

Active Learning across the Content Areas

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What Is Active Learning, and Why Do We Need It?

Defined, active learning offers an “engagement in learning; the development of conceptual knowledge and higher-order thinking skills; a love of learning; cognitive and linguistic development; and a sense of responsibility or ‘empowerment’ of students in their own learning” (Lathrop, Vincent, and Zehler 1993, 6). Active learning means that students are engaged in a guided classroom activity instead of sitting quietly and listening to the teacher lecture. A classroom where active learning takes place is one that includes time for collaboration, various forms of communication, and the freedom for movement. This type of classroom demands that students be engaged learners who create knowledge—as opposed to passive ones who only receive information. It also changes the role of the teacher from one who bestows knowledge to a teacher-coach and mentor who acts as a facilitator and provides support and guidance for learning. We are familiar with “hands-on” activities, which much of active learning requires. But active learning also requires “heads-on” activities, meaning the brain is engaged in thinking and creating knowledge through appropriate challenges and peer discussions.

The idea of active learning is nothing new. Even back before many of us were students, Piaget wrote that learners must be active in order to be engaged in real learning (1954, 1974). Piaget was one of several constructivists who believed that students construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences. For example, when students are presented with new information, they merge it with their previous ideas and experiences. They might change what they think or discard this new information as useless. In effect, they create their knowledge by asking questions, exploring new ideas, and assessing what they know. The emphasis is on the students, not the teacher.

To give a more concrete picture, let's look at a few scenarios in a classroom.

Figure 1.1 Active Learning Scenarios

Active Learning	
Example	Nonexample
Students are out of their seats, collaborating with peers on a project.	Students listen to a lecture.
Students use various forms of communication, like podcasting, to share their ideas with others.	Students quietly write responses to questions, using complete sentences.
Students use manipulatives to build models to demonstrate what they learned.	Students work written problems on a worksheet to show what they have learned.
Students create movie trailers to summarize a book they just read.	Students write a one-page book report.
Students participate in small-group discussions in efforts to produce ideas for solving a problem.	Students individually read research material and take notes.
Students use their bodies to act out a scene and demonstrate a newly learned concept.	Students give a two-sentence ticket-out-the-door reflection on what they learned.
Students are presented with higher-order questions that challenge their views and must consult other documents before answering.	Students answer lower-level questions over material they read to ensure basic comprehension.
Students work with primary-source documents to piece together details and clues about an event in history.	Students read a textbook to understand an event in history.
Students design an experiment to test a hypothesis.	Students read a newspaper article about a science breakthrough.

The examples on the left side of the table clearly demonstrate students using heads-on and, in some cases, hands-on activities, while the nonexamples on the right do not demonstrate active learning. At times, teachers need to use the nonexamples like the ones listed in the chart because quick feedback is necessary to know if students are on track in their understandings. The caveat is that these can't be the *only* things students are doing in their day and certainly not the majority of the time. To truly internalize content so students

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Strategies that Activate Prior Knowledge

Connections for students occur when they bridge what they already know with what they are learning. For many students, activating prior knowledge is a skill that they must learn. Mastering this skill helps students approach learning with a purpose because they become aware of what they know and do not know about the topic. They then work to construct meaning from the experience. As a result, students' knowledge base grows and expands.

The strategies presented in this chapter activate students' prior knowledge. While participating in these active strategies, students dig deeply into Piagetan cognitive structures called *schemata*. As they learn more about a topic, they accommodate or make changes in previously held knowledge, and their connections between schemata become more complex.

Active learning strategies that activate prior knowledge include:

- Carousel Brainstorming (page 64)
- Virtual Field Trip (page 68)
- True or False Game (page 71)
- Concept Attainment (page 74)
- Layered Ball Questions (page 76)

Carousel Brainstorming

Carousel Brainstorming is designed to identify the collective thinking of a group by using open-ended questions. In small groups, students “carousel,” or walk, from one question to another, brainstorming together to write the best new answer for each question.

Brainstorming is a method of thinking up new concepts, ideas, or solutions. The goal in brainstorming is to generate as many ideas as possible within a time frame. The more ideas that are generated, the better the chance of finding a satisfying answer. Brainstorming with others brings out creative ideas that might not have been evident if students had been working alone. Open-ended questions are needed for brainstorming because they offer opportunities for many answers and are exclusively dependent on the creativity of students’ thinking. The end result is open, not closed, and facilitates higher-order thinking in students. Open-ended questions provoke a higher-level response from students and responses can be easily written. Some sentence stems for open-ended questions include:

- Explain in detail another idea for. . .
- Describe specifically how you could change . . .
- Compose a list of other ways this could be solved . . .
- Generate a list of alternatives to . . .
- For what reasons . . .
- In what ways could this person have responded . . .
- What motives did this person have, and what did he or she want to accomplish. . .

There are some students who will, at first, be resistant to open-ended questions, but this is not because they are unable to answer these questions. Rather, it is because they are afraid to think on their own. Years of looking for the one correct answer have brought this fear of failure and embarrassment of getting the “wrong” answer (Jackson 2009). It will take time for these students to be at ease with these types of questions. To help them, model how to answer these questions. Keep encouraging them to answer these questions. And most importantly, be patient with them.

How to Do It

Carousel Brainstorming can be set up in a variety of ways. The preferred way is to hang posters or large sheets of chart paper on the walls around the room. Each poster should have a different open-ended question or directive written on it.

For example in social studies, questions having to do with leadership and governing are great to use at election time. These open-ended questions and directives can include:

1. Generate a list of as many leaders as you can think of (in school, or on a local or national level).
2. In your opinion, who is the worst leader in history? Explain in detail your reasoning.
3. Describe in detail the kinds of life experiences a good leader should have.
4. Generate a list of the worst qualities a leader could have.
5. Explain in detail how much education a good leader needs.
6. Generate a list of the kinds of job experiences a good leader should have.
7. Describe specifically the number one quality a good leader should have.

Divide the students into small groups of three to five students. Give each group a different-colored marker. Each group walks to a poster, discusses the question, and brainstorms possible answers. When they decide on an answer as a group, one student writes it down on the poster. Give the groups a time limit at each poster, or allow students to take as much time as needed before moving on to the next poster. Each group writes as many responses as possible within a given time period on a poster. Then, the group carousels to the next poster and repeats the process but passes the marker to a different student within the group. This allows all students to be the scribe at some point. This time, students must read the responses written by the previous groups before they begin to write new ideas. They cannot copy an answer that is already written down. Students repeat this process until they have visited

all the posters. Keep track of student answers by tracking the colored markers on each poster. For example, group one used the green marker, so you can evaluate student answers by following the green answers on each poster.

Another way to use Carousel Brainstorming is by placing open-ended questions on papers in different file folders. The file folder is placed with students sitting together in groups at tables or desks. Each group of students has a different-color marker. The students discuss the question and brainstorm possible answers. When they decide on an answer, one student uses the marker to write it down on an answer sheet inside the file folder. Give a signal (such as ringing a bell) when student groups must rotate to a new file folder. Students repeat this process until they have “visited” all the file folders. Keep track of student answers by tracking the colored markers in each file folder until all folders are rotated. Once students have a clear understanding of the task, you may wish to begin negotiable contracting of assessment so that students are familiar with the expected criteria.

Ideas for Assessment

Carousel Brainstorming can be used to gather information about what students already know, what needs to be taught, and what should be differentiated for students. A teacher-coach’s checklist to keep track of student responses can be as simple as checking for a recorded answer or responding with a check mark. Teacher-coaches can also rate student understanding of the topic using the following criteria:

- Student shows no understanding of the topic (✓-).
- Student has a limited or narrow understanding of the topic (✓).
- Student displays a sound understanding of the topic (✓+).
- Student shows a broad understanding of the topic (✓++).

Before they embark on the task, the teacher-coach and students can negotiably contract what will be observed. Choices may include but are not limited to:

- Students listen to one another.
- Students have meaningful conversations.

- Students write legibly, so other students will be able to read the text.

The criteria above can help teacher-coaches authentically assess as they differentiate the curriculum for students. Those students who have a strong grasp of the content need more challenging work so that they can continue to grow in their knowledge. Students who show a limited understanding of the content are most likely ready for the lessons that are prepared for the topic. And those who show no understanding of the topic will need the content scaffolded at first so that they can gain the necessary ground to participate in the classroom discussions and activities.

Applying the Strategy



There are an endless number of topics that teacher-coaches can use with the Carousel Brainstorming strategy. For example, in mathematics, you can ask young students about number representations. As you write different numbers like 6, 10, 4, and 2 on posters around the room, have students carousel brainstorm to draw or write representations of those numbers on the posters. For the number 2, some students might draw two circles, write the word two, or draw a face with two eyes. To activate prior knowledge in science, use topics like biomes and ecosystems around the world with a different one on each poster. Students will need to write at least one thing they know about that biome or ecosystem. In language arts, open-ended questions could include questions about books or their characters and could also incorporate mini-writing assignments such as the following:

1. A catchy first sentence for a story
2. An unusual setting for a story with a sentence about what makes it unusual
3. A sentence that describes a character's face

Accountable Talk

The Accountable Talk strategy involves listening attentively to others. Students work as partners to evaluate each other's public discussion and presentation skills. This strategy can be used alongside of the Lobbyist Hearing, Stix Discussion, or any other strategy where we want students to assess each other on how well they speak.

Accountable Talk is an activity that increases the positive traits students possess to become good speakers, convincing negotiators, lobbyists, and skilled speech makers. Whereas a teaching strategy for primary grades would focus on the ability to understand and use the content proficiently, Accountable Talk is a strategy for secondary grades that involves listening attentively to others. This strategy focuses on the delivery of the content and students' behavior in a group setting. These are major concerns and top priorities of businesses, companies, and corporations hiring adults. By using Accountable Talk, teacher-coaches can help students achieve their goals.

How to Do It

To begin this strategy, partner students. Present a scenario to students that asks for their help in teaching something. This can be an advertisement (e.g., a museum needs docents to lead tours), a formal announcement (e.g., the principal announces a need for student teachers to teach a math concept to younger students), or a written invitation (e.g., guides are needed in the science lab to show a student audience how an experiment works). Have student partners prepare for the same presentation together. Then, on the day of the presentation, student A and a group from the class watch Student B present. Then Student A presents while Student B and a new group from the class watch him or her present. Students use an observation sheet with the following qualities to assess their counterpart during the activity.

Students should focus on the following as the active participant in the Accountable Talk:

- Actively speaks and participates
- Makes eye contact with others

- Refers to notes for important information
- Asks quality questions in a thoughtful manner that furthers conversation
- Responds to others

In the same manner, students should avoid the following behaviors:

- Speaks in a condescending way
- Interrupts another person
- Engages in conversation on the side
- Does not stay on topic
- Makes fun of others

The first student should present while the other student assesses. After a set amount of time (5 or 10 minutes), have students switch places and gather a new audience to participate in the presentation, and the other student now assesses his or her counterpart. Once the activity has been described in detail, you may wish to implement negotiable contracting of assessments. After the activity, allow partners to discuss how well they performed. In a positive fashion, students should comment on their strengths, and then discuss how they could improve on the areas of weakness. Consider modeling how to discuss the activity so that students use appropriate language and do not inadvertently offend anyone.

Ideas for Assessment

The peer assessment mentioned above is an integral part of this activity. It should provide the information a teacher-coach needs for each student. The teacher-coach should also be charting how well students are progressing based on the criteria for negotiable contracting of assessments. The activity sheet for an observational checklist might look like Figure 5.1.

The teacher-coach can also keep a similar chart for each student as well in order to complete an assessment of each student's performance and participation. See Figure 5.2 for a sample.

Figure 5.2 Accountable Talk: Performance Assessment

Name: _____

Accountable Talk Observation

Directions: Each time your partner does one of the following, place a check in the box.

Your partner's name _____

Positive																			
Actively speaks and participates:																			
Responds to others:																			
Refers to his or her notes or any text with pertinent information:																			
Makes eye contact with the person who is speaking or listening:																			
Asks quality questions:																			
Negative																			
Speaks in a condescending way:																			
Interrupts another person:																			
Engages in conversation on the side:																			
Does not stay on the topic:																			
Makes fun of others:																			

Figure 5.3 Sample Student Performance and Participation Chart

	Actively speaks and participates	Makes eye contact with others	Refers to notes for important information	Asks quality questions
Joseph	✓+	✓-	✓+	✓+
Samantha	✓-	✓+	✓	✓
Alice	✓+	✓-	✓	✓+
Courtney	✓-	✓+	✓-	✓+
Oscar	✓	✓+	✓+	✓
Olivia	✓+	✓	✓-	✓+
Steven	✓	✓-	✓+	✓

Key	
✓-	no understanding
✓	limited understanding
✓+	sound understanding
✓++	broad understanding

Describe in detail the two most interesting points your partner made and what made them stand out to you.

Out of the things you have added to the discussion, describe specifically the one that is most important.

Applying the Strategy



Accountable Talk can be used in any content area in the most basic way of teaching others through public speaking about the content that students are learning. For example, math students can use Accountable Talk to teach others in small groups about multiplying fractions. Accountable Talk can be used in language arts to teach others about genres or to present how-to speeches. Science teacher-coaches can use Accountable Talk to reinforce information on cells, allowing students to present to other classes or staff. Social studies classes can use Accountable Talk to present information on different cultures, famous people, or student-generated “museum pieces” to parents.

Magnetic Debate

The Magnetic Debate is a discussion strategy in which participants are given an opportunity to influence others through persuasive speeches, sincere advice, and education so an informed decision can be made on a controversial issue. Teacher-coaches make the selection of the area of study and have the students research the specific topic. Then, positions are assigned “for” or “against,” with a portion of the class as “fence-sitters” or the “undecided” element who can be swayed one way or the other. Then, the students debate the issue.

More than any other strategy, the Magnetic Debate places students in the position of working on their abilities to persuade audiences. Students must combine top-notch research with finessed speaking skills so that others will want to side with their views. This strategy gives students practice empathizing with others as they prepare these types of speeches. It forces the students preparing and practicing the speeches to think like others would think so that they can become effective communicators. It also gives the students who are making the decisions during the debate opportunities to practice critical thinking. These students must analyze the facts and nuances set before them so that they can make informed decisions.

Socratic Method: Student Assessment Chart

Topic:	Listening and Responding	Adding New Information	Analyzing Peer Comments	Good Eye Contact	Date:	Listening and Responding	Adding New Information	Analyzing Peer Comments	Good Eye Contact
Student's Name:									
1.					15.				
2.					16.				
3.					17.				
4.					18.				
5.					19.				
6.					20.				
7.					21.				
8.					22.				
9.					23.				
10.					24.				
11.					25.				
12.					26.				
13.					27.				
14.					28.				