

New Taxonomy of Educational Objectives

Marzano & Kendall, 2007

Prepared by:
Amber Garrison Duncan, 2012

- Provides a model (predictive) of cognitive processing instead of a framework (loosely organized principles that describe characteristics).
- All mental processes can be learned, even the most complex or difficult.
- Mental processes cannot be ordered hierarchically in terms of difficulty.
- Rather they can be ordered hierarchically in the order of which they are controlled.
- The difficulty of a process is a function of 2 things:
 - The steps involved in mentally processing the flow of information (these do not change).
 - The individuals level of familiarity with the process and the level of consciousness needed to perform the process (this can change).
- Thinking skills should be taught throughout the curriculum, not just after students mastered the subject knowledge.
- Major difference from Bloom's is clarity of action from the object of action. Knowledge is the object of action by mental processes.

Characteristics of the New Taxonomy

- All tasks start in the self system.
- Network of interrelated goals and beliefs used to make judgments about engaging in new tasks.
- Personal beliefs and values determine if the individual deems the task important.
- Includes motivation, emotional response, and efficacy.

Self System

- In charge of conscious operations relative to knowledge including goal setting, process monitoring, and monitoring for clarity and accuracy.
- Four Functions
 - Specifying Goals- sets goals and strategies to accomplish goals
 - Process Monitoring- effectiveness of a procedure being used in a task
 - Monitoring Clarity- individual must decide to approach task with clarity
 - Monitoring Accuracy- individual must decide to approach task with accuracy

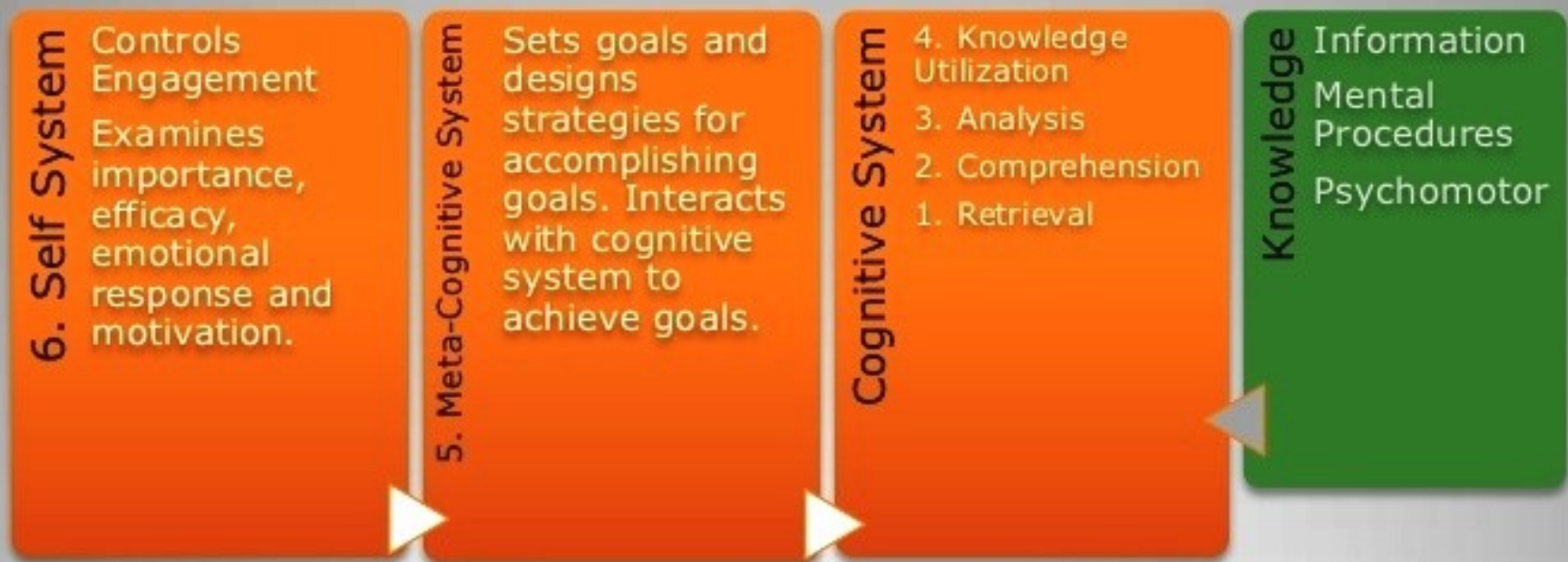
Metacognitive System

- Responsible for the processing of the information needed to complete the task.
- Responsible for analytic operations such as making inferences, comparing, and classifying.
- Four Processes
 - Retrieval
 - Comprehension
 - Analysis
 - Knowledge Utilization

Cognitive System

- The object of action for the three systems.
- Plays a key role in ability to successfully engage in a new task.
- Three Categories
 - Information or declarative knowledge (vocabulary, terms, facts, principles, concepts)
 - Mental Procedures or procedural knowledge (the "how-to" procedures)
 - Psychomotor Procedures (physical action)

Knowledge



Steps of Mental Processing

Also demonstrates highest demand of consciousness to lowest

Systems of Thinking

- Innate process, generally done without conscious awareness.
- Is a matter of the type of knowledge
 - Information
 - Recognition- matching of stimulus with information in permanent memory
 - Recall-transfer of details from permanent memory into working memory to be consciously processed
 - Procedural knowledge
 - Can be recognized and recalled as it has information embedded.
 - Procedural knowledge is executed in this process.

Cognitive System: Retrieval

- Responsible for translating knowledge into a form for storage in permanent memory.
- Information is processed into two mode: linguistic or imagery.
- Translation occurs by integrating and symbolizing
 - Integrating- Mixing of new knowledge with old knowledge in permanent memory and distilling it down to key characteristics in a general form.
 - Symbolizing- the process of creating symbolic (nonlinguistic) analog of the knowledge.

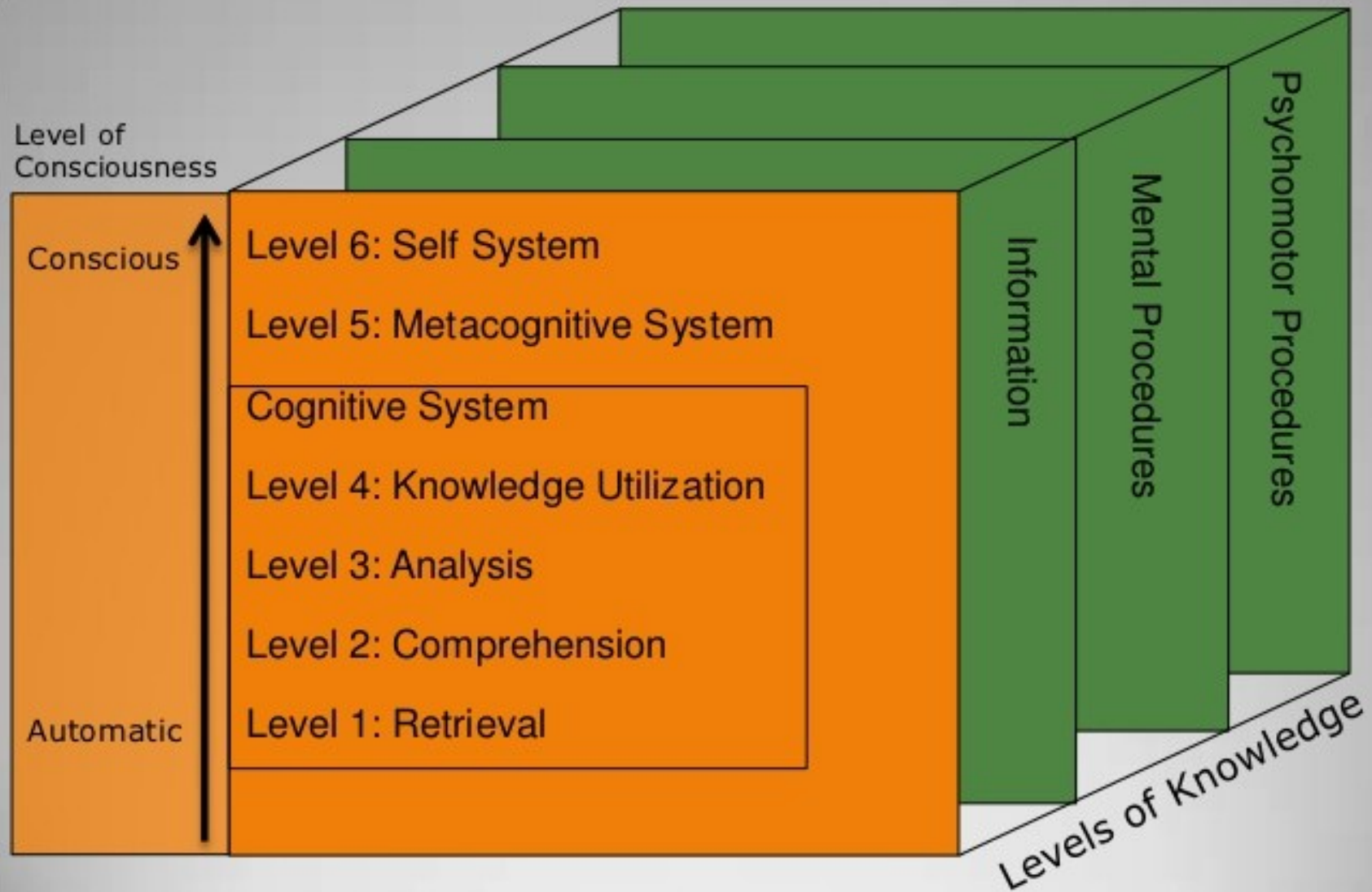
Cognitive System: Comprehension

- The reasoned extension of new knowledge not already possessed by the individual.
- Requires conscious and rigorous application, forcing the learner to cycle through knowledge multiple times, changing and refining it along the way.
- There are five processes:
 - Matching- identify similarities/differences
 - Classifying- organizing into meaningful categories
 - Analyzing errors- logic, reasonableness and accuracy of knowledge
 - Generalizing- construct new generalizations from information already known or observed
 - Specifying- generating new applications of a known generalization or principle

Cognitive System: Analysis

- Processes employed to accomplish a specific task.
- Four categories
 - Decision making- must select between 2 or more alternatives
 - Problem Solving- identify obstacles to a goal, select and evaluate alternatives
 - Experimenting- generating and testing hypothesis for purpose of understanding
 - Investigating- identifying what is known, identifying areas of confusion/controversy, provide an answer and logically constructed argument

Cognitive System: Knowledge Utilization



Two-Dimensional Model

Taxonomies of Educational Objectives:

Bloom (1956)	Anderson & Krathwohl (2001)	Marzano & Kendall (2006)	PISA (2000)
Evaluation	Create	Self-System Thinking	Communicate
Synthesis	Evaluate	Metacognition	Construct
Analysis	Analyze	Knowledge Utilization	Evaluate
Application	Apply	Analysis	Integrate
Comprehension	Understand	Comprehension	Manage
Knowledge	Remember	Retrieval	Access