

Teaching in the clinical environment

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doi: 10.1029/WFSA-D-21-00004

Abstract

The nature of clinical teaching is challenging due to the complex and demanding nature of the clinical environment. Many clinical teachers have little formal teacher training or knowledge of medical educational theory and will be simultaneously responsible for teaching and delivery of safe patient care, while busy operating theatres can be particularly intimidating for students and new trainees. Experiential and sociocultural theories of learning are useful to help clinical educators derive sound principles for fostering learning in the clinical context. Anaesthesia and the perioperative setting are a rich source of learning opportunities for medical curricula, with opportunities for learning practical skills, applied physiology and pharmacology and the understanding of critical illness. By promoting participation, belonging and reflective practice to embed deep learning, many teachers manage to create powerful learning experiences even in busy, time-poor environments. Professional educators seek out feedback from learners and develop their own educational portfolios.

Key words: medical education; experiential learning; active learning; social cognitive theory

INTRODUCTION

Teaching effectively in the clinical environment is a challenging task with competing demands on the teacher's time and attention. Traditionally called bedside teaching, clinical teaching has been defined as learning focused on patients and their problems¹. Not all learning in the clinical environment is actually at the patient bedside and it can include inpatient, outpatient and community settings, ward rounds, clinics, operating lists, multidisciplinary meetings and handovers. It is important to recognise the complexity of the learning environment and that each may present different challenges². Of particular relevance to anaesthesia will be the perioperative pathway as a locus of learning, with the difficulty of teaching well in a busy theatre environment.

Common to all of these locations and learning opportunities will be the usual problems facing healthcare systems; these include service and time pressures and the unpredictability of the learning environment and teaching opportunities. There may be issues around space, noise, and comfort for learners, consent and dignity for the patients, and the teacher may be simultaneously responsible for education and safe medical care. Few doctors have formal teaching training, and may not be familiar with educational theory or the formal university curriculum. Despite extensive medical knowledge they may lack the tools

to facilitate effective learning in a busy, complex environment. These problems can have far-reaching ramifications and research has linked an ineffective clinical learning environment to poor patient care and burnout for both learners and doctors².

Despite these challenges, on-the-job learning is unavoidable if we wish students to become capable doctors. In many healthcare systems, learners are also workers relied upon for service delivery. It has been noted that learners frequently feel ill-prepared for stages of transition, whether becoming a new doctor, registrar or consultant³. Work-based learning allows students to learn "real-time" from patients, alongside future colleagues in the various clinical environments they will be working in when fully qualified. It contextualises abstract knowledge and keeps learning patient-focused and memorable. It also supports the development of communication skills, interprofessional teamwork and plays an essential role in the development of professional identity.

With an increased emphasis in medical education on competency-based learning, professionalism and student-centred teaching that facilitates self-directed and self-regulated learning, it is important that clinical teaching is delivered in such a way as to support these outcomes⁴. As I will set out in this article, anaesthesia

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is particularly well-placed as a specialty for teaching multiple skills and knowledge across a typical undergraduate curriculum. I will review some of the relevant medical educational theories of relevance to the clinical learning environment then set out some practical examples of how to teach effectively in the face of the challenges above and how to develop one's own role as a professional educator.

THEORIES OF MEDICAL EDUCATION

Theory relevant to work-based learning

An in-depth study of medical educational theory may not suit all doctors, but a grounding in basic principles is essential for anyone interested in teaching in the clinical environment. It is worth asking ourselves what methods of teaching we tend to fall back on when faced with a group of students. Doctors may find themselves simply replicating teaching approaches that they themselves have experienced, but an understanding of theory can inform our choices more critically. It is important to grasp that there has been a paradigm shift in medical education, from seeing education as a pure acquisition of knowledge, to an appreciation of the active role of the student in constructing their learning, and a requirement for learners to develop higher order thinking, professionalism and reflective skills. A sound theoretical footing is required to effectively facilitate this kind of educational growth, particularly in busy, time-poor clinical environments.

Of particular relevance to learning in the workplace are theories of experiential learning and sociocultural theories of education which this review will discuss in more detail here^{3,5}. Both of these approaches to learning view learning as an active process which is indivisible from the context and "situation" (physical or social) in which it occurs.

Experiential learning

The most well-known of these theories is Kolb's theory of experiential learning. Kolb's theory is an individual constructivist theory of learning in that it focuses on the learner's internal cognitive processes and sees the learning as actively constructed by the individual^{3,5,6}. Kolb describes learning as "a holistic process of adaptation to the world" and the learning process as occurring in four cyclical stages (Figure 1). First the learner must involve themselves fully in a new concrete experience, and reflect upon it from a number of different perspectives. He or she then forms abstract concepts or theories to be applied more flexibly in ongoing active experimentation⁶. It has been pointed out that real life learning may not occur in such neat stages⁵. However it has remained a useful model over time which emphasises the active role of the learner and the central role of reflection in assimilating practical learning experiences. Reflection is often considered to be more effective when it is a structured, mentored process, which allows underlying assumptions to be challenged where necessary⁵.

Sociocultural theories of learning

Sociocultural theories of learning have become increasingly significant in medical education and these emphasise experiential learning as a collective and social activity, rather than an internal individual phenomenon. The emphasis is on context, participation and sociocultural interactions, and these theories are argued to be more relevant to the complexity of working in the medical community⁽³⁾. Vygotsky was one of the first thinkers to insist that social and cultural interactions were essential to the process of making meaning^(3,5). He stressed the importance of language as a tool to mediate learning, and the role of the facilitator (or "teacher") in keeping the learner

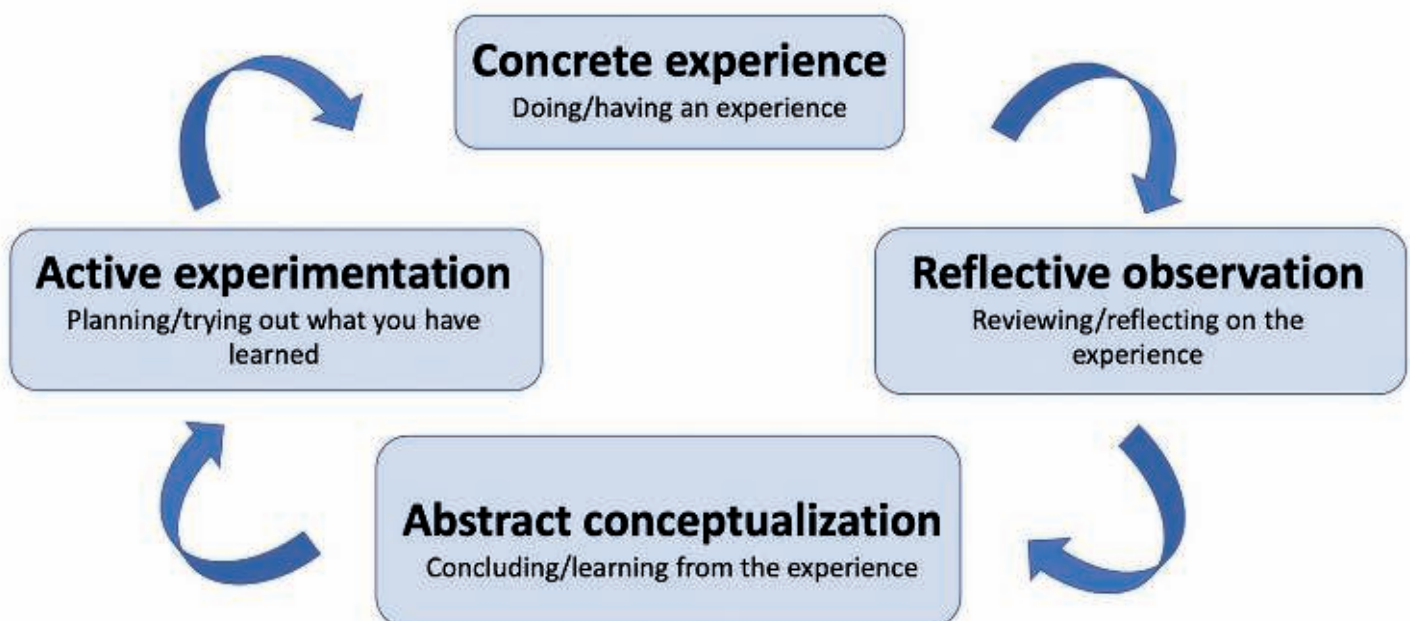


Figure 1: Kolb learning cycle

working in their “Zone of Proximal Development”. This zone describes the activities that the learner is close to mastering, but isn’t quite comfortable doing alone yet, requiring appropriate supervision or assistance from a teacher^{3,5}.

Modern sociocultural theories go further in breaking down distinction between learning and work altogether. Put simply, work is learning. Lave and Wenger describe “situated learning in communities of practice”. Through active participation in clinical activities of a community the learner builds confidence and assumes greater responsibility, moving from the periphery of a community to its core^{3,7}. These theories suggest we should take full advantage of natural community processes and opportunities for participation for our learners when teaching in the clinical environment.

Medical education is the construction of a professional identity and this process is indivisible from the acquisition of knowledge and skills⁸. There is a significant moral and ethical dimension to medical practice, the transmission of which relies heavily on a process of professional socialisation. As this is a social and collective activity, role modelling by educators plays a central role here^{3,8}. The “hidden curriculum” has been described as the unwritten values and beliefs that are transmitted (often unintentionally) alongside explicit learning goals and is mediated by the actions and language of educators and role models, as well as the organisational culture^{3,8}. We need to be aware of our power as role models in both clinical care and our approach to professional self-improvement.

BOX 1: How to be a good role model

- Be aware of yourself as a role model
- Demonstrate clinical competence and commitment to excellence
- Engage with improving institutional culture
- Show respect for patients, colleagues and learners
- Have a positive attitude to life-long learning
- Be passionate about teaching and engaging with learners
- Demonstrate good communication skills

Theories of motivation and self-regulation

Deci and Ryan identified three factors driving intrinsic human motivation: autonomy, competence, and relatedness and these are seen as key forces fuelling learner self-determination education⁹. It follows that as well as participation, which can bring a sense of autonomy and competence to the learner, a sense of belonging to the working community is essential. Simple actions such as introducing medical students and encouraging involvement in learning from senior team members will help learners to feel included and encouraged to learn. Ensuring an inclusive environment regardless of gender, race and other is important here as all learners should feel able to belong equally, and all team members need to be aware of and challenge any systemic and personal biases that they encounter.

There is a growing emphasis on self-regulation in medical education, which requires a high level of intrinsic motivation. Doctors are required to take responsibility for their own learning throughout their career. This requires the learner to reflect critically on their learning processes and formulate their own strategies for improvement. Too often theories of motivation and self-regulation in learning are seen as individual traits, but we should be conscious of how the learning

environment and the observed practices of the community affects their development in students and trainees. When we understand the power of the hidden curriculum and role modelling, we can make our own methods of self-inquiry and self-regulation explicit in such a way that help learners develop their own self-monitoring and self-regulation skills⁸.

In summary, most modern educational theories view the learner as an active participant in the process while sociocultural and experiential perspectives on learning help us to see that it is inseparable from the work-based context, activities and relationships in which it happens. A focus on participation and community can inform our choices of teaching strategies. For example, if learning is a social activity then appropriate support and mentorship in the workplace is critical and the teacher-learner relationship becomes more significant. From the above theories we can formulate some principles to underpin our approach to teaching (box 2) before we look at some simple practical ways to use this in time-poor clinical environments, particularly those relevant to anaesthesia.

BOX 2: Principles of clinical teaching derived from educational theory

- Focus on facilitating learning rather than didactic teaching
- Foster a sense of belonging for all students
- Support active participation by all students
- Involve whole team (“community of practice”) in supporting learning
- Make learning explicit as it occurs in everyday practice
- Make powerful use of reflection and feedback in integrating learning
- Avoid teaching by humiliation, psychological safety is paramount for developing capability
- Facilitate the development of self-regulation and self-direction in learners
- Consider yourself a professional role model at all times

EFFECTIVE TEACHING STRATEGIES

Common problems with clinical teaching

While certainly useful, theories do not always acknowledge the messy reality of the clinical environment in which learning takes place. Spencer identifies some common problems with clinical teaching, including a lack of clear objectives, teaching pitched at wrong level (often too high), a failure to promote problem solving skills and critical thinking, as well as inadequate time for feedback, reflection and discussion¹⁰.

In particular, the operating theatre can be a stressful and intimidating space, with a perception of a traditional hierarchy that may leave learners feeling passive, excluded or, at worst, humiliated. Students report feeling like a nuisance, anxious about violating protocol, and not knowing where to stand or what they are allowed to touch¹¹. Teaching is frequently opportunistic which makes planning and structure difficult. There may be multiple students with different members of the operating team causing issues with comfort, communication and safety, as well as the challenge of managing differing learning needs of the multidisciplinary team.

What to teach: useful anaesthesia and perioperative care opportunities for learners

Despite the difficulties above, many educators still manage to deliver excellent teaching. Medical students may not recognise the wealth of relevant experience and skills that anaesthetists have to offer and many medical schools do not offer specific anaesthetic attachments,

considering it largely of postgraduate interest. However, anaesthetists are specialists in the management of airway, ventilation, circulation, consciousness and pain, as well as skilled in the assessment and management of critically ill patients with a deep understanding of applied physiology and clinical pharmacology. The perioperative environment also offers multiple opportunities for learning practical skills. Anaesthesia is the single largest hospital specialty in most parts of the world and in the UK 68% of hospital inpatients interact with an anaesthetist¹². Medical schools in the UK are beginning to offer perioperative medicine modules in which anaesthetists can play a significant role in teaching.

BOX 3: Ideas for ad-hoc teaching content in theatre

Use patients on the list to start a case-based discussion on the patient's presentation or an aspect of their medical history
 Choose an aspect of the patient's monitoring or an investigations to discuss: for example, arterial blood gas interpretation or ECG monitoring
 Use a perioperative risk calculator to stimulate a discussion around risk and shared decision making
 Choose a guideline or protocol to centre a short teaching session around for example major haemorrhage or cardiac arrest
 Teach practical pharmacology by involving students in drawing up drugs and infusions and preparing fluids, discussion of possible affects, for example, using anaesthetic drugs to teach on automatic nervous system
 Use ultrasound to demonstrate practical anatomy
 Discussions on patient safety and cognitive aids such as the WHO checklist
 Use handovers for explicit teaching on non-technical and communication skills
 Introduce end of life topic: eg DNACPR and discuss how decisions should be made and communicated
 Remember other perioperative settings: preassessment clinics, CPEX clinics for cardiorespiratory physiology, pain rounds, morbidity and mortality meetings

How to teach: tips and models for teaching in the clinical environment

The qualities that make a good educator have been studied widely and learners regularly identify the following as characteristic; a passion for teaching, good rapport with students, accessibility and supportiveness, clinical competence, compassion, integrity, with organisation and flexibility in teaching approach^(4,13). When we are engaged in clinical teaching, we should consider these qualities and the principles set out above of fostering participation, belonging, and self-regulation skills. The best way to educate in the clinical environment has been summed up as follows:

“Support students’ participation in clinical practice; help them step outside their comfort zones, learn reflectively from doing so, and become more capable”¹⁴.

The authors suggest the following three questions to ask yourself as an educator¹⁴. The answers provided are my own suggestions for a theatre list and there will be many more, depending on the clinical context. Bear in mind the qualities of an excellent teacher and the principles derived from educational theory as you plan your teaching opportunities for the session.

1. *What opportunities to participate can this placement (or theatre list/clinic/round) offer?*

For example, pre-assessing and presenting patients, reviewing patient notes and images, assisting with monitoring, practical skills such as cannulae, catheters, basic airway management, drawing up drugs and infusions, and reviewing patients postoperatively. Communicate these opportunities to the student and help them to formulate their own.

2. *What capabilities can students develop from those opportunities?*

For example, the development of technical skills, an understanding of the perioperative pathway, the impact of surgery and anaesthesia on chronic disease and vice versa, human factors and patient safety issues, management of airway, ventilation and circulation in critically ill patients, practical pharmacology, drugs for anxiolysis, nausea and pain management, and interpreting basic monitoring. Establish baseline knowledge, communicate these broader learning goals to the learner and help them formulate their own.

3. *How can we support students’ participation and development of those capabilities?*

- Create a safe and welcoming learning environment with introductions and appropriate orientation to theatres and protocols.
- Clarify roles, responsibilities and expectations at start of the list.
- Have student be present at WHO briefing.
- Involve whole team in learning.
- Make learning explicit, and where possible state clear learning goals in advance.
- Ensure student actively participates as much as patient safety (and consent) allows.
- Role modelling professional behaviour, excellent patient care and enthusiasm for teaching.
- Make explicit your clinical reasoning skills; explain why you are doing things.
- Role model a commitment to self-inquiry, reflection and life-long learning behaviours.
- Make time for student feedback and reflection to encourage deep learning.
- Promote self-direction, encourage students to make their own plans for improving their future performance.
- A professional teacher will also elicit feedback and reflect on their own performance.

Sometimes we may only have students for an even shorter period of time, or we may wish to use some downtime when the patient is anaesthetised to teach some general principles. The microskills model of clinical teaching (also known as the one minute preceptor) consists of five tasks to be accomplished when discussing a clinical case with a learner¹⁵. It can be used easily in a short space of time, for example when asked for advice on a patient by a junior trainee, and it can be

useful for less experienced teachers to increase the use of key teaching behaviours.

1. **Get a commitment:** ask learner to formulate their own plan for the situation.
2. **Probe for supporting evidence:** for example ask, what made you come to that conclusion? This helps learner and teacher identify gaps in knowledge.
3. **Teach general rules:** Tailor this to the information above. Try not to overload the learner; select a few general rules. If there is a big knowledge gap, make a plan for addressing it at a later time.
4. **Reinforce what was done right and 5. correct mistakes.** Use constructive feedback rules to reinforce what was done well and correct any errors.

BOX 4: Possible feedback questions for one minute papers

What question remains uppermost in your mind after today's teaching?

What is the main way you will change your practice after this session?

Was this topic relevant to your practice?

Would you attend another session held by this educator?

What could the educator do to improve this session?

Did this educator inspire you?

Professionalism as a clinical educator

As few doctors receive formal teacher training, it is up to the clinical teacher who aims for excellence to develop their own professional identity as an educator. Performing essential teaching tasks and assessments well is the beginning, while the application of a greater understanding of theory and enthusiasm will take one further as an educator. However, a fully developed professional approach includes asking for, and acting on, learner feedback, reflecting on one's own teaching capabilities, developing an educational portfolio, seeking out mentorship, and engaging in educational scholarship⁴.

Collecting feedback from learners in the clinical environment is essential to improve your teaching skills. Some simple methods for getting feedback on the session content can be done in conversation with the learners; for example asking students to summarise key learning points and to identify areas they still feel unsure about. This will have the dual role of embedding learning for the students and feeding back to the teacher about their delivery. However it may be difficult to get honest feedback about your teaching skills face-to-face, so make use of anonymous written feedback as well. Beware of feedback fatigue and keep things short: try using post it notes, one minute papers (box 4), or Stop, Start, Continue techniques (students are asked to write down one thing the teacher should stop doing, one to start doing and one to continue doing). To develop your teaching further, you can design your own self-evaluation forms based on the principles we have discussed above and consider whether you

have met your own standards. Seeking out the mentorship of a professional clinical educator can be invaluable as you develop your own educational portfolio.

CONCLUSION

With a basic grasp of medical educational theory and a clear understanding of what anaesthesia and perioperative medicine have to offer, it is possible for us to create powerful educational experiences with limited time and resources. A small amount of planning and reflection will help you develop your role as an educator and keep your own skills, knowledge and passion alive. As well as being rewarding in its own right, excellent perioperative teaching promotes anaesthesia as a specialty and can improve future recruitment by encouraging students to choose special modules in anaesthesia and take part in departmental audit and research.

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