



Experiential learning: AMEE Guide No. 63

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AMEE GUIDE: THEORIES IN MEDICAL EDUCATION

Experiential learning: AMEE guide No. 63

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Abstract

This Guide provides an overview of educational theory relevant to learning from experience. It considers experience gained in clinical workplaces from early medical student days through qualification to continuing professional development. Three key assumptions underpin the Guide: learning is 'situated'; it can be viewed either as an individual or a collective process; and the learning relevant to this Guide is triggered by authentic practice-based experiences. We first provide an overview of the guiding principles of experiential learning and significant historical contributions to its development as a theoretical perspective. We then discuss socio-cultural perspectives on experiential learning, highlighting their key tenets and drawing together common threads between theories. The second part of the Guide provides examples of learning from experience in practice to show how theoretical stances apply to clinical workplaces. Early experience, student clerkships and residency training are discussed in turn. We end with a summary of the current state of understanding.

Introduction

The statement 'one learns from experience' will probably conjure up pictures of undergraduate medical students learning from patients during clerkships, residents learning whilst caring for patients, or trained physicians sustaining and enhancing their mastery of clinical practice. It would not be wrong to also regard dissecting a cadaver, participating in a problem-based learning group, or being instructed in a skills laboratory as 'experiential learning', but our focus here is on authentic experience gained in clinical workplaces. To discuss the types of experiential learning that are dissociated from clinical practice would take us to a rather different type of 'experience' and into reflective and cognitive learning theories, which need a separate Guide to do them justice (interested readers are directed to the companion AMEE Guide of Sandars 2010: 'The use of reflection in medical education').

From a user's perspective, it would be simpler if there was just one set of learning theories, but that is unfortunately not true. There are whole families of them, which means that anyone wishing to put their teaching or research on a theoretical footing has to make choices. Since it is good practice to state the assumptions that underpin such choices, below are the ones that the authors feel underpin this Guide:

- Learning is 'situated'. Learning cannot be dissociated from the context in which it occurs and an important aspect of any such context is its social nature. Developing transferable learning requires understanding both the context in which learning was originally situated and its potential for applicability in other contexts with or without refinement. These ideas are discussed in detail on the companion AMEE Guide on Situativity Theory (Durning & Artino 2011).

Practice points

- The work of many experiential learning and socio-cultural theorists is underpinned by constructionist philosophies.
- Socio-cultural learning theories acknowledge the importance of interactions for both individuals and collective learning in workplaces.
- Context and potential for participation (in terms of opportunities and type of participants) must be accounted for when designing an experiential learning intervention.
- Educators need to distinguish between theoretical concepts which describe ideal learning circumstances (and aspire to reproduce these) and experience in practice, in order to address the realities of education in complex workplaces.

- Learning can be viewed either as an individual or a collective process. In this Guide, we emphasise that interactions are fundamental to experiential learning. This means that, although individuals may construct different understandings from experience, these are still considered to derive from multi-directional influences between them and others in the context; that is, from a collective experience.
- The learning that is relevant to this Guide is triggered by authentic practice-based experiences. It is the way people learn to practice from experience gained within real life, workplace learning.

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The Guide has three overarching objectives. These are to: discuss the origins and historical development of experiential learning in order to define where current knowledge ends and research and development must take over; explain how social learning theories can be applied to experiential learning, and; illustrate how applying these theories helps structure and deliver experiential learning at three levels – during the initial years of medical studies, the later undergraduate years, and in postgraduate education.

Part 1: The theory explained

Overview

Different learning theories are linked to different philosophical views of the nature of knowledge. Experiential learning theories explain how individual people learn individual things in individual ways as they react to individual perceptions of experiences throughout their lives. Education, from that perspective, is a process of individual transformation, which means there can be no such thing as absolute knowledge divorced from the person who knows it. So, the philosophical principle underpinning experiential learning is ‘constructivism’. Constructivism acknowledges that there may be many competing truths. Research in this tradition aims at understanding how people create (different) versions of reality. This is not to suggest it is a better (or worse) philosophical perspective from others; different perspectives are useful to inform different problems and questions.

The name of Kolb (1984) is very strongly associated with experiential learning. Kolb’s learning cycle, discussed in more detail later, is a constructivist theory concerning how learners take experiences from the external world into their private worlds of thought and emotions. They interpret experiences, give them personal meaning, and plan new actions in response to their interpretations. The simplicity of this ‘experiential learning cycle’ is appealing but it builds on just one specific historical tradition; there are other, competing traditions of experiential learning theories about which interested readers can find more details, such as in Kolb’s (1984) ‘Experiential Learning: experience as the source of learning and development’.

Kolb has not been alone in theorising experiential learning. Knowles, for example, distinguished ‘pedagogic’ (child) from ‘andragogic’ (adult) ways of learning from the world of experience. Andragogic learners, according to Knowles, self-directedly take charge of their experiential learning. Whilst Knowles’ work played an important part in freeing adult learners from being treated like children in inappropriate ways, his distinction has come to be viewed as simplistic. To understand why, consider an adult medical school entrant who has to learn the new language of medicine and the norms of a new culture; that type of learning has closer parallels with child than adult learning. Consider, in contrast, a child learning by discovery. Now, ‘adult’ learning behaviour is what a child is expected to demonstrate. Viewing learning as a lifelong continuum is, in many people’s view, more satisfactory because it allows learning to change with

increasing experience, but does not preclude adults learning like children under some circumstances or children learning like adults under other ones.

Social learning theory is a theoretical perspective that has come to great prominence of late within the medical education domain and altered our understanding of experiential learning. Social learning theory moves the focus away from internalisation to how experience and its learning consequences are essentially located in social milieus. Inevitably, psychological disciplines that are primarily concerned with internal processes put less emphasis on learning as a social, developmental process so you will encounter both perspectives on experiential learning. For that reason, we will in this Guide go into more depth about individual key authors, whose work has influenced experiential learning theory, finishing with Kolb. We will then present and explain socio-cultural theory, which regards experiential learning as an essentially social phenomenon. It differs from the preceding perspectives in not focusing on processes of internalisation and regarding social and cultural environments as integral components of learning. We will present examples of research on learning in the medical domain in the second part of this Guide to contextualise experiential learning theory into medical learning environments.

Experiential learning theorists

John Dewey (1859–1952)

An American scholar, John Dewey contributed significantly to a variety of scientific fields, most notably philosophy, psychology and education. His ‘Experience and Education’ (Dewey 1938) argued for a ‘progressive approach’ to education, which recognised there was ‘an intimate and necessary relation between the processes of actual experience and education’ (Dewey 1938, p. 20). Dewey’s significance to educators is given in the following.

First, an important motivator for his work on education was a democratic passion for education that enabled everyone to share in a common life and contribute to society.

Second, Dewey conceptualised experience as an organising focus for lifelong learning and development. He believed that active engagement and interaction with their surroundings helped learners gain applied rather than abstract knowledge. Consequently, education had to engage with and enlarge learners’ experience. In relation to this, Dewey wrote on the role of thinking and reflection in learning from experience. This has continued to be an inspiration and aspects of Dewey’s work are reflected in, for example, Schön’s (1983) more recent writings on reflective practice.

Dewey argued that, without direct personal experience something was lost from a learner’s understanding. He believed that students thrived in environments where they were allowed to experience and interact with curricula and all students should have opportunities that suited their own learning. Students’ needs should be the starting point for organising education based on meaningful experiences. That did not mean the content of education and the role of teachers was unimportant. On the contrary, Dewey advocated an

educational system that took into account the subject matter on the one hand and the interests and experiences of the student on the other (Dewey 1902). He argued that, for education to be most effective, content had to be presented in ways that allowed the student to relate information to prior experiences. Those views on the role of experience in education made Dewey an important proponent of experiential education, which was later an inspiration to Kolb's notion of experiential learning.

Based on his ideas about how learning should take place, Dewey also had clear ideas about the role teachers should play in it.

The teacher is not in the school to impose certain ideas or to form certain habits in the child, but is there as a member of the community to select the influences which shall affect the child and to assist him in properly responding to these influences.' (Dewey 1897, p. 9).

In other words, the role of teachers was not to transfer knowledge and truths, but to guide and assist learners who were actively working through meaningful experiences.

Kurt Lewin (1890–1947)

Lewin was a refugee from Nazi Germany who became a leading American Social Psychologist, one of whose most enduring legacies has been his contribution to understanding organisational behaviour. He was particularly interested in group dynamics and the role of action research in bringing about change. His work on integrating theory and practice in areas such as leadership styles and collaborative peer working led to the development of training groups. These 't-groups' encouraged cooperative leadership, democratic values and dialogue between learners and teachers. He studied interactions within t-groups that resulted from tensions between the direct concrete experiences of trainees and the conceptual models of their teachers. The need to address those tensions and help trainees to abstract learning from concrete experiences influenced the development of both experiential learning models and models of effective organisational change management (Argyris & Schon 1974, 1978; Kolb 1984).

Jean Piaget (1896–1980)

Born in Switzerland, Piaget originally studied biology before becoming concerned with the development of 'true knowledge' and the problem of different accounts of reality arising from human actions. He focused his work on cognitive development processes and the nature of intelligence, including how it develops, believing that cognitive processes were key to understanding quantitative and qualitative differences in intelligence. His constructivist epistemology was crucial to his view of education. He argued that rather than simply asking normative questions about knowledge – for example, setting criteria for what is or is not knowledge – empirical questions about how knowledge develops should also be researched to develop understanding. This led him to focus his work on the growth of knowledge in childhood.

Whilst working on research aimed at measuring levels of intelligence in childhood, he became convinced that it was more important to understand how conclusions were reached by learners (particularly when incorrect) than to established 'normal' levels of intelligence. His work (which involved setting children problem solving tasks and observing the qualitative approaches they took) focused increasingly on detailed observation, from which he documented a schematic sequence of thought. He described learners developing their thoughts from simple ideas to complex organised abstractions. He defined intelligence as 'the state of equilibrium towards which tend all the successive adaptations of a sensori-motor and cognitive nature, as well as all assimilatory and accommodatory interactions between the organism and the environment' (Piaget 1950). Helmore argues that the term equilibrium describes a state in which a learner has taken account of interactions within their environment, assimilating and accommodating these into their own thought. Assimilation refers to the organisation of experiences into increasingly complex schemata for future use, and accommodation refers to the modification of these schemata in the light of new experiences (Helmore 1969). Ultimately, Piaget suggested that intelligence was shaped qualitatively by experience, in which environmental interactions played a key role. He reasoned that individuals with greater capacity to assimilate and accommodate through cognitive processes had greater intelligence and capacity for abstract thinking, which could be transferred from one environment to another (Kolb 1984).

Piaget defined education as having two linked components – 'the growing individual' and 'social, intellectual, and moral values' (Smith 2001, p. 40) instilled by educators, who were broadly defined as people with more experience and greater knowledge. Piaget recognised both the need for learners to transform received information into understanding and the need for interaction but he placed greater importance on learners developing their own reasoning – their active minds. He emphasised learners' autonomy rather than social interdependency as the means of creating new knowledge (Smith 2001). His work challenged both the idea that subject matter could only be taught at certain levels of academic progression (e.g. the learner had to be of a certain age) and the idea that different pedagogies should be selected for teaching and learning according to subject matter. Instead, he argued that educational pedagogy should be matched to stage of development but any content could be delivered (Kolb 1984). The most enduring critique of Piaget is that his theory of learning as schemata was too generic and not specific enough about the relation between specific experiences, or specific content, and levels of thought (Helmore 1969). In fact, this criticism actually widens the potential to apply Piaget's ideas to learning beyond adolescence as it suggests individual learners may display different levels of abstraction or ability to think symbolically and, therefore, transfer learning between contexts. The suggestion that a person might be at one stage of cognitive development in a given subject or context but another with something less familiar combined with individualised trajectories of development has since been argued by proponents of Piaget's theories in other settings (Perry 1970).

Malcolm Knowles (1913–1997)

Criticism of Knowles' earlier work, which was described above, led him to acknowledge that there is a continuum of learning from childhood into adulthood. Although andragogy cannot really be regarded as a 'theory', it was so influential that we summarise adult learning principles (or assumptions) here. Adults learn best when: they can collaborate in partnerships with teachers; they are able to draw on prior life experience, which helps identify personal learning needs; learning is relevant to their current lives; learning is problem-centred rather than subject-centred, and; internal motivation drives them to learn autonomously (Knowles 1980). Taken together, those elements suggest that the potential to learn from new experiences will be influenced by learning from previous experiences and how their current concerns sensitise learners to what they are experiencing. This sensitisation, which Kolb (1984) termed 'appreciation', explains why people may struggle to learn when they cannot see a relatively immediate purpose to which their learning can be put. It also explains why different learners gain in different ways from shared experiences.

David Kolb (1939–)

Kolb's influential 1984 book entitled 'Experiential Learning: Experience as the source of learning and development' defined learning as a 'process whereby knowledge is created through the transformation of experience' (Kolb 1984, p. 41). He proposed a four-stage cyclical model of knowledge development that combined individuals' conscious recognition and transformation of experience. The four modes of adaptive learning that constituted his cycle (Figure 1) were: 'concrete experience, reflective observation, abstract conceptualisation and active experimentation' (Kolb 1984, p. 40).

Whilst 'concrete experience' locates the starting point of learning in the experiential world, the next two phases of the cycle represent complex learning processes within the mind of individuals and the last one moves back to the experiential world. Reflective observation describes learners making sense of experience. Abstract conceptualisation encompasses what Kolb called 'figurative representation' and 'transformation of that representation' of experience. He theorised that learners extract from their experiences an essence of learning; they identify what principles can be learnt, form an opinion on what that means to them, and then assimilate this into their existing knowledge. Lastly, they try out for themselves what they have learned in response to further experiences (Kolb 1984). Through those processes, the learner creates both knowledge and personal meaning. Kolb also recognised that professional learning involved 'learning' in the sense of constructing an appropriate identity as well as gaining specific knowledge (Kolb 1984).

Kolb's four stage experiential learning theory has been criticised for many reasons. The idea that learning takes the form of a neat four-stage cycle has been challenged. For instance, Schlesinger (1996a, b) argued that, whilst the separate elements of the cycle may be relevant, learning is really much more fragmented and chaotic (Cheetham & Chivers 2005). Bleakley (2006) saw it as a paradox that a

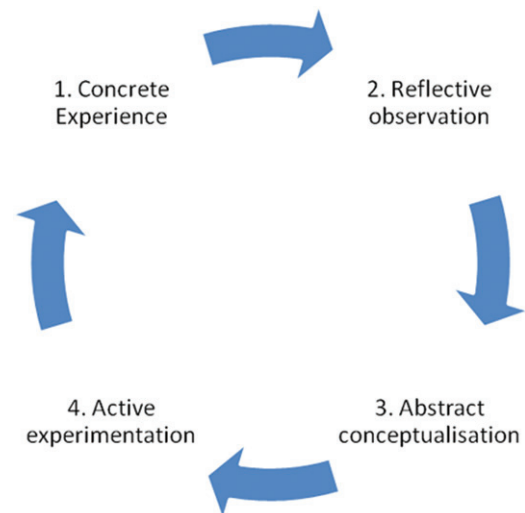


Figure 1. Kolb's learning cycle.

model of 'experience' neglected the social context of that experience and its influence on what was learned. Nonetheless, researchers have found that Kolb's experiential learning theory can explain a number of phenomena related to learning in medical workplaces (White & Anderson 1995; Chung et al. 2003; Smith et al. 2004).

Other experiential learning theorists

Although Kolb is often credited with having shown that reflection is the means by which learners abstract and transfer their learning into new contexts, others have contributed theoretical and empirical insights on reflective learning and medical education; notably, Schön (1983) and more recently Norman (2005) and Norman et al. (2007). Whilst reflective learning has been avidly adopted in medical education, implementation has tended to deviate from Kolb's theory in important and potentially detrimental ways. In particular, the need for learners to be supported in every stage of the cycle has not been recognised. Without support, in the form of guidance from someone more experienced, learners may not be able to make adequate sense of their experiences (Kolb 1984, p. 42). Instead, the educational value of experiences may be underestimated or learners may be confused by unexplained dissonances between experiences in different contexts. Concrete experiences, Kolb argued, need to lead on to abstract concepts in order for learners to apply their understanding in new contexts. Mezirow (2000, p. 8) elaborated further on the concept of transformative learning, which he defined as 'the process by which we transform our taken-for-granted frames of reference (meaning perspectives, habits of mind, mindsets) to make them more inclusive, discriminating, open, emotionally capable of change and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action'. Mezirow (2000) also emphasised the significance of pre-existing knowledge on future learning potential and the need for learners to participate in constructive discourse with others if they were to make

maximum use of experiences to transform understanding of the subject of interest. The theories of transformation described by Mezirow, therefore, emphasise an intrinsic human need to make meaning out of experience and to integrate that new meaning with prior understanding, which is how transformation takes place. This suggests that in certain circumstances, the learning of a role and of knowledge may be too closely intertwined to separate.

Practical illustration: cognitive perspectives on experiential learning

- Consider medical students in the clerkship phase of undergraduate programmes. When behaviourist theories of learning dominated, it would have been logical to focus on students' experience of being 'taught' by expert clinicians – authority figures. Students' responses would be to 'learn what they were being taught'.
- Given the number of medical school teachers who still adhere to those behaviourist principles, it is rather shocking to realise Dewey introduced cognitive alternatives to such a simplistic behaviourist model nearly a century ago! Dewey's work shifted attention from the teaching a student might experience in a clerkship to their learning from experience.
- At one time, it would have been normal to regard students' ability to learn as limited by their intelligence, which was seen as a fixed, measurable trait. The work of Piaget shifted attention to the shaping of learners by their experiences.
- Whilst Piaget's work centred on children, Knowles centred his work on adults. He would draw our attention to supportive relationships between clinicians and clerkship students, which resulted in students becoming better able to take charge of their clerkship experiences.
- Kolb's work draws our attention to the process of reflection. Our clerkship students step back from their experiences and deliberately interpret and understand what their experiences meant to them. They plan new actions to promote their further experiential learning.
- Schön would focus attention on our clerkship students interacting with patients, finding their limitations from challenging experiences, coming up with improvised solutions, then reflecting later on what had happened and how they might respond to such experiences in the future.

Unlike the socio-cultural perspectives on experience, which follow, those cognitive perspectives are primarily focused on our clerkship students as individuals and the changes that experience brings about in their knowledge, skills, attitudes and behaviours. Socio-cultural perspectives go beyond recognising that experience in the social world brings about individual learning to seeing learning as something that is essentially communal and located in society rather than in the heads of individuals.

Socio-cultural perspectives on experiential learning

Socio-cultural theories are rooted in Marxist theory so it is no coincidence that these originated in Soviet Russia.

Its foundational writings were in Russian and it was not until they were translated into English and there was freer communication between west and east that socio-cultural scholarship became accessible to western scholars who did not read Russian. Our brief introductory overview explained that, as might be expected of Marxist-inspired scholarship, it shifted the focus from individual to social learning. Socio-cultural theories consider experience and its learning consequences as essentially located in social milieus rather than the heads of individuals. Vygotsky can be regarded as the tradition's father.

Lev Vygotsky (1896–1934)

This Russian psychologist studied both medicine and law before pursuing research in developmental psychology and education. He taught and researched education, developing a focus on the relationship of speech and language development to thought (Vygotsky 1986). Vygotsky conceptualised learning as a social and cultural rather than individual process (Kozulin et al. 2003). He fell out of favour with the Communist Party and found it increasingly difficult to continue his work in the 1930s, dying of tuberculosis in 1934. A significant and enduring tenet of Vygotsky's work was his attribution of mental processes to social origins. Rather than taking individuals as his starting point, he argued that social and cultural interactions were of fundamental importance to understanding learning. These ideas led to his concepts of 'inner speech' and the 'zone of proximal development'. Inner speech is a concept of links between internal thought and spoken language – links which Vygotsky believed were only formed during social interactions, through which words gained meaning (Ardichvili 2001). He described the zone of proximal development as a metaphorical space that defined the additional potential for learning resulting from interaction with other agents and structures. This, combined with his concepts of scientific and spontaneous learning, predicted that experiential learning would contribute to different types of functional and transferable knowledge. The term 'spontaneous', in the Vygotskian sense, refers to the meaning-making, which results from a person's desire to make sense of events. 'Scientific', in contrast, refers to theoretical, organised, abstract principles which can be drawn from the experience and applied to other situations. This, Vygotsky suggested, was critically dependent on interaction with others (Kozulin et al. 2003). Experience alone was, therefore, necessary but not sufficient for creating meaning. The section about clerkship learning below shows how Vygotsky's thinking is as relevant today as it was in his own day. Whilst adult learning principles would predict that 'self direction' is the optimum condition for medical students to learn in clerkships, research has indicated that the benign influence of experienced practitioners can help them achieve what they could not achieve alone (Doran et al. 2005). So, the contemporary notion of 'supported participation' (Billett 2002) is conceptually related to Vygotsky's Zone of Proximal Development.

Box 1. Central tenets of socio-cultural theory.

- The subject matter of learning and the processes by which people learn are not uniform; they are as diverse as the people who learn (Wertsch 1991), so socio-cultural theory is constructionist.
- Peoples' higher mental functions are strongly influenced by the activities of social milieus in which they develop (Wells 1999).
- Learning is mediated by artefacts, which have cultural and historical significance, and sign systems, of which language is the most prominent and important.
- Action, which can be defined as a goal-directed joint activity, has a central place in learning.
- Learning is situated within the context in which it takes place; the subject matter, content and process of learning are inseparable from one another.
- If interactions are perceived to be adversarial (with either people or institutions) then this will lead to a different sort of 'learning' and risks marginalisation of the learner rather than gradual integration into the practice community (Wenger 1998).

Tenets of socio-cultural theory and post-Vygotskian perspectives

Socio-cultural theory, as its name indicates, holds that learning is an essentially social process with processes and outcomes that have cultural and historical dimensions. Some other central tenets are shown in Box 1.

Two main perspectives are prominent in contemporary socio-cultural learning theory: one is activity theory; the other is communities of practice (COP) theory. Whilst they share the above tenets, they differ in their focus.

Cultural Historical Activity Theory focuses on goal-directed joint activity. The contemporary scholar Yrjö Engeström has developed the theory to explain how learning results from unstable, complex structural processes (Engeström 2001, 2005). Three components of Activity Theory are relevant to experiential learning: First, interaction between people and contexts is subject to multiple influences; second, learning is a collective activity; and third, conceptual tools used to explain learning outcomes need to 'understand dialogue, multiple perspectives, and networks of interacting activity systems' (Engeström 2001, p. 135). Figure 2 summarises the generic model components of activity systems and associated definitions.

A recently published example of how activity theory can explain conflicting influences on medical students' experiential learning is related to student perceptions of patient safety during their transition from undergraduate to postgraduate education (de Feijter et al. 2011). The application of applying activity theory is summarised in Box 2 with technical terms derived from activity theory emphasised in bold to illustrate how the theory can explain a real tension in experiential learning and point towards solutions.

An educational intervention which further explored that contradiction and provided strategies for behaving safely even under such circumstances could make safe patient care synonymous with competence, which de Feijter et al. (2011) showed not to be the case at present.

COP theory (also known by the names Situated Learning and Legitimate Peripheral Participation) was first published by Lave and Wenger (1991). Taking inspiration from Marxist theory and the works of earlier socio-cultural scholars, their original mission was to reconceptualise apprenticeship for an age

when mastery was no longer an attribute of individual people, but an increasingly communal and negotiated construct. From a variety of anthropological case studies of work-based learning, they developed a theory that resonated with medical education to a remarkable degree. For them, the clinical unit in which the previous paragraph's fictitious medical student is learning is a *community of practice*. The student is a *legitimate* (because (s) he has a mandate to be there), *peripheral* (because qualified doctors and nurses are at the core of the practice) and *participant* (because his/her participation in the activities of the unit is the means by which (s)he learns). 'Getting away with it' is salient because it is a more central participatory act than standing on the sidelines and makes an important contribution to the student's development of the *identity* of a doctor. From a community of practice perspective, adaptation so that patient safety is a more central focus of the practice would be a communal act of learning. For Lave and Wenger, *learning, meaning and identity* are inextricably tied up with one another and with practice. Wenger's (1998) more recent work examined educational interactions within COP in greater detail. For example, the prescription chart in the previous example 'reifies' the practice of prescribing. For Wenger, reification of practice in the artefact of the prescription chart is intimately tied with prescribing as an act of participation in practice. In his most recent work, Wenger (1998) has used the metaphor of 'landscapes of practice' to describe how, for example, a resident rotating through different clinical units progressively negotiates the identity of a specialist by passing through the educational landscape.

Tailpiece on socio-cultural theory as an exemplar learning theory

We expect that different readers will react to the preceding paragraphs in different ways; it would be inconsistent with our constructivist stance not to expect that. Kurt Lewin's aphorism that 'there is nothing as practical as a good theory' is one we agree with. It is quite legitimate for a person not to find theories helpful, but those who are able to engage with theory will find they open up very useful ways of enhancing research and practice. The two different post-Vygotskian perspectives discussed above draw attention to different aspects of the same learning environment and it is a matter of judgement which one better highlights the problem in a way that is more amenable to solution. The common ground shared by situated learning and activity theory moves away from any focus on potentially fruitless 'teaching' initiatives to focusing on the practice environment that is integral to learning and capable of swamping any decontextualised teaching. A patient safety initiative focused there could change practice in the short term, and contribute to the continuing education of all the members of the community of practice, not just the medical student.

Practical illustration: socio-cultural perspectives on experiential learning

- Whilst the cognitive theories reviewed above see the social milieu as a trigger for learning, which is essentially in the

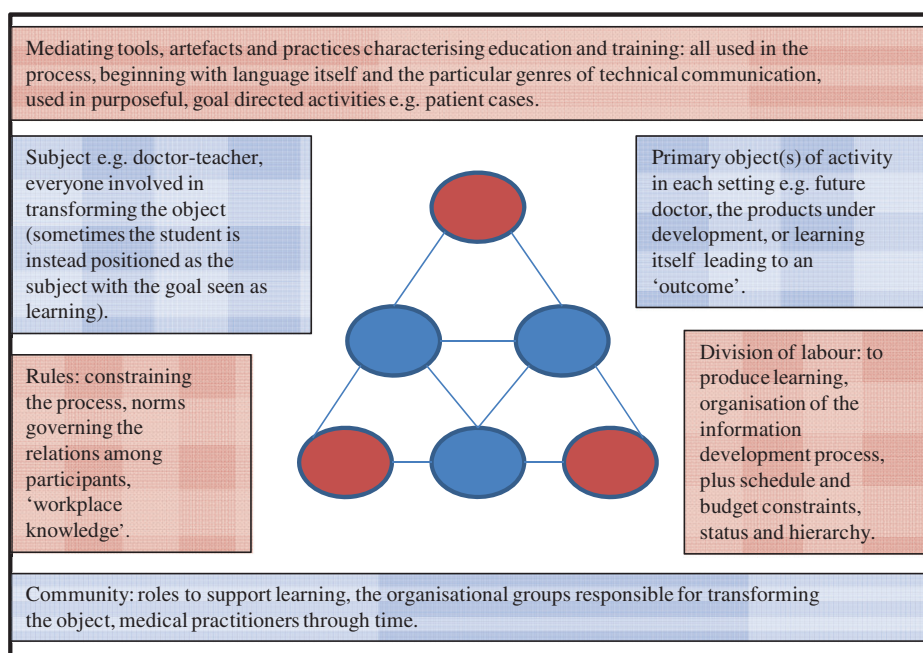


Figure 2. Generic model components of activity systems and associated definitions.

Source: Reproduced from Yardley (2011), after adaptation from Schryer et al. (2003), Dayton (2008) and Morris (2009).

Box 2. Example of using activity theory to interpret workplace learning.

Medical students are the *subject* of two concurrent activity systems, which are in *contradiction* with one another. The *object* of their experiences in activity system 1 is to become competent. The *object* of those same experiences in activity system 2 is to care safely for patients. Using *artefacts* like their stethoscopes, pens and prescription charts, the (tacit) *rules* of system 1 are that students should be given responsibility. There is a *division of labour* in workplaces, which may result in other members of the practice *community* – notably, nurses and, perhaps, supervisors – giving students' responsibility that enhances their competence, but goes beyond the limits that assure patient safety. Some components of activity system 2 are similar but others are different; key *artefacts* are operating procedures, and a division of labour that might, for example, emphasise the role of pharmacists in ensuring proper prescribing procedures and safe decisions. If a student, who is not formally licensed to prescribe but is able to 'get away with it' because of lax procedures is asked by a nurse to prescribe, there is a contradiction between the object of learning and the object of patient care which may result in 'getting away with it' when the pressure is when the pressure is on.

heads of our clerkship students, socio-cultural theory places its primary emphasis on interactions in the social milieu and individual learning as of secondary importance.

- Vygotsky's Zone of Proximal Development draws our attention to the social world of clerkship. The interaction between students and practitioners creates a potential for learning that would not exist without social interaction and of which the social interaction is an essential part.
- Wenger would see our clerkship students as novice members of a community of practice, participation in which leads to them developing the identity of a doctor. Whereas cognitive theorists see participatory experience as leading to learning, socio-cultural theorists see those experiences as learning.

Common threads in theorists' work

The preceding section gave detailed information about the work of a number of theorists, whose scholarship contributed to experiential learning theory as we understand it today. The details of their different perspectives are of intrinsic interest, necessary for an in-depth understanding of the field, and illustrative of the richness of theory that informs education scholarship. But it is important also to identify what is common to their perspectives. The theoretical positions taken by them are constructionist. They locate learning in social milieus of which learners are part. In contrast to what has been called the 'transmission metaphor' of learning (Sfard 1988), according to which knowledge is transmitted by experts to inexpert learners through the medium of 'teaching', the core condition for learning is participation (Sfard 1988). Without denying the difference in expertise that exists between learners and practitioners, they are co-members of social groups, which mediate learning. Learners are active influences on learning environments, just as learning environments actively influence learners. Learners and practitioners are not just joint members of the social groups of which they are part, and not even just joint contributors to those groups, but learners create teachers through the same processes by which teachers create learners. Far from being coincidental, the contexts of learning and purposes of activities in which teachers and learners co-participate are integral components of learning. Environment, activity and learning outcome are 'mutually constitutive'. Medical education has a centuries old tradition of 'learning on the job'. Experiential learning theory fits medical workplace education remarkably well, and the currency of experiential learning theory mandates medicine to continue its

time-honoured experiential learning tradition. Experiential learning theory underlines two other important educational principles: that past experience influences learners' approaches to new experiences, the amount, and the type of learning that ensues; and that practitioners' support is a vital ingredient of experiential learning.

Linking theory to practice

There is, however, a note of caution. A common misunderstanding arising when attempting to apply the theories we have discussed above to educational interventions stems from a failure to recognise these are theories of what should happen in ideal circumstances. As such, they provide a theoretical explanation of what educationalists should aspire to, and why. It cannot be assumed that a particular form of experiential learning will follow this trajectory. In particular, changes or deviations from the integral support assumed with theories would be expected to alter outcomes in practice. Equally human interactions in practice might be fruitfully researched to refine theory in specific settings. Given the importance placed on social interactions within these theories, the possibility of unintended consequences must also be acknowledged (Merton 1936). This issue has begun to be addressed through a body of research that seeks to refine understanding of experiential learning in medical education through empirical work studying 'experiences in action' (Dornan et al. 2009; Teunissen et al. 2009; Yardley 2011). Such work seeks to link what should happen with what does happen in practice in order to develop a more holistic understanding of experiential learning in medical education which includes but is not limited to the intended learning objectives of faculty designed curricula. This is important because formal learning objectives or goals are interpreted differently by medical students and doctors at different stages of their career trajectories. Students are more likely to want to define desirable learning from experience through the creation of minimum level checklists to meet the demands of the medical school, whilst senior doctors prefer their experiential learning to be guided by collaboratively developed practice-based objectives (Dornan et al. 2005; Morcke et al. 2006). This means that learners may need qualitatively and quantitatively different support to maximise the potential for experiential learning at different career stages.

Having noted these considerations, we present examples of how experiential learning can be applied to different stages of medical education. Our examples are presented chronologically along the lifelong learning trajectory. The first section discusses learning from early experience. The next two sections consider learning in clerkships and learning during residency as instances of experiential learning.

Part 2: Examples of learning from experience in practice

Learning through early experience

'Early' experience describes students engaging in authentic workplace contexts from the start of their medical studies. In UK-based undergraduate curricula, this refers to the first

2 years. Internationally, it refers to any time when students who are mainly based in higher education institutions have planned visits to workplaces for the purpose of experiential learning (Littlewood et al. 2005). Early experience in authentic workplaces is significantly different to experiential learning in clerkships and residency as it forms a minority part of the 'students' world' in time, location and, therefore, expectations of learning (Yardley 2011). Unlike the learners in the next two examples, early experience students are through making relatively short and repeated transitions into and out of different workplaces.

The widespread introduction of early experiences has been driven by both policy imperatives such as the UK General Medical Council's (2009) 'Tomorrow's Doctors' and equivalent publications (Irby et al. 2010) alongside the pedagogical trends towards 'adult' learning discussed above. The design and intention of early experiences vary widely, ranging from attracting students to specialties or locations which are struggling to recruit through to increasing student understanding of patient perspectives, professionalism and communication skills (Dornan et al. 2006; Hopayian et al. 2007; Howe et al. 2007; Yardley et al. 2010). These different intentions are important because, in the former, societal need is privileged and students provide services whilst, in the latter, students learn without actively contributing to the primary functions of the workplace. The educational value of the various forms of early experience is difficult to identify from research literature as most empirical studies simply report positive evaluations of intended objectives and ignore additional or alternative consequences (Yardley 2011). Despite this, application of the theories outlined above to the design and implementation of early experience interventions suggests that there are two elements of early experience which warrant specific consideration. Each of these is now taken in turn, drawing on the current literature regarding early experience and recent doctoral work (Littlewood et al. 2005; Yardley et al. 2010; Yardley 2011).

Situated social learning

Experiential learning and socio-cultural theories suggest that students need support in order to translate learning from one context to another (Dornan et al. 2011). Piaget noted that accommodating conflicting ideas to develop a refined understanding was more challenging than rejecting some information to resolve the conflict. In this instance, students may reject medical school ideals in favour of practice culture in order to integrate themselves within workplaces. As Lewin's work demonstrated (see above), mechanisms are needed to identify and make explicit tensions between concrete experiences and conceptual models offered by teachers. Left to their own devices students may create 'spontaneous' knowledge rather than 'scientific' constructs as described by Vygotsky (see above).

Collaborative and relevant learning goals

To remain true to the common principles of experiential learning, which we have discussed above, is challenging with

respect to early experiences. Consideration needs to be given to how students are best supported to develop learning goals which integrate with the remainder of their studies and which they can practice. This requires the creation of experiences in which students can actively participate. Students involved in service delivery report taking away a sense of purpose – satisfaction at having made a useful contribution. The strongest example of this in early experience literature is, however, in dental education where students are more quickly given a significant degree of responsibility than their medical peers (Lalumandier et al. 2004). Most conceptualisations of authentic early experience include few if any opportunities for graded increases in responsibility for students (Dornan et al. 2006; Hopayian et al. 2007; Howe et al. 2007). There is a risk that non-participation could lead to sub-optimal learning. The difficulty present is achieving balance between ensuring patient safety and giving students meaningful patient-related tasks. There needs to be development of shared understanding of the students' roles with respect to both learning and workplace functions.

All of the theorists discussed above expected learners to gain subject, or content, knowledge from experiential learning. Whether authentic early experience in current forms does, or should, contribute to new knowledge content has been unclear from the literature (Mann 1994; Littlewood et al. 2005). There is work to show that students believe authentic early experience has assisted them in understanding the relevance of basic science studies, but it is less clear or convincing that it has directly helped them achieve deep learning (Jones et al. 1986). Whilst studies describe perceptions that authentic early experience (in its current iterations) has helped in this area (Dornan & Bundy 2004), there are others that show students are still struggling to apply knowledge in new situations (Dornan 2003). Studies which were set in a particular patient group (Orbell & Abraham 1993) or in a specialty such as geriatrics (Alford et al. 2001), endocrinology (Sathishkumar et al. 2007), or palliative medicine (MacLeod et al. 2003) describe changes in student understanding of the relevant specialty. This suggests that experiential learning can result in medically useful content knowledge as well as interpersonal skills and reinforcement of medical school learning. Students, in later years reflecting back on early experience report being questioned by others (teachers and peers) prompting study of the biomedical science related to authentic patients' problems, suggesting that debriefing and feedback may be a necessary condition for the processing of experiences (Diemers et al. 2008). Recent work seeking to understand the consequences of authentic early experiences, including the meaning-making and knowledge construction which results from students' perspectives has identified several findings which further the state of knowledge in this area (Yardley 2011). In particular, it was demonstrated that dynamic social interactions are fundamental to meaning-making and knowledge construction (which are inextricably intertwined with identity evolution). The variables influencing social processes in early experience divided into two categories: workplace variables relating to the development of cultural competencies, and educational variables describing how learning is shaped through social interactions. Workplace variables

related to legitimacy, professional perspectives, role and identity and risk. Educational variables related to specificity of objectives, integration, performance and transfer of learning (Yardley 2011). A detailed discussion of these variables is currently in preparation as a separate publication.

Translation of these principles into practical actions requires those responsible for students undertaking early experiences to consider the specifics of their particular workplace and the potential for learning in the broadest sense. Many may find it helpful to draw on reported patient (client) experiences of the workplace as students without previous healthcare experience are likely to experience comparable uncertainties and anxieties. For example, just as it would be good practice for members of staff to introduce themselves to a patient, and explain what they are doing during their interactions, similar actions can help students feel a welcome and legitimate part of the team. Actively engaging learners with identifying the key aspects of the context in which they are gaining experience and encourage explicit consideration of how other contexts might differ to enable them to identify relevance for transfer can help to align their desired outcomes with necessary workplace functions and avoid problems from mismatches in expectation. Social interactions can mediate unintended as well as intended learning. Unintended learning may be desirable, for example if it allows a learner to develop from competence in an area to excellence, or undesirable, for example if negative attitudes are replicated towards a particular patient group. Consideration of how your workplace might be perceived to new participants can help to identify some of these consequences. Students should be encouraged to discuss any perceived differences in their workplace experiences and their prior expectations or medical school-based learning. Within competency-based curricula, it is also important that workplace supervisors and medical school staff share a common understanding of student competencies and appropriate activities at each stage of the course.

Practical illustration: early workplace experience

- The simple fact that the surgeon performing an operation made a first year medical student welcome to the operating theatre and asked them their name would, according to socio-cultural learning theory, make an important contribution to that student's development of the identity of 'student doctor' and possible future surgeon.

Learning in clerkships

Teaching or learning?

Even in undergraduate medical programmes that provide early experience of the type described above, a point of transition from predominantly non-clinical to more or less wholly clinical education usually comes about half way through the curriculum (Teunissen & Westerman 2011). According to Teunissen and Westerman (2011), 'students enter clinical environments

with an expectation to “be educated” and find themselves in an environment requiring experiential and more self-directed learning.’ The pedagogy of clerkship education is quite nebulous, perhaps because it was so firmly based on apprenticeship principles in the past that no statement of pedagogic principles was needed (Dornan et al. 2005). Apprenticeship principles are not a learning theory but a historical tradition of experiential learning dating back to medieval times. Apprenticeship began in teenage years and consisted of a 7-year term of bondage to a master of a trade. In return for his labour, an apprentice learned from the master and, after a term as a ‘journeyman’, entered the trade guild as a master. Quite simply, apprentices learned in, from and to work. Learning and work were inseparable from one another; that was the theory. As professions have grown in size and relationships have become more complicated than dyadic ones between single learners bound to individual master clinicians, descriptions of preceptorship relationships (Usatine et al. 1997) have been supplemented by a growing literature about ‘clinical teaching’ (Beckman et al. 2005; Stalmeijer et al. 2010). At the same time, there is a steady research output about ‘firms’, clerkships, primary care attachments and other forms of experiential learning contextualised to practice settings. It seems to be tacitly assumed that apprenticeship principles operate, supplemented by clinical teaching. In an era when the focus of attention has shifted from teaching to learning and we know that most learning is ‘experiential and self-directed’, it is very unsatisfactory that ‘clinical teaching’ has, until recently, been the one pedagogy of clerkship education that has received much attention.

Experience-based learning

Over the last decade, Dornan et al. (2011) have conducted research to develop a programme theory of how medical students learn in workplaces that fills the gap identified above. As stated earlier, Lave and Wenger (1991) set out to articulate a new, socio-cultural theory of apprenticeship two decades ago. Key differences between their Situated Learning theory (Lave & Wenger 1991) and traditional apprenticeship principles were that learning was now in COP, rather than in a dyadic relationship with a single master practitioner, and the outcome of learning was not so much task mastery as development of professional identity. Qualitative, observational research (Dornan et al. 2007) found that medical student education conformed remarkably well to the principle of Lave and Wenger (1991) and Wenger (1998) of legitimate peripheral participation in COP. Whereas, it is no surprise that medical apprenticeship is similar to workplace education in other domains, the close fit of experience-based learning (eXBL; Dornan et al. 2007, 2009, 2011) to situated learning/COP theory validates it and fits it within a wider theoretical context. The description that follows is taken from a recent publication, which related the eXBL model to a detailed review of 168 articles published between 2000 and 2006, inclusive, about medical students’ workplace learning (Dornan et al. 2011).

Sfard (1988) described how socio-cultural theory introduced a ‘participation’ metaphor to contemporary learning theory, in line with which eXBL regards participation in

practice as the process by which medical students learn from experience. Depending on a learner’s level of proficiency and the complexity of the clinical situation in which they are participating, their participation may be contributing to practice, rehearsing the task of a doctor, or observing. Participation leads to ‘real patient learning’, a term that describes the processes and very immediate consequences of interaction between a learner and a patient, facilitated by a practitioner. Although participation is an essentially social process, Bell et al. (2009) described some cognitive consequences of it. Real patient learning results in the development of proficiencies, which include applied knowledge, attitudes, skills, and an enhanced ability to learn in practice settings. It leads, also to affects such as confidence, motivation and a sense of belonging. Affects and proficiencies together constitute professional identity. So, participation alters professional identity through the medium of real patient learning. eXBL does not regard self-direction as the core condition for participation (Dornan et al. 2005). Rather, learners’ participation is supported by the environment in which learning takes place, which conforms also to Billett’s (2002) pedagogy of workplace learning. At the curriculum and placement level, good organisation is a precondition for effective participation. At the interactional level, affective support is a precondition. Rather than ‘clinical teaching’, eXBL speaks of ‘pedagogic support’, because the practitioner behaviour that favours experiential learning includes facilitative and supportive behaviours as well as ‘teaching’.

To summarise, eXBL conforms to a number of experiential learning theories discussed in this guide. Its conformity to socio-cultural theory was strongly emphasised in the previous paragraph. Informal learning, as theorised in the following section, predominates over formal ‘teaching’ processes. And there are strong resonances between real patient learning and cognitive experiential learning theories associated with, for example, Kolb, and reflective learning theory as articulated by Schon. The practical application of these ideas within workplaces is not dissimilar to that outlined at the end of the section on early experiences. As students spend increasing time within workplaces, the importance of offering cognitive, affective and practical support continues to become even more significant. Workplace supervisors should seek to ensure students have opportunity to discuss all of these areas and to create an environment where students can move gradually more centrally in their participation, contributing to the functions of the workplace in order to fulfil their learning needs (Figure 3 and Box 3). In longer placements at clerkship level and later in residency, explicit discussion of the students’ interactions with others, based on an understanding of socio-cultural theory as well as knowledge of the individual, can inform the identification of tailored learning needs.

Practical illustration: clerkship rotations

- Interviewing and examining patients before the qualified doctor in an outpatient clinic or general practice surgery makes a far stronger contribution to students’ learning than sitting in purely as an observer because their experience is

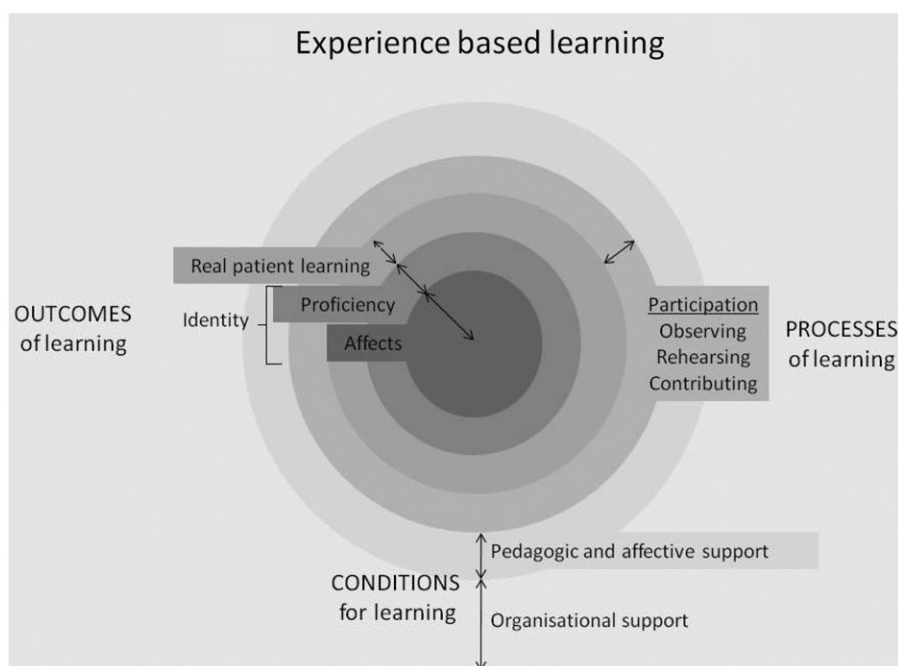


Figure 3. Support of learners.

Box 3. Support of learners (example text alongside Figure 3).

Example: Addressing the elements of support when introducing a clerkship student to a new ward

- Practical: make sure the student knows the layout of the ward, where to find key items (e.g. for practical procedures), how to contact you.
- Affective support: introduce the student to key members of staff and ensure the student and staff understand the student's role and intended activities, discuss with student any potentially challenging patient encounters which might occur.
- Cognitive support: identify learning objectives for students and discuss how these link with other aspects of their learning, encourage students to discuss any 'surprises' in order to help them develop authentic workplace knowledge.

of participation in the practice they are learning rather than just acquiring isolated facts or limited skills.

Learning in residency

The importance of informal learning

After 4–6 years in medical school, newly qualified doctors take supervised responsibility for the care of patients for the first time. By doing so, they participate in postgraduate education programmes that lead to certification to practise as a medical specialist. Postgraduate education is a decisive phase in doctors' careers because it prepares 'for the independent practice of medicine and plays a crucial role in shaping their habits, behaviours, attitudes, and values' (Ludmerer & Johns 2005). Postgraduate medical education consists mainly of on-the-job learning, involving 'a process of progressively independent delivery of patient care by a trainee, associated with

a decreasing level of supervision by clinical supervisors' (Kennedy et al. 2005). Much learning at work, even within residency programmes, occurs outside formally organised and delivered curricula. This 'informal learning' has been described by Eraut (2004) as taking place 'in the spaces surrounding activities and events with a more formal educational purpose'. From an educational viewpoint, informal learning is unstructured, unintended and opportunistic. It is closely linked to implicit or tacit learning, which Reber (1993) described as 'the acquisition of knowledge, independent of conscious attempts to learn and in the absence of explicit knowledge about what was learned'. According to Eraut (2004), several factors make it hard to understand learning at work. First, it is largely invisible because much of it is taken for granted and not recognised as learning. Second, the resulting knowledge is either tacit or regarded as part of a person's general capability rather than something that has been learned. Finally, discourse about learning is predominantly about propositional, codified knowledge, and people have difficulty describing the more complex aspects of their work and the nature of their expertise. So, although informal learning and the use of tacit knowledge is probably the largest part of the learning process in workplaces, its characteristics make it difficult to identify.

Theoretical perspectives on residency education

Current insights into workplace learning stress residents' experiences and their active participative roles in workplaces, which allow them to develop into medical specialists (Teunissen et al. 2007). Clinical supervisors guide residents' development (Billett 2002) whilst simultaneously taking final responsibility for safe patient care. These notions are well aligned with Dewey's (1987) concept of experience and his view on the role of teachers. The current focus on participation

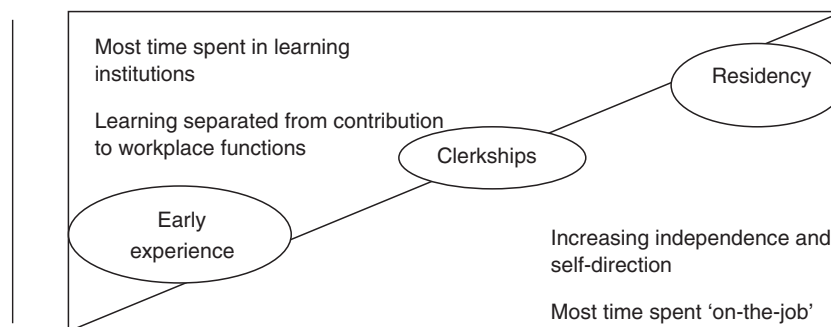


Figure 4. Transitions in experiential learning.

of residents with a larger group of clinical supervisors, instead of the single master–apprentice interaction, and the recognition that medical knowledge and skills need to be supplemented by other competencies, such as communication and professionalism, has led to a reorientation of theoretical perspectives on residency learning; notably, the emergence of socio-cultural as well as cognitive accounts of learning (Bleakley 2002; Brown et al. 2007).

Application of theory to practice

Theoretical perspectives from the experiential learning tradition have been applied to residency learning in several ways. Building on the importance of participation, Stok-Koch et al. examined factors that made workplace experiences conducive to learning. They conducted small group interviews with nursing home physicians in training and their educational supervisors and came up with a list of 56 factors that influence workplace learning, such as ‘interdisciplinary meetings’, ‘a good workspace’, ‘access to library/internet’, and residents’ ‘experiences of social integration’ (Stok-Koch et al. 2007). Research by Sheehan et al. provides a prime example of how such factors can be used to develop an educational model. In a three-stage qualitative study, they showed how trainees’ participation developed during rotations in a New Zealand hospital. It depended mainly on clinical supervisors’ ability to engage interns in shared experiences and encourage them to learn from everyday clinical tasks (Sheehan et al. 2005). Teunissen and Wilkinson (2010) built on the constructivist outlook of experiential learning theorists when they described how experiences become meaningful events for residents. According to them, the interaction between residents, clinical supervisors and other health care professionals working together on tasks in a shared physical and social context lead to different interpretations on their experiences.

Practical illustration: Residency education

- Mastering the use of a slit lamp in the ophthalmology clinic is not just acquisition of a necessary competency but – according to socio-cultural theory – part of the socio-cultural process of learning because the slit lamp is a cultural artefact and tool that embodies the whole socio-cultural tradition of ophthalmology. Just as walking round the

hospital with a stethoscope round your neck is part of the process of acculturation for junior medical students.

Learning styles

There has been a lot of interest in learning styles as individual characteristics of learners (Kaufman & Mann 2007), as reflected in the plethora of learning style inventories in the general educational literature (Curry 1999; Cook & Smith 2006). One such inventory, Honey and Mumford’s (1992) Learning Style Questionnaire (LSQ), was used to study postgraduate trainees’ learning preferences. LSQ is based on Kolb’s (1984) experiential learning theory of ‘learning as a circular continuous process with four distinct stages’. An overall preference for one of the stages is held to be indicative of a person’s predominant learning style. The LSQ distinguishes four learning styles on two axes: activist versus theorist and pragmatist versus reflector. It was predicted that matching learning preference with learning style would enhance learning and attempts were made to identify the learning preferences of different groups of residents, for instance within one speciality or between specialities. For instance, Lesmes-Anel et al. (2001) studied the correlations between learning preferences and learning styles in general practice registrars within the Wessex Region. They found a wide range of learning style scores, mainly within the LSQ’s reflector–theorist quadrant. They concluded that effective professional development and performance rely mostly on individual learners’ ability to adopt different learning styles. In other words, helping learners adapt their learning styles was a more important goal than matching pedagogy to any one style. According to Curry (1991), there are three problems in applying learning styles to educational practice. The availability of many different learning style theories has created confusion about definitions; the concept suffers from weaknesses in reliability and validity; and it is unclear how teacher styles or instructional designs can best be tailored to trainees’ learning styles. As for Kolb’s experiential learning theory, the notion that a continuous four-stage cycle can accurately describe or predict workplace-based learning has been much criticised (Eraut 2004). Nonetheless, researchers have found Kolb’s experiential learning theory useful to explain phenomena related to learning in medical workplaces (Smith et al. 2004).

Summary

The progression from new medical student to clerkships, then the transition to qualified doctor, residency and beyond involves increasing reliance on experiential learning. Figure 4 provides a diagrammatic representation of this.

The different experiential learning theories discussed in this Guide provide a conceptual grounding for the development of ideal learning conditions throughout the spectrum of medical education. Comparison to learners' perceptions of their experiences in practice can be used to identify areas for improvement.

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