

Common Learning Activities

Learning Strategies are general methods that guide how you will approach your teaching. Learning Activities, on the other hand, are the more specific implementations of these strategies that you design to achieve specific learning outcomes. The focus here is on formal learning. Informal learning, like coaching, mentoring, or learning in a community, has fewer structured activities.

In another WMO Trainer Resource you can read about higher-level learning strategies such as **Discussion, Inquiry, Experiential Learning, Case-based Learning, and Project-based Learning** strategies, as well as **Guided Practice and Feedback, and Lectures and Readings**. In this resource we briefly explore a variety of “tactics” that implement those strategies, or “learning activities.”

The number of possible learning activities could be nearly endless, depending out how specific the activities are classified. In this resource, we take a middle-ground and list only 15 common learning activities that can also have many variations. You may think of many others we missed, but this resource should bring to mind the many options you have for creating an engaging learning experience.

They are divided into two main types, **Active Learning Approaches** and **Information Transfer**, and the Active Learning Approaches are addressed in more detail. This does not mean that there are not many, many forms of Information Transfer available to use (see the Lectures and Readings section of the Learning Strategies resource). We are stressing active approaches because traditionally these are underutilized, and yet these are the activities most necessary to achieve higher-level learning outcomes. Using Bloom’s Taxonomy, Information Transfer might be adequate to achieve outcomes related to Remembering and Understanding, but those outcomes related to Application, Analysis, Synthesis and Evaluation require active practice in addition to information.

Active learning approaches are those that ask learners to engage in complex cognitive tasks like analytical thinking, decision-making, creative thinking, problem solving, or evaluation, or to complete practical tasks that require some combination of these. In the end, this is the learning that we want most learners to achieve. So, one very good way of blending learning is to ensure you use many active learning approaches, or even use them exclusively. The information required can be learned in the process of the engaging in the activities.

Common Learning Activities

Active Learning Approaches

More than lecture

1. **Problems, Questions, Cases and Issues** Instruction is presented around a situation, perhaps by telling a story or describing a case, rather than by providing only information. Discussion is encouraged in which students explore the situation and propose explanations or solutions, using what they’ve learned to support their positions, while the teacher provides information and ideas to expand and clarify. Instruction is limited to short, but critical

information. A conclusion can summarize the ideas proposed, as well as make the key points that would have been made in a lecture on the same topic.

2. **Demonstration** Rather than built around telling, a demonstration allows learners to see the procedures, concepts and principles in action. A demonstration can show how to use real technologies, show scientific principles through real or simulated processes, or reveal human behaviors with students or others as subjects in staged activities. When possible, demonstration is followed by practice. Field trips are also a form of demonstration, showing sites where work is conducted.
3. **Socratic Lesson** For this specialized, teacher-led activity, a series of questions guides learning within a topic, probing students' understanding and questioning assumptions, not just testing memory. (If this activity type is unfamiliar, recall films where you may have seen how teaching is done in a Law School classroom.) Questions should be designed to demonstrate critical thinking in the topic domain. Some questions can be prepared in advance, but questions should also be allowed to arise spontaneously in response to the responses. The direction of the conversation should explore increasing levels of complexity of an issue or topic or help to uncover fundamental principles and definitions. For example, instead of just describing the components of a numerical weather prediction system, allow learners to discover them by asking them questions that lead them to realize that quality-controlled observations, data assimilation methods, physical parameterizations, forecast models, post-processing for product generation, and verification methods are all required components. "How can we use data from so many varied sources and times of day to be compatible to define initial conditions? How would a modeler deal with the data at the edges of a limited model domain? What do you need to help a model decide if precipitation will occur? How can you keep a model from going further and further astray due to errors in previous forecasts? Etc."

Discussion Options

4. **Structured discussions** Discussion is used to meet specific learning outcomes, based on discussion guidelines and expected outcomes. Rules might restrict the boundaries of the topic, tell when and how to make contributions to the discussion, ask students to represent sides to an argument, require responses to a set of questions, or work toward a planned conclusion. A debate is a structured discussion with a highly specified set of rules.
5. **Open discussions** Students are provided a direction, but empowered to freely explore a topic together. Students are encouraged to answer each other's questions and even guide the direction of discussion. The teacher offers input only when no student can answer a question, or when it can expand or steer the discussion in a more productive direction. On the whole, when the teacher does contribute, it is more often to ask probing questions than provide information and answers.
6. **Small group discussions** Students are divided into small discussion groups to encourage more individuals to contribute, bringing out a greater diversity of opinions. Small groups can discuss the same topic and then compare and discuss their outcomes, or discuss different topics and then teach what they discussed to the large group.
7. **Collaborative Decision Making** Students work together in loosely structured ways to explore complex problems or issues. They collaborate in analyzing information, drawing conclusions, generating solutions and making decisions. Room is offered for creative approaches and evolving team dynamics, which also develops teamwork skills.

Focus on Practice

8. **Practice exercises** Sets of numerous practice exercises, such as lab exercises, require the application of the procedures or cognitive skills being learned. The exercises should require practice under varying situations or conditions, and might increase in difficulty or complexity. They can include, for laboratory exercises, math problems, and other short practice exercises with objective answers.
9. **Tutorials** The teacher provides a sequence of instructions, readings or presentations with frequent, interspersed testing and opportunities to practice what is taught. Tutorials may include individual branching based on assessment, redirecting those that need reinforcement to additional lessons, and allowing those that succeed to advance more quickly. In this way, it is personalized learning.
10. **Case studies** Instructional case studies require students to make decisions similar to those that would be made in real-world situations. Cases should be realistic, but might be simplified to focus on specific aspects of a case or specific learning goals. Students practice using data, interpretation, analysis, decision-making, and/or communication skills.
11. **Simulations** Instructional simulations call for authentic decision-making in realistic conditions, including representative data, tools, and time limits, and in the responses learners receive in to their decisions.
12. **Role play** Role-play is a form of simulation in which a group of learners improvise in a scenario, taking on the roles of people in the situation with differing needs, goals, and responsibilities in order to have first-hand experience in responding in such situations. If some students are in the role of observers, they should also be given guidelines on what to watch for. The teacher sets up the scenario, establishes the roles, and helps students to debrief and reflect on the experience.
13. **Games** Instructional games use game-tactics to heighten the learning experience through time limits, competition, and engaging and creative tasks like solving puzzles. In games, students have tasks to complete, they play by rules, and they work with the limited set of resources and tools provided. These constraints make a game fun and more comfortable than everyday life—by setting a beginning and end and by providing a level of fairness and equality through chance, while also rewarding skill. In these ways, games can be like simulations, which are often called “serious games.”

Bigger Tasks

14. **Problem-based learning** Instead of merely using a problem to initiate learning, the teacher designs large-scale problems that provide the overarching context for learning. Problem-based learning problems might require days or weeks of planning, researching, and developing a solution. The teacher provides resources and strategies, but let’s learners create their own solutions, justify them, and reflect on the process.
15. **Projects** Learners engage in realistic or real tasks and challenges. Projects might include research, report writing, data gathering, trying a new technique, developing a model or tool, or creating a local application.

Information Transfer

The most common learning activities are those based on the traditional assumption that learning occurs best in a process of transmitting information. Learning certainly does occur through activities such as **lectures**, **readings**, and watching or listening to **digital media**. How effective that learning occurs is a matter of whether the intended learning outcomes are met. Higher-level learning outcomes that are application-oriented are rarely fully met through information transfer alone. However, information transfer plays an important role in higher-level learning outcomes if active learning approaches like those above are blended within and around them.

Even when only Remember- and Understanding-level outcomes are intended, Information transfer activities can improve learning by asking students to test their knowledge and reflect simply by including questions and stories that connect otherwise abstract concepts and principles to real situations. Information transfer interspersed with periodic discussion is one basic way to ensure learning outcomes are met.

Reflection Exercise:

Choose a topic that you currently teach by information transfer only. Consider how to apply at least 3-5 of the active learning approaches in the first list above to create a blended approach. Answer in the Moodle forum for this unit if you wish to share.