Collaborative Learning Technique 8

Learning Cell

Characteristics

Group Size	2
Time on Task	15–30 MINUTES
Duration of Groups	SINGLE SESSION, MULTIPLE, OR ALL TERM

Description and Purpose

In Learning Cells, students individually develop questions about a reading assignment or other learning activity and then work with a partner, alternating asking and answering each other's questions.

The purpose of this CoLT is to engage students actively in thinking about content, to encourage students to generate thought-provoking questions, and to teach students how to check their understanding. Creating questions about an assignment requires students to think about the content in a way that is different from simply taking notes on it. It provides an opportunity for students to think analytically, to elaborate as they put material into their own words, and to begin to use the language of the discipline. Responding to the questions of peers provides a platform for discussion based on student levels of understanding. Exchanging questions and answers with a peer can motivate students and challenge them to pursue deeper levels of thought.

In addition to developing content mastery, this technique motivates students to practice interpersonal skills such as giving feedback in nonthreatening ways, maintaining focus, and developing and sustaining mutual tasks. Students learn to question, explain, admit confusion, and reveal misconceptions—something that they are more likely to do with a peer than with the instructor. Finally, an effective partner can act as a role model for useful learning strategies.

Preparation

Teach students how to write good questions.

Procedure

1. Ask students to individually develop a list of questions and answers dealing with the major points raised in a reading or other learning assignment.
2. Form student pairs or simply ask students to partner with a student sitting nearby.
3. Explain the process by which you want partners to alternate asking and answering each other's questions.
4. Student A begins by asking the first question and Student B answers the question. Student A offers corrections and additional information until a satisfactory answer is achieved.
5. Student B asks the next question and Student A answers, and the process repeats until all questions have been asked and answered.

Online Implementation: Learning Cell

Timing: Synchronous or asynchronous

Tools: LMS messaging, Web conferencing, immersive environment, e-mail, VoIP

The advantage of implementing this CoLT online is that it gives students some physical distance from each other, which may make them more comfortable. At the same time, a learning cell provides online students, who can feel isolated, with an immediate connection to another real student. It also allows them to make such a connection while developing a deeper understanding of course content by creating and then answering questions. The challenge to implementing this CoLT online is that it requires a relatively quick turnaround time from students, and if one student does not hold up his or her end of the Learning Cell it will not be an effective activity.

To implement this CoLT online, use your LMS's messaging system or e-mail. Organize students into pairs, and ask them to exchange questions and then to respond to each other with answers. Alternatively, use telecommunications, voiceover Internet protocol (VoIP), or an immersive environment. Ask students to use a tool such as Skype to alternate asking and responding to each other's questions. Provide a firm timeline for students to submit their questions and responses to each other. Ask them to record their partner's responses to the questions and submit to you to ensure individual accountability. Finally, immersive environments provide another tool that can be effective for this CoLT. Students simply meet in the immersive environment and ask and answer questions just as they would in an onsite course. Other options include robust student-centered collaboration tools such as VoiceThread and Classroom Salon.

Examples

Human Anatomy and Physiology (Traditional Onsite)

Professor Tish Oosells chose this CoLT to break up her three-hour class sessions and to deepen students' understanding of the content she was presenting. She

lectured on her first topic and then distributed a handout with a set of questions based on the lecture that were samples of the kind she would use on an exam. She next engaged students in a class discussion in which she guided them through the process of creating similar questions. After she lectured on her second topic, she asked students to write a set of questions on their own that addressed the material she had just covered.

She then asked students to find a partner and take turns asking and answering the questions. She used this technique throughout the semester, and as students became more proficient with practice the activity took less time. Professor Oosells believed that the process of creating the questions provided a clear framework for focusing students' attention on the lecture. She also thought that responding to another student's questions provided the opportunity for each student to recall, rehearse, and check their understanding of key concepts in a way that kept students engaged and motivated during the long class session.

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Introduction to Art (Flipped Course)

In this art appreciation course, the instructor prepared a series of online videos on major schools, including cubism, Dada, expressionism, Fauvism, futurism, impressionism, postimpressionism, and surrealism. The instructor used Learning Cells to help students review these major schools of art to prepare for an upcoming examination. In class, the instructor asked students to develop two questions for each of the schools: one to address a defining feature and the other to be more thought-provoking and emerging out of some aspect of the school that they found particularly intriguing. After students finished asking and responding to each other's questions, they turned in their questions and answers to the instructor. He reviewed the questions, added a few questions that had not been addressed by the students, and then selected five questions for each school, transcribing them into a single document. At the next class meeting, the professor distributed the handout as a study guide, explaining to students that he would draw his exam questions from the guide.

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Race and Ethnic Relations (Online Course)

This professor organized his online class into three segments. At the beginning of the semester, he assigned students to work in pairs for the first course segment and then reassigned new pairs for the next two segments. For each of the three segments he asked students to prepare two questions that particularly intrigued or puzzled them. Since the course focused on racial

relations, he encouraged students to use the assignment to ask questions that were appropriate to segment topics but that they might otherwise feel uncomfortable about asking. For example, one student asked, "Should I be using the terms 'Black' or 'African American?' Partners then exchanged questions. This format gave students permission to pursue answers outside of class (e.g., "I'm in a class and was asked to find out whether 'Black' or 'African American' was the preferred term. Can you help me?). Students returned their answers to the partner who had created the questions. The partner added any comments or follow-up questions and submitted it to the professor. The professor evaluated both partners' contributions, added his own comments, and assigned each student a grade that took into consideration the thoroughness and thoughtfulness of their work. For each segment, he selected several of the best questions and answers and posted them in a forum on the course's discussion board.

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Chemistry (Large Lecture)

The professor of this large lecture course, comprising three hundred students with auditorium-style seating, used Learning Cells at the beginning of each class period. He allocated approximately five minutes at the start of each class session. The night before each class, students were to read an assignment and to develop a list of five questions from it. In class, they partnered with a student sitting next to them, asking and answering their questions.

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Introduction to Business (Online Course)

In this class the professor decided to use Learning Cells to help students study for an upcoming test. He formed pairs and gave them the following instructions for the week leading up to the examination:

Day 1: Each student develops a list of five short study questions that could conceivably be asked on the test.

Day 1: Each student develops a model answer to the questions that he or she has written.

Day 1: Each student e-mails his or her partner with *questions only*.

Day 3: Each partner responds to the questions he or she received.

Day 3: Each student e-mails responses to the question writers.

Day 5: Each question writer uses his or her model answer to provide suggestions to the answering student's response, copying him on the final e-mail.

Variations and Extensions

- Instead of using this activity only sporadically, use the technique regularly as an opening activity for class sessions (McKeachie, 2002).

- Vary this CoLT by having each student in the pair read different materials. Rather than asking questions about the reading, have them teach the essentials of their reading to the second student (McKeachie, 2002).

- Provide students with generic question stems to guide their question writing (e.g., *Explain why ____. Why is ____ important? Compare ___ and ___. Summarize ___.*). This variation is called guided reciprocal peer questioning, and a fuller list of generic question stems may be found in Chapter 3, Designing the Learning Task.

- Vary the type of question. On one assignment, have students create an essay question. On the next assignment, have students create five multiple-choice questions or five true/false questions. Or ask students to create one of each kind for the assignment.

- Rather than having students asking and answering questions orally, have students write out questions and answers.

- Have long-term student pairs meet frequently to administer questions under test-like conditions. This variation is called reciprocal peer tutoring (Fantuzzo, Dimeff, & Fox, 1989; Fantuzzo, Riggio, Connelly, & Dimeff, 1989).

- Ask students to write more open-ended questions that may not have a single right answer. Students may then pose questions that interest, puzzle, or inspire them.

Observations and Advice

- The time this CoLT takes up in class can vary widely depending on the kinds of questions students will develop (questions that can be answered in a word or phrase or questions requiring more elaborate responses). Asking students to prepare questions in advance can save class time.

- Both students must prepare and participate for this activity to work well. If students are not prepared with thoughtful questions, time is wasted and nonproductive. Therefore, consider using an entry-ticket approach (see Chapter Four), requiring students to be prepared to participate and allowing pairs to reform if a student comes unprepared. Students who are unprepared lose participation points.

- To assess this CoLT, ask students to write out, on a single sheet of paper, two questions that their peer should be able to answer, leaving space on the page for their peer to provide brief written answers. Collect the papers. This assessment should be used sparingly, perhaps once in the

beginning of the term to alert students to the importance of the exercise and again later to note improvement in questions and answers. Or in a report-out to the class, ask a few students to volunteer an especially interesting, creative, or provocative question posed by their peer. Ask other students in the class to respond to the question.

Primary Resources

Johnson, D. W., Johnson, R., & Smith, K. (1998). *Active learning: Cooperation in the college classroom*. Edina, MN: Interaction Book Company, pp. 2:28, 3:21–3:22.

McKeachie, W. J. (2002). *McKeachie's teaching tips: Strategies, research, and theory for College and University Teachers*. Boston: Houghton Mifflin, pp. 190–191.