

## COGNITIVE APPRENTICESHIP

### Goals

What do you hope to learn during our session? Please rank the goal statements below on a scale from 1-3, with 1 being “most important to me” and 3 being “least important to me”.

**I hope / expect this session will help me to...**

- \_\_\_\_\_ 1. Describe the cognitive apprenticeship framework as it relates to teaching in workplace environments
- \_\_\_\_\_ 2. Evaluate cognitive apprenticeship strategies that can be applied to enhance the learning environment
- \_\_\_\_\_ 3. Develop a plan to integrate strategies to optimize learning in the workplace

**What questions would you like addressed during this session?**

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### Reflection

Think about your experiences of learning in clinical settings as a student and/or resident.

**What made an experience positive? How do you know?**

  
  
  
  

**What made an experience negative? Why?**

  
  
  
  

### Prior Knowledge

Below is a list of key terms and concepts that may be of use in our sessions. Place an “X” next to words you DO NOT know.

- |                          |                              |                      |
|--------------------------|------------------------------|----------------------|
| Cognitive apprenticeship | Scaffolding                  | Situated Learning    |
| Modeling                 | Sequencing                   | Reflective Practice  |
| Coaching                 | Zone of Proximal Development | Intrinsic Motivation |

### Self-Assessment

Rate the extent you agree with the following statements (1 = strongly disagree to 5 = strongly agree)

- 1. I consistently demonstrate how to perform clinical skills to learners. \_\_\_\_\_
- 2. I consistently give useful feedback after direct observation of learners. \_\_\_\_\_
- 3. I consistently adjust my level of support for learners based on need. \_\_\_\_\_
- 4. I consistently ask learners to provide a rationale for their actions. \_\_\_\_\_
- 5. I consistently ask learners to reflect on their learning experiences. \_\_\_\_\_
- 6. I consistently ask learners to apply their learning to new scenarios. \_\_\_\_\_

**Cognitive Apprenticeship Framework**

**Why Cognitive Apprenticeship?**

- Provides a framework to support teaching in practice-based environments
- Goal is to “*make expert thinking visible*”—expertise becomes automatic after time and difficult to teach
- Supports a safe learning environment that engages learners as they develop expertise
- Incorporates various methods to accommodate diverse skill sets and settings

<p><b>What is a major skill or task you want learners to be able to do at the end of rotation?</b></p>
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**Four Domains of Cognitive Apprenticeship**

CONTENT	
<i>Types of knowledge required for expertise</i>	
Domain knowledge Heuristic strategies Control strategies Learning strategies	<p><b>What <u>knowledge</u> is necessary for the learner to accomplish this skill or task?</b></p> <p><b>What <u>strategies</u> do you use to accomplish this skill or task?</b></p>
SEQUENCING	
<i>Keys to ordering learning activities</i>	
Increasing complexity Increasing diversity Global to local skills	<p><b>What would a <u>minimally</u> complex example look like? <u>Moderately</u> complex? <u>Highly</u> complex?</b></p> <p><b>What are different <u>contexts</u> the learner can apply this skill or task?</b></p>
SOCIOLOGY	
<i>Social characteristics of learning environments</i>	
Intrinsic motivation Situated learning Communities of practice Cooperation	<p><b>How can you motivate learners to complete the skill or task?</b></p> <p><b>How can learners practice this skill or task as a group? How does your team support them?</b></p>

What are different strategies that could be used when teaching in clinical practice based on the *methods* domain?

**MODELING**

**COACHING**

**SCAFFOLDING**

**ARTICULATION**

**REFLECTION**

**EXPLORATION**

**Additional Notes**

**Reflection**

**How do you plan to incorporate cognitive apprenticeship into your learning, teaching, and / or practice?**

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**How will you hold yourself accountable to applying cognitive apprenticeship?**

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**Resources**

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**Table 1. Four dimensions of the cognitive apprenticeship model**

<b>Content</b>	<b>Types of knowledge required for apprenticeship</b>
Dimension knowledge	Specific concepts, facts, & procedures
Heuristic strategies	Generally applicable techniques to accomplish tasks (“rules of thumb”)
Control strategies	General approaches for directing one’s solution process
Learning strategies	Knowledge about how to learn new concepts, facts, and procedures
<b>Method</b>	<b>Ways to promote the development of expertise</b>
Modeling	Perform a task so students can observe
Coaching	Observe and facilitate while students perform a task
Scaffolding	Provide supports to help the student perform a task
Articulation	Encourage students to verbalize their knowledge and thinking
Reflection	Enable students to compare their performance with others
Exploration	Invite students to propose and solve their own problems
<b>Sequencing</b>	<b>Keys to ordering learning activities</b>
Increasing complexity	Arrange tasks to gradually increase in difficulty
Increasing diversity	Allow practice in a variety of situations to emphasize broad application
Global to local skills	Focus on conceptualizing the whole task before executing the parts
<b>Sociology</b>	<b>Social characteristics of learning environments</b>
Situated learning	Use realistic tasks that are in the context of practice
Communities of practice	Communicate about different ways to accomplish meaningful tasks
Intrinsic motivation	Have students set personal goals to seek skills and solutions
Cooperation	Have students work together to accomplish their goals

**Table 2. Examples of cognitive apprenticeship methods activities**

<b>Method</b>	<b>Examples</b>
<b>Modeling</b>	Observation of experts, both skills and attributes Externalizing mental processes in text or oral explanations Modeled in person, 3D animations or video footage
<b>Coaching</b>	Individualized feedback Expert observes student demonstrate a skill Replay of a video-taped student performance Checklists for trainers and learners Formative assessments
<b>Scaffolding</b>	Individualized support from experts Conceptual models, algorithms Hints, reminders, access to resources, informal chatting Simulations, scenarios
<b>Articulation</b>	Summative assessments Socratic questioning, assessment questions Students explain rationale
<b>Reflection</b>	Post-hoc reflection of performance Informal or formal discussions with colleagues or peers Portfolios, online forums, journals, online prompts, video footage of performance Comparison with expert performance Encouragement by mentors
<b>Exploration</b>	Self-directed learning in related content areas Encouragement to explore and form own learning goals Stimulate students to ask more questions

Adopted from: Lyons K, McLaughlin JE, Khanova J, Roth MT. Cognitive apprenticeship in health sciences education: a qualitative review. *Adv in Health Sci Educ.* 2017;22(3):723-739

Wolcott MD, Brame JL