

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

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In Case-based Collaborative Learning (CBCL), students and facilitators share responsibility in exploring, uncovering, and applying knowledge in order to create in-depth and lasting understanding of complex concepts and organizing principles. Through guided inquiry, creative problem solving, and advanced preparation, 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 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 Peer Observation Worksheet outlines 8 categories of effective CBCL facilitation strategies, each supported by demonstrable examples of these behaviors. On the second page of the worksheet, we have included 8 elements of effective instruction that should form the basis of any instructional session. The Compendium further identifies and defines for the CBCL facilitator and the peer observer the varied, demonstrable behaviors associated with each category. We have tried to distinguish elements of content and organization of the sessions that are the responsibility of the course director from the management of the session by a particular faculty member teaching in the course.

Having studied Case-based Collaborative Learning over a two-year period, the crucial element our interest group identified as essential to running a successful CBCL session is for the facilitator to establish a safe learning environment – one in which students are encouraged to and are comfortable with revealing their thought processes, taking intellectual risks, and openly expressing what they know and don't know. Without such an environment any student self-directed exploration, collaborative problem solving or expression of curiosity will not occur.

## Peer Observation Worksheet of Case-Based Collaborative Learning

Category/Behavior	Notes
1. <b>Connects prior learning and pre-class assignment to in-class activities</b>	
2. <b>Explicitly determines student preparation and understanding of core concepts</b> (e.g. “readiness” test, mini-needs assessment, student self-assessments) <i>Note: May occur prior to start of class</i>	
3. <b>Prompts deeper learning by using one or more of the following active learning strategies:</b> <ul style="list-style-type: none"> <li>• Uses higher-order questioning or asks questions such as “Why?” “What if?” or “How does this happen? 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</li> <li>• Challenges students’ existing ways of thinking or points out exceptions to the rule</li> </ul>	
4. <b>Responds to students’ questions in ways to promote further learning.</b> Examples: <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>	
5. <b>Uses a variety of learner-centered activities to engage students in the application, transfer, or generation of knowledge.</b> Examples: <ul style="list-style-type: none"> <li>• Audience response, open-ended questions, “warm” calls</li> <li>• "Think-Pair-Share" activities</li> <li>• Team learning; Near-peer teaching</li> <li>• Learner calibration (a.k.a. self-graded mini-quiz)</li> </ul>	
6. <b>Conducts frequent, formative 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,”	
7. <b>When co-teaching with other faculty, does so in a coordinated and collaborative manner.</b> Examples: <ul style="list-style-type: none"> <li>• Lends insights from own specialty and experiences</li> <li>• 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>	

Category/Behavior	Notes
8. <b>Blends facilitated instruction with student self-directed learning</b> (e.g. promotes exploration or discussion of topic, encourages students to relate response to larger framework, prompts students to find solutions to unanswered questions or steers them in right direction)	

Elements of Effective Instruction	Notes
A. 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.	
B. Clearly states learning objectives and plans for in-class time, making organization of session transparent to students	
C. Effectively manages time to address learning objectives	
D. Demonstrates enthusiasm about topic and promotes student engagement	
E. Uses effective strategies to manage group dynamics	
F. Is available to students during classroom activities; conducts in-class formative assessment to ensure students are making appropriate progress and provides immediate feedback	
G. Highlights main teaching points or asks students to summarize or put main points in their own words	
H. 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)	
I. Other observations:	

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

Category/Behavior
<b>1. Connects prior learning and pre-class assignment to in-class activities</b>

- Evident that pre-class assignment was:
  - Understandable
  - Easy to access
  - Appropriate amount of material
- Uses pre-class communication (e.g. email, online forum) to identify challenging concepts
- Provides clear rationale as to how pre-class assignment connects to that day's topic
- Informs the class the questions that will be answered by the end of the session
- Begins session by presenting a mini-didactic to fill knowledge gaps and correct misunderstanding
- Starts session by asking students which part of the pre-assignment they found most challenging or need further clarification
- Starts by asking open-ended or challenging question derived from the assignment
- Starts session by having students work in small groups (e.g. 4 students) in which they are asked to discuss a case or work through a problem based on the prior session's learning objectives
- Asks students to summarize what they learned during the previous class as the instructor takes notes on the board
- At the beginning of class, students form pairs or groups of 4 and generate a summary of the main ideas covered during the pre-class assignment
- 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.

Category/Behavior
<p><b>2. Explicitly determines student preparation and readiness for class</b> (e.g. “readiness test,” mini-needs assessment, student self-assessment) <i>Note: This may occur prior to the start of class</i></p> <ul style="list-style-type: none"><li>• Instructor demonstrates that he/she has reviewed the students’ responses to the pre-work assignment prior to class and incorporates their level of understanding into that day’s lesson</li><li>• Assessment Types<ul style="list-style-type: none"><li>◦ <i>Knowledge readiness quiz</i> -- A mini-quiz of selected questions administered at the start of class and collected to evaluate individual pre-class learning</li><li>◦ <i>Mini-needs assessment</i> -- 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.</li><li>◦ <i>Student self-assessment</i> -- Students are asked to complete a questionnaire to evaluate their own understanding of the pre-class material and identify gaps in their knowledge</li></ul></li><li>• At the beginning of class, faculty member asks students to summarize what they learned during the previous class as he or she takes notes on the board.</li><li>• 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.</li><li>• Instructor starts by reviewing what the students have identified as the most difficult concepts presented during pre-class assignment, making note of who is willing to contribute to the discussion.</li><li>• Students are able to differentiate understanding of material: “I understand this concept, but not that one.”</li></ul>

## Category/Behavior

### 3. 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 this 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 patterns, making hypotheses, or building conceptual frameworks.
  - Encourages student to apply conceptual frameworks and newly-learned concepts to novel situations, patient cases, and authentic problems
  - Rather than leading students to single “correct” answer, uses questions to promote active learning and stimulate critical thinking about a topic. As an example, the instructor avoids responding to answers with comments such as “that’s correct” or “that’s wrong,” but probes the students so that he/she can clarify or elaborate upon his/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 instructor 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 questions that promote deeper learning include:

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

*Professor Chris Christiansen's Typology of Questions\**

- Open-ended: What are your reactions...? What aspects were of greatest interest to you...? Where should we begin...?
- Diagnostic: What is your analysis of the problem? What conclusions did you draw from the data?
- Information seeking: What is...?
- Challenge (testing) questions: Why do you believe that? What evidence supports your conclusion? What arguments might be developed to counter that point of view?
- Action questions: What needs to be done to...?
- Questions on priority and sequence: Given X... what is the first step to be taken? The second? Third?
- Prediction questions: If your conclusions are correct, what might be the reaction...?
- Hypothetical questions: What would have happened if...?
- Questions of extension: What are the implications of your conclusions...?
- Questions of generalization: Based on your study, what do you consider to be the major...?

\*Christensen, C R., Garvin, D. A. and Sweet, A. Educating for Judgment: The Artistry of Discussion Leadership. Cambridge, Mass: Harvard University Press, 1992

Category/Behavior
<p><b>4. Responds to students' questions in ways to promote further learning</b></p> <p>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>



- Encourages questions and demonstrates enthusiasm for students' questions
- 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
    - demonstrate enthusiasm for student questions and engagement
- Waits before answering question to see if other students want to respond
- Purposefully holds off on answering question – “Let's hold on that and see how your question plays into the next part of our discussion.”
- Explores student's thought process before answering:
  - Can you say a little more about that?
  - That's very interesting; can you take that a step further? Or step back?
  - What are the factors that led you to that conclusion?
  - How do you relate that to the structural framework up on the board?
- Asks students to respond to each other:
  - Sarah, what do you think?
  - Who has an opposing point of view?
  - What might be another answer?
  - Who can elaborate further?
- Relates student's question back to the conceptual framework or core concept
  - I'm glad you raised that as it relates back to ...
  - How does Joe's question relate to our discussion of ...?
  - Mary, please explain how you arrived at that conclusion.
- Uses student's question as a means to assess the level of understanding of the class:
  - Who else has a question about ...?
  - Before I answer that, let's review ...



- Admits own uncertainty/knowledge limit
  - I don't know, let's think that through together
  - This is a difficult area for most people
- When reviewing multiple choice answers, discusses correct and incorrect responses to clarify errors in students' understanding/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
<p><b>5. Use a variety of learner-centered activities to engage students in the application, transfer, or generation of knowledge and core concepts.</b></p> <p>Examples:</p> <ul style="list-style-type: none"><li>• Open-ended questions</li><li>• “Warm” calls</li><li>• “Think-Pair-Share” or “Write-Pair-Share” activities</li><li>• Team learning</li><li>• Near-peer teaching</li><li>• Mini-quiz</li></ul>

- Open-ended questions
  - Questions that require students to communicate application of concepts and new knowledge about a subject.
  - Questions that ask:
    - How? Why? What?
    - What else can you tell me about ...
    - What do you think about ...?
    - How would you explain ...?
    - Can you give me an example?
    - Can you describe how that would ...?
- Warm call
  - Provides students the opportunity to sign-up ahead of time to be called on 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 may still explicitly indicate a willingness to answer a question
- Think-Pair-Share or Write-Pair-Share
  - Instructor poses a question that students must consider alone or take a few minutes to write about, and then discuss with another student before settling on a final answer to be shared with the rest of the class.
- Audience Response
  - Using either smartphone devices (high tech) or show of hands in front of chest (low tech)
  - Asks students to form buzz groups first and then vote
  - Uses a Google Doc Form in order to collect answers to discuss later in session

- Team Learning
  - Involves small groups of students working collaboratively to solve problems and practice applying concepts
  - Students learn from each other as they work together on activities that require shared decision making and articulation of complex concepts
  - Exercises that encourage higher-order thinking, application and practice
- Near-Peer Teaching
  - Time designated for students to teach each other and help fellow students get past confusion
  - 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 posed by instructor, student can “call a friend”
- Instructor 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.
- Asks students to engage in physical activity – e.g. demonstrate physiological reaction, feel for pulse, etc.

Category/Behavior
<p><b>6. Conducts frequent, formative assessment of students' understanding to allow for immediate feedback and inform real-time instruction</b> 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>

- Audience response polls
  - Group quiz
  - Partnering with student
  - "Assessment while walking around"
- 
- Provides support and facilitates learning as students work through problems
  - Assessment while walking around
    - While students are engaged team learning in small groups, instructor identifies learning gaps and provides just-in-time teaching
  - Audience Response Polls
    - Uses mobile phones or the internet to engage students by collecting answers or feedback from class in real-time
    - May use an App such as "Socrative" to collect responses and show visually to class
  - Group Quiz
    - Small groups of students work together to answer questions on a short quiz
  - Partnering with a student
    - Instructor sits next to a student in class and actively guides student through their thinking to answer a question or assess a situation
  - Stresses to students that he/she is interested in seeing how they got to an answer rather than the answer
  - After determining students have achieved appropriate level of understanding, delivers a new challenge to advance students' understanding of topic– new mini-case to discuss or higher order question to answer.

Category/Behavior
<p><b>7. 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 experience</li><li>• Builds upon 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>



- Faculty model how to respond to an open-ended question or undifferentiated patient case
- Faculty integrate diverse, but equally relevant, answers to a case
- Faculty question each other to unveil underlying thought processes
- Demonstrate how to think together as a healthcare team
- Multiple faculty demonstrate interconnectivity among multiple specialties
- Faculty members each leads a team of students in friendly, in-class competition
- The faculty member who is not currently taking the lead walks around the class, partners with the student, or physically joins the students in the “audience.”

Category/Behavior
<p><b>8. Blends facilitated instruction with student self-directed learning</b> (e.g. promotes exploration or discussion of topic; encourages students to relate responses to larger framework; prompts students to find solutions to unanswered questions or steers them in right direction)</p> <ul style="list-style-type: none"><li>• Encourages students to think critically by asking them questions that require conceptual understanding rather than simple, factual responses</li><li>• Breaks down larger concepts into smaller chunks, making it clear what is important to know right now and what needs to be learned at later stages</li><li>• Sequences learning so that activities increase in complexity</li><li>• Models conceptual thinking by placing facts into larger frameworks</li><li>• Returns to complex material presented two sessions prior</li><li>• Flips class time appropriately -- choose activities that require student application of knowledge rather than review of basic information</li><li>• Allows class time to explore a new or novel question raised by students</li><li>• Provides guidance and support as students work through a problem together -- does not jump in with the “right” answer</li><li>• Designs sessions that provide students with opportunities to explore new or complex concepts using a variety of learning approaches that speak to a range of learning preferences – (e.g. active engagement and discussion, reading, writing, reflection, chunking knowledge vs presenting entire framework, working through cases, demonstrations, or observations)</li><li>• Demonstrates patience if a student seems confused; allows time for student to think through issues and acquire own understanding</li><li>• Gives student-groups time and space to plan, think, and do</li><li>• Asks students to submit remaining questions about a topic at the end of a session</li><li>• Asks students to determine what the next session should focus on</li><li>• Ends session with a synopsis of key concepts, provided either by students (preferably) or instructor.</li><li>• Announces what higher order questions the students will answer next class</li><li>• Students identify own understanding and areas of confusion about their in-class work before handing it in to instructor</li><li>• Maintains a “parking lot” of important unanswered questions; highlights these at the end of class and encourages students to pursue answers</li></ul>

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