# Chapter 12
# Developing Medical Capacities and Dispositions Through Practice-Based Experiences

**Jennifer Cleland, Joseph Leaman, and Stephen Billett**

**Abstract** Experiences in clinical settings have long been featured in medical education. Students engage in these experiences across their undergraduate programmes and beyond their registration as doctors during specialty training. Such is the institutional, personal and financial investment in the provision of these practice-based experiences that it is important to understand more about how they can be used to most effectively develop medical capacities and dispositions initially and then continue to support them across medical working lives. Consequently, this chapter seeks to understand more fully something of practice-based experiences' contributions to initial and continuing medical education and learning. Quite specifically, it seeks to identify how three key educational purposes can be secured through experiences in clinical settings. These goals are those associated with assisting individuals to (1) identify whether they want to practise medicine and, if so, which specialty they wish to pursue; (2) develop the occupational capacities required to practise their preferred form of medicine; and (3) continue to learn and develop further their medical practice over lengthening professional lives. The data from interviews with new doctors beginning their second-year post-graduation clinical work in the UK medical training pathway (Foundation Year 2) are used to identify and illuminate how these experiences can be used to realise each of these three kinds of goals. The intention is to understand how best these experiences

J. Cleland (✉)
Medical Education Research, College of Life Sciences and Medicine, University of Aberdeen, Aberdeen, UK
e-mail: jen.cleland@bdn.ac.uk

J. Leaman
Raigmore Hospital, Inverness, UK
e-mail: jleaman@nhs.net

S. Billett
Professor of Adult and Vocational Education, School of Education and Professional Studies, Griffith University, Brisbane, Australia
e-mail: s.billett@griffith.edu.au

C. Harteis et al. (eds.), *Discourses on Professional Learning: On the Boundary Between Learning and Working*, Professional and Practice-based Learning 9,
DOI 10.1007/978-94-007-7012-6_12, 

might be afforded to, and taken up by, newly qualified doctors, and in what ways practice-based experiences need to be augmented to more fully secure those medical education goals.

## 12.1 Developing Medical Capacities

Experiences in clinical settings have long been featured in medical education. In Hellenic Greece, it seems students learnt medicine largely through experiences in practice. They acted as assistants to experienced medical practitioners and had particular roles to perform, often being left by those practitioners to nurse patients after medical interventions (Clarke, 1971). Hence, much of that preparation for learning to be a doctor was realised through authentic experiences of medical practice. However, because of the difficulty with securing sufficient time with experienced practitioners and medical practice, it was recognised that these practice-based experiences were not providing an adequate understanding of anatomy or providing comprehensive access to the required medical knowledge. Therefore, it became necessary to provide these classes for students to learn about human anatomy and also codify medical knowledge in books and thereby augment practice-based experiences. So, on their own, they were not sufficient.

Although medical education programmes are now largely located within universities, medical students engage in experiences in health-care settings intentionally associated with their initial preparation within medical degree programmes and also for further development through a period of residency that lead to registration as a doctor and then following that as part of speciality training. Yet, medical education programmes differ in their approach to providing clinical experiences and in the sequencing and duration of those experiences (Cooke, Irby & O'Brien, 2010). Nevertheless, a common and enduring feature of these programmes is the extensive use of practice-based experiences, which take time and require resources. Such is the institutional, personal and financial investment in these provisions that it is becoming increasingly important to understand more about how such clinical experiences can be used to initially develop medical students' capacities and dispositions. Also, there is a related need to identify how these experiences can be used to develop further those capacities across medical practitioners' working lives (i.e. continuing professional education/learning).

This chapter seeks to understand more fully something of the contribution of these experiences to initial medical education and ongoing professional development. Quite specifically, it seeks to understand how those experiences can contribute to securing three kinds of important medical educational purposes. These are assisting individuals to (1) identify whether they are suited to practising medicine and, if so, to what specialism or kind of practice they are most suited; (2) develop the occupational capacities required to practise their preferred form of medical specialism; and (3) continue to learn and develop further their medical practice across lengthening professional lives. Interview data from doctors engaging in their

second-year post-graduation (i.e. Year 2 of the UK Foundation Programme) experiences are used to identify and illuminate how these experiences can contribute to achieving these goals. To reaffirm, the intention here is to understand how best these experiences might be provided for new medical practitioners and also be augmented to more fully secure these three kinds of key educational goals.

Following the setting out of some assumptions associated with learning through practice, the chapter outlines the salience of each of these goals. That is, assisting the formation of professional identity and initial and further development of medical competence. Then, the potentials and limitations of learning through practice settings and experiences are briefly rehearsed drawing upon earlier research. This overview is followed by a consideration of the ways in which learning through experiences in medical settings can lead to these kinds of goals. Informing that discussion are some initial findings from interviews with foundation year medical practitioners. These are used to illustrate how practice-based experiences contribute to those goals.

Having described the method and procedures used to conduct these interviews and analyse the data, their contributions to each of these three goals are presented and discussed. In all, it is proposed that these experiences are essential and highly constitutive of the kinds of capacities required to be an effective doctor. However, other experiences also play roles in achieving those goals and actively mediate practice-based experiences in important ways. That is, associations and circumstances outside of practice settings and 'teaching' experiences within those settings perform important roles in augmenting and extending the particular worth of practice-based experiences.

## 12.2 Learning Through Practice

Educational institutions and processes have become ubiquitous and are highly privileged in most countries with advanced industrial economies. Therefore, it is necessary to be reminded about the important role that experiences in practice settings (e.g. hospitals) and practice (i.e. enacting health care) play in learning generally and, in particular, domain-specific occupational knowledge such as medicine. Importantly, there is no inherent privileging of experiences in education institutions over those provided in practice settings (Billett, 2013; Raizen, 1991). This is because, firstly, there is no separation between participating in any kind of goal-directed experiences and learning. That is, when people engage in activities and interactions, they induce change within themselves, which is referred to as learning (Lave, 1993; Rogoff, 1990). So, when individuals engage in activities which are wholly new to them, they likely generate new forms of knowledge or knowing, albeit these may be partially and not wholly coherent. Then, when individuals engage in activities with which they have undertaken before or are even familiar with, the kind of changes that occur are associated with owning and refining what people can do or establishing links and associations between things. Some theorists

refer to these two processes as securing viability with what has been experienced (von Glasersfeld, 1987). Piaget (1985) distinguished accommodation (i.e. experiencing something novel and creating a new cognitive structure to make sense of it) and assimilation (i.e. fitting what is experienced within an existing structure (e.g. ideas, practices)), which are analogous to engaging in activities that are variously routine (i.e. familiar) or nonroutine (i.e. novel). However, it is important to be reminded that what constitutes familiar or novel activities are person dependent, as is their legacies (i.e. learning) (Greeno, 1989). What for one individual is a novel experience for another it is quite routine. For instance, in talking to a clinical educator who is a physician in an emergency room in a major American hospital, he observed that what for him are routine accident and emergency cases, yet for his students these are novel and sometimes highly confronting and almost overwhelming experiences. Such propositions are well supported within literature from both individual (Anderson, 1982, 1993) and social (Martin & Scribner, 1991; Rogoff, 1990) constructivism. Not the least here is that the opportunities for rehearsal and repeated exposure are very important for human learning and development. These processes can have particular legacies in form of developing procedural capacities in ways that do not require conscious engagement to be enacted (i.e. automatisation) (Anderson, 1982; Sun, Merrill & Peterson, 2001) and also building propositional links and causal associations (Anderson, 1982; Groen & Patel, 1988) which are central to developing rich (or deep) understanding. So, it is important to realise that the legacies that arise from engaging with everyday experiences are not restricted to new experiences and that the opportunity for experiences that permit practice and rehearsal is generative of other aspects of development.

It is also important to note that there are limitations of learning through everyday practice. As was indicated in the account of learning medicine largely through practice in Hellenic Greece, there can be limitations in learning through practice. In that case, the lack of access to experts from whom to learn the procedures and concepts, as well as the ability to come to understand human physiology and anatomy, required specific educational interventions to be introduced for these learners. Similarly, in more contemporary studies, a series of limitations of learning through practice have been found in studies drawing upon the experiences of workers of different kinds from across a range of industries (Billett 2001). These workers identified limitations comprising: (1) learning that is inappropriate (i.e. bad, unhelpful, wrong); (2) lack of access to activities and guidance; (3) not understanding the goals for workplace performance, reluctance of experts to provide guidance, absence of expert guidance, limits in developing understanding in the workplace and reluctance of workers to participate. These limitations need to be understood and arrangements made to redress them or augment learning experiences in ways which overcome them.

The salient point is that these legacies (both good and bad) arise for individuals from them engaging in goal-directed activities and interactions (Scribner, 1984), which then lead to change in what individuals know and can do, for better or worse (see below). Moreover, learning arises from what experiences individuals have been able to access. Importantly for the development of occupational knowledge,

knowledge does not come from within individuals; it needs to be accessed and sourced in the world beyond individuals (Billett, 2003; Scribner, 1985). However, through engaging with workplace activities and interactions with others (e.g. other practitioners, patients, etc.), what has made available through those experiences is a way in which individuals come to construe and construct that knowledge. This process is referred to as inter-psychological (i.e. between the personal and the world beyond them) (Wertsch & Tulviste, 1992). For instance, because medical knowledge is a product of history and culture, with its concepts, norms and procedures manifested in particular medical situations, it needs to be accessed and engaged with (i.e. inter-psychologically) for it to be learnt. So, on the one hand, learning is an active and interdependent process (i.e. relying on mutual contributions between the individual and others or objects). It follows then that rich learning of medical knowledge, for instance, is likely dependent upon the: (1) kinds of activities and interactions that are available to students and (2) the quality of students' engagement with them. Richness is founded on the interdependence between the experiences afforded and individuals' engagement with them (Billett, 2006). So, such precepts suggest that, rather than assuming that the richness of learning experiences is premised upon them being intentionally educational (i.e. what is intentionally provided through educational programmes and institutions), it is through the inherent qualities of what experiences are provided or afforded and how individuals engage with those experiences. This conception also serves to remind that experiences provided in both educational institutions and practice settings are nothing more or less than invitations to change. Ultimately, how students or workers take up those invitations is most salient.

As noted above, the example of medical education in Hellenic Greece emphasised practice-based experiences. This example appears to illustrate how the vast majority of how the learning of occupations has progressed across human history. That is, experiences of the occupational practice and in the circumstances of work being enacted are by far the most common and sustained mode of learning occupations across the human history (Billett, 2010). In this way, the provision of practice experiences is central to humanity and human progress, not just on an individual basis but in its contribution to the development and remaking of occupations. Moreover, similar processes for learning occupations have been identified in Europe, Asia and, likely, occurred elsewhere. As what was suggested for the learning of medical practice in Hellenic Greece (Clarke 1971), local workplaces have been common sites for learning in Europe, India (Menon & Varma, 2010), Japan (Singleton, 1989) and China (Ebrey, 1996). It is also quite noteworthy to mention that across these accounts and others which describe processes of learning occupations, there is little evidence of direct teaching (Billett, 2011). Instead, the vast majority of this learning appears based on mimesis: observation and imitation, then practice.

That is, this development of occupational capacity and innovations in those occupations arose through learning processes they were not premised on being taught, but enacted interdependently between the social circumstance and the learner. So, it is important to advance a consideration of the contributions of

practice-based experiences to medical education and their efficacy not only in terms of what occurs in educational institutions, or being dependent on processes premised upon teaching, but also other kinds of premises. In particular, understanding how those practice-based experiences are generative of learning through interdependent processes seems essential. That is, these learning processes were not processes independent of other influences and contributions; they were intricately linked and associated with other sources – interdependent with them – and were enacted through accessing them. So, having outlined some of the premises upon which practice-based experiences might be helpful for securing the goals of medical education, it is helpful to consider what constitutes those goals. This consideration will be used to align the potential contributions of practice-based experiences to securing those goals.

## 12.3 Goals from Medical Education

Educational efforts are intended to be intentional and directed towards particular kinds of outcomes or intended purposes. That is, education processes and the selection of content and experiences for students should be premised on clear educational intents. Usually, within curriculum parlance, these intents are referred to variously (and not always consistently) as a hierarchy of aims, goals and objectives, in terms of degree of specificity of educational purposes (Marsh, 2004). Dewey (1916), who coined the term of vocational education, suggested that there were two key goals for the vocational aspects of education.

Firstly, to assist individuals identify an occupation to which they were suited (i.e. coming to identify with medical work or a specialism within it). He argued that individuals caught in uncongenial callings (i.e. those in which they were not suited or uninterested) are a waste of human talent and energy. For instance, in the occupational context of current medical education in the United Kingdom discussed here, individuals have to decide very early in their careers about which specialty (e.g. general practice, surgery, oncology, etc.) they will pursue, hence heightening the risk of practitioners being caught up in specialisations that they ultimately find uncongenial.

Secondly, he proposed that the other key goal for vocational education provisions is to secure the development of occupational capacities – the kinds of knowledge (e.g. concepts, practices and dispositions) that permit individuals to effectively practise their preferred occupation. It would seem that, in the case of occupations such as medicine, this knowledge comprises not only the canonical knowledge of medicine (i.e. the knowledge all medical practitioners would be expected to possess) but also the situated requirements for performance of medicine in the particular circumstances in which they practise. That is, the competence required to practise comprises both the canonical knowledge but also responding effectively to the situational requirements that constitute the practising of medicine in a particular circumstance. Although Dewey (1916) was focused on preparing people adequately

for working life, he also expressed beliefs about ongoing learning as being the single most important human vocation. Consequently, in responding to the challenge of contemporary work life, he would have added a third educational goal: sustaining the competence to sustain their vocations – the occupations that they identify with – across their professional lives. Certainly, in contemporary times with changing requirements of work and constant concerns about continuing professional development, for instance, this goal now seems as necessary as the two earlier ones. Given their centrality of those goals to medical education, these three goals are now worth considering more fully.

### *12.3.1 Identifying and Selecting an Occupation/Specialism*

As noted above, Dewey (1916) held that it was important for individuals to find an occupation to which they were suited and met their interests. He stated that:

> A vocation means nothing but such direction in life activities as render them perceptibly significant to a person, because of the consequences they accomplish, and are also useful to his [sic] associates. (Dewey, 1916:307)

That is, it is important that educational experiences assist individuals to come to identify an occupation to which they are suited and in which they are interested and which constitutes a vocation for them. Importantly, whilst others might advise, suggest or even cajole somebody to take up an occupation such as medicine, ultimately, individuals have to assent to that occupation becoming their vocation.

> … being a teacher, a minister, a doctor, or a parent would not be vocational if the individual kept the practice at arm's length, divorced from his or her sense of identity, treating it in effect as one among many indistinguishable occupations. … (Hansen 1994: 263–64)

Hansen suggested that individuals who do not accept their occupation as their vocation would not necessarily conceive it as meaningless activities. They might regard it as strictly a job, which is what one of the informants in the enquiry reported, and as a necessity one has to accept, perhaps to secure the time or resources to do something they are more interested in (Hansen 1994). However, in this case, individuals may not invest the kinds of personal effort and intentionality required to become highly competent in that occupation (i.e. actively and deliberately seeking to hone and improve that practice and deliberately extend further their occupational knowledge). This kind of intentionality is perhaps most likely to be exercised when individuals' sense of self and investment in a thoughtful action is directed towards something which they see as being worthwhile (i.e. their vocation). So, the exercise of personal agency in such learning efforts is likely to be central to their intentionality and direction of their learning (Malle, Moses & Baldwin, 2001) and is likely to be optimised when individuals take their occupations as their vocations. Moreover, it is likely that much if not most of innovations across human history have arisen from personal interest, inquisitiveness and enquiry through practice, rather than in hybrid spaces were innovation is privileged (i.e. laboratories and the like).

Given the criticality of medical work for individuals and society and it being subject to constant change (for UK examples, see Department of Health DH, 2012; Francis, 2013; Greenaway, 2013), securing individuals' vocations and coming to effectively practise medicine is quite central to personal and societal purposes globally (e.g. AAMC, 1999; AMA, 2007; Australian Medical Council, 2010; Frank & Danoff , 2007; General Medical Council, 1993, 2003, 2009 and 2012; Department of Health, 2004). In this way, opportunities to participation in medical practice can assist to identify whether individuals are suited to medicine and also in which specialism they are interested and particularly suited. Hence, the contributions that practice-based experiences can make to this decision-making and formation of occupational subjectivity (i.e. their vocation) are likely to be salient to the richness of their learning but also as a means of effective expenditure of public, personal and societal investments in supporting individuals learning for their occupations. This development, however, is also associated with individuals developing the capacities and confidence to practise effectively that occupation and specialism.

### *12.3.2 Developing Capacities to Practise Medicine*

As noted, the second goal is associated with developing the capacities required to effectively practise medicine. This comprises, as foreshadowed, securing the canonical knowledge of medicine and specialisms and also situated requirements for practising medicine and the particular specialism. As a means to consider what constitutes the development of those capacities, the literature on expertise is helpful in identifying not only the qualities of high performance (i.e. expertise) within a particular occupational domain but also in providing accounts of the kinds of knowledge needing to be learnt for securing that level of performance. Proposed here is that there are three dimensions of this medical knowledge, and they exist at both the canonical and situational levels: the conceptual, procedural and dispositional domain-specific medical knowledge and its situational manifestations.

Firstly, there is domain-specific conceptual knowledge – 'knowing that' (Ryle, 1949). It comprises concepts, facts and propositions and can be understood as ranging from surface to deep conceptual knowledge (e.g. Glaser, 1989). This form of knowledge is that which can be stated or declared and is sometimes referred to as declarative knowledge. At one level, it comprises simple factual knowledge such as the names or concepts (parts of the anatomy, medicine, diseases, etc.). At another level, often referred to as deep conceptual knowledge, are the links and associations amongst concepts in the form of propositional associations and causal links, which permit understandings of contingencies and relations and their associations. So, whereas factual information (i.e. the stuff of quiz shows) is important, a more important level of knowledge is the rich associations between concepts comprising what often referred to as deep understanding. So, diagnosing a patient's conditions and assigning and then monitoring their treatment and making adjustments and predicting prognoses are dependent on this kind of knowledge.

Secondly, is the domain-specific procedural knowledge or 'knowing how' (Ryle 1949). This form of knowledge also has extended across highly specific and strategic procedures (e.g. Anderson, 1993, Sun et al., 2001). Highly specific procedures are those activities which comprise a way of doing something quite specifically such as cleaning a wound, placing a dressing on, taking a temperature and recording a pulse. These highly specific procedures are often those which are learnt, and through practice (i.e. rehearsal), they become able to be enacted without the course to conscious thought. This developmental process is referred to as proceduralisation – the ability to perform highly routine and practical procedures (e.g. taking bloods, temperature, blood pressure), without recourse to the exercise of conscious mental processes. However, beyond the importance and development of specific procedures are higher orders of procedures that serve to guide and monitor performance through active engagement and develop capacities that can plan for, enacted and monitor the enactment of medical tasks. Again, these forms of knowledge likely arise from access to a range of experiences permitting the honing of specific procedures and understanding the requirements of more strategic use of procedural knowledge.

Thirdly, dispositional knowledge – 'knowing for' (i.e. values, attitudes) relates to canonical and instances of practice (e.g. Perkins, Jay & Tishman, 1993) – includes criticality, and these can include the kind of dispositional qualities required for medicine (e.g. patient confidentiality, diligence and care in record-keeping). These dispositions both energise and assist in the formation of goals for work performance, and as such an alignment between the kinds of dispositional values required for effective and ethical medical practice is likely to be found within the learning of appropriate dispositional qualities.

Although these three dimensions of knowledge are referred to above separately, which is often helpful for considering particular interventions directed towards their development, in reality all three forms of knowledge are interdependent. That is, when something is conceived or perceived, that process is shaped by dispositions (i.e. what is valued) and the kinds of concepts used to consider what is being experienced and the exercise of procedures in doing so (e.g. the effort to be expended in achieving goals, etc.). So, these three forms of knowledge interdependently are helpful for promoting appropriate occupational capacities. As such, they become the goals for what needs to be learnt to be an effective medical practitioner. Hence, one way of evaluating the educational worth of particular experiences is developing these capacities.

### *12.3.3 Sustaining Occupational Competence Across Working Life*

The third educational purpose is concerned with ongoing learning about medical practice – sustaining occupational competence across working life. That is the kind of learning permitting medical practitioners to be current and develop further their capacities through learning from the new experiences, as well as building and

honing the capacities required to remain effective and current. As noted above, learning and work co-occur, and through everyday work, there are ongoing processes of learning and development. Hence, engaging in everyday medical work potentially contributes to this ongoing development of competence. However, these capacities can be developed further by particular sets of experiences including specific training programmes that assist in securing knowledge that might not be learnt through everyday work experiences. For instance, the clinical teaching interludes in hospitals can be of this kind. Here again, the interdependence between the work situation and the medical practitioner is evident. That is, specific kinds of experiences are afforded through work activities and also particular and intentional educational experiences, but without active engagement by individuals, the learning potential of these experiences may not be optimum. Hence, sustaining occupational competence is likely premised upon them being active and agentic learners. This requirement then raises the question of how students or practitioners can be prepared to be active and intentional learners both for their initial study and also across their working lives.

Consequently, it is the degree and means by which practice-based experiences are able to support the kinds of knowledge represented in these three educational goals which will ultimately be used to determine their effectiveness and how these experiences might be augmented in some ways to make them more effective. In many ways, much of the focus on engagement in practice-based experiences is about individuals coming to identify what constitutes their preferred occupation or specialism (i.e. their vocation). This can then assist them realise that vocation and sustain it across working life.

## 12.4 Investigating the Efficacy of Practice-Based Experiences for Medical Education

In the section that follows, the processes used to investigate these phenomena in a small cohort of new doctors are set out and described, before the findings advanced from this investigation are presented and discussed. First, the participants are described which is followed by the means through which the data were gathered through interviews and then the procedures used to analyse the interview data.

### *12.4.1 Participants*

This was a qualitative study using individual interviews. The informants targeted for the practical enquiry study were doctors in Year 2 of the 2-year Foundation Programme. In the first 2 years of training post-graduation, the Foundation Programme (FP) (www.foundationprogramme.nhs.uk/pages/home) is intended to expose junior doctors to a broad range of specialties and health-care settings (Tooke, 2008), usually in the form of six practice-based rotations each lasting 4 months. Thus, our interviewees were relatively new doctors who had successfully

completed medical school, then entered into competitive national recruitment for places on the 2-year FP, with full General Medical Council (GMC) registration after successful completion of the first year. After the Foundation Programme, doctors enter into either core, specialty or general practice training.

We were particularly interested in this group of doctors for a number of reasons. First, they were about to make critical decisions about their careers by applying for core, specialty or GP training and, hence, may be at a stage of their development conducive to reflecting on their learning in practice. Second, they are working under a change in working patterns from a traditional on-call pattern to a shift system which has led to a reduction in total training hours (Morris-Stiff et al., 2004). The clinical apprenticeship with its reliance on time-related experiential training and subjective, observational assessment of clinical skills is no longer feasible (Chikwe, de Souza & Pepper, 2004). There has been a reported deterioration in the quality of learning opportunities as a result of these changes in working practice (Paice, 1998; Scallan, 2003). Third, a recent evaluation of the FP (Collins, 2010) identified a lack of clarity over the role of junior doctors within the FP, particularly in terms of a tension between service provision and education. Issues of role uncertainty and question marks over supervision appear to be particularly problematic in FY2, when doctors are expected to 'step up', to contribute more and extend their boundaries of competence.

### *12.4.2 Data Collection*

The study was carried out in the United Kingdom in 2013. After receiving the necessary ethics clearance, we identified Foundation Programme Year 2 (FP2) doctors to be informants via the Northern Deanery, NHS Education for Scotland (NES, the training provider for the FP in Scotland) mailing lists. We emailed potential participants inviting them to take part in the study at the beginning of their FP2 (August 2013). The aim was to recruit FY2 doctors training in hospital environments only, but we sought to ensure our participants were from a range of programmes and environments (representing medical and surgical). We also aimed to secure a varied group of trainees in terms of gender and ethnicity to achieve a diversity of views and experiences. Of the 10 doctors interviewed, four were male and six female (this proportion of male to female actually reflects that of the Foundation Doctor population). Five were aged between 20 and 24 years, three were aged between 25 and 29 years and two were in the 30–34 age group. There were two graduates (one male and one female), whilst the other eight interviewees had studied medicine as their first degree (as is still the norm in the United Kingdom). Two of those interviewed had relatives who were doctors. Six had graduated from the medical school in the same region as their Foundation Programme. Two had studied at other UK medical schools. The remaining two interviewees had studied medicine overseas before coming to Britain for the Foundation Programme.

Interviews occurred 2–4 weeks after the informants had commenced FP2 and were held in a location convenient for the interviewee (usually a coffee shop within work premises). At the commencement of the interviews, we asked participants to

complete a personal details questionnaire collecting demographic information, education-related details and specific questions relating to training. An interview schedule was developed, trialled and then used to ensure consistency across two interviewers. The interviews continued until participants agreed they had shared their experiences sufficiently. Having worked through the interview schedule, the interviews were concluded and the informants thanked for their participation. The medium interview length was about an hour. All of the interviews were digitally audio-recorded with consent and anonymised then converted to tax copies through a transcription process.

### *12.4.3 Analysis of Data*

We analysed content-related themes only, i.e. what participants said (Ritchie and Spencer 1994) using a themed approach that engaged in a range of different kinds of categorisation exercises linked to the three goals outlined earlier. We analysed the data manually and used peer verification of an initial coding framework based on analysis of two interviews which were then used to independently analyse two further interviews. The basis for categorising the data was through its reference to one of the three kinds of goals referred to above (i.e. identifying a preferred specialism, developing capacities to practise medicine and ongoing learning through work). In essence, the process is comprised of identifying a set of themes and then using one of the research team members to verify another's allocation of data to the particular themes. Discussions about the categorisation of data were conducted through written comments on transcripts which we shared across the research team and then discussions about bases for categorising data. The face validity of the data was enhanced by one of the research team being a familiar of the circumstances of the doctors' working environment and knowing a number of them through repeated encounters. Subsequently, reports from these independent analyses were circulated around the team and discussed in several teleconferences and one face-to-face meeting to secure consensus about the coding and analysis of data. Patterns and differences in the views and experiences of interviewees were explored, debated and agreed through discussion.

## 12.5 How Practice Experiences Contribute to Junior Doctors' Learning

The data from this small sample of junior doctors permits the identification of some contributions that experiences in practice settings afford these doctors' decision-making about their choice of medicine as a career and also the preferred specialisations they will pursue after their foundation year experiences. In addition, these data illuminate how these experiences assist them to achieve goals of developing further

their capacities to be effective doctors. Yet, in considering these data, it is helpful to be reminded that what is afforded to these doctors by their experience in clinical settings can comprise both positive and negative contributions. That is, affordances can be either supportive or can restrict, limit or impact negatively upon these doctors' decision-making and capacity building. Moreover, how each doctor construes and constructs these experiences as particular kinds of affordances and then elects how to engage with them are shaped by their particular intentionalities, interests and previous experiences (Malle, Moses & Baldwin, 2001). So, this experiencing will be person dependent in some ways. Hence, there are understandable variations in the reported experiences and their particular worth to the informants.

In the sections below, a summary of the contribution and illustrative examples aligned to each of the three goals discussed earlier are provided from the interview data.

### *12.5.1 Goal 1: Identifying Suitability to Occupation/Specialism*

Some of these junior doctors' transcripts illustrated, firstly, how experiences in practice settings and of performing medical work lead to judgements about its congeniality for them. In this way, it reports experience of engaging in medical work led the participants to make judgements about the personal worthiness of their decisions about studying to become doctors and practice medicine. Secondly, those experiences also informed decisions about the particular specialisms they would pursue after their foundation years. The following quotation was provided by a new female doctor.

> When we are a student we don't have such a responsibility as a working adult. What we were focussing is just exams, get it passed, make sure you got knowledge. And the knowledge that is enough to survive as junior doctors and so on. You think you have big dreams – "I want to be like surgeons, I want to be this and that"- but once you start working with the working hours, with the working environment, the stress level you start realising that it's not that easy and I've realised that working in this field, as with medicine, it requires a lot of commitment to keep you going. (new female doctor#1)

Noteworthy in her response is the distinction made between being a student who although engaging in clinical experience had done so from the position of being a student, not as a practising doctor. She refers to the differences in imperatives (i.e. from exams to working as a doctor) and the demands of engaging in actual medical practice. So, despite having had a range of clinical experiences as a student, the demands arising from actually practising as a doctor have critical implications for judgements about becoming a doctor and, as will be seen shortly, decisions about specialisms. Another informant, a male, refers to the affirming experience of practising medicine and how this experience has led to the realisation that his career choice was well made. That is, it is aligned with his personal interests and goals.

> … you always knew that there was a reason why you got into it (medicine) in the first place. And when you start work that's when you realise that you've made the right decision, or at least I did, or I felt that way. (new male doctor #1)

Here, this informant refers in a different way than the first informant about how the experiences (and demands) of practising medicine have led to him making particular judgements about the career choice. Again, he refers to the actual experience of working in, rather than studying, medicine as being a basis for arriving at such a conclusion. All these suggest that contributions clinical experiences afford to those engaging as students may be quite different than to those actually practising medicine. Put plainly, the consequences of individuals practising medicine is reported as being distinct from when these informants were positioned and engaged as students. All of this supports the view that it is necessary to go beyond a consideration of the social and physical experience as being in somewhere deterministic. Instead, it is necessary to account for how individuals come to construe and engage with the experience which is dependent upon their imperatives, positioning and intentionality and goals for their engagement.

Moreover, beyond informing the worth of their decision to study and work in medicine, these same two junior doctors also report how their experiences in practice settings are shaping their decisions about what specialisations they will pursue. Noteworthy, the new female doctor changes the intended focus of her specialism quite considerably as a result of working as a doctor. Experiences in the previous year when working as a doctor has overturned career intentions generated over the 5 years of medical school, which included experiences in hospital settings. By encountering the practices, protocols and demands of being a surgeon, she has decided to pursue a very different form of specialism, seemingly one which is quite distinct from her initial preference of general surgery.

> Since I was student I had always been thinking of … becoming general surgeon. But once I start working in general surgery things changed. My interest in the surgical topics, the surgical skills is still very strong. But looking at the working environment, the working physical demands, mental strain, it's really tough. … So I don't feel like I would like to work in that way for 30 years so I start changing my mind. I still have strong interest like in anatomy and understand how it works and how it change. So I start thinking about radiology. So radiology is my current first choice. (new female doctor#1)

So, evident here is that experiences in the foundation year (the first-year post-graduation but before full registration) have not affirmed her initial preference for specialism: surgery. In this way, her experiences whilst highly informative might be described as being not particularly invitational. In contrast, the young male doctor has very positive experiences in his medical rotation, and these have both informed and affirmed his choice of specialism.

> I'll apply for Acute Care … hopefully apply to dual medical and anaesthetics. I'd quite like to do ITU. That was my last job and I loved it so I quite fancy, like, doing something in that area. (new male doctor #1)
>
> … you can see … the actions that you make, you can see the effect so I quite like the acute aspect of it. And the patients are quite sick and I think it's quite interesting whenever they're really sick- you can treat them, rather than, you know, watching and waiting for, like, a slow chronic treatment. I find that probably a bit less exciting. (new male doctor #1)

Then, there is the instance of a junior doctor reporting that reluctance and uncertainty about the occupation were redressed through practice-based experiences.

> I think it's only since I've started working, because I wasn't really sure where I wanted to go in med school so I can't really change it. So it's only now I've decided on obs and gynae, (new female doctor#2)

Hence, the qualities of experiences in practice settings have been central to his choice of specialism. He suggests that working with critically ill patients provides the kinds of work tasks he prefers and the satisfaction he seeks through his work. Hence, these experiences shaped his judgement about preferred specialisations. Of course, a consideration here is that if his experiences had not been positive whether he would have still pursued this specialism. In another study, differences of medical students' experiences in orthopaedic and paediatric wards – the former being confronting and intimidating, whilst the latter was encouraging and inclusive – led to choices about specialism (Richards, Sweet & Billett 2013). The medical students were drawn to paediatrics because of the positive invitational qualities exercised by paediatricians and seemed to reject orthopaedic work because of the difficulties (i.e. negative invitations) they experienced in interactions with orthopaedic surgeons.

### *12.5.2 Goal 2: Developing Occupational Capacities*

The experiences provided through working in clinical settings are also reported as contributing to the development of the occupational capacities required to practise medicine. In particular, data referring to developing procedural capacities (i.e. how to achieve goals) of both specific and strategic kind are reported. Firstly, the junior female doctor refers to the development of both very specific procedures (i.e. drawing blood from patients) through to strategic procedures about managing patients' needs on busy medical ward that requires decisions to be made and priorities enacted.

> …when I first started, … the simplest job became the toughest job for me. So if I manage to get some bloods off from patient I'll be very happy then (laughs). But I feel like I'm enjoying it because I'm learning again. I like to learn as in when I learnt I see the patient, I practice it and I understand it and I know in the future if come across this case I have better knowledge, more confident in managing the patient or dealing with it, compared with like one year ago which I have no confidence. But now I feel like everyday I'm learning and seeing patients and new cases and I feel excited. (new female doctor#1)

Here, the junior doctor refers to the learning of a specific procedures (i.e. taking blood) from a patient group she had not previously encountered (i.e. children). She refers specifically to the opportunities provided to undertake this task and the satisfaction and confidence she gains from gaining competence in this procedure. She also elaborates how working as a doctor has developed more strategic procedures in the following long statement.

> I learnt most after a year of working … in the ward. Let's say after the ward round patient who needs to go home, they need medication to be prepared by a certain time. So things you have to consider not only yourself, you also have to consider about like pharmacies, what

> time they come and check the medication or how much time they need to prepare the medication. And if there is any patient coming in that didn't need the bed and then someone needs to clean the room so I have to judge the time. And also imaging scans, if in the ward if there are any sick patients that have to take priority first so if they need imaging scan do it right then. And then do they need any urgent bloods or do you need to communicate with anyone? Get the information first. Yeah, or any family members that would like to get an update from you. So I just look at it, any sick patient, I have to deal with sick patient first. And if I'm going to spend a lot of time with just one particular patient and I will still have a lot of jobs to be done I have to inform my senior colleague and ask for help from my other colleagues to make sure things are still progressing while I'm occupied with this patient. So I have to make it a balance between the two. Or plan ahead… things that I can do beforehand then I try to do it like the day before or two days ahead. (new female doctor#1)

Given what was stated above about the differences that the two junior doctors report between engaging as students and then practising doctors, it seems reasonable to impute that the authenticity of working as a doctor leads to the active learning in ways that are qualitatively distinct from when being a medical student. That is, the quality of engaging in goal-directed activities and interactions is such that junior doctors are pressed to engage in decision-making, considering options, problem-solving and making choices that are qualitatively distinct from when they were students. Both the process of engagement in and the legacy (i.e. learning) are likely to be influenced by the effort, intentionality and focus of their engagement in these goal-directed activities. Included here is the need to draw upon what they know and actively make decisions about responding to patient needs and in ways quite distinct from when they were students. That is, they draw upon their medical knowledge and ways of knowing it in a very contextualised and demanding way. Indeed, the majority of the informants volunteered that once they began making clinical decisions they wished they had given greater emphasis to foundational medical science (e.g. studied harder) as this kind of knowledge was of the kind that they needed to make those decisions.

> I think you always look back and think oh I wish I'd studied, you know, anatomy more… or done this more. But I think you don't realise what you need to know until you start work and you can do your best at medical school and still you'll spend ages learning something that you'll never use in clinical practice! (new male doctor#2)

In these ways, the informants provide accounts of the ways in which practice-based experiences contribute to the development of capacities, including making judgements about what kinds of knowledge is likely to be useful.

### *12.5.3 Goal 3: Sustaining Occupational Competence*

The illustrative examples provided above also referred to sustaining occupational competence. That is, these junior doctors are engaged in an ongoing process of learning after graduating from a medical programme. Consequently, qualitatively, the examples above are also illustrative of how ongoing learning for medical practitioners can arise through their engagement in clinical practice. The example of having to learn how to take blood from children, when earlier experiences have been with

adults, is indicative of doctors' practice that might change and engage new kinds of patients or those with conditions that have not previously been encountered. Some informants referred to the worth of the teaching interludes provided in the hospital and emphasised the pertinence of those experiences to what they were practising or hoped to practise and also some of their preferences for being actively involved in those teaching interludes. In referring to these experiences, informants made the following observations.

> … it's weekly, and it's among your peers so you can interact a lot better, ask lots of questions, and you get to see [it] in practice every single day. So I think that will be really good. And then, plus it develops our own teaching (new female doctor#3)
>
> … me and the GPST (GP specialty trainees) prepare presentations and teach each other with a GP present, so they can put input into… teach us things that they've learned from being a GP, but at the same time we're helping each other learn (new female doctor#4)
>
> .... some GPs will have specialist interests, so we might say 'they've got a special interest, it would be good to utilise that' and get them to do something on that. And basically the other weeks, it's just kind of what we feel we want to learn about, what would be useful to us. So this week we did depression and alcohol misuse, because we thought that was kind of a common thing, even in a week, we'd seen lots of depression. And then next week we're doing skin conditions, dermatology, because […] it's something that none of us feel that confident in. (new female doctor#4)
>
> … they're not forcing learning onto us, it's us picking what we would find most useful for us in GP and for our careers ahead (new female doctor#4)

In these ways, the junior doctors refer to ongoing learning arising through processes of active engagement and then juxtapositioned with the application of what has been initially learnt in that session. Moreover, one of these informants refers to processes of learning through collaborative learning with more experienced practitioners, which permits joint problem-solving.

## 12.6 Contributions for Medical Education

What has been suggested in the data reported above is that practice experiences go beyond just exercising, practising and 'contextualising' what is or has been learnt in medical educational programmes. The data indicate that these experiences have specific qualities and make particular contributions. In the cases reported here, the informants referred to the difference between engaging in practice settings as students compared with when practising as doctors. The requirements, expectations and nature of their engagement are reported as being manifestly distinct. The authenticity of their experiencing activities and interactions in clinical settings is heightened tangibly and qualitatively different than when being engaged as students. This distinctiveness underlines the importance of understanding the process of experiencing and learning as a personal process and situated process. It also underlines the importance of the experience curriculum: how individuals construe and construct from what they are provided. Indicated here is the nature of personal engagement and intentionality being shaped by how they are positioned (e.g. as student or medical practitioner). Moreover, the data suggest that

practice-based experiences directly contribute to securing three key educational goals of (1) identifying preferred specialisms and suitedness to medicine, (2) developing medical capacities and (3) sustaining and developing further professional competence, albeit in personal particular ways.

Particular noteworthy here is the authenticity of engagement that clinical experiences afforded for securing learning in quite distinct ways than those provided whilst engaged in student-like activities. All of this suggests that there is a need to understand further the particular qualities or affordances of the kinds of experiences at different points in medical education and training. Given the differences between what was learnt when the junior doctors were students suggests that the process of experiencing is likely to be quite different at particular points in their learning trajectories. Considerations about how to optimise experiences in clinical settings in generating the kinds of knowledge required for medicine therefore become central to medical education and training policy and delivery.

The potency for decision-making and capacity building of particular experiences also opens up questions about other contributions afforded by other experiences that medical students and practitioners have. For instance, they may be particular consequences for medical students living together in students' quarters and being immersed in the process of learning medicine, which may play out differently for students who are more or less immersed in that process. For instance, students and junior doctors from overseas, such as the female junior doctor whose data is reported above, may have quite different experiences than those who share language, cultural preferences and high levels of common understanding (i.e. intersubjectivity). Then, there is the diversity of experiences that medical students and junior doctors bring to their clinical experiences. For instance, those who come from families or backgrounds with strong connections to medicine may have particular and potentially more informed or grounded bases to understand medical work and/or health-care settings than those who do not. All of this goes to suggest that there are issues associated with the organisation and ordering of practice-based experiences in medical education, yet there are also considerations associated with the ways in which individuals come to be positioned and engage in these clinical experiences.

**Acknowledgements** We would like to thank the following for supporting and facilitating the data collection reported in this chapter: Drs. Peter Johnston, Kim Walker, Richard Coleman and Emma Watson. Our thanks also go to Nathan Smith for his help with data collection and to the new doctors who participated in the interviews. The interviews were granted ethical approval from the College of Life Sciences and Medicine Ethical Research Board (CERB), University of Aberdeen.

## References

American Medical Association (AMA). (2007). *Initiative to transform medical education: Recommendations for change in the system of medical education*. DC: Washington.

Anderson, J. R. (1982). Acquisition of cognitive skill. *Psychological Review, 89*(4), 369–406.

Anderson, J. R. (1993). Problem solving and learning. *American Psychologist, 48*(1), 35–44.
Association of American Medical Colleges (AAMC). (1999). Learning objectives for medical student education – Guidelines for medical schools: Report I of the Medical School Objectives Project. *Academic Medicine, 4*, 13–18.
Australian Medical Council. (2010). *Competence-based medical education*. Australian Medical Council Limited Consultation Document. http://www.amc.org.au/index.php/pub/policy-documents
Billett, S. (2001). *Learning in the workplace*. Sydney, SW, Australia: Allen and Unwin.
Billett, S. (2003). Sociogeneses, activity and ontogeny. *Culture and Psychology, 9*(2), 133–169.
Billett, S. (2006). Relational interdependence between social and individual agency in work and working life. *Mind, Culture, and Activity, 13*(1), 53–69.
Billett, S. (2010). The practices of learning through occupations. In S. Billett (Ed.), *Learning through practice: Models, traditions, orientations and approaches* (Vol. 1, pp. 59–81). Dordrecht, The Netherlands: Springer.
Billett, S. (2011). Learning in the circumstances of work: The didactics of practice. *Education and Didactique, 5*(2), 129–149.
Billett, S. (2013). Recasting transfer as a socio-personal process of adaptable learning. *Educational Research Review, 8*, 5–13.
Chikwe, J., de Souza, A. C., & Pepper, J. R. (2004). No time to train surgeons. *British Medical Journal, 328*, 418–419.
Clarke, M. L. (1971). *Higher education in the ancient world*. London: Routledge & Kegan Paul.
Collins J. P. (2010). *Foundation for excellence: An evaluation of the foundation programme*. Medical Education England.
Cooke, M., Irby, D., & O'Brien, B. C. (2010). *Educating physicians: A call for reform of medical school and residency*. Washington, DC: The Carnegie Foundation for the Advancement of Teaching.
Department of Health. (2004). *Modernising medical careers*. London: Department of Health. http://www.dh.gov.uk/publications. Accessed 23 Mar 2012.
Department of Health (DH). (2012). *Liberating the NHS: Developing the healthcare workforce*. Fromdesigntodelivery.https://www.gov.uk/government/publications/developing-the-healthcare-workforce-from-design-to-delivery
Dewey, J. (1916). *Democracy and education*. New York: The Free Press.
Ebrey, P. B. (1996). *China: Illustrated history*. Cambridge, UK: Cambridge University Press.
Francis R. (2013). *The final report of the Mid Staffordshire NHS Foundation Trust Public Inquiry*. http://www.midstaffspublicinquiry.com/
Frank, J. R., & Danoff, D. (2007). The CanMEDS initiative: Implementing an outcomes-based framework of physician competencies. *Medical Teacher, 29*, 642–647.
General Medical Council. (1993, 2003, 2009). *Tomorrow's doctors: Recommendations on undergraduate medical education*. London: GMC.
General Medical Council (GMC). (2012). Recognising and approving trainers: The implementation plan. London: GMC.
Glaser, R. (1989). Expertise and learning: How do we think about instructional processes now that we have discovered knowledge structures? In D. Klahr & K. Kotovsky (Eds.), *Complex information processing: The impact of Herbert A. Simon* (pp. 289–317). Hillsdale, NJ: Erlbaum & Associates.
Greenaway, D. (2013). *Securing the future of excellent patient care*. Final report of the independent review led by Professor David Greenaway. http://www.shapeoftraining.co.uk/reviewsofar/1788.asp
Greeno, J. G. (1989). A perspective on thinking. *American Psychologist, 44*(2), 134–141.
Groen, G. J., & Patel, P. (1988). The relationship between comprehension and reasoning in medical expertise. In M. T. H. Chi, R. Glaser, & R. Farr (Eds.), *The nature of expertise* (pp. 287–310). New York: Erlbaum.
Hansen, D. T. (1994). Teaching and the sense of vocation. *Educational Theory, 44*(3), 259–275.
Lave, J. (1993). The practice of learning. In S. Chaiklin & J. Lave (Eds.), *Understanding practice: Perspectives on activity and context* (pp. 3–32). Cambridge, UK: Cambridge University Press.

Malle, B. F., Moses, L. J., & Baldwin, D. A. (2001). Introduction: The significance of intentionality. In B. F. Malle, L. J. Moses, & D. A. Baldwin (Eds.), *Intentions and intentionality: Foundations of social cognition* (pp. 1–26). Cambridge, MA: The MIT Press.

Marsh, C. J. (2004). *Key concepts for understanding curriculum*. London: Routledge Falmer.

Martin, L. M. W., & Scribner, S. (1991). Laboratory for cognitive studies of work: A case study of the intellectual implications of a new technology. *Teachers College Record, 92*(4), 582–602.

Menon, J., & Varma, S. (2010). Children playing and learning: Crafting ceramics in ancient Indor Khera. *Asian Perspectives, 49*(1), 85–109.

Morris-Stiff, G., Ball, E., Torkington, J., et al. (2004). Registrar operating experience over a 15-year period: More, less or more or less the same? *Surgeons: Journal of Royal College of Surgeons Edinburgh & Ireland, 2*, 161–164.

Paice, E. (1998). Is the New Deal compatible with good training? A survey of senior house officers. *Hospital Medicine, 59*, 72–74.

Perkins, D., Jay, E., & Tishman, S. (1993). Beyond abilities: A dispositional theory of thinking. *Merrill-Palmer Quarterly, 39*(1), 1–21.

Piaget, J. (1985). *The equilibration of cognitive structures*. Chicago: University of Chicago Press.

Raizen, S. A. (1991). *Learning and work: The research base. Vocational education and training for youth: Towards coherent policy and practice*. Paris: OECD.

Richards, J., Sweet, L., & Billett, S. (2013). Preparing medical students as agentic learners through enhancing student engagement in clinical education. *Asia-Pacific Journal of Cooperative Education, 14*(4), 251–263.

Ritchie, J., & Spencer, L. (1994). *Qualitative data analysis for applied policy research in A Bryman, & R G Burgess, Analyzing qualitative data* (pp. 172–194). London: Routledge.

Rogoff, B. (1990). *Apprenticeship in thinking – Cognitive development in social context*. New York: Oxford University Press.

Ryle, G. (1949). *The concept of mind*. London: Hutchinson University Library.

Scallan, S. (2003). Education and the working patterns of junior doctors in the UK: A review of the literature. *Medical Education, 37*, 907–912.

Scribner, S. (1984). Studying working intelligence. In B. Rogoff & J. Lave (Eds.), *Everyday cognition: Its development in social context* (pp. 9–40). Cambridge, MA: Harvard University Press.

Scribner, S. (1985). Vygotsky's use of history. In J. V. Wertsch (Ed.), *Culture, communication and cognition: Vygotskian perspectives* (pp. 119–145). Cambridge, UK: Cambridge University Press.

Singleton, J. (1989). The Japanese folkcraft pottery apprenticeship: Cultural patterns of an educational institution. In M. W. Coy (Ed.), *Apprenticeship: From theory to method and back again* (pp. 13–30). New York: SUNY.

Sun, R., Merrill, E., & Peterson, T. (2001). From implicit skills to explicit knowledge: A bottom-up model of skill development. *Cognitive Science, 25*, 203–244.

Tooke, J. (2008). *Aspiring to excellence*. Final report of the independent inquiry into Modernising Medical Careers. London: MMC Inquiry.

von Glasersfeld, E. (1987). Learning as a constructive activity. In C. Janvier (Ed.), *Problems of representation in the teaching and learning of mathematics* (pp. 3–17). Hillsdale, NJ: Lawrence Erlbaum.

Wertsch, J. V., & Tulviste, P. (1992). L. S. Vygotsky and contemporary developmental psychology. *Developmental Psychology, 28*(4), 548–557.