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UNDERSTANDING HOW CLINICIANS LEARN

Applying adult learning theory in health professions education

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INTRODUCTION

Learning happens all the time in a clinical setting. When doctors and nurses are working with patients, they're learning too. They learn when they try to figure out what's wrong with a patient, when they connect new information with what they already know, and when they practice doing things under the watchful eye of someone more experienced. They also learn from watching their colleagues think and solve problems, from getting feedback on their work, and from rethinking ideas they had before. Some of this learning is easy to see, like when someone gets better at doing something. But some of it is deeper, like when someone's whole way of thinking about their job changes, or when they become more confident in their abilities, or when they can handle situations they've never seen before. Having a framework for understanding how people learn helps us make sense of all these different ways that learning happens in a clinical setting, rather than just assuming that being in a clinical setting automatically means someone is learning (Dennick, 2012; Dong et al., 2021).

Learning is a complex process that can't be explained by just one theory. It's about more than just learning facts - it's also about organizing what you know, developing physical skills, making decisions when you're not sure, becoming part of a professional group, and creating your own professional identity. Different theories can help us understand different parts of this process. So, instead of competing with each other, these theories should work together to give us a clearer picture. Think of them like different lenses that help us see the whole process of learning more clearly. By using them together, we can get a better understanding of how people learn and how we can help them learn more effectively (Dong et al., 2021; Taylor & Hamdy, 2013).

Learning for adults is more complicated than just comparing how kids and grown-ups learn. Even though many adults have prior experience, want to learn things that matter, and like to be involved, not all adults are the same. Some adults might need a lot of guidance, while some younger learners might be able to direct their own learning. So, it's not just about being a kid or an adult, it's about where you are in your learning journey. Taylor and Hamdy said in 2013 that we should think of learning as a continuum, not just two separate groups. The teacher's job is to figure out what kind of support each learner needs at any given time. This way, teachers can help learners of all ages and backgrounds get the most out of their learning experience. By understanding that everyone learns differently, teachers can provide the right amount of guidance and support to help each learner succeed (Taylor & Hamdy, 2013).

This booklet reviews major theories relevant to health professions education and repeatedly applies them to one clinical encounter. Its principal question is not "What makes a good teacher?" but "How does a clinician come to know, participate, reason and act differently?" The educator appears as one influence within a wider learning system that also includes the learner's prior knowledge, motivation, task, team, culture and patient-care context.

CONTINUING EXAMPLE - THE ENCOUNTER: A learner joins a clinician to assess and manage a patient with a potentially serious but initially undifferentiated problem. The learner has encountered similar cases in textbooks but has limited real-world experience. The clinician must protect the patient while creating an authentic opportunity for the learner to reason, perform selected tasks and receive feedback.

WHAT DOES IT MEAN FOR A CLINICIAN TO LEARN?

Learning in the health professions cannot be reduced to remembering information. A clinician may learn by developing a more organised illness script, performing a procedure with less support, recognising when a familiar pattern does not apply, communicating more effectively, participating more fully in a team or adopting the values and responsibilities of a professional community. Knowledge, performance, participation and identity are related but not interchangeable outcomes.

Learning is more effective when it's based on a clear understanding of how people learn. There are different ways to think about learning, like behaviourism, which focuses on what we can see and measure. This approach helps us understand how people learn through observation and feedback. On the other hand, cognitivism looks at how our minds work, including attention, memory, and how we organize information. Constructivism is another approach that explains how we build new knowledge on top of what we already know. Humanism is also important, as it considers the whole person, including their feelings, values, and goals. When we learn through experience, we can reflect on what worked and what didn't, and use that to inform our future actions. This is called experiential learning. We can also learn by participating in real-world activities and getting guidance from experts, which is known as situated learning or cognitive apprenticeship. With the rise of technology, connectivism is becoming more relevant, as it shows how we can learn from the people and resources around us, including online networks. Ultimately, what motivates us to learn is complex, but it's influenced by factors like autonomy, competence, and our relationships with others. When we feel in control of our learning, when we're able to do things successfully, and when we feel connected to others, we're more likely to be motivated to learn. This is supported by research from various experts in the field, including Dennick, Dong, Goldie, Taylor, Hamdy, and Ten Cate, who have all contributed to our understanding of how people learn. By considering these different perspectives, we can create learning experiences that are more effective and engaging (Dennick, 2012; Dong et al., 2021; Goldie, 2016; Taylor & Hamdy, 2013; Ten Cate et al., 2011).

Learning isn't just about being exposed to a lot of information. Just because someone is shown many examples, it doesn't mean they'll actually learn from them. And simply asking if they understand something doesn't necessarily mean they really do. Letting a learner who's new to something struggle on their own without any help isn't the same as teaching them to be independent. On the other hand, constantly explaining and correcting can be too much for someone to handle and can actually prevent them from putting in the effort they need to learn. Having a good understanding of how people learn helps teachers find the right balance between giving support and challenging their students. This balance is important because it helps learners stay engaged and motivated, and it also helps them develop the skills they need to succeed. By finding this balance, teachers can help their students learn more effectively and retain what they've learned over time.

APPLICATION: Before the encounter, the clinician asks: What does this learner already know? What is one achievable objective? What must remain under direct supervision? During the encounter, the clinician makes selected reasoning visible and adjusts support. Afterwards, the learner explains what changed in their understanding and identifies a next step.

THE ADULT LEARNER AND ANDRAGOGY

Historical development and central ideas

The modern discussion of adult learning is strongly associated with Malcolm Knowles, who popularised andragogy during the twentieth century. He used the term to distinguish assumptions about adult learners from teacher-directed approaches commonly associated with children. Knowles proposed that adults increasingly want to understand why they need to learn something, draw on a growing reservoir of experience, become ready to learn when a task is relevant to real life, prefer problem-centred learning and are often motivated by internal goals such as competence and professional growth (Knowles et al., 2015). These are useful starting assumptions, but they are not universal rules.

Andragogy is best understood as a practical orientation rather than a complete theory of cognition. It describes conditions that often make adult learning more meaningful, but it does not fully explain how information is remembered, how skills become automatic or how professional identity develops. Adults may need close direction when entering an unfamiliar field, when they cannot yet recognise their own knowledge gaps or when safety is at risk. Conversely, younger learners may be highly self-directed. Readiness for independence therefore depends more on prior knowledge, confidence, context and task complexity than on age alone (Merriam & Bierema, 2014; Taylor & Hamdy, 2013).

Implications for health professions education

Clinical educators can apply andragogy by explaining why a task matters, linking new material to the learner's experience, agreeing on achievable goals and using authentic problems. Choice should be real but bounded. For example, a learner may choose whether to focus on assessment or management planning, while the supervisor retains responsibility for the standard required and the degree of independence that is safe. The aim is supported autonomy: enough ownership to make the learning personally meaningful, with enough structure to prevent avoidable failure.

Running case

Before assessing the deteriorating patient, the supervisor asks what similar cases the learner has encountered and offers two relevant goals: organising the initial assessment or explaining the immediate management plan. The learner chooses one, while the supervisor clarifies when direct intervention will occur. The learner's experience and preferences shape the encounter, but patient safety still determines its boundaries.

Adults tend to take charge of their own learning, using their life experiences to guide them. They are more likely to learn when the material is relevant to their work or personal life. When teaching is connected to real-life situations, like patient care, learners become more engaged. Recognizing their past experiences also helps. This is why it's a good idea to involve learners in setting their own goals and asking them to identify what they need to learn. This approach makes learning more meaningful and effective. By doing so, learners are more motivated to learn because they see the value in it (Taylor & Hamdy, 2013).

We should not assume that adults are always ready to take charge of their own learning. In reality, people are different and may not always be motivated to learn on their own. Sometimes, learners may not even know what they need to learn, and they may not be able to accurately assess their own abilities. Additionally, factors like time constraints, exhaustion, fear of being judged, and unfamiliarity with the subject matter can limit their independence. Therefore, educators need to find a balance between giving learners the freedom to make choices and providing guidance, setting standards, and ensuring patient safety. This balance is crucial, as seen in the research by Dong et al. in 2021 and Taylor

& Hamdy in 2013. By acknowledging these complexities, educators can create a more effective and supportive learning environment (Dong et al., 2021; Taylor & Hamdy, 2013).

In this example, the clinician doesn't just ask the learner to pick an objective without any help. They give the learner a choice, but with some limits. The clinician says, "Do you want to work on organizing the first assessment or explaining the management plan today?" This way, the learner still gets to make a decision, but the clinician makes sure the objective is suitable for the case and the learner's level. This approach helps the learner feel more in control while still keeping the goal relevant and achievable.

Application of Learning Theories in Medical Education

Learning theories provide different ways of understanding what happens when health professionals learn. They are best used as complementary lenses rather than fixed recipes: one theory may help explain the development of a reliable clinical behaviour, another the organisation of knowledge and reasoning, and another the influence of experience, relationships or the workplace. In medical education, their value lies in helping educators choose teaching activities that fit the learner, the task and the clinical context (Dennick, 2012; Dong et al., 2021; Taylor & Hamdy, 2013). The following sections therefore examine the main theories individually before showing how they can be combined in practice.

BEFORE: Establish relevance, invite the learner's goal, identify prior experience and agree on one achievable objective. Clarify that supervision will be adjusted according to performance and patient risk.

BEHAVIOURISM AND OBSERVABLE PERFORMANCE

Historical development and central ideas

Behaviourism emerged in the early twentieth century as psychologists sought to study learning through events that could be observed and measured. Pavlov's work on conditioned responses, Thorndike's law of effect and Watson's emphasis on observable behaviour laid early foundations. Skinner later described operant conditioning: behaviour is strengthened or weakened by its consequences. Educationally, this shifted attention towards clear stimuli, observable responses, practice, feedback and reinforcement (Ertmer & Newby, 2013; Skinner, 1954).

Several terms are important. Reinforcement increases the likelihood that a behaviour will recur; it is not the same as reward and does not necessarily mean praise. Positive reinforcement adds a useful consequence, whereas negative reinforcement removes an unpleasant condition after the desired response. Punishment aims to reduce behaviour but can also produce avoidance, concealment and anxiety. Shaping develops a complex skill by reinforcing increasingly accurate approximations. Extinction occurs when reinforcement is withdrawn and a behaviour gradually diminishes.

Implications for clinical learning

Behaviourist methods are valuable when the required performance is explicit, observable and safety critical. Examples include hand hygiene, equipment checks, sterile technique, basic life-support sequences and the coordinated steps of a procedure. The educator states the standard, demonstrates the action, allows repeated practice, observes performance and gives prompt corrective feedback. Simulation and deliberate practice can use these principles to build fluency before performance on patients.

The limitation is that correct behaviour may conceal weak understanding. A learner can reproduce an ABCDE sequence without recognising which abnormality is most dangerous, or follow a checklist without adapting when the case changes. Behaviourism is therefore strongest for reliable routines and component skills, but it should be combined with questions that reveal reasoning, varied examples that test transfer and reflection on why an action is appropriate. Reinforcement must never reward speed or confidence at the expense of accuracy, teamwork or patient safety.

Running case

The learner repeats the ABCDE assessment in simulation and receives immediate, specific feedback on omitted or incorrectly sequenced actions. The supervisor reinforces correct escalation and reassesses performance against explicit criteria. The scenario is then varied—for example, the blood pressure improves but consciousness deteriorates—and the learner must explain why priorities change. This retains behavioural practice while testing understanding rather than memorised performance.

Learning is basically about changing how we behave. This change happens when we interact with our environment, and our actions get a response. If we do something and get a good result, we're more likely to do it again. So, to learn, we need to practice and get feedback that tells us if we're doing it right. This way, we can connect what we do with what happens next, and that helps us learn better. It's like a cycle: we do something, we get a response, and that helps us learn. To make this work, we need to know what we're trying to achieve, have chances to try, see how we're doing, and get feedback that makes sense and happens soon after we act (Ertmer & Newby, 2013; Taylor & Hamdy, 2013).

In training for healthcare jobs, you can see behaviourist ideas at work in things like practice drills, checklists, and step-by-step procedures. They're really helpful when someone needs to do a critical task just right, like washing their hands, checking a patient's vital signs, or using a defibrillator. The teacher shows the learner how it's done, gives them lots of chances to practice, and provides feedback right away. If they do it right, they get positive reinforcement, and if they make a mistake, it gets corrected. They keep practicing until they meet the standard they're aiming for. This approach is based on the idea that learning is about repeating and reinforcing the right behaviours until they become second nature. By using this method, educators can help learners develop the skills and confidence they need to perform critical tasks safely and effectively (Taylor & Hamdy, 2013).

The limitation is that observable performance does not necessarily reveal understanding, flexible reasoning or transfer to an unfamiliar context. A learner may reproduce a checklist while missing the patient's principal physiological threat. Behaviourist methods are therefore most defensible when the required action is explicit and measurable, and when they are combined with questions, reflection and varied cases that test why, when and how the action should be adapted (Ertmer & Newby, 2013).

ACROSS THE ENCOUNTER: Before: state an observable outcome and performance standard. During: allow repeated practice, reinforce correct actions and correct errors promptly. After: assess performance against explicit criteria and arrange another opportunity to practise. Ask the learner to explain the reasoning so that accurate performance is not mistaken for understanding.

COGNITIVISM AND COGNITIVE LOAD

From behaviour to the study of thinking

Cognitivism developed during the mid-twentieth-century ‘cognitive revolution’, when researchers increasingly examined the mental processes between a stimulus and a response. Learning was understood not simply as a visible change in behaviour, but as a change in how knowledge is attended to, encoded, organised, stored and retrieved. The learner became an active processor of information rather than a passive recipient. In clinical education this perspective is central because competent performance depends on recognising patterns, selecting relevant cues, retrieving knowledge and making decisions under uncertainty (Ertmer & Newby, 2013).

Memory, schemas and clinical reasoning

Information must first receive attention before it can be processed in working memory. Working memory is limited: only a small amount of unfamiliar information can be held and manipulated at one time. Long-term memory, by contrast, can store extensive organised knowledge. Learning becomes more efficient when separate facts are integrated into schemas—organised knowledge structures that allow several elements to be treated as one meaningful pattern. Experts appear to ‘see more’ in a case because their schemas help them recognise relationships and retrieve relevant knowledge quickly; novices often see many disconnected details (van Merriënboer & Sweller, 2010; Young et al., 2014).

In medicine, illness scripts are clinically organised schemas containing enabling conditions, pathophysiological mechanisms and expected consequences. A novice may remember that sepsis can cause hypotension, tachycardia and confusion as separate facts. With experience, these cues become connected within a script that supports rapid recognition while still allowing competing diagnoses to be considered. Effective teaching therefore helps learners compare cases, explain relationships, retrieve knowledge repeatedly and revise schemas when findings do not fit. A misconception is also a schema; simply adding more facts may not correct it unless the learner recognises the conflict and reconstructs the explanation.

Cognitive load theory

Cognitive load theory applies knowledge of working-memory limits to instructional design. Intrinsic load arises from the inherent complexity and interacting elements of the task relative to the learner’s prior knowledge. Extraneous load is created by avoidable features of instruction, such as disorganised explanations, irrelevant detail, split attention or questioning during a crisis. Productive processing is the mental effort used to organise and integrate knowledge. Educators cannot remove all difficulty; they should reduce avoidable load, sequence complexity and preserve enough mental capacity for meaningful processing (van Merriënboer & Sweller, 2010).

Bloom’s taxonomy: organising intended cognitive outcomes

Bloom and colleagues created a taxonomy in 1956 to classify educational objectives. The revised taxonomy changed the categories into action-oriented processes: remember, understand, apply, analyse, evaluate and create (Anderson & Krathwohl, 2001; Bloom et al., 1956). It is not a theory of how the brain learns and should not be treated as a rigid staircase. A clinical task may require several processes at once, and remembering essential facts remains necessary for higher-level reasoning. Its practical value is alignment: the learning activity and assessment should require the same type of thinking promised by the objective.

Process	Useful verbs	Clinical example
Remember	Recall, identify	Recall immediate causes of hypotension.
Understand	Explain, summarise	Explain why hypotension threatens organ perfusion.
Apply	Use, perform	Use ABCDE to assess the patient.
Analyse	Differentiate, compare	Distinguish distributive from hypovolaemic shock using case findings.
Evaluate	Justify, prioritise	Justify which intervention should occur first.
Create	Design, formulate	Formulate a management and reassessment plan.

Running case

Before the case, the supervisor gives the learner a short organising framework: identify the immediate physiological threat, localise the affected system and select the next action. During instability, detailed teaching pauses to reduce extraneous load. Afterwards, the learner retrieves the key findings from memory, explains how they fit an illness script, analyses one discordant finding, evaluates two possible plans and creates a concise plan for the next similar case. Bloom's taxonomy helps vary the cognitive demand; schema-building and load management explain why the sequence supports learning.

Learning isn't just about taking in facts from a teacher. It's about how we process and connect new information to what we already know. Our brains are like filing systems, and when we learn, we're basically creating new files and linking them to old ones. Teachers can help by getting us to think about what we already know, organizing new information in a way that makes sense, and asking us questions that make us really think. They can also help us compare, explain, and apply what we've learned, which makes it stick better. This way, learning becomes more active and meaningful, rather than just a one-way transfer of information. By doing so, educators can support learners in building a strong foundation of knowledge and skills (Dong et al., 2021).

Learning is a complex process and our brain can only handle so much information at a time. When we're trying to learn something new, it's like trying to drink from a firehose - too much information can be overwhelming. There are different types of "loads" that affect how we learn: intrinsic load, which is just how complicated the task is, and extraneous load, which is when unnecessary stuff gets in the way. Then there's germane processing, which is like building blocks in your mind to help you understand things better. To learn effectively, we need to manage how much we're trying to take in, cut out distractions, and focus on what really matters. This way, we can build strong foundations of knowledge and make connections between different ideas. It's all about finding a balance and making learning work for us, not against us. Researchers like Szulewski, van Merriënboer, and Sweller have been studying how we can optimize learning by reducing unnecessary complexity and supporting productive thinking (Szulewski et al., 2021; van Merriënboer & Sweller, 2010; Young et al., 2014).

In a clinical setting, things can get pretty overwhelming. The learner has to deal with a lot of things at once - symptoms, how the body works, equipment, talking to people, writing things down, working with a team, and worrying about what others think of them. When someone is trying to learn something new and complicated, it's hard to take in a lot of information all at once. If someone is trying to teach them and gives a long explanation while they're in the middle of doing something tough, it can be too much for their brain to handle. Even experts can make things worse by pointing out multiple mistakes at the same time or skipping over steps that are second nature to them.

- Segment complex tasks and teach one decision or skill component at a time.
- Provide a brief organising framework before adding detail.
- Remove irrelevant information and avoid simultaneous questioning during the most demanding part of a task.
- Use worked examples, prompts or partially completed plans for novices.
- Fade support as schemas develop and vary cases to promote transfer.

DURING: When the patient becomes unstable, teaching pauses and patient care takes priority. Once stable, the clinician uses a short cue: “First assess immediate threats; then localise the likely system; then decide what information changes management.” Detailed explanation is deferred until cognitive capacity is available.

CONSTRUCTIVISM AND ACTIVE MEANING-MAKING

Historical development and central ideas

Constructivism developed from several traditions rather than a single founder. Piaget emphasised how individuals actively organise experience, while Vygotsky highlighted the social and cultural nature of learning. Both perspectives reject the idea that knowledge can simply be transferred intact from teacher to learner. New information is interpreted through existing knowledge, assumptions, language and experience; learners therefore construct meaning, and different learners may understand the same teaching differently (Piaget, 1970; Vygotsky, 1978).

Piaget described assimilation as incorporating new information into an existing mental model and accommodation as changing the model when it no longer explains experience. Vygotsky’s zone of proximal development describes what a learner cannot yet achieve independently but can accomplish with guidance. Scaffolding is the temporary support that makes this performance possible. Although the term scaffolding was developed later, it captures a practical implication of social constructivism: support should be responsive and gradually withdrawn as capability increases.

Implications for clinical learning

Constructivist teaching begins by making the learner’s current explanation visible. Questions such as ‘What do you think is happening?’, ‘Which finding does not fit?’ and ‘What would change your mind?’ reveal prior conceptions. Cases, contrasts, concept maps, peer discussion and guided questioning can create productive tension between the learner’s model and the evidence. The educator does not withhold expertise; rather, explanation is timed and targeted to help the learner reorganise understanding.

Constructivism can be misapplied as minimally guided discovery. Novices do not benefit from being left to discover high-risk practice through trial and error, particularly when they lack the knowledge needed to recognise relevant patterns. Good constructivist teaching combines active meaning-making with explicit instruction, worked examples and supervision. The amount of guidance depends on prior knowledge and task risk.

Running case

The learner initially attributes hypotension and confusion to dehydration. Instead of immediately naming the diagnosis, the supervisor asks the learner to explain the model and identify the finding that least fits it. When a new fever and rising lactate are introduced, the learner accommodates the new evidence by revising the differential and management priorities. The supervisor then provides a concise explanation that consolidates the reconstructed model.

Learning is a process where we build our own understanding. We use what we already know, our experiences, and what we believe to make sense of new things. When we learn something new, we look at it through what we already know. So, the same lesson can mean different things to different people. Sometimes we add new ideas to what we already know, and sometimes we have to change or replace things we thought were true but aren't (Dennick, 2012; Dong et al., 2021). This means that learning is not just about getting new information, but also about how we connect it to what we already understand.

The clinical teacher must therefore elicit thinking rather than merely deliver information. Questions such as “What do you think is happening?”, “What finding does not fit your current explanation?” and “What would change your mind?” make the learner’s conceptual model visible. The educator can then provide a case, contrast, prompt or explanation that creates productive cognitive conflict without humiliating the learner.

Social constructivist perspectives emphasise that meaning is also negotiated through language and interaction. Discussion with clinicians, peers, patients and other professionals exposes the learner to alternative explanations and professional ways of thinking. Scaffolding allows the learner to perform beyond current independent capability, while gradual withdrawal of support promotes independence.

DURING: The learner initially attributes all symptoms to one common diagnosis. Instead of immediately correcting the answer, the clinician asks the learner to account for one discordant finding and compare two plausible explanations. The learner revises the differential, making the change in reasoning explicit.

HUMANISM AND LEARNER-CENTRED DEVELOPMENT

Historical development and central ideas

Humanistic psychology emerged in the mid-twentieth century partly in response to approaches that portrayed people as controlled mainly by conditioning or unconscious drives. Maslow described human motivation and the pursuit of growth and self-actualisation, while Rogers emphasised empathy, genuineness, acceptance and the learner’s capacity for self-directed development. These ideas helped shape learner-centred education, in which the learner is treated as a whole person with emotions, values, goals and agency—not merely as a container for knowledge (Maslow, 1943; Rogers, 1969).

Humanism distinguishes meaningful learning from the accumulation of facts. Learning is more likely to be personally significant when it relates to the learner’s goals, permits appropriate choice and occurs within a respectful relationship. The educator acts as a facilitator who helps the learner clarify goals, access resources, examine experience and evaluate progress. In health professions education, this includes attention to fatigue, confidence, identity, belonging and the emotional weight of caring for patients.

Bounded learner-centredness

Learner-centred does not mean learner-controlled in every respect. Professional standards, curricula, equity and patient safety impose legitimate boundaries. Learners may also underestimate important gaps or avoid difficult areas. A humanistic educator therefore combines empathy with honest expectations and corrective feedback. Respect is demonstrated not by lowering standards, but by making expectations transparent, inviting the learner’s perspective and addressing performance without attacking personal worth.

Running case

Before the encounter, the supervisor asks about the learner's confidence and concern, acknowledges that managing deterioration can be stressful and agrees on a realistic goal. Afterward, the learner is invited to evaluate performance first. The supervisor listens, validates the emotional experience, identifies a strength and gives necessary corrective feedback. The conversation preserves dignity while maintaining clinical accountability.

Learning is about more than just getting the right answers. It's about the whole person, and how they can grow and become the best version of themselves. Humanistic learning theory says that people have the power to make their own choices and create their own meaning in life. It's not just about processing information, but about how we feel, what we value, and how we relate to others. This way of thinking is at the heart of learner-centred education, where the focus is on the individual's needs and experiences. It's an approach that was developed by thinkers like Maslow and Rogers, who believed that people have the potential to become more than they are, and that learning should be a journey of self-discovery and growth. By putting the learner at the centre, we can create a more personal and meaningful experience that helps people achieve their full potential. This approach to learning is supported by researchers like Dennick, Dong, and Taylor, who have shown that it can have a positive impact on education (Dennick, 2012; Dong et al., 2021; Taylor & Hamdy, 2013).

Learning happens best when the teacher is real, caring, and understanding. This means they should let students work on problems that matter to them. In medical training, this approach helps teachers and students set goals together, recognize when students are feeling anxious or tired, and make sure students are doing okay. It also gives students some control over their learning and a chance to evaluate themselves. But the teacher is still in charge of making sure students meet the standards and keep patients safe. Just because students are in charge of their learning doesn't mean they get to do whatever they want all the time (Dennick, 2012; Dong et al., 2021).

Humanism in learning can be flawed if it assumes students can direct their own learning without considering the curriculum, power imbalances, or the student's ability to identify knowledge gaps. To avoid this, it's essential to combine humanism with clear learning objectives, supervision, and feedback based on evidence. What sets humanism apart is that it looks at how the learning environment impacts a student's self-worth, motivation, sense of self, and desire to learn and grow. It's not just about what students know or can do, but also about how they feel and develop as individuals. By considering these factors, humanism can help create a more supportive and effective learning environment.

BEFORE AND AFTER: Before the encounter, invite a meaningful goal and acknowledge the learner's experience, concerns and readiness. Afterwards, use an empathic conversation that preserves dignity, supports honest self-evaluation and helps the learner choose a realistic next step—without withholding necessary corrective feedback.

EXPERIENTIAL LEARNING AND REFLECTIVE PRACTICE

Historical development and central ideas

The idea that experience can educate has deep roots in the work of John Dewey, who argued that experience becomes educational when it is examined and connected to future action. Kolb later described experiential learning as a cycle involving concrete experience, reflective observation, abstract conceptualisation and active experimentation.

Schön distinguished reflection-in-action—thinking and adapting while an event unfolds—from reflection-on-action after the event (Dewey, 1938; Kolb, 1984; Schön, 1983).

Clinical exposure is therefore not automatically equivalent to learning. An experience may reinforce poor habits, remain uninterpreted or be remembered only as emotion. Reflection helps the learner notice important cues, examine assumptions, connect events to knowledge and formulate a testable plan for the future. Conceptualisation matters: the learner should move beyond ‘what happened’ to explain why it happened and what principle might apply elsewhere. Active experimentation closes the loop when the new plan is tried in another encounter.

Using reflection responsibly

Kolb’s cycle is a planning aid rather than a mandatory sequence, and evidence does not support categorising learners into fixed ‘learning styles’ derived from the model. Reflection can also become superficial when it is reduced to compulsory paperwork. Useful prompts focus on a decision or discrepancy: What did I expect? What did I notice? Which assumption influenced my action? What evidence changed my mind? What will I test next time? Learners require psychological safety and some control over personal disclosure, especially after emotionally difficult events (Yardley et al., 2012).

Running case

During the assessment, the learner notices that the response to initial treatment is not as expected and pauses to reconsider the working explanation—reflection-in-action. After the case, the learner identifies the decision point, links the unexpected response to an alternative mechanism and states one action for the next patient. At a later encounter, the learner deliberately tests the revised approach. Experience has become learning because it changed subsequent interpretation and action.

Learning from experience is key, but just having an experience isn’t enough. We need to think about what happened, connect it to what we already know, and use that to plan what we’ll do next. This is called experiential learning. It’s not just about what we experience, but how we process it and use it to improve. Researchers like Dennick and Taylor & Hamdy have shown that this approach is important for really learning from our experiences (Dennick, 2012; Taylor & Hamdy, 2013).

When we’re in the middle of doing something, like a doctor treating a patient, we might stop and think, “wait a minute, this isn’t going as planned.” So we adjust what we’re doing right then and there. Or, after it’s all over, we can look back and think about what happened, what we were thinking, and what we could’ve done differently. This kind of thinking, called reflection, is really helpful for learning when we go beyond just describing what happened. It’s more useful when we ask ourselves questions like: what caught my attention? what was I expecting to happen? what made me decide to do things a certain way? and what would I do the same or differently next time? By asking these kinds of questions, we can really learn from our experiences (Dong et al., 2021).

Reflection should not become ritualised documentation or compulsory disclosure. Learners need an appropriate degree of safety and choice. The teacher should model reflection by acknowledging uncertainty and explaining how new information changed the plan. This normalises adaptive expertise rather than presenting expertise as flawless certainty.

AFTER: The clinician asks the learner to identify the point at which the case diverged from expectations, explain how the new information changed the working diagnosis and formulate one action for the next similar encounter. The learner records a concise learning plan rather than producing a long descriptive narrative.

SITUATED LEARNING AND COMMUNITIES OF PRACTICE

Historical development and central ideas

Lave and Wenger introduced situated learning and legitimate peripheral participation to explain how newcomers learn through participation in social practice. Wenger later developed the idea of communities of practice: groups connected by a shared domain, relationships and a repertoire of language, tools, stories and ways of working. Knowledge is therefore not entirely separate from the context in which it is used. Becoming a clinician involves learning how to participate, communicate, judge and take responsibility within a professional community (Lave & Wenger, 1991; Wenger, 1998).

Legitimate peripheral participation does not mean passive observation or unimportant work. 'Legitimate' means the learner is recognised as a member with an authentic role; 'peripheral' means participation begins with limited complexity and responsibility while still providing access to the wider practice. As competence and trust develop, participation becomes fuller. Access matters: a learner who is physically present but excluded from reasoning, decisions and follow-up may have little opportunity to learn.

The workplace and hidden curriculum

Clinical workplaces teach through routines, relationships and what the team repeatedly rewards or tolerates. Learners notice whether uncertainty is admitted, whether questions are welcomed, how errors are discussed and whose contributions are valued. This hidden curriculum may reinforce or contradict formal teaching. Educators can improve situated learning by introducing the learner to the team, assigning a genuine contribution, explaining local language and norms, making selected reasoning accessible and allowing the learner to follow the consequences of decisions.

A community can also reproduce poor practice, hierarchy and exclusion. Participation alone does not guarantee accurate knowledge or ethical development. Workplace learning should therefore be connected to evidence, supervision and opportunities to question established routines. Inclusion must be balanced with graduated responsibility and patient safety.

Running case

The learner is introduced to the patient and team as the person who will perform the first assessment under supervision. They present the working assessment, contact another service and later review the response to treatment. These are authentic contributions rather than invented educational tasks. During the team discussion, the supervisor explains unfamiliar language and invites the learner's reasoning, allowing movement from observation towards fuller participation.

Situated learning proposes that knowledge is inseparable from the activity, relationships and culture in which it is used. Clinical learning is not simply classroom knowledge transported to a workplace. Learners become clinicians by participating in authentic practice, using professional language, observing norms, accepting responsibility and gradually moving from peripheral to fuller participation (Dong et al., 2021).

A community of practice is made up of people who share a common interest and work together. Being part of this group gives you access to real-life examples, expert knowledge, feedback, and a sense of professional identity. However, just being part of the group doesn't mean everyone is treated equally. Some people might be there in person, but they're not really involved in the learning process if they're ignored, only given simple tasks, or left out of important decisions. On the other hand, even small but meaningful

contributions - like sharing a patient's history, talking to another team, explaining a plan to a patient, or following up on a test - can make someone a valued member of the group. This kind of participation is important because it makes people feel like they're really part of the team.

The hidden curriculum also matters. Learners observe how clinicians respond to uncertainty, hierarchy, resource limitations, error and disagreement. What the team repeatedly rewards or tolerates may teach more powerfully than formal statements. Clinicians are therefore always modelling professional practice, even when they do not intend to teach.

BEFORE AND DURING: The clinician introduces the learner to the patient and team, explains the learner's role and assigns a genuine contribution matched to competence. The learner is invited to present a working assessment during the team discussion and later follows the consequences of the plan.

LEARNING THROUGH GUIDED PARTICIPATION

From apprenticeship to cognitive apprenticeship

Traditional apprenticeship makes physical performance visible: the learner watches an expert and gradually attempts the task. Cognitive apprenticeship was developed to make normally hidden thinking equally visible. Collins and colleagues described teaching methods including modelling, coaching, scaffolding, articulation, reflection and exploration. The approach places these methods within authentic activity and gradually increases task diversity and complexity (Collins et al., 1989).

Modelling means demonstrating both selected actions and the reasoning that guides them. Coaching occurs while the learner performs and includes observation, prompts and feedback. Scaffolding temporarily reduces difficulty through cues, checklists, partial plans or shared performance; fading withdraws this support as competence grows. Articulation asks the learner to state reasoning. Reflection compares approaches or performances. Exploration encourages the learner to define and pursue the next problem independently.

Making expert thinking accessible

Experts often omit steps that have become automatic, a problem sometimes called expert blind spot. Thinking aloud can reveal how cues are prioritised, how uncertainty is managed and why one option is chosen over another. It should be selective: narrating every thought during a demanding task can overload the learner and distract from patient care. Brief pre-briefing, short pauses when stable and post-encounter reconstruction are often more useful than continuous commentary (Jagannath et al., 2022).

Cognitive apprenticeship is not the same as 'see one, do one, teach one'. The learner's participation is deliberately sequenced, support is responsive, reasoning is articulated and independence is based on demonstrated capability rather than exposure count. It also requires repeated participation across varied cases so that learning transfers beyond one supervisor or context (Stalmeijer et al., 2009, 2013).

Running case

The supervisor first models a focused assessment and verbalises two key decisions. The learner then performs the next component while the supervisor coaches with prompts. As performance improves, prompts are faded. The learner articulates the management plan,

compares it with the supervisor's approach and identifies what to explore before the next case. Responsibility increases only as observed capability and patient stability permit.

Learning for clinicians is not just about watching others, it's about taking part and being involved. When we just observe, we can't see the thought process behind it. That's where cognitive apprenticeship comes in - it's a way for learners to get access to both the actions and the thinking behind them. This happens through modelling, where someone shows us how it's done, coaching, where we get guidance and support, scaffolding, where we're given help to build our skills, articulation, where we put our thoughts into words, reflection, where we think about what we've learned, and exploration, where we try new things. These steps take us from needing a lot of support to being more independent. They're not a one-size-fits-all plan for training teachers, but rather one way to understand how we learn (Stalmeijer et al., 2009, 2013).

Modelling involves performing while explaining selected cognitive processes. Coaching provides observation, prompts and feedback while the learner performs. Scaffolding temporarily supports performance through cues, checklists, partial plans or shared tasks. Articulation asks learners to express reasoning. Reflection compares current performance with an appropriate standard or prior performance. Exploration invites the learner to formulate and pursue next questions. As competence grows, scaffolding is faded and responsibility increases.

Thinking out loud is really helpful when it comes to figuring out complex problems, especially in clinical settings. When experts talk through their thought process, they can share what's important, say when they're not sure, and explain why they make certain decisions. But they should keep it short and to the point - too much talking can be distracting. The goal is to show how they think, not to share every single thought that comes to mind (Jagannath et al., 2022).

ACROSS THE ENCOUNTER: The clinician first models a focused assessment and verbalises two key decisions. The learner then performs the next component with coaching. The clinician uses fewer prompts as performance improves, asks the learner to articulate the plan and ends by inviting the learner to identify what they would independently explore before the next case.

CONNECTIVISM AND LEARNING THROUGH NETWORKS

Historical development and central ideas

Connectivism was proposed by George Siemens in the early 2000s to address learning in a digital environment where knowledge changes rapidly and is distributed across people, organisations, databases and technologies. It argues that competence includes knowing where trustworthy knowledge resides, recognising connections between ideas and maintaining networks that allow information to be updated. The capacity to learn and refresh knowledge may be more important than retaining every fact (Siemens, 2005).

A node in a learning network may be a person, guideline, professional group, database, digital platform or other information source. Learning involves creating and strengthening useful connections between nodes. Decision-making is itself a learning process because information changes and may be contradictory. In clinical practice this perspective is immediately recognisable: clinicians depend on colleagues, local protocols, reference tools, alerts and specialist networks to supplement personal knowledge.

Digital literacy, evidence appraisal and limitations

More connections do not necessarily produce better learning. Networks can amplify misinformation, popularity bias, commercial influence and outdated local practice. Unequal internet access and confidence with technology may exclude learners.

Connectivist practice therefore requires information literacy: choosing an authoritative starting source, checking authorship and currency, comparing claims with local guidance, recognising conflicts of interest and integrating information with the patient's context and professional judgement (Goldie, 2016).

Whether connectivism is a distinct learning theory remains debated; critics argue that it describes knowledge distribution and digital pedagogy more than the internal process of learning. Its value in this booklet is therefore practical and bounded. It reminds clinicians that safe contemporary practice includes building, appraising and maintaining a reliable learning network, but it does not replace foundational knowledge, reasoning or accountability.

Running case

After the encounter, the learner identifies an unanswered question, begins with an authoritative guideline, checks it against local resources and consults the appropriate colleague. The learner returns with a short synthesis and records where updates can be found. The network supports learning only because its sources are deliberately selected and critically appraised.

Connectivism was proposed to explain learning in a digital environment where knowledge changes rapidly and is distributed across networks of people, organisations and technologies. From this perspective, competence includes not only “knowing what” and “knowing how”, but also knowing where trustworthy knowledge can be found, how sources are connected and how to maintain an up-to-date learning network (Goldie, 2016; Siemens, 2005).

For doctors and other medical professionals, it's really hard to remember every single guideline, dosage, and new discovery. So, learning is often about connecting with others who can help, like colleagues, teams of experts, professional groups, or online communities that are carefully chosen for their reliability. The most important skill here isn't just searching for information everywhere, but rather building a network of trustworthy sources, knowing who to turn to for the right expertise, evaluating the information carefully, and then using it in the context of the patient's needs and your own professional judgment (Goldie, 2016).

Connectivism remains debated: critics question whether it is a distinct learning theory rather than an account of networked knowledge and pedagogy. It also risks amplifying misinformation, popularity bias, commercial influence and unequal digital access. In health professions education, connectivist practice therefore requires source appraisal, attention to conflicts of interest, local applicability, patient confidentiality and verification against authoritative guidance (Goldie, 2016).

AFTER AND BETWEEN ENCOUNTERS: The learner identifies the unanswered question, selects an authoritative starting source, checks it against local guidance and consults an appropriate colleague where needed. The learner saves or subscribes to the resource, returns with a concise synthesis and updates the plan when the evidence changes.

MOTIVATION, SELF-DIRECTION AND PSYCHOLOGICAL SAFETY

Self-determination theory

Self-determination theory, developed by Deci and Ryan, distinguishes the amount of motivation from its quality. It proposes that people are more likely to engage and persist when three basic psychological needs are supported: autonomy, competence and relatedness. Autonomy means experiencing meaningful choice and ownership, not working without structure. Competence grows through achievable challenge and informative feedback. Relatedness is the sense of being respected, connected and valued within the group (Deci & Ryan, 2000; Ten Cate et al., 2011).

External requirements are unavoidable in professional education, but they can be internalised when learners understand their value and feel some ownership of how they meet them. Controlling language, humiliation and tasks that are either impossible or trivial can weaken motivation. Clear rationale, bounded choice, progressive challenge and respectful supervision support more durable engagement while preserving standards.

Self-directed and self-regulated learning

Self-directed learning concerns taking responsibility for identifying learning needs, setting goals, selecting resources and evaluating outcomes. Self-regulated learning explains how learners manage a particular learning cycle. Zimmerman described forethought, performance and self-reflection phases. In forethought, the learner analyses the task, sets goals and plans. During performance, attention, strategy use and self-monitoring matter. Afterwards, the learner evaluates results, explains success or difficulty and adapts the next plan (Zimmerman, 2002).

Independence should be developed rather than assumed. Novices may not know what they do not know, select weak resources or misjudge performance. Educators can model goal-setting, make standards visible, provide feedback and gradually transfer responsibility. A learning plan is useful when it specifies what will be done, how it will be practised, what evidence will show improvement and when the outcome will be reviewed.

Psychological safety and accountable learning

Psychological safety is a shared belief that interpersonal risk such as asking a question, admitting uncertainty or reporting a concern will not lead to humiliation or rejection. It does not mean comfort at all times, avoidance of difficult feedback or freedom from consequences. In healthcare, psychological safety and accountability must coexist: learners should be able to disclose uncertainty early, while unsafe actions are corrected promptly and standards remain explicit (Edmondson, 1999; McClintock et al., 2023).

Educators support safety by clarifying roles and whether an interaction is formative or summative, inviting questions, responding appreciatively to uncertainty, acknowledging their own limits and criticising decisions rather than identity. Learners are more likely to seek feedback and reveal incomplete thinking when the relationship signals respect. This gives the supervisor access to information needed to protect patients and guide learning.

Running case

The supervisor explains: 'I expect you to reason aloud. You do not have to know everything. I will intervene if safety requires it, and we will discuss the decisions afterwards.' The learner chooses a meaningful goal, monitors uncertainty during the assessment and asks for help when the case exceeds current capability. After feedback, the learner writes one specific plan for the next encounter and agrees when it will be reviewed.

Self-determination theory proposes that high-quality motivation is supported when learners experience autonomy, competence and relatedness. Autonomy is a sense of meaningful choice rather than absence of structure. Competence grows through achievable challenge, clear expectations and informative feedback. Relatedness reflects belonging and respectful connection. Clinical teachers can support all three needs while maintaining standards and patient-safety limits (Ten Cate et al., 2011).

Learning on your own terms means you take charge of what you want to learn. You figure out what you need to work on, set your own goals, find the resources that work best for you, choose how you want to learn, and then see how well you've done. This way of learning is not just a method, but also a goal in itself. When you're just starting out, you might need some guidance to understand what you really need to learn and where to find reliable resources. As you become more confident and able to manage your own learning, the teacher's role changes from telling you what to do to helping you along the way. This change happens as you grow in knowledge and become better at regulating your own learning process (Dong et al., 2021).

When people feel safe to take risks and be themselves, they're more likely to ask questions, admit when they don't know something, and share their ideas. This is called psychological safety. It's not about being comfortable all the time or avoiding feedback that can help us improve. It's about feeling like we won't be embarrassed or rejected if we make a mistake or don't know something. When we feel safe, we're more likely to share our thoughts and ideas, even if they're not fully formed. This helps us get useful feedback and guidance from others. But when there's a lot of hierarchy or pressure to be perfect, people might be less likely to speak up or ask for help. This can happen when people fear being shamed, judged or treated as though every learning interaction were a high-stakes assessment (McClintock & Fainstad, 2022; McClintock et al., 2023).

- Clarify roles, objectives and whether the interaction is formative or summative.
- Invite questions and uncertainty explicitly; respond appreciatively when they are disclosed.
- Challenge ideas without attacking identity and correct unsafe actions promptly but respectfully.
- Acknowledge the limits of one's own knowledge and model help-seeking.
- Give learners meaningful choices within clear clinical boundaries.

BEFORE: The clinician says: "I expect you to reason aloud. You do not have to know everything. I will intervene if safety requires it, and we will discuss decisions afterwards." This frames uncertainty as part of learning while preserving accountability.

FEEDBACK, ASSESSMENT AND LEARNER UPTAKE

When we give feedback, we're trying to help someone understand how they're doing and how they can do better next time. But just because we give feedback, it doesn't mean the person will automatically learn from it. Whether or not they take it on board depends on a few things: how believable the feedback is, the relationship between the person giving and receiving the feedback, when the feedback is given, how the person feels about it, what they think it means, whether they feel like they can do something about it, and whether they actually get the chance to act on it. Feedback is more likely to make a difference when it's connected to a goal that both people agree on, based on things the person has actually done, specific, and a two-way conversation. It's also important that the feedback leads to a plan that the person can put into action (Lefroy et al., 2015; Natesan et al., 2023).

A helpful conversation starts with what the learner has to say, then the teacher adds their thoughts, and finally, they figure out what to do next. Just saying something is "good" or "weak" doesn't really help. It's more useful to be specific, like: "Your first summary did a great job of identifying the main physical problem, but it was hard to tell which test result would change the treatment plan right away. So, next time, make sure to say what you're trying to figure out with each test." This way, the learner knows exactly what they did well and what they can improve on. By being clear and specific, the teacher can help the learner learn and grow.

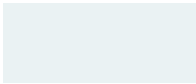
Formative assessment should be continuous and aligned with objectives. It can include questions, direct observation, case discussion, simulation, peer input and learner self-assessment. No single observation establishes competence. Repeated low-stakes observations across contexts provide a richer picture and make feedback part of learning rather than an occasional judgement (Lipnevich et al., 2026).

AFTER: The learner first identifies one effective action and one uncertainty. The clinician confirms the effective behaviour, adds one prioritised improvement point and agrees on a specific task for the next encounter. The next teacher can observe that task, closing the feedback loop.

THE LEARNING ENCOUNTER: BEFORE, DURING AND AFTER

The framework below is not a new learning theory or a formula for good teaching. It is a practical structure for examining what enables or obstructs learning over the course of an encounter. It can be applied to five minutes of clinical participation or a longer placement. Supervision must always reflect learner competence, task complexity and patient risk.

Phase	Learning process	Conditions and support	Theory in action
Before	Activate prior knowledge and form an intention	Relevant goal; observable outcome; legitimate role; clear boundaries; manageable challenge; readiness to disclose uncertainty.	Andragogy; behaviourism; constructivism; humanism; self-determination; psychological safety.
During	Interpret experience and participate with support	Authentic activity; repeated practice; prompt feedback; access to expert reasoning; manageable cognitive load; progressive responsibility.	Behaviourism; cognitivism; cognitive load; situated learning; cognitive apprenticeship.
After	Consolidate meaning and prepare transfer	Reflection; specific feedback; conceptual connection; trusted resource network; opportunity to act;	Experiential learning; reflection; connectivism; formative assessment; self-directed learning.



plan for the next encounter.

Worked example: one encounter from beginning to end

Before starting, the clinician makes sure the situation is right and decides the learner can handle the first assessment with direct supervision. Instead of asking "What do you want to learn?", the clinician gives a few options and asks about the learner's past experiences. Together, they pick one goal: to plan and explain the first assessment. The clinician explains when they will step in and tells the learner to speak up if they're unsure. This helps the learner use what they already know, be more independent, and feel safe to make mistakes.

As the learner starts the assessment, the clinician watches carefully without interrupting, even when they notice small mistakes. But when the learner becomes overwhelmed, the clinician steps in with a simple and clear prompt to help them get back on track. If the learner's initial diagnosis is challenged by a key finding, the clinician asks them to think about what's not adding up and what other explanation might be possible. The learner then revises their approach. The clinician also shares their own thought process on a tough decision, and then asks the learner to keep going. As the learner shows they can prioritize more safely, the clinician gradually reduces their coaching, giving the learner more independence. This process helps the learner develop their skills and build confidence in their decision-making.

When the learner is away from the clinical pressure, they think back to the decision point and explain how the unexpected finding changed their plan. The clinician finds one thing the learner did well and one thing they need to work on, based on what they saw. Then, they work together to come up with a next step. For example, during the next similar encounter, the learner will say what the immediate threat is, give a list of possible causes, and name the information that would most likely change how they manage the case. The learner is also given a specific resource to look at and asked to come up with one question they still have, to discuss next time. This way, the learner can keep improving and learning from their experiences. The goal is to help the learner become more confident and skilled in their decision-making, by giving them the chance to reflect on their actions and get feedback from the clinician.

Adapting the framework

For a novice, the teacher may demonstrate more, reduce task complexity and use explicit prompts. For an advanced learner, the teacher may permit greater ownership, ask for justification of uncertainty and focus feedback on efficiency, adaptability and prioritisation. In a resource-limited environment, theory remains applicable: teaching can use real cases, brief pauses, verbalised reasoning, peer discussion and focused feedback without expensive technology. The scarce resource is often protected attention, making clear objectives and concise debriefing particularly important.

The framework also applies outside direct patient care. Before a tutorial, establish relevance and prior knowledge; during it, promote active processing and scaffold difficult reasoning; afterwards, retrieve key ideas, provide feedback and plan application. Before simulation, orient learners and establish safety; during it, observe performance; afterwards, debrief experience and connect it to future practice.

EXAMPLE LESSON PLAN: PRACTICAL APPLICATION

A lesson plan makes the relationship between intended learning, learner activity, support and assessment explicit. The following example shows how the theories reviewed in this booklet can inform one discipline-inclusive learning activity. It can be used with junior doctors or adapted for other healthcare professionals, local protocols and available resources.

Recognising and initially managing a deteriorating adult patient

Learners	Young doctors and other medical staff who take care of patients in emergency situations.
Setting	Ward, emergency unit, clinic, simulation room or case-based tutorial.
Duration	30–40 minutes.
Prior knowledge	Basic physiological assessment, vital signs and principles of emergency care.
Resources	Clinical case or suitable patient encounter, observation chart, available monitoring and relevant local emergency-care guidance.

Learning outcomes

By the end of the session, the learner should be able to:

1. Recognise clinical and physiological indicators of deterioration.
2. Perform a structured initial assessment and identify immediate threats.
3. Prioritise initial interventions and explain the reasoning behind the plan.
4. Identify when senior or additional assistance is required.
5. Reflect on performance and formulate one individual learning goal.

Before: prepare and activate

The teacher starts by finding out what the learner already knows: "Have you ever taken care of a patient who was getting worse?" and "What's the hardest part of checking a patient for the first time?" Then, the teacher clearly says what the learner will do: find big problems right away, explain their thinking, and start taking care of the patient while being watched. The teacher also makes sure the learner knows what they are responsible for, what they can do on their own, and when the teacher will step in. If the learner is unsure, they should say so, and the teacher will use this to help the learner learn and improve.

LEARNING THEORY IN ACTION: Relevance and prior experience reflect andragogy; an observable outcome and explicit standard reflect behaviourism; eliciting the learner's current model reflects constructivism; respectful goal negotiation and attention to the whole person reflect humanism; and permission to disclose uncertainty promotes psychological safety.

During: experience and guided participation

The learner takes charge of the assessment and explains the key decisions they make. The facilitator watches closely, but doesn't interrupt, even when things aren't perfect. If the learner starts to struggle with the task, the facilitator steps in to help, but does so in a gradual way. First, they might say something like, "Okay, let's pause for a moment and figure out what the most pressing issue is right now." If the learner needs more help, the facilitator might suggest going back to a more structured approach, like checking the patient's airway, breathing, and circulation. The facilitator might also think out loud for a moment, to show the learner how they would handle a tough decision, and then hand the responsibility back to the learner. As the learner gets more confident and their performance becomes more polished, the facilitator gives them fewer prompts and lets them take the lead.

Questions should reveal reasoning rather than test isolated recall: "Which finding concerns you most?", "What is your current explanation?", "What must happen first?", "What information would change your management?" and "When should additional help be called?" Patient safety takes priority; the facilitator intervenes directly when delay or error presents material risk.

The learner goes through the ABCDE sequence again or tries it out in a different situation. They get feedback right away on how they're doing, and if they make a mistake, it's pointed out and corrected. Then, the teacher changes one thing about the scenario and asks the learner to think about how that change affects what they need to do first. This helps the learner learn to think on their feet and make good decisions, even when things don't go exactly as planned. The goal is to help the learner become really good at handling different situations and making the right choices quickly.

LEARNING THEORY IN ACTION: Repeated practice, immediate feedback, reinforcement and assessment against explicit criteria reflect behaviourism. Authentic participation reflects situated and experiential learning. Organising cues manage cognitive load; modelling and fading support reflect cognitive apprenticeship; and questions that expose the learner's mental model reflect constructivism.

After: reflect, receive feedback and plan transfer

After the urgent medical situation has been taken care of, the learner thinks back on what happened using questions like: "What did I do right?", "When was I unsure about what to do?", "What new information changed my understanding of the situation?", and "What would I do differently if it happened again?" The teacher then gives specific feedback based on what they saw the learner do. For example: "You quickly noticed the patient's low blood pressure and asked for help at the right time. But before you finished checking the patient's circulation, you started talking about tests. Next time, make sure to say what the main problem is and how you plan to stabilize the patient before discussing tests."

The learner and the teacher work together to decide on a specific action the learner will take next time they're in a similar situation. This action is something that can be seen and measured, like a checklist. In this case, the learner will identify the main physical problem, come up with three things to do right away, and explain when it's time to get more help. They'll also find a trusted guide or expert resource, make sure it fits with what's normally done in their workplace, and know who to ask if they're still unsure. Later, they'll try out what they've learned and the teacher will check to see if they can really do it.

LEARNING THEORY IN ACTION: Reflection converts experience into meaning; behaviourally specific feedback and another performance opportunity reinforce safe actions; an agreed next action supports self-directed learning; a credible people-and-information network reflects connectivism; and a varied subsequent case tests transfer rather than rote reproduction.

Assessment of learning

When we want to know if someone has really learned something, we need to look at how they do things, not just what they say. We can see this by watching them work on a task, listening to how they think things through, and seeing how they decide what to do first. We also need to see if they know what they don't know and can think about what they did after it's all done. Just because someone does something right once, it doesn't mean they'll always be able to do it. We need to see them do it many times, in different situations, to know for sure that they really get it.

Facilitator reflection

The facilitator should also examine the learning conditions: Was the objective appropriate? Did the learner have meaningful participation? Was cognitive demand manageable? Was support excessive or insufficient? Did questioning reveal reasoning? Was feedback actionable? Will the learner have an opportunity to apply it? This reflection acknowledges that learning outcomes arise from the interaction between learner, task, relationships and environment, rather than from learner ability alone.

LIMITATIONS AND RESPONSIBLE USE OF THEORY

Learning is not a one-size-fits-all concept. Different theories and models have been developed in various fields and contexts, and some popular ones have been oversimplified. What works for one person may not work for another, and what works in one situation may not work in another. For example, Kolb's experiential learning cycle can be a useful tool for planning, but it's not a hard and fast rule that applies to everyone. The idea that people have fixed "learning styles" - like being a visual, auditory, or kinaesthetic learner - is not supported by evidence. Instead of trying to match teaching methods to these supposed styles, educators should focus on matching their methods to the content, the task at hand, and the learner's growing abilities. This approach recognizes that learning is a complex and dynamic process that can't be reduced to simple formulas or labels. By being more flexible and responsive to the needs of their students, educators can create a more effective and engaging learning environment.

Theories can overlap and use different language for related processes. Humanism, andragogy and self-determination theory all attend to learner agency, but from different traditions. Situated learning, communities of practice and connectivism all involve networks, although connectivism gives particular attention to digitally mediated and rapidly changing knowledge. The educator need not label every action. The important question is whether the chosen action is coherent with the learning goal, feasible in context, respectful of the learner and safe for the patient (Dong et al., 2021; Goldie, 2016).

Learning in a classroom is different from treating patients. What works in one school may not work in another. This is because students, teachers, and the community all play a role in how well something works. So, teachers should use a combination of ideas, research, watching their students, and seeing what works locally. It's better to try small changes, see how they work, and make adjustments as needed, rather than just following the latest trends without thinking them through. This way, teachers can figure out what really helps

their students learn. They can plan a lesson, teach it, get feedback, think about what worked and what didn't, and then make changes for the next time. This approach helps teachers come up with lessons that are tailored to their students' needs. By doing this, teachers can make sure their students are getting the best education possible.

CONCLUSION

Clinical teaching is most effective when it is intentional but remains responsive to the learner, patient and workplace. Behaviourism helps educators define, practise and reinforce observable performance. Cognitivism and cognitive load theory explain information processing and working-memory limits, while constructivism highlights prior knowledge and active meaning-making. Humanism keeps the learner's dignity, agency, affect and development in view. Experiential and reflective learning turn clinical exposure into future capability. Situated learning and cognitive apprenticeship explain participation and graded access to professional practice. Connectivism highlights the ability to build, appraise and maintain networks of people and information as knowledge changes. Motivation and psychological safety shape whether learners participate, reveal uncertainty and use feedback.

When we think about learning, we need to consider what happens before, during, and after the learning experience. Before it starts, the learner's past experiences, goals, and readiness to learn all play a role in what they can take away from it. During the experience, being fully involved, having the ability to think critically, access to expert guidance, and support that's gradually phased out all help shape how the learner interprets what's happening. After it's over, reflecting on what happened, getting feedback, and having the chance to try again all help decide whether the experience sticks and can be applied in real situations. No one theory can explain everything, but when we combine them, we get a better understanding of how clinicians develop their knowledge, skills, and professional judgment over time.

FINAL MESSAGE: Clinical exposure is not synonymous with learning. Learning becomes more likely when experience is connected to prior knowledge, participation is meaningful, cognitive demand is manageable, uncertainty can be disclosed, and reflection and feedback lead to another opportunity to act.

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