

Three Lenses on Learning: Frames for Residency Education

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The Challenge

Program directors and faculty face continuous demands to develop and improve curricula and instruction. Learning theories can provide a lens to guide curricular innovations and offer new teaching strategies, yet few faculty feel the need or are equipped to apply these theories to inform practice. A simple typology, based on 3 key lenses on learning,^{1,2} can help faculty demystify learning theories and appreciate their utility in guiding practice.

What Is Known: 3 Lenses on Learning

Consider a program director who is baffled by residents' inability to master central line placement after watching a high-quality video. Each lens on learning provides a different perspective on why residents are struggling.

Behaviorist: "*Video-based instruction failed because it omits trial and error with direct feedback.*" For a behaviorist, learning occurs through actions and consequences using rewards and punishments (feedback) to reinforce or discourage specific behaviors (operant conditioning). Graduate medical education (GME) often uses behaviorist learning approaches with procedural skills training followed by checklists or ratings to assess behaviors.

Cognitive: "*This was too complicated—it overloaded learners.*" Using this lens, the instructor could assess what residents understood about central lines, and build on this to integrate cognitive and psychomotor skills to support knowledge transfer to real situations. Learning involves connecting new information with prior knowledge and experience.³ Resident morning report and rounds exemplify cognitive strategies to enhance clinical reasoning. In these settings, attending physicians assess residents' clinical judgment by asking them to articulate their thought processes, and then probe areas of uncertainty, with the intent of moving residents to the next level of understanding.

Sociocultural: "*We need residents to observe this in real life to see how others plan, set up, and execute line placements.*" In the sociocultural lens, learning occurs through active participation in particular social and cultural contexts.⁴ When faculty members consider how the situation (eg, context, content, community, participation, and identity) contributes to learning, or when a physician describes how novice learners acquire knowledge and skills

Rip Out Action Items

Clinician educators should:

1. Share the 3 (or more!) lenses on learning with clinician educator colleagues.
2. Challenge themselves to view commonly taught material through different learning lenses.
3. Incorporate another lens into teaching a complex or frequently taught topic, and see what changes.

through observation and progressive responsibility (*legitimate peripheral participation*), they are applying a socio-cultural lens. Multi-source, work-based assessment aligns with sociocultural principles.

Each of these learning lenses draws on different theories and disciplines (eg, psychology, anthropology). Key features of each lens for learners and educators are outlined in the TABLE and applied to a *code blue* curriculum example.

How You Can Start TODAY

1. **Decide what you assume about learning and what lens best represents your teaching.** Review your residency curriculum, and consider what you might do differently in your teaching or curriculum if you used a different lens.
2. **Reflect with GME learners about how they learn.** Give residents time to discuss how they are taught and how they learn. This can also help residents identify their individual learning needs and approaches. Their insights can point to areas where a different lens on learning suggests new instructional strategies.
3. **Incorporate reading on learning theory into your next journal club.** Group discussion of literature on learning (eg, excerpts from *How Learning Works: Seven Research-Based Principles for Smart Teaching*⁵) can provide both a theoretical framework and practical application.

What You Can Do LONG TERM

1. **Develop a learning theory workshop for new clinician educators.** Hands-on activities that evaluate existing and potential curricula or teaching strategies through learning lenses can enhance comfort in applying theory.

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TABLE
Learning Lens Features and Application to a *Code Blue* Curriculum

Lens	Key Features for Learner	Key Features for Educator	Code Blue Curriculum Example
Behaviorist	Learns by “doing”; receives positive or negative reinforcement to make behavior permanent Acquires skills/knowledge in sequence to work toward mastery Acts and responds to events to gain expertise	Sets expectations Provides frequent feedback that prompts correct responses and chastens incorrect responses Course descriptions provide clear objectives, rationale, and consequences	Computer-based ACLS protocol training with virtual patient simulator that provides feedback based on learner responses Applies basic checklist protocols to virtual cases Mistakes in protocol require repetition until demonstration of proficiency; success merits progression to more complex cases
Cognitive	Actively constructs knowledge to make meaning by processing new information relative to prior knowledge and experiences Requires self-motivation to become competent	Facilitates learning Connects new knowledge to prior knowledge Relates materials and skills to previously covered or upcoming content Avoids overloading learners	Mannequin-based code blue case simulations (assumes basic understanding of ACLS protocols) Applies new knowledge through interactive and evolving simulations Learners practice and problem solve to improve on code blue skill set
Sociocultural	Develops identity and competence through meaningful participation in professional activities Recognizes the influence of cultural and social contexts and practices on learning Seeks out quality learning environments	Shapes learning environment Tailors activities to engender learner participation Models professional identity in context	Early learner code blue learning via legitimate peripheral participation at real codes (active observer) Learner graduates to more critical roles (eg, chest compressions → retrieving and interpreting pertinent patient data → leading codes), and incorporates interactions within the code team culture at each step

Abbreviation: ACLS, advanced cardiovascular life support.

2. Involve GME learners in educational scholarship.

Learning theories provide helpful guidance for residents engaging in curricular innovations; the lenses establish a solid foundation for future scholarship.

- Bleakley A. Broadening conceptions of learning in medical education: the message from teamworking. *Med Educ.* 2006;40(2):150–157.
- Ambrose SA, Bridges MW, DiPietro M, et al. *How Learning Works: Seven Research-Based Principles for Smart Teaching.* San Francisco, CA: John Wiley & Sons; 2010.

Resources

- Mann KV. Theoretical perspectives in medical education: past experience and future possibilities. *Med Educ.* 2011;45(1):60–68.
- Hodges BD, Kuper A. Theory and practice in the design and conduct of graduate medical education. *Acad Med.* 2012;87(1):25–33.
- Regehr G, Rajaratanam K. Models of learning: implications for teaching students and residents. In: Distlehorst LH, Dunnington GL, Folse JR, eds. *Teaching and Learning in Medical and Surgical Education, Lessons Learned for the 21st Century.* Mahwah, NJ: Lawrence Erlbaum Associates; 2000:51–55.



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