Cooperative learning; direct instruction; discovery learning; whole-group discussion; independent study interdisciplinary instruction; concept mapping; inquiry method; questioning; play; learning centers; small-group work; reflection; and project approach

The various approaches to instruction are all used selectively to help learners use their minds while learning information. Different activities and types of instruction demand that learners use different skills and mental processes. Teachers directions and guidance during instruction allow the learners to not only gain content but also thinking, reasoning, recall, and problem solving strategies. Below each strategy will be briefly explained and at least one connection to a major cognitive process will be illustrated. Needless to say there are many ways each strategy can be implemented either independently or in conjunction with other strategies. It is the design and the implementation of these strategies that determine how particular cognitive processes are used and then become associated with student learning.

Cooperative Learning: This method of instruction allows students to work together. It is important that the teacher assure each student is accountable for work and cooperation with others. Cognitive processes such as critical thinking and negotiating ideas with others are developed. Students also should learn to appreciate others’ ways of observing the world and knowing how to do particular tasks which include the task of learning.

Direct Instruction: This method of instruction allows students to observe and listen to the teacher or when reading, the author. It is important the teacher actively involve the learners with the information being presented. Teachers must show a skill or process or directly explain a procedure or concept. Precision and visual representations of content help the learner. Cognitive processes that students are likely to develop when teachers use direct instruction include listening skills, reproduction/recall skills, and the ability to mentally represent ideas. If teachers couple direct instruction with multiple opportunities for students to use and work with the information they are learning, the students will develop cognitive skills associated with whatever task the teacher asked the students to do.

Discovery Learning: This method of instruction is used when students are asked to evaluate and consider the evidence and
examples of concepts, principles, or generalizations. Cognitive processes that are developed with this strategy are those of critical thinking, creative thinking, and higher order thinking such as evaluation and judgment skills. Discovery learning is a powerful tool and very closely linked with deep learning and personal understanding of content. It usually takes more time to implement this method but is well worth it when the concept is a very important essential aspect of the knowledge base to be learned.

**Whole-group discussion:** This method of instruction is used when teachers want students to learn from each other and to listen to their classmates understanding of key content. It is essential to establish the expectation and readiness of all learners to participate and gather information from the members participating in the discussion. Cognitive processes that are developed by learners when this strategy is used include listening skills, higher order thinking skills, social reasoning skills and deductive thinking skills. If the task is well directed by the teacher the students can also learn problem-solving skills.

**Independent Study:** This method of instruction allows a student to work at his/her own pace and study a topic in a more personal way. Most independent study is outlined by the teacher and monitored by the teacher. Students are expected to show progress toward reaching learning goals and demonstrate self-discipline. Independent study can allow learners to work at an advanced level or to catch-up if and when needed. Cognitive processes that are developed include self-discipline, problem solving skills, and critical thinking skills. A teacher can integrate almost any task/challenge into an independent study project thus allowing a student to develop a variety of potential mental abilities.

**Interdisciplinary instruction**: This method on instruction is focused on the integration of several different disciplines or content areas into one unit of instruction or an entire course. This type of teaching is particularly important for middle school students because they need and like to see how things are related and connected. In addition they have less personal experience and knowledge to make the connections on their own. The connections among disciplines are very important and as teachers help students see connections the students are given additional insights that make content more relevant and interesting.

**Concept Mapping:** This method of instruction is focused on the visual design of concepts and ideas. Students can draw their own concept and show how it relates to other ideas, teachers can then add to the student’s understanding. Teachers can begin with a diagram and tell students about how the diagram/map illustrates the idea or the concept. The teacher can ask the student to draw or fill in a map of a text that they read or a video that they watch. The map/diagram shows relationships and connections
between parts of an idea or the sequence of a process or timeline. Cognitive processes developed using concept mapping include representation of ideas, creativity, memorization and recall and possibly problem structuring.

**Inquiry method:** This method of instruction is designed around a process of guiding students to gather facts and observations about the world. They then use those facts and observations to answer questions that they have generated. Students identify a question, form hypotheses, gather data, assess the hypotheses, generalize, and then rethink/evaluate the process. This process is great when students have authentic questions and the data is in the world in which they live. It is the implementation of the scientific method in a relevant and meaningful situation. Cognitive processes being developed include creative thinking, problem solving, and problem structuring.

**Questioning:** This method of instruction allows the teacher to ask students many different types of questions. Students use their personal understanding and their language skills to answer the questions. The teacher is able to determine what the student knows and how they understand the information. Even more powerful that teachers asking questions, although the most effective teachers ask the most questions) is the ability of a teacher to get students to actively ask their own questions. Cognitive processes that are developed by learners in classrooms where they are encouraged to ask lots of questions are higher order thinking skills, critical thinking skills, and creative thinking skills.

**Play:** This method of instruction is a motivational way to allow students to be either very creative or simply have fun practicing routine memorization work. Play invites students to use their social skills and may allow a little bit of competition in the classroom. A bit of well-guided competition is welcomed by most students and can be a different way to practice ideas when working toward automaticity.

**Learning centers:** This method of instruction is used when the teacher wants individual students within a class to work on different types of tasks at the same time. Often around the room are various stations where the students work to complete the tasks that are explained at each learning center. The materials needed to complete the task are located at the center. Students usually move from one center to another as they complete the educational tasks. Cognitive processes developed at learning stations depend on the learning task but certainly include the expectation that the learner demonstrate independence and practice following instructions.

**Small-group work:** This type of instruction is used when the teacher wants a small number of students to complete an educational task. The task is often related to the application
of content that is being delivered to the students. A small
group could complete a research project as a team. Cognitive
skills are similar to cooperative learning but on a more short
term basis.

**Reflection:** This method of instruction is a technique that allows
the student to think about his or her learning and mental
activity. A learner can compare what is known now to what was
known earlier, thus realizing what they have learned. Reflection
is simply thinking back. Metacognition is needed in that a
learner must be able to pay attention to what they are thinking
about. Many different cognitive processes can be developed using
reflection. A teacher can outline the steps of various cognitive
strategies and then ask the learner if he/she used those steps.
Through reflection and personal analysis the learner can critique
his/her thinking and develop the skills as the comparison is
accomplished

**Project approach:** This method of instruction is used when
students create something. The something can be a poster, a
video, a newspaper, a welded gate, or an international meal. In
each discipline/course there are many authentic projects a
student can make that allow him/her to illustrate the application
of the knowledge and skills being learned. The project approach
is nice because it allows the student to complete a more complex
task and use a variety of skills often learned in the past.
Learners enjoy seeing the result of their learning and projects
allow this to happen. When projects are designed well the
cognitive processes include creative thinking, problem solving
and high order thinking skills.