by factories as sites of production and the reorganisation of that production which often broke occupations into small units of work (Kincheloe 1995) thereby having deleterious effects upon the standing, completeness and learning of entire occupations.

Moreover, as elaborated below, within the circumstances of practice in these family (Bunn 1999) and small community businesses (Greinert 2002), the majority of that learning appears to be based on active learning by novices, which are labelled here as mimesis, that is, processes of observation and imitation, then practice (i.e., rehearsal). So, across this time, it seems the process of learning occupations was largely premised upon novices' active learning, rather than their being taught. Indeed, the act of teaching seems to have arisen in modernity. So, it was a learner-initiated, directed and enacted process of skill development in the

circumstances of practice, rather than one based on didactic or taught processes that often characterise how learning is promoted through educational institutions and their programs.

Early accounts from diverse cultures offer tentative insights for understanding this process of learning. In ancient Mesopotamia, the Talmud (i.e., Jewish book of law) suggested to family members that “as it is your duty to teach your son the law, teach him a trade”. The tradition was for the son to go to the rabbi’s school in the morning, and in the afternoon learn his father’s trade (Bennett 1938, p. 3). In Hellenic Greece, Plato noted that:

The son learned his trade by growing up in his father’s family and participating in the family activities, imitating what he saw his father doing. At first, the imitation would be playful and childish, carried out with such toy tools as a child could handle. Later, it would become more deliberately purposive. Practice produced technical proficiency in details and the growing boy would act first as his father’s ‘helper’, then as his associate, and would eventually himself become the head of a family, and the centre from which further training in the family craft would radiate (Lodge 1947, p. 18).

In ancient India, similar practices occurred with pottery production (Menon and Varma 2010). Here, tiny and rough pottery artefacts have been found by archaeologists in locations where pottery was manufactured, leading to conclusions that they were fashioned by potters’ children, in ways analogous to those Plato described as occurring in Hellenic Greece.

Yet, these accounts also point to the foundations of a practice curriculum and pedagogic strategies associated with practice settings. Why, for instance, did the boy go to the rabbi’s school in the morning and work with his father in the afternoon? Presumably, the sequencing of experiences was seen to be most suited to these students’ learning. Moreover, Plato’s account provides a detailed description of the pathway (i.e., curriculum) along which children would progress in their activities and their learning and advance towards becoming a skilled practitioner (Lodge 1947). The pedagogic devices included access to making small artefacts and activities that cost little in terms of materials and progressively developed the capacities required for effective practice. Hence, the evidence from Hellenic Greece and ancient India points to children engaging in activities in ways described more recently as comprising increasingly mature approximations of modelled tasks (Gott 1989). That is, learners engaged in tasks that, progressively, provided opportunities to shape, approximate, refine and hone capacities to complete the modelled tasks, and along a pathway referred to by Lave (1990) as the learning curriculum. These tasks and that pathway were made available because the learners engaged or were immersed in the circumstances in which this work was being undertaken, most likely in small family-owned businesses, and through engagement in communities where these activities were undertaken. For instance, mediaeval cities up until industrialisation often used to concentrate particular occupations in particular districts or streets. Just as today a visit to London will reveal streets full of tailors (Saville Row) or doctors (e.g. Harley Street), these were common arrangements across many European cities. The same thing can be seen today in a city such as Hanoi which has streets dedicated to particular kinds of goods and services.

Yet it is not only customers who congregate in these districts but also those who work and learn there. For novices, all around are models of what is to be achieved, discussions, objects and artefacts associated with a particular occupational practice; many of these novices were either family members or lived with those to whom they were apprenticed. In essence, in these situations the learners were immersed in the same kind of culture of practice that Lave (1990) identified in Angola and other anthropologists identified in other countries.

Further, and coming back to Hellenic Greece, the role of personal epistemologies arising from individuals' experience is also evident in Plato's account of physicians' training, including the personal experiencing of the goals and capacities required for this occupation.

The best physicians are those who have treated the greatest number of constitutions good and bad. From youth up they have combined with the knowledge of their art the greatest experience of disease. It is better for them not to be robust of health themselves, but to have had all manner of diseases in their own persons. For it is not with the body, but with the mind, that they cure the body. And, thus they infer further bodily diseases of others from the knowledge of what has taken place in their own bodies (Lodge 1947, pp. 42–43).

What is evident in Plato's account is the importance of personal epistemologies. That is, the ways in which individuals come to know and engage with their occupational practice. It also emphasises the salience of the ways in which those who are learning come to construe and construct their knowledge. That is, there is a need for purposeful engagement. These early accounts emphasise the sequencing of experiences (i.e., practice curriculum), how those practices were purposefully directed towards enriching the learning (i.e., practice pedagogies) and the importance of learners' personal epistemologies in construing and constructing (i.e., learning) from what has been experienced and how these will shape the need for continuing learning. These bases are helpful in establishing premises for an account of learning through practice, understanding how support for that learning is afforded in the circumstances of practice, as elaborated in Chap. 4. However, it is also helpful to discuss the nature of the occupational tasks to be learnt and how cultural and societal factors shape how this work and learning is and needs to be valued and organised. The following section compares how concepts of occupational practice and their engagement were enacted in Hellenic Greece and in the Early Imperial China to make this point.

2.4 Societal Shaping of Occupations: Two Cases

Many Western traditions and precepts about work and education for work emanate from Hellenic Greece and its key philosophers (Billett 2011b). In a highly socially-segmented and gendered society owing its existence to slavery, it is hardly surprising that occupations were categorised hierarchically, as were the means of learning about them. Plato distinguished among three kinds of work: artisans, artists and professions. Firstly, artisans engaged in activities such as building, carpentry, pottery, and weaving that led to the creation of tangible products or services. Artists comprise

musicians, painters, poets and those who produced things which were concrete and also aesthetic. Then, there were the professions, such as those associated with medical, legal, theological and military activities. Yet for Plato, “artisans’ and artists’ work belonged to that side of life which the average free born Greek citizen regarded as ‘banausic’ and unworthy of his serious attention ...” (Lodge 1947, p. 15). These forms of employment were not deemed to be worthy of the efforts of free-born Greek males. Similarly, Aristotle proposed that: “The citizens must not lead the life of mechanics or tradesmen, which is ignoble and far from conducive of virtue” (cited in Elias 1995, p. 167). It follows that Plato considered the lowest level of education was for those who worked with their hands and not with their minds (Lodge 1947), categorised as technical from the Greek *techne*—to make. So, there are distinct cultural and societal values shaping the kinds of work undertaken, their worth and conduct, and arrangements for their learning. A limited number of professions (e.g., medicine, law, military, and philosophy) were to be prepared for through a university education. Certainly, there would be no such provisions for occupations (i.e., artists and artisans) that were not deemed worthwhile by elites ruling that country.

It is instructive to compare the kinds of values above with those within Early Imperial China (Barbieri-Low 2007). Whilst there were commonalities in the standing of occupations across these cultures, the form and character of skilled work and its origins differ. Certainly, the demands and requirements for high-level skills and those deployed in generating massive numbers of products occurred earlier in China than elsewhere. To make that comparison, when the Domesday book was published in 1086 AD, it estimated Britain’s population to be between 1.75 and 2 million. Yet, contemporaneously China’s population is estimated to have been 80–100 million (Ebrey 1996). It comprised a highly organised society with many major cities with large populations many of which had piped water, sewerage and street lighting. By that time, China was already a complex and mass society requiring commensurate amounts and quality of goods, buildings and services, in ways which seem wholly novel for that time. To illustrate this demand, in 1085, the Song government’s mint is estimated to have produced over 6 billion coins a year (Ebrey 1996). These coins were produced through three different means of production (Ledderose 2000), each requiring high levels of work organisation and skilled workers, and also in procuring and preparing resources for producing and then distributing these coins across the Empire. Such was the demand for these coins, that by 1114 AD they began printing paper money and, by doing so were able to close 50 copper mines. So, the size of population and demands of society meant the requirements for mass production of artefacts and goods arose far earlier in China than elsewhere.

Because of this demand, a modular approach was adopted for the manufacture of artefacts, manufacture of building materials and the construction of buildings (Ledderose 2000) that was commensurate with the requirements for mass manufacture. This approach developed over time and even extended to writing. Indeed, between the Shang (1600 BC) and Qing (220 BC) dynasties there was movement from craft to industrial production. The Shang dynasty is best known for the production of large bronze urns, the Zhou dynasty (1050–250 BC) for the production of knives, the Tang Dynasty (618–906 AD) for its intricate pottery work, with its

layers of glazes, and the Qing dynasty (221–206 BC) for the mass production of coins, roof tiles, drainage pipes and crossbow triggers, all indicative of this development. During the Qing dynasty, the so-called terracotta army was manufactured to accompany and protect the first Emperor in the “after-life”. Analyses of clay from the warriors so far uncovered reveal high levels of consistency in its composition across the cohort. Moreover, each warrior is unique in some way and great differences are evident across the entire cohort of warriors so far uncovered. Yet, only eight different moulds were probably used to make them (Ebrey 1996). Each of these warriors was manufactured by a team of workers, possibly contracted from nearby villages and whose activities were overseen by a supervisor, whose initials were marked on each warrior. Much of the work was undertaken by potters who had previously made water pipes for the imperial capital (Ledderose 2000), which was nearby the location for this mausoleum. Their skills were adapted to produce the cohorts of warriors. There were a range of skills associated with forming the warriors uniquely, then glazing and painting them in unique ways which were exercised through the production of this significant warrior cohort (Portal 2007).

A later account of this kind of production work is available from the Jingdezhen Kilns in the Ming dynasty (1368–1644). This city was famous for its white porcelain which was created in massive sets for the imperial palace (Kerr 2004). In 1577, for instance, the order for the Imperial Palace comprised 96,500 small pieces, 56,000 large ones and 21,600 items for sacrificial ceremonies (Ebrey 1996). These items had to be uniform in design and appearance and produced to a very high standard of finish. There are few accounts of how this work was conducted and learnt. However, a French missionary, visiting the kilns in the 18th century, reported watching a cup pass through more than a dozen hands, one worker giving it an initial shaping on the wheel in a matter of seconds, another setting it on a base, another pressing it into a mould to make sure its size was uniform, another polishing it with a chisel, and so on (Ebrey 1996). The missionary reported that as many as 70 people were involved in the production of a single item. In 1743, Tang Ying described the division of labour employed in the decoration of a large set of dishes such as those referred to above in the following way:

If the painted decoration on each piece is not exactly alike, the set will be spoiled. For this reason the man who sketched the line will learn sketching, but not painting; those who painted, study only painting, no sketching; by this means the hands acquire skills in their own speciality and their minds are not distracted. In order to secure a certain uniformity in their work, the sketches and painters, although kept distinct occupy the same house (Ebrey 1996, p. 217).

From a contemporary Western perspective, this kind of work might be described (and dismissed by many) as being mere production work. However, a more considered account suggests that these highly skilled practices arose from a need for manufacturing large number of intricate artefacts requiring high levels of uniformity. Yet, this work was highly skilled and relied on the techniques and capacities (i.e., skilfulness) of those who performed those tasks. So, the processes and concepts of skilled work being exercised in these accounts are probably more consonant with what occurs currently in manufacturing aircraft and quality automobiles, than the work undertaken by trade workers in Western countries. In this way, the conception

of Chinese craft workers seems distinct from European traditions. That is, they were less the independent artisan and more the artisan as having specific skills and capacities, and working in a team to generate these artefacts. This is perhaps not surprising given the European trades workers likely worked in communities with small populations and with little requirement to mass manufacture artefacts in those eras. Instead, they created individual products and entire artefacts. Indeed, the requirements for mass manufacture did much to destroy craft work in European countries (Greinert 2002; Kincheloe 1995). The point here is that the kinds of circumstances in which work is undertaken and its purposes shape the mode of production and also what constitutes skilled work, and its ordering and development.

There are similarities, and also distinctions, in the valuing of skilled work in Imperial China and Hellenic Greece, which is not surprising. Both were intensely hierarchical societies, with elites who would never engage in these kinds of work. Yet, in Imperial China merit was valued and articulation through class was possible based on it, in ways unimaginable in Hellenic Greece. Also, manual skills, such as calligraphy, were a competency required for the merit-based public examination used for access to employment and promotion in the public service. The valuing of skilled work also seems to be sufficient to warrant a questioning of the kinds of knowledge privileged by elites: declarative kinds. The Daoist philosopher Zhuangzi (369–286 BC) used a parable of a wheelwright talking to a learned general to describe the power of personal knowledge over what is found in books.

I see things in terms of my own work. When I chisel at a wheel, if I go slow, the chisel slides and does not stay put; if I hurry, it jams and doesn't move properly. When it is neither too slow nor too fast, I can feel it in my hand and respond to it from my heart. My mouth cannot describe it in words, but there is something there. I cannot teach it to my son, and my son cannot learn it from me. So, I have gone on for seventy years, growing old chiselling wheels. The men of old died in possession of what they could not transmit. So it follows that what you are reading are their dregs (cited in Ebrey 1996, p. 49).

This parable says much about the importance of skilful techniques and the embodied knowing of skilled workers. It also provides an early questioning of the power of declarative or discursive knowledge that is privileged in contemporary educational discourses. Instead, emphasised here is the importance of forms of knowledge and ways of knowing such as those exercised through kinds of haptic and sensory capacities not acknowledged or promoted in discourses of schooling, with its emphasis on declarative forms of knowledge and knowing. Yet, it is these capacities that are central to effective performance in occupational practices. Importantly, most of these kinds of capacities are not easily taught didactically: they have to be learnt.

2.4.1 Explaining Learning Through Practice

But if it was not taught, how was this knowledge and ways of knowing learnt through practice? Sources dating back to Early Imperial China provide highly detailed descriptions of the bureaucratic ordering of work and workers

including who is allowed to produce what where and how it can be traded (Kerr 2004). Yet, despite all of these detailed records there is seemingly no accounts of how these skilled workers developed their occupational capacities. Indeed, few written accounts of the processes of skill development appear to exist in pre-modern societies. Perhaps these processes were not of interest to those who were able to write.¹ Consequently, apart from the accounts referred to above, to date, few others have been identified reporting the processes of learning and support for the learning. An archaeologist specialising in excavating ancient kilns² advised that rhymes and mnemonics may have been used within communities such as those producing pottery and porcelain. But, beyond that, little else is known.

However, there may also be a very plausible explanation. That is, this learning occurred as part of individuals' everyday engagement in their work activities. As such, it was not the subject of any teaching or direct guidance or specialised training facilities and resources as we might expect today. Instead, it was an outcome of novices' engaging in work, possibly within family or community and where these workers had the responsibility to learn their occupation through their work, rather than being taught by somebody. Indeed, it is imputed that much of this learning arose through active processes of observation and imitation (i.e., mimesis), opportunities to practise and, occasionally, direct guidance of more informed co-workers. Most of the evidence of direct guidance by more expert workers refers to instances in which it was necessary to model or demonstrate something that could not be easily learnt through observation and imitation. For instance, Gowlland (2012) refers to the practice of more expert partners verbalising the processes that they are engaged in completing so that novices can understand. Moreover, there are also instances of experts placing the hands upon those of novices, when trying to assist them understand the feel for fashioning pots on a potter's wheel (Singleton 1989). So, it is not as though there was no direct guidance, although evidence of teaching seems to be absent. That kind of guidance appears reserved for circumstances and tasks which were unlikely to be learnt through observation and imitation alone, rather than being a standard form of support for learning by more experienced co-workers.

These conclusions arise from a review of historical and anthropological literature (Billett 2011a) identifying learning practices for occupations across a range of cultures and countries from which can be imputed how these occupations were learnt over time. These accounts provide instances of how intentional learning activities occurred outside of educational programs and institutions.

¹ This comment was made by the librarian at the Joseph Needham Centre at the University of Cambridge, John P.C. Moffett.

² Prof Nigel Wood from the University of Oxford.

In preview, what this review suggests is that learning through practice circumstances arose through:

- (i) participating in a particular occupational practice;
- (ii) the actions of learners, rather than direct guidance of more experienced workers;
- (iii) learning processes, therefore residing with learners, whose responsibility it was to learn;
- (iv) processes where direct guidance and teaching was a rarity;
- (v) more experienced workers' role being the source for goals for learning, and of modelling of procedures and values;
- (vi) there being a pathway of experiences for novices to progress along determined by the requirements of the practice;
- (vii) progression along this pathway being determined by learners demonstrating their developing competence and ability to move onto the next task;
- (viii) experienced workers occasionally providing direct guidance or hands-on assistance; and
- (ix) pedagogic support in the form of artefacts, such as half-completed tasks, observing others, being able to engage in practice rather than being directly assisted by a skilled worker.

It seems that there were pathways of experiences that novices had to progress along, but that progression was largely determined by demonstrating their growing capacities and competence in their occupational capacities until it met more skilled workers' expectations. Moreover, the kind of pedagogic support that is engaged with through an active process of learning, rather than being taught. Central to all of this progression is, therefore, novice workers' active engagement in processes of the construal and construction of what they observe and securing opportunities to engage in practice, with a central role here comprising their processes of mimesis or mimetic learning.

In sum, before the "eras of schooling", which largely arose in late modernity as part of the various processes of industrialisation and formation of modern nation states in Western countries and elsewhere, institutionalised educational provisions were limited to a few occupations, mainly those which were taken to be elite professions. Yet, even for these occupations, much of the students' learning occurred through engagement in practice and in practice settings. Indeed, within medical education in Hellenic Greece, the need to introduce anatomy classes and the production of textbooks arose because of limited practice opportunities available for medical students (Clarke 1971). So, despite these students acting as assistants to medical practitioners and directly taking care of patients, there were limited opportunities for them to observe qualified practitioners engaging in performing operations. This lack of opportunities for learning physiology led to the need for anatomy classes. Similarly, the lack of sustained interactions with medical practitioners and the limits of learning that could be secured through these interactions necessitated the codification of medical knowledge into textbooks, which then could be read by the students

independently of their access to being able to observe and be guided by experienced medical practitioners. These texts, although comprising the “dregs” to which the wheelwright above referred, while very necessary, were substitutes for engaging in actual practice.

These accounts suggest that when seeking to understand how individuals learn outside of educational provisions, in circumstances of practice for instance, there is a need to be wary of uncritical use of the discourse of schooling in describing these processes and their outcomes. Indeed, and finally, a critical consideration of this discourse, its precepts and emphases is necessary when considering the forms, contributions and potentials of learning through practice.

2.4.2 Going Beyond the Discourse of Schooling and Schooled Societies

As discussed in the first chapter, the discourse of schooling is powerful and shapes conceptions of how processes of learning are viewed and judged. Given societal emphases, expenditure of resources and, in part, its compulsory nature, and their deliberate introduction to sustain and advance nation states (Gonon 2009), it is not surprising that schooled societies have discourses, orthodoxies and assumptions about the inherent value and the privileged status of “schooling”. These are often seen as the legitimate premises for intentional learning. At its worst, it is the narrow administrative focus of educational provisions that comes to dominate views about what constitutes acceptable educational provisions (i.e., numbers of students in classrooms and for how long). It is not so long ago that the accepted definition of curriculum was what was required to achieve the goals of the school (Marsh 2004). However, more broadly the focus on educational institutions, their goals and processes used within them to instruct learners and assess what they have learnt has arisen from the interests of governments’ and religious orders’ economic and social imperatives. For a number of generations now in most countries with advanced industrial economies, compulsory schooling and tertiary education have been the ubiquitous and orthodox experience from infancy through to adolescence, and on through adulthood (Billett 2011b). In its own terms, there is nothing wrong with such provisions and educational institutions and processes that serve many useful purposes and secure many benefits for individuals, their communities and their nations. So, there are good justifications for such discourses. Educational institutions perform important roles, are highly generative of worthwhile learning and are essential in securing some outcomes for students, not the least for those disadvantaged by circumstances of birth. In raising concerns here about these discourses there is no intent to critique schooling per se or the activities of educational institutions.

Instead, the case here is largely about providing a space to consider, legitimise and offer bases for learning through practice to be understood and evaluated in

its own terms. For instance, because of its privileging, schooled societies tend to ignore, deny or, even worse, patronise learning experiences outside of schooling settings and experiences. These are sometimes described as being informal or non-formal (Eraut 2004). When considered and engaged by educational program and systems, experiences in work settings are often seen as opportunities for students to practise or contextualise what they have learnt within those programs, rather than them generating potentially important learning in their own right (Billett 2009).

So, from the perspective of learning through practice there are three concerns about the educational discourse.

Firstly, whilst education practices and “schooling” experiences have brought many benefits, their discourse offers narrow accounts about (a) human knowing (i.e., that which can be observed/measured), (b) learning (i.e., that which can be declared), and (c) knowledge (i.e., conceptual accounts). Scholars across disciplines concur that much human knowing is not evident by observing its outcomes or easy forms of measurement (Bourdieu 1977; Lakoff and Johnson 1999) such as those even used within educational institutions. Much is also made of knowledge which can be declared (i.e., written down or stated) in this discourse and it is this kind of knowledge that is often used as the means of assessment within educational institutions and programs. That is, the written word and essay stand as the means by which worthwhile knowledge is judged and student learning is assessed. However, much of what cannot be so declared is of great worth. The very iterative process of learning—of construing and constructing knowledge—moment by moment as in micro-genesis (Rogoff 1990) is almost impossible to capture and categorise declaratively, because it cannot be articulated by those engaged in it (Anderson 1982). For individuals engaging in this iterative and incremental process, the changes may be unperceivable as the changes are minute and barely perceivable. Moreover, and of a different kind and order, when participating in demanding activities many aspects of human performance similarly cannot be captured through observation or measurement because the individual is utilising their conscious thought or mental capacities to focus on this tasks and often deliberately and actively ignoring extraneous suggestions around them [e.g. Glenberg et al. (1998)] and, again, will unlikely to be able to declare that knowledge (Pozzali 2008). So, much of what is important in learning about practice cannot be captured through declarative means (MacKenzie and Spinardi 1995).

Secondly, there is an enduring societal bias towards conceptual knowledge and its learning has long privileged it over procedures and dispositions (Perkins et al. 1993; Ryle 1949). Yet, despite the privileging of declarative forms these forms are not comprehensive bases of human knowing and acting (Ryle 1949), as the wheelwright’s parable illustrates, and others note (Downey 2010). Furthermore, in contemporary times, these declarative accounts are increasingly those now being emphasised within prescriptive occupational standards and educational provisions that are increasingly pervasive within vocational and higher education, despite

long-standing concerns about their efficacy (Billett et al. 1999; Hogben 1970; Jackson 1993; Stenhouse 1975; Stevenson 1992, 2005).

Indeed, not captured, articulated or privileged in the educational discourse are: (a) much of the procedural (i.e., strategic and specific) capacities required for effective work performance; (b) embodied forms of knowing and its learning (i.e., those through the senses); (c) haptic qualities (i.e., feeling, tactile competence) that are central to a range of occupations such as physiotherapy, creative arts, clothing, occupational therapy; and (d) dispositions (i.e., values, interest, intentionality) that are so essential for the exercise of occupational competence. Whilst these capacities are not easily captured and are difficult to quantify, the forms and discourses of educational provisions and practices often ignore their qualities.

Thirdly, another quality of the schooling discourse is an emphasis on didactic teaching—the telling by one to many, often as the direct transmission of knowledge. This quality can lead to de-emphasise learning processes directed by learners themselves, except when associated with teaching processes. Given long-held concerns about the efficacy of didactic teaching, its premises should not be used for considering and appraising qualities of learning experiences outside of institutions. Yet, such processes remain privileged within schooled societies, and sometimes for very good reasons.

All of this suggests, as foreshadowed in Chap. 1, that it is important to go beyond the discourse of schooling and educational science as these conceptions may not be helpful for representing and advancing learning through practice.

2.5 Learning Through Practice

What this chapter has proposed is that across human history, learning through practice has been the key source of the development of occupational competence, as have the innovations and advancements that have progressed what constitutes occupational practice and its requirements. These processes of learning and innovation have been essential for humanity and humankind. We simply would not exist as a species had not learning and innovations of kinds required for sustaining humanity's needs across human history been realised. Yet, the learning about and advancing means of addressing human needs, such as securing nutrition, shelter and care, not to mention those capacities required by societies to function, progress, develop cultural and social practices seemingly have almost universally been learnt through practice, until the most recent of times. For the majority of people, across most of human history, these outcomes have been secured by people learning through practice. Even now in contemporary schooled societies, with educational institutions now supporting much of the initial development of occupations through programs in schools, vocational colleges and, increasingly, universities, there remains a strong need for practice-based experiences to support the required outcomes. Moreover, beyond the initial provision of occupational skills there is a need for ongoing learning across workers' lengthening working lives

which are most likely supported through learning experiences in workplaces and their work.

The central point here is that these learning processes and innovations have most likely been secured mimetically. Therefore, we need to acknowledge these contributions and re-position this process with the lexicon of learning and development and bring it more centre stage in processes such as educational provisions for initial and ongoing occupational development, not to mention considerations of life-long learning and educational provision more generally. As noted, likely, it will be necessary not to be restricted by the educational discourse because this speaks mainly to schooling and educational provisions rather than those outside of them and how best requirements for work can be captured.

Following from this elaboration of how learning of occupations has arisen across human history, the next chapter elaborates the mimetic processes as an explanatory account of that learning.

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<http://www.springer.com/978-3-319-09276-8>

Mimetic Learning at Work
Learning in the Circumstances of Practice
Billett, S.
2014, XV, 107 p., Softcover
ISBN: 978-3-319-09276-8