

## **Peer Observation of Case-Based Collaborative Learning\* Worksheet and Compendium**

**Developed by the Academy at Harvard Medical School's**

**Peer Observation of Teaching Interest Group Members**

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In Case-based Collaborative Learning (CBCL), students and facilitators *share* responsibility for exploring, uncovering, and applying knowledge, creating in-depth and lasting understanding of complex concepts and organizing principles. Through advanced preparation, guided inquiry, and creative problem solving, students assume active responsibility for their own intellectual development.

The packet presented here is the result of scholarly and real-time classroom exploration of effective CBCL facilitation behaviors by the Harvard Medical School (HMS) Academy's Peer Observation of Teaching Interest Group. Our aim in developing the observation worksheet and accompanying compendium was to identify and define the principles and behaviors needed to lead a successful CBCL session, thereby establishing a shared understanding of this student-centered, collaborative pedagogic approach. The observation worksheet will become a key instrument in future faculty development efforts to prepare individuals to teach in this format.

The Peer Observation Worksheet outlines 7 categories of effective CBCL facilitation strategies, each supported by demonstrable examples of these behaviors. On the second page of the worksheet, we have included 7 elements of effective instruction that should form the basis of any instructional session. The Compendium further defines for the CBCL facilitator and the peer observer the varied, demonstrable behaviors associated with each category. We have tried to include a comprehensive listing for each category. However, not all behaviors are applicable to every teaching session; instructors should not feel it is necessary to demonstrate all listed behaviors.

Having studied Case-based Collaborative Learning over a multi-year period, our interest group has identified the establishment of a safe, collaborative learning environment by the course director and faculty as the element most critical to leading a successful CBCL session. This is due to the focus on individual and group work in which students are encouraged to reveal their thought processes and engage in critical thinking. They must feel comfortable with taking intellectual risks and openly expressing what they know and don't know.

\*CBCL applies flipped classroom principles to the medical school classroom.

## Peer Observation Worksheet of Case-Based Collaborative Learning

THIS FORM IS ONLY INTENDED TO BE USED FOR FORMATIVE PURPOSES.

Category/Behavior	Notes
<p><b>1. Connects prior learning and pre-class assignment to in-class activities. May conduct a student readiness assessment.</b></p>	
<p><b>2. Prompts deeper learning by using one or more of the following active learning strategies:</b></p> <ul style="list-style-type: none"> <li>• Uses higher-order questioning; asks questions such as “Why?” “What if?” or “How does that happen and why?” to further students’ understanding and critical thinking</li> <li>• Asks students to clarify, elaborate further, make connections, or reason through their responses</li> <li>• Alters case or question to see if students can apply their knowledge to different situations (e.g., predict what will happen if...; compare or contrast this situation with another one)</li> <li>• Challenges students’ existing ways of thinking or points out exceptions to the rule</li> </ul>	
<p><b>3. Responds to students’ questions in ways that promote further learning.</b> Examples:</p> <ul style="list-style-type: none"> <li>• Explores student’s thought process before answering</li> <li>• Asks students to respond to each other</li> <li>• Relates students’ questions back to conceptual framework</li> <li>• Uses student’s question as a means to assess his/her understanding</li> </ul>	
<p><b>4. Uses a variety of learner-centered activities to engage students in the application, transfer, or generation of knowledge.</b> Examples:</p> <ul style="list-style-type: none"> <li>• "Think-Pair-Share" activities; peer teaching; team learning</li> <li>• Audience response, open-ended questions, “warm” calls</li> <li>• Innovation challenges; hypothesis generation and testing</li> <li>• Learner calibration (e.g. peer-graded quizzes; “think out loud” problem solving)</li> </ul>	
<p><b>5. Conducts frequent, “non-graded” assessment of students’ understanding to allow for immediate feedback and inform real-time instruction.</b> Examples include audience response, polls, group quiz, partnering with student, and “assessment while walking around” during small group work</p>	

Category/Behavior	Notes
<p>6. <b>When co-teaching with other faculty, does so in a coordinated and collaborative manner.</b> Examples:</p> <ul style="list-style-type: none"> <li>• Lends insights from own specialty and experiences</li> <li>• Respectfully builds upon the other faculty's responses as if having a conversation</li> <li>• Provides support to students when not taking the lead in a discussion or activity</li> </ul>	
<p>7. <b>Blends facilitated instruction with students' self-directed learning</b> (e.g. promotes exploration, analysis, and/or evaluation of topic; prompts students to find solutions to unanswered questions or steers them in right direction)</p>	

Elements of Effective Instruction	Notes
<p><b>A.</b> Establishes an environment of intellectual safety in which students feel comfortable expressing their thoughts, learning from mistakes, and admitting if they do not know the answer.</p>	
<p><b>B.</b> States learning objectives and plan for in-class time, making organization of session transparent to students (Note: this may have already been accomplished prior to session)</p>	
<p><b>C.</b> Effectively manages time to address learning objectives. (Majority of time is for active learning. Attention paid to pacing, momentum, and flow of session; knows when to dive deeper into content, move session forward, or pause to reinforce core concepts. Able to adapt to immediate student learning needs, including modifying session plan or making in-the-moment adjustments.)</p>	
<p><b>D.</b> Demonstrates enthusiasm about topic and promotes student engagement (e.g. maintains eye contact, varies voice, intonations, pitch, inflections; purposefully gestures; attends to body movement).</p>	
<p><b>E.</b> Uses effective strategies to manage group dynamics, including engaging the quiet learner, managing the overly talkative student, or redirecting the distracted learner. Element also includes attending to and addressing the emotional tenor of the room.</p>	
<p><b>F.</b> Highlights main teaching points or asks students to summarize or state main points in own words.</p>	
<p><b>G.</b> Provides closure to the session (e.g. leaves time at end of session for final reflections or questions, informs students about upcoming sessions, or notes office hours or extra help).</p>	

## Compendium for Peer Observation of Case-Based Collaborative Learning

We have included a comprehensive listing of behaviors associated with each category to amplify on the descriptions provided in the worksheet. A facilitator may demonstrate any combination of these behaviors. We encourage the peer observer and facilitator to meet prior to the session to identify behaviors that are of the highest priority for the observation.

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Category/Behaviors -- OPENING
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<b>1. Connects prior learning and pre-class assignment to in-class activities. May conduct a student readiness assessment.</b>
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- Starts session by asking students which parts of the pre-assignments they found most challenging or need further clarification. Alternatively, students form groups and discuss what they found most challenging about completing the assignment; students clarify confusing concepts or teach each other how they arrived at answers.
- Starts the class with a “Think, Write, Share.” Instructor poses a problem or case to the class; students are then given time to write or map their ideas, after which they are asked to share their reflections in small groups or with the whole class.
- Contextualizes the content learned prior to class.
- Student Readiness Assessment Types:
  - *Knowledge readiness quiz* -- A mini-quiz of selected questions administered at the start of class, occasionally collected to evaluate individual pre-class learning.
  - *Mini-needs assessment* -- An assessment of the entire class’ understanding of pre-class learning. Usually conducted verbally at beginning of class; may be performed using an audience response system.
  - *Student self-assessment* -- Students are asked to complete a questionnaire to evaluate their own understanding of the pre-class material and identify gaps in their knowledge.

## Category/Behaviors – ACTIVE LEARNING

### 2. Prompts deeper learning by using one or more of the following active learning strategies:

- Uses higher-order questioning or asks questions such as “Why?” “What if?” or “How does that happen? Why?” to further students’ understanding and critical thinking
- Asks students to clarify, elaborate further, make connections, or reason through their responses
- Alters case or question to see if students can apply their knowledge to different situations
- Challenges students’ existing ways of thinking or points out exceptions to the rule

- Asks students to dive deeper into material by discovering links to prior knowledge, making hypotheses, or building conceptual frameworks.
- Encourages student to use inductive reasoning while applying conceptual frameworks and newly-learned concepts to novel situations, patient cases, and authentic problems.
- Instead of leading students to a single “correct” answer, uses questions to promote learning and stimulate critical thinking about a topic. For example, facilitator avoids responding to answers with comments such as “that’s correct” or “that’s wrong.” Rather the facilitator probes the student to clarify or elaborate his or her thinking: “You’re on to something. Tell us all how you got there. What if I changed the scenario slightly to...then what?”
- If the class doesn’t answer a question the facilitator poses, he/she will wait and then ask the class to identify what is most confusing about the question.
- Uses questions to stimulate active engagement and discussion by having students build upon their classmates’ answers, suggest counterpoints, or ask related questions.

Examples of higher-order questions that promote deeper learning include:

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|--------------------------------------|------------------------------------------------------------------------------|
| “Why?”                               | “Can you walk me through your thought process?”                              |
| “What if?”                           | “Why did you choose b over c?”                                               |
| “How and why does this happen?”      | “Consider a patient with x instead of y. How would you think about it then?” |
| “What do you think about...?”        | “What do these cases have in common?”                                        |
| “How would you explain?”             | “How does this case differ from the previous one?”                           |
| Can you describe how that would ...? | “How does this case relate to those we discussed last session?”              |
| “Can you tell me more about that?”   |                                                                              |

Category/Behavior – RESPONSE TO QUESTIONS
<p><b>3. Responds to students' responses or questions in ways to promote further learning.</b> Examples:</p> <ul style="list-style-type: none"><li>▪ Explores student's thought process before answering</li><li>▪ Asks students to respond to each other</li><li>▪ Relates student's question back to the conceptual framework or core concepts</li><li>▪ Use student's question as a means to assess his/her understanding</li></ul>

- Repeats student question to the rest of the class. This is done to:
  - validate the importance of the question
  - clarify the question
  - build on the question
- Purposefully holds off on answering question – “Let’s hold off on that and see how your question plays into the next part of our discussion.”
- Explores student’s thought process before answering:
  - That’s very interesting. Can you take that thought a step further? Or step back?
  - What factors led you to that conclusion?
  - How does your answer relate to the framework up on the board?
- Asks students to respond to each other:
  - Sarah, why do you think Peter chose that response? Do you agree?
  - What might be another answer?
  - Who can elaborate further?
- Uses student’s question as a means to assess the class’ understanding:
  - Who else has a question about ...?
  - Before I answer that, let’s review ...
  - Mary, please explain how you arrived at that conclusion.
- Admits own uncertainty/knowledge limit
  - I don’t know, let’s think that through together.
  - This is a difficult area for most people, but let’s consider what we do know.
- When reviewing multiple choice answers, discusses correct and incorrect responses to clarify errors in students’ understanding and reasoning.
- Collects multiple answers to a question before revealing correct response.
- Calls attention to how the student’s thinking about a particular problem can be applied to other scenarios.

## Category/Behavior – LEARNER-CENTER ACTIVITIES

### 4. Use a variety of learner-centered activities to engage students in the application, transfer, or generation of knowledge and core concepts.

Examples:

- “Think-Pair-Share,” peer teaching or team learning
- Audience response, open-ended questions, “warm” calls
- Innovation challenges; hypothesis generation and testing
- Learner calibration (e.g. peer-graded quizzes; “think out loud” problem solving)

- Think-Pair-Share
  - Instructor poses question to which students must come up with answer alone and then discuss with a partner before settling on final answer to be shared with the rest of the class.
- Peer Teaching
  - Time designated for students to teach each other and help fellow students get past confusion or summarize the case and its main points
  - Instruction is provided by students who have just recently grasped the material themselves
  - In small groups or pairs, students take a low-stake assessment (quiz) and then share and discuss answers with each other
  - Time in class for notes sharing or prep work sharing
  - When feeling “stumped” by a question, student can “call a friend”
  - Students are asked to present answer and share thought process to the entire class
- Team Learning
  - Involves small groups of students working collaboratively to solve problems and practice applying concepts
  - Students learn from each other as they work on activities that require shared decision making and articulation of complex concepts
  - Students, together, summarize the main points of a case
- Audience Response
  - Using either smartphone devices (high tech) or show of hands in front of chest
  - Asks students to form buzz groups first and then vote
- Warm call
  - Provides students the opportunity to sign-up ahead of time to be called upon in class without raising their hands
  - Students who volunteer to be called on may be incentivized with extra credit
  - Students who choose not to sign-up can still indicate a willingness to answer a question
- Innovation challenges
  - Students are challenged to formulate therapy for a disease, build mechanisms to prevent pathophysiologic occurrence; design disease-free environments; generate/test hypotheses.
- Facilitator gives low-stakes, cumulative assessment of prior sessions to engage students in spaced and accumulated learning
- Students author test questions (and answers) that they pose to other class members
- Students engage in a physical activity – e.g. demonstrate physiological reaction, feel for pulse, etc.
- Students are asked to come to board and draw diagram or explain a particular concept

Category/Behavior – ASSESSMENT AND FEEDBACK
<p>5. Conducts frequent, “non-graded” assessment of students’ understanding to allow for immediate feedback and inform real-time instruction Examples:</p> <ul style="list-style-type: none"><li>▪ Audience response polls</li><li>▪ Group quiz</li><li>▪ Partnering with student</li><li>▪ “Assessment while walking around”</li></ul>



- Assessment while walking around --
  - While students are engaged in small group work, instructor walks about the room, listening in to small group conversations, and identifies learning gaps and provides just-in-time teaching
- Audience Response Polls
  - Uses mobile phones or the internet to collect students’ answers or feedback in real-time
- Group Quiz
  - Small groups of students work together to answer questions on a short quiz
- Partnering with a student
  - Facilitator sits next to a student in class and actively guides student while he/she answers a question or assesses a situation
- Faculty facilitator stresses to students that he/she is as interested in seeing how they got to an answer as he/she is with the answer itself. “Show your work.”
- After determining students have achieved appropriate level of understanding, facilitator delivers a new challenge to advance students’ understanding of topic– new mini-case to discuss or higher order question to answer.



### Category/Behavior – CO-TEACHING

**6. When co-teaching with other faculty, does so in a coordinated and collaborative manner.** Examples:

- Lends insights from own specialty and experience
  - Respectfully builds upon other faculty's responses as if having a conversation, including offering another view point
  - Provides support to students when not taking the lead in a discussion activity
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- Faculty members identify the roles they will take during the class time.
  - Faculty members model how to respond to an open-ended question or undifferentiated patient case.
  - Faculty offer diverse, yet equally relevant answers, often providing differing perspectives.
  - Faculty question each other to unveil underlying thought processes.
  - Faculty demonstrate interconnectivity among multiple specialties and how to think together as a healthcare team.
  - Faculty members take turns leading 2-4 minute micro-tutoring about specific topics in their areas of expertise.
  - Faculty members each lead a team of students in friendly, in-class competition.
  - The faculty member who is not currently taking the lead remains engaged and interested. May walk around the class, partner with the students, ask clarifying questions, or physically join the students as a "participant."
  - Faculty member encourages students to ask faculty partner question(s) or re-directs students to partner for insight, additional information, or commentary.

**Category/Behavior –BALANCING FACILITATED/SELF-DIRECTED LEARNING**

**7. Balances facilitated instruction with students' self-directed learning**

(e.g. promotes exploration, analysis, and/or evaluation of topic; prompts students to find solutions to unanswered questions or steers them in right direction)

- Provides guidance and support as students work through a problem—
  - does not jump in with the “right” answer, yet does not allow students to flounder unnecessarily
  - works with students’ misconceptions, bringing them back to foundational knowledge until they express understanding of main concept
- Allows class time to explore a new or novel question raised by students.
- Sequences learning so that activities are logically organized and increase in complexity as students demonstrate understanding.
- Provides students with opportunities to explore new or complex concepts using a variety of approaches that address a range of learning preferences – e.g. discussion, reading, writing, reflection, demonstrations, observations, and chunking knowledge vs presenting entire framework.
- Demonstrates patience if a student seems confused; allows time for student to think through issues and acquire own understanding.
- Gives student-groups time and space to plan, think, and do.
- Asks students identify their own areas of confusion about in-class work before submitting to facilitator.
- Suggests areas of further study or presents questions students should answer on their own.
- Maintains a “parking lot” of important unanswered questions; highlights these at the end of class and encourages students to pursue answers.
- Ends session with a synopsis of key concepts – generated by either students (preferably) or facilitator.