DOMAINS AND TAXONOMIES[1]

A **domain** is a distinct sphere of knowledge or intellectual activity.
- In biology, for example, domain is the highest rank of organisms (single-celled, bacteria, and multi-celled plants and animals).

There are three domains in learning theory:
1. *Cognitive* – involves knowledge and the development of intellectual skills. This includes the recall or recognition of specific facts, procedural patterns, and concepts that serve in the development of intellectual abilities and skills.
2. *Affective* – involves the manner in which people deal with things emotionally, such as feelings, values, appreciations, and attitudes.
3. *Psychomotor/Behavioral* – involves physic al movement, coordination, and the use of motor skills. Development of these skills requires practice and is measured in terms of speed, precision, distance, and techniques in execution.
4. Other domains focus on ethical or moral development.

A **taxonomy** is a classification system that establishes a hierarchy of the parts of a whole and a system for organizing them.
- Greek ("arrangement" and "method").
- A relationship exists between the parts.
- Generally, but not always, a lower class is a prerequisite to a higher order.

INCORPORATING LEARNING DOMAINS INTO CURRICULUM

Before writing learning outcomes, ask yourself the following questions:
- *Cognitive domain:* "What do you want your graduates to *know*?"
- *Affective domain:* "What do you want your students to *care* about?" or "What do you want students to *value*?"
- *Psychomotor (or Behavioral) domain:* "What do you want your graduates to be able to *do*?"

When this is clarified, learning outcomes, objectives, or targets can be constructed using the tables associated with each domain in the rest of this document.

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[1] Elements from or adapted from: Hauenstein, A.D. (1998). *A Conceptual Framework for Educational Objectives: A Holistic Approach to Traditional Taxonomies*. New York: University Press of America.; University of Guelph (Canada), Open Learning and Educational Support: https://www.uoguelph.ca/tss/pdfs/Domains%20of%20Learning.pdf

Cognitive Domain

The cognitive domain includes the development of intellectual skills and content knowledge. From an early age humans develop an ability to recall and recognize facts and concepts, and we should get better at it as we move through the formal education system. Bloom's Taxonomy in the cognitive domain presents 6 major categories.

These levels are important to distinguish as we consider the courses in the curriculum. The first course in biology will require fewer complex skills than the most advanced course in the department.

1. **Knowledge** of terminology; learning specific facts and being able to remember or recall them.
2. **Comprehension**: Grasping **(understanding)** the meaning of informational materials.
3. **Application**: The use of previously learned information in new and concrete situations to solve problems that have single or best answers.
4. **Analysis**: The breaking down of informational materials into their component parts, examining (and trying to understand the organizational structure of) such information to develop divergent conclusions by identifying motives or causes, making inferences, and/or finding evidence to support generalizations.
5. **Synthesis**: **Creatively** or divergently applying prior knowledge and skills to produce a new or original whole.
6. **Evaluation**: **Judging the value** of material based on personal values/opinions, and evidence.

As an example, in that first course in biology the students might be expected "to list common laboratory safety guidelines." This is a low level skill that requires simple memorization. But by the end of the program of study, through multiple courses and laboratory activities at a community college, a student would likely be expected to "demonstrate and apply an appropriate knowledge of the terms, concepts, and theories relative to the biological sciences." Not only would a student need to **know** what the terms and concepts are, he or she would need to be able to **analyze** the similarities and differences between them, and **synthesize** them appropriately to be able to apply them in a new way. *The last sheet in this handout connects action words with learning domains.*

Bloom's Cognitive Taxonomy

Category or 'level'	Behavior descriptions	Examples of activity to be trained, or demonstration and evidence to be measured	'Key words' (verbs which describe the activity to be trained or measured at each level)
1. Remembering	Recall or recognize information	Multiple-choice test, recount facts or statistics, recall a process, rules, definitions; quote law or procedure	Arrange, define, describe, label, list, memorize, recognize, relate, reproduce, select, state
2. Understanding	Understand meaning, re-state data in one's own words, interpret, extrapolate, translate	Explain or interpret meaning from a given scenario or statement, suggest treatment, reaction or solution to given problem, create examples or metaphors	Explain, reiterate, reword, critique, classify, summarize, illustrate, translate, review, report, discuss, re-write, estimate, interpret, theorize, paraphrase, reference, example
3. Applying	Use or apply knowledge, put theory into practice, use knowledge in response to real circumstances	Put a theory into practical effect, demonstrate, solve a problem, manage an activity	Use, apply, discover, manage, execute, solve, produce, implement, construct, change, prepare, conduct, perform, react, respond, role-play
4. Analyzing	Interpret elements, organizational principles, structure, construction, internal relationships; quality, reliability of individual components	Identify constituent parts and functions of a process or concept, or de-construct a methodology or process, making qualitative assessment of elements, relationships, values and effects; measure requirements or needs	Analyze, break down, catalogue, compare, quantify, measure, test, examine, experiment, relate, graph, diagram, plot, extrapolate, value, divide
5. Evaluating	Assess effectiveness of whole concepts, in relation to values, outputs, efficacy, viability; critical thinking, strategic comparison and review; judgment relating to external criteria	Review strategic options or plans in terms of efficacy, return on investment or cost-effectiveness, practicability; assess sustainability; perform a SWOT analysis in relation to alternatives; produce a financial justification for a proposition or venture, calculate the effects of a plan or strategy; perform a detailed risk analysis with recommendations and justifications	Review, justify, assess, present a case for, defend, report on, investigate, direct, appraise, argue, project-manage
6. Creating	Develop new unique structures, systems, models, approaches, ideas; creative thinking, operations	Develop plans or procedures, design solutions, integrate methods, resources, ideas, parts; create teams or new approaches, write protocols & contingencies	Develop, plan, build, create, design, organize, revise, formulate, propose, establish, assemble, integrate, re-arrange, modify

Affective Domain (dispositions; attitudinal)

The affective domain represents attitudes and dispositions (Krathwohl et al., 1964). "The taxonomy is ordered according to the principle of internalization. Internalization refers to the process whereby a person's affect toward an object passes from a general awareness level to a point where the affect is 'internalized' and consistently guides or controls the person's behavior" (Seels & Glasgow, 1990, p. 28).

There are five levels within Krathwohl's affective taxonomy:

1. **Receiving** - is being aware of or sensitive to the existence of certain ideas, material, or phenomena and being willing to tolerate them. Examples include: to differentiate, to accept, to listen (for), to respond to.
2. **Responding** - is committed in some small measure to the ideas, materials, or phenomena involved by actively responding to them. Examples are: to comply with, to follow, to commend, to volunteer, to spend leisure time in, to acclaim.
3. **Valuing** - is willing to be perceived by others as valuing certain ideas, materials, or phenomena. Examples include: to increase measured proficiency in, to relinquish, to subsidize, to support, to debate.
4. **Organizing & Conceptualizing** - is to relate the value to those already held and bring it into a harmonious and internally consistent philosophy. Examples are: to discuss, to theorize, to formulate, to balance, to examine.
5. **Characterization by value or value set** - is to act consistently in accordance with the values he or she has internalized. Examples include: to revise, to require, to be rated high in the value, to avoid, to resist, to manage, to resolve.

Consider the desire of faculty and staff at most institutions to help students mature in their view of the world around them, and to "value" and "respect" the diversity of people different than themselves. Student affairs professionals often work in the affective domain, as well as faculty who teach in areas related to multiculturalism and human development. Much of the literature in student development theory reflects the dispositional nature in humans.

Bloom, Krathwhol, & Masia's Affective Taxonomy

Category or 'level'	Behavior descriptions	Examples of experience, or demonstration and evidence to be measured	'Key words' (verbs which describe the activity to be trained or measured at each level)
1. Receiving	Open to experience, willing to hear	Listen to teacher or trainer, take interest in session or learning experience, take notes, turn up, make time for learning experience, participate passively	Ask, listen, focus, attend, take part, discuss, acknowledge, hear, be open to, retain, follow, concentrate, read, do, feel
2. Responding	React and participate actively	Participate actively in group discussion, active participation in activity, interest in outcomes, enthusiasm for action, question and probe ideas, suggest interpretation	React, respond, seek clarification, interpret, clarify, provide other references and examples, contribute, question, present, cite, become animated or excited, help team, write, perform
3. Valuing	Attach values and express personal opinions	Decide worth and relevance of ideas, experiences; accept or commit to particular stance or action	Argue, challenge, debate, refute, confront, justify, persuade, criticize,
4. Organizing or Conceptualizing Values	Reconcile internal conflicts; develop value system	Qualify and quantify personal views, state personal position and reasons, state beliefs	Build, develop, formulate, defend, modify, relate, prioritize, reconcile, contrast, arrange, compare
5. Internalizing Values	Adopt belief system and philosophy	Self-reliant; behave consistently with personal value set	Act, display, influence, solve, practice,

Psychomotor Domain (Behavioral)

In this domain the student will produce something or demonstrate a skill. The levels include *observation, imitation, practice, and habit.* The observation and imitation phases are just as they sound . . . an instructor or expert demonstrates the skill (such as the section of a new piece of music on the piano), and the student repeats it. The practice stage has the student gaining proficiency by continuing the skill on her own – musicians spend a lot of time in the practice room! The habit level is achieved when the student can perform the skill to the satisfaction of an evaluator, in this case the music teacher, or in a performance setting. Feedback is important here, as adjustments can be made in order to continually raise the level of ability. See the tables at the end of this document for more details on the categories.

There are many skills to be learned throughout education—in the lab, the classroom, the workplace—outcomes in this domain should reflect the demonstration and proficiency-building nature of applicable content.

There seven six levels within this domain:

1. **Perception** - The ability to use sensory cues to guide motor activity. This ranges from sensory stimulation, through cue selection, to translation.
2. **Set** - Readiness to act. It includes mental, physical, and emotional sets. These three sets are dispositions that predetermine a person's response to different situations (sometimes called mindsets).
3. **Guided Response** - The early stages in learning a complex skill that includes imitation and trial and error. Adequacy of performance is achieved by practicing.
4. **Mechanism** - This is the intermediate stage in learning a complex skill. Learned responses have become habitual and the movements can be performed with some confidence and proficiency.
5. **Complex or Overt Response** - The skillful performance of motor acts that involve complex movement patterns. Proficiency is indicated by a quick, accurate, and highly coordinated performance, requiring a minimum of energy. This category includes performing without hesitation, and automatic performance. For example, players often utter sounds of satisfaction or expletives as soon as they hit a tennis ball or throw a football, because they can tell by the feel of the act what the result will produce.
6. **Adaptation** - Skills are well developed and the individual can modify movement patterns to fit special requirements.
7. **Origination -** Creating new movement patterns to fit a particular situation or specific problem. Learning outcomes.

Dave's Psychomotor Taxonomy (Behavioral)

Category or 'level'	Behavior descriptions	Examples of activity or demonstration and evidence to be measured	'Key words' (verbs which describe the activity to be trained or measured at each level)
1. Imitation	Copy action of another; observe and replicate	Watch teacher or trainer and repeat action, process or activity	Copy, follow, replicate, repeat, adhere, attempt, reproduce, organize, sketch, duplicate
2. Manipulation	Reproduce activity from instruction or memory	Carry out task from written or verbal instruction	Re-create, build, perform, execute, implement, acquire, conduct, operate
3. Precision	Execute skill reliably, independent of help, activity is quick, smooth, and accurate	Perform a task or activity with expertise and to high quality without assistance or instruction; able to demonstrate an activity to other learners	Demonstrate, complete, show, perfect, calibrate, control, achieve, accomplish, master, refine
4. Articulation	Adapt and integrate expertise to satisfy a new context or task	Relate and combine associated activities to develop methods to meet varying, novel requirements	Solve, adapt, combine, coordinate, revise, integrate, adapt, develop, formulate, modify, master
5. Naturalization	Instinctive, effortless, unconscious mastery of activity and related skills at strategic level	Define aim, approach and strategy for use of activities to meet strategic need	Construct, compose, create, design, specify, manage, invent, project-manage, originate