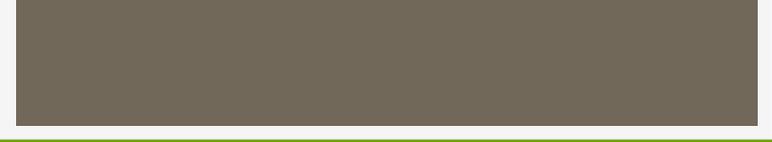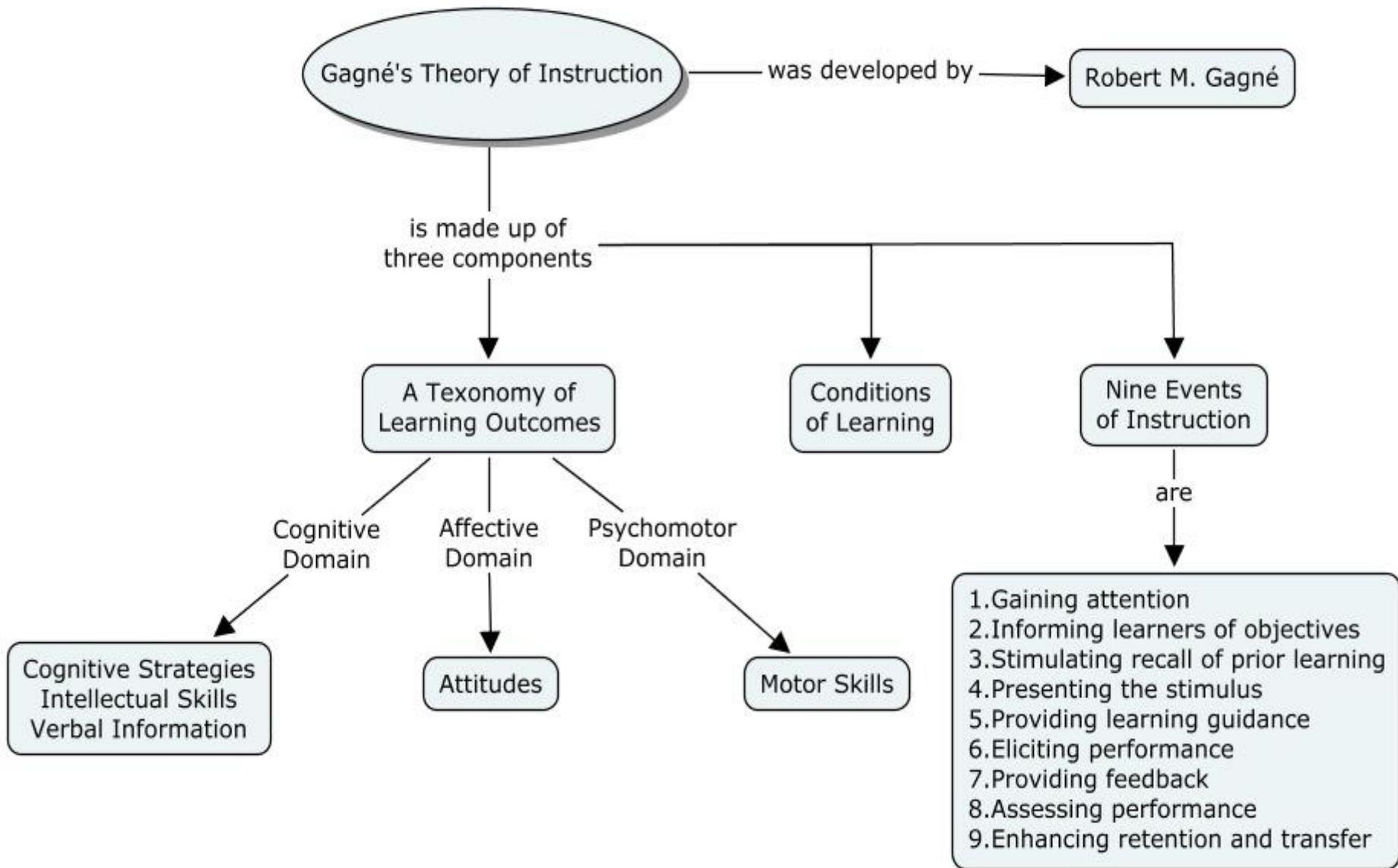# Gagne
Learning Theory

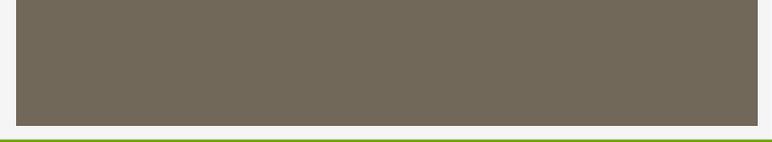- **Robert Mills Gagné (August 21, 1916 – April 28, 2002) was an American educational psychologist best known for his "Conditions of Learning". Gagné pioneered the science of instruction during World War II when he worked with the Army Air Corps training pilots. He went on to develop a series of studies and works that simplified and explained what he and others believed to be 'good instruction.'**

In 1965 Robert Gagne published his book entitled *The Conditions of Learning*. In his book, Gagne (1965) described the analysis of learning objectives, and how these different classes of learning objectives relate to the appropriate instructional designs.

Gagné's Theory of Instruction — was developed by → Robert M. Gagné

is made up of three components

A Texonomy of Learning Outcomes

Conditions of Learning

Nine Events of Instruction

Cognitive Domain

Affective Domain

Psychomotor Domain

Cognitive Strategies
Intellectual Skills
Verbal Information

Attitudes

Motor Skills

are

1. Gaining attention
2. Informing learners of objectives
3. Stimulating recall of prior learning
4. Presenting the stimulus
5. Providing learning guidance
6. Eliciting performance
7. Providing feedback
8. Assessing performance
9. Enhancing retention and transfer

HIERARCHY OF LEARNING

GAGNE'S HIERARCHY OF LEARNING

PROBLEM SOLVING
RULE LEARNING
CONCEPT LEARNING
DISCRIMINATION LEARNING
VERBAL ASSOCIATION
CHAINING
STIMULUS RESPONSE
SIGNAL LEARNING

Sprawls

Signal Learning

- This is the simplest form of learning, and consists essentially of the classical conditioning first described by the behavioural psychologist Pavlov. In this, the subject is 'conditioned' to emit a desired response as a result of a stimulus that would not normally produce that response. This is done by first exposing the subject to the chosen stimulus (known as the conditioned stimulus) along with another stimulus (known as the unconditioned stimulus) which produces the desired response naturally; after a certain number of repetitions of the double stimulus, it is found that the subject emits the desired response when exposed to the conditioned stimulus on its own. The applications of classical conditioning in facilitating human learning are, however, very limited.

Stimulus-response learning

- **This somewhat more sophisticated form of learning, which is also known as operant conditioning, was originally developed by Skinner. It involves developing desired stimulus-response bonds in the subject through a carefully-planned reinforcement schedule based on the use of 'rewards' and 'punishments'. Operant conditioning differs from classical conditioning in that the reinforcing agent (the 'reward' or 'punishment') is presented after the response. It is this type of conditioning that forms the basis of programmed learning in all its various manifestations.**

Chaining

- **This is a more advanced form of learning in which the subject develops the ability to connect two or more previously-learned stimulus-response bonds into a linked sequence. It is the process whereby most complex psychomotor skills (eg riding a bicycle or playing the piano) are learned.**

Verbal association

- **This is a form of chaining in which the links between the items being connected are verbal in nature. Verbal association is one of the key processes in the development of language skills.**

Discrimination learning

- **This involves developing the ability to make appropriate (different) responses to a series of similar stimuli that differ in a systematic way. The process is made more complex (and hence more difficult) by the phenomenon of interference, whereby one piece of learning inhibits another. Interference is thought to be one of the main causes of forgetting.**

Concept learning

- This involves developing the ability to make a consistent response to different stimuli that form a common class or category of some sort. It forms the basis of the ability to generalize, classify etc.

Rule learning

- **This is a very-high-level cognitive process that involves being able to learn relationships between concepts and apply these relationships in different situations, including situations not previously encountered. It forms the basis of the learning of general rules, procedures, etc.**

Problem solving

- **This is the highest level of cognitive process according to Gagné. It involves developing the ability to invent a complex rule, algorithm or procedure for the purpose of solving one particular problem, and then using the method to solve other problems of a similar nature.**
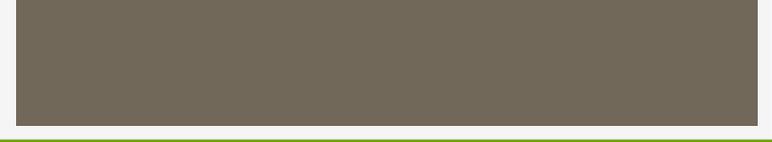
Gagne's Nine Events of Instruction

Gain attention of the students

- Ensure the learners are ready to learn and participate in activities by presenting a stimulus to gain their attention.

Methods for gaining learners' attention include:

- Stimulate students with novelty, uncertainty and surprise
- Pose thought-provoking questions to the students
- Have students pose questions to be answered by other students

Inform students of the objectives

- **Inform students of the objectives or outcomes to help them understand what they are to learn during the course. Provide objectives before instruction begins.**

Stimulate recall of prior learning

- Help students make sense of new information by relating it to something they already know or something they have already experienced.

Methods for stimulating recall include:

- Ask questions about previous experiences
- Ask students about their understanding of previous concepts

Present the content

Use strategies to present and cue lesson content to provide more effective, efficient instruction. Organize and chunk content in a meaningful way. Provide explanations after demonstrations.

Ways to present and cue lesson content include:

- Provide examples
- Present multiple versions of the same content, e.g., video, demonstration, lecture, group work
- Provide instructional support as needed – as scaffolds (cues, hints, prompts) which can be removed after the student learns the task or content.
- Ask deep-learning questions, making reference to what students already know.
- Help students integrate new knowledge by providing real-world examples.

Provide learning guidance

Advise students of strategies to aid them in learning content and of resources available.

Methods to provide learning guidance include:

- **Provide instructional support as needed** – as scaffolds (cues, hints, prompts) which can be removed after the student learns the task or content
- **Model varied learning strategies** –concept mapping, role playing, visualizing
- **Use examples and non-examples** – in addition to providing examples, use non-examples to help students see what not to do or the opposite of examples
- **Provide case studies, analogies, visual images and metaphors** – case studies for real world application, analogies for knowledge construction, visual images to make visual associations, metaphors to support learning

Elicit performance (practice)

Activate student processing to help them internalize new skills and knowledge and to confirm correct understanding of these concepts.

Ways to activate learner processing include:

- **Elicit student activities** – ask deep-learning questions, make reference to what students already know or have students collaborate with their peers
- **Elicit recall strategies** – ask students to recite, revisit, or reiterate information they have learned
- **Facilitate student elaborations** – ask students to elaborate or explain details and provide more complexity to their responses
- **Help students integrate new knowledge** – provide content in a context-rich way (use real-world examples)

Provide feedback

Provide immediate feedback of students' performance to assess and facilitate learning.

Types of feedback include:

- **Confirmatory feedback –** Informs the student they did what he or she were supposed to do
- **Corrective and remedial feedback –** informs the student the accuracy of their performance or response
- **Informative feedback –** Provides information (new, different, additions, suggestions) to a student and confirms that you have been actively listening – this information allows sharing between two people
- **Analytical feedback –** Provides the student with suggestions, recommendations, and information for them to correct their performance

Assess performance

In order to evaluate the effectiveness of the instructional events, you must test to see if the expected learning outcomes have been achieved. Performance should be based on previously stated objectives.

Methods for testing learning include:

- Pretest for mastery of prerequisites
- Conduct a post-test to check for mastery of content or skills
- Embed questions throughout instruction through oral questioning and/or quizzes
- Include objective or criterion-referenced performances which measure how well a student has learned a topic
- Identify normative-referenced performances which compares one student to another student

Enhance retention and transfer to the job

To help learners develop expertise, they must internalize new knowledge.

Methods for helping learners internalize new knowledge include:

- Generating examples
- Create concept maps or outlines

Intellectual Skills	Discriminations, concepts, principles problem solving
Cognitive Strategy	Strategies for thinking and problem solving (meta-cognition)
Verbal Information	Facts and bodies of knowledge
Attitude	Choice of actions toward person, place, thing
Motor Skills	Skilled Physical behaviour

Verbal information

Reciting something from memory
- state, recite, tell, declare

Intellectual skills

- **Discrimination:** Recognizing that two classes of things differ
- **Concrete concept:** Classifying things by their physical features alone
- **Defined concept:** Classifying things by their abstract (and possibly physical) features
- **Rule:** Applying a simple procedure to solve a problem or accomplish a task
- **Higher-order rule:** Applying a complex procedure (or multiple simple procedures) to solve a problem or accomplish a task

Cognitive strategies

Cognitive strategies are one type of learning strategy that learners use in order to learn more successfully. These include repetition, organising new language, summarising meaning, guessing meaning from context, using imagery for memorisation. All of these strategies involve deliberate manipulation of language to improve learning.

Motor skills

- A motor skill is an intentional movement involving a motor or muscular component, that must be learned and voluntarily produced to proficiently perform goal-oriented task, according to Knapp, Newell, and Sparrow. Performing a physical task to some specified standard

Attitudes

- Choosing to behave in a way that reflects a newly-acquired value or belief