

ANNEX B

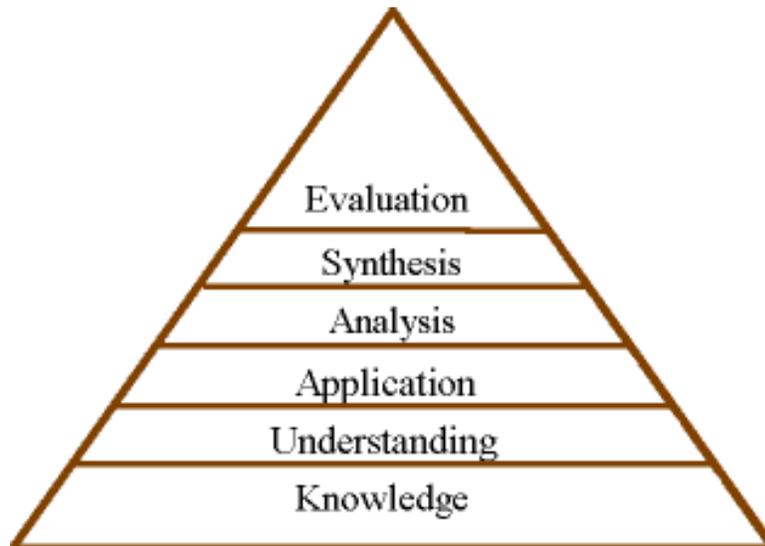
BLOOM'S TAXONOMY

*"Think left and think right and think low and think high. Oh, the thinks
you can think up if only you try!"*

(Theodor Seuss Geisel)

In 1956, Benjamin Bloom headed a group of educational psychologists who developed a classification of levels of intellectual behavior important in learning. Bloom found that over 95% of the test questions students encounter require them to think only at the lowest possible level...the recall of information.

Bloom identified six levels within the cognitive domain, from the simple recall or recognition of facts, as the lowest level, through increasingly more complex and abstract mental levels, to the highest order which is classified as evaluation. Verb examples that represent intellectual activity on each level are listed below.



Bloom's Taxonomy

Evaluation

Present and defend opinions by making judgments about information, validity of ideas or quality of work based on a set of criteria

- Judgments in terms of internal evidence
- Judgments in terms of external criteria

- making value decisions about issues;
- resolving controversies or differences of opinion;
- development of opinions, judgments or decisions
 - Do you agree...?
 - What do you think about...?
 - What is the most important...?
 - Place the following in order of priority...
 - How would you decide about...?
 - What criteria would you use to assess...?

Action Verbs: assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize, appraise, argue, attach, defend, choose, predict, rate, core, value, evaluate, defend estimate.

Synthesis

Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions

- Production of a unique communication
 - Production of a plan, or proposed set of operations
 - Derivation of a set of abstract relations
- creating a unique, original product that may be in verbal form or may be a physical object;
 - combination of ideas to form a new whole
 - What would you predict/infer from...?
 - What ideas can you add to...?
 - How would you create/design a new...?
 - What might happen if you combined...?
 - What solutions would you suggest for...?

Action Verbs: combine, integrate, modify, rearrange, substitute, plan, create, design, invent, compose, formulate, prepare, generalize, rewrite, arrange, assemble, collect, construct, develop, manage, organize, propose, set up, and write.

Analysis

Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations

- Analysis of elements
- Analysis of relationships

- Analysis of organizational principles
- subdividing something to show how it is put together;
- finding the underlying structure of a communication;
- identifying motives;
- separation of a whole into component parts
 - What are the parts or features of...?
 - Classify...according to...
 - Outline/diagram...
 - How does...compare/contrast with...?
 - What evidence can you list for...?

Action Verbs: analyze, separate, order, explain, connect, classify, arrange, divide, compare, select, infer, appraise, calculate, categorize, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, and test.

Application

Using new knowledge. Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way

- **problem solving;**
- **applying information to produce some result;**
- **use of facts, rules and principles**
 - **How is...an example of...?**
 - **How is...related to...?**
 - **Why is...significant?**

Action Verbs: apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover, choose, dramatize, employ, interpret, operate, practice, schedule, sketch, solve, use, write.

Understanding/Comprehension

Demonstrative understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas

- Translation
- Interpretation
- Extrapolation
- interpreting;
- translating from one medium to another;
- describing in one's own words;
- organization and selection of facts and ideas
 - Retell...

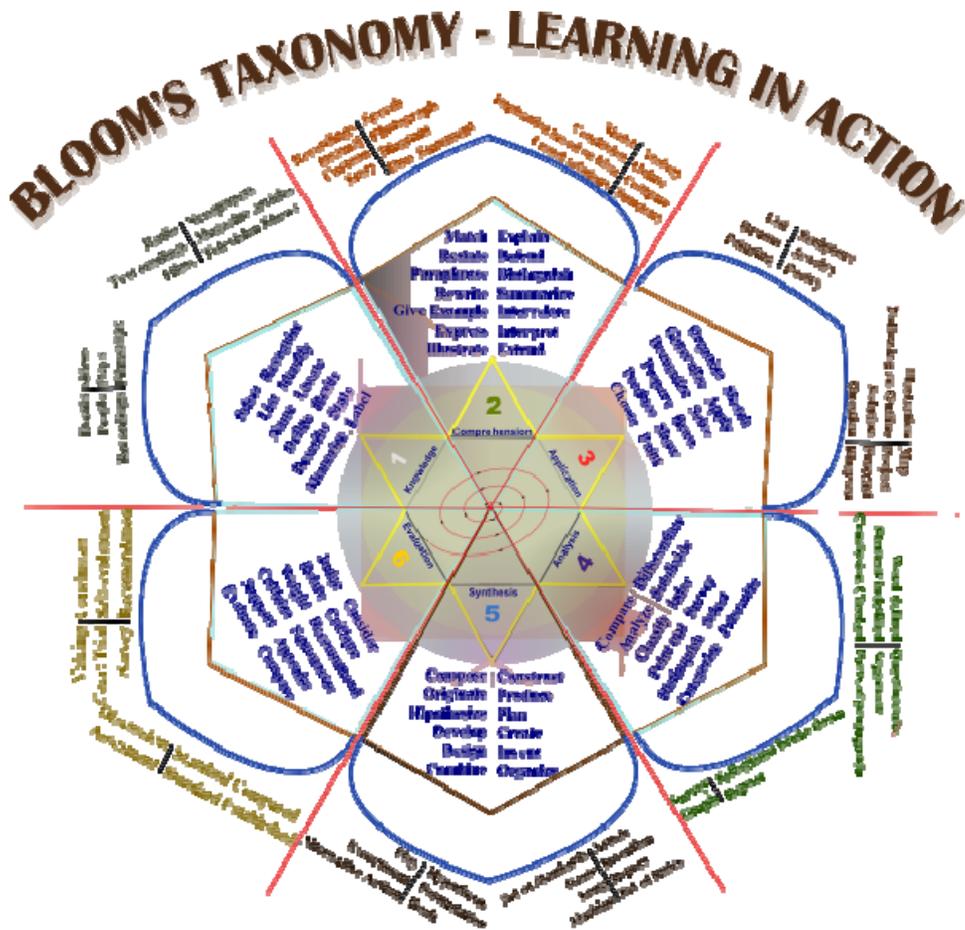
Action Verbs: summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend, classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, and translate,

Knowledge

Exhibit memory of previously-learned materials by recalling facts, terms, basic concepts and answers

- Knowledge of specifics - terminology, specific facts
 - Knowledge of ways and means of dealing with specifics - conventions, trends and sequences, classifications and categories, criteria, methodology
 - Knowledge of the universals and abstractions in a field - principles and generalizations, theories and structures
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- remembering;
 - memorizing;
 - recognizing;
 - recalling identification and
 - recall of information
 - Who, what, when, where, how...?
 - Describe

Action Verbs: list, define, tell, describe, identify, show, label, collect, examine, tabulate, arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce, state, quote, who, when, and where.



Creative Thinking

Creative thinking involves creating something new or original. It involves the skills of flexibility, originality, fluency, elaboration, brainstorming, modification, imagery, associative thinking, attribute listing, metaphorical thinking, and forced relationships. The aim of creative thinking is to stimulate curiosity and promote divergence.

While critical thinking can be thought of as more left-brain and creative thinking more right brain, they both involve "thinking." When we talk about HOTS "higher-order thinking skills" we're concentrating on the top three levels of Bloom's Taxonomy: analysis, synthesis, and evaluation.

Knowledge

collect	describe	identify	list	show	tell	tabulate
define	examine	label	name	retell	state	quote
enumerate	match	read	record	reproduce	copy	select

Examples: dates, events, places, vocabulary, key ideas, parts of diagram, 5Ws

Comprehension

associate	compare	distinguish	extend	interpret	predict	differentiate
contrast	describe	discuss	estimate	group	summarize	order
cite	convert	explain	paraphrase	restate	trace	

Examples: find meaning, transfer, interpret facts, to infer cause & consequence, examples

Application

apply	classify	change	illustrate	solve	demonstrate
calculate	complete	solve	modify	show	experiment
relate	discover	act	administer	articulate	chart
collect	compute	construct	determine	develop	establish
prepare	produce	report	teach	transfer	use

Examples: use information in new situations, solve problems

Analysis

analyze	arrange	connect	divide	infer	separate
classify	compare	contrast	explain	select	order
breakdown	correlate	diagram	discriminate	focus	illustrate
infer	outline	prioritize	subdivide	points out	prioritize

Examples: recognize and explain patterns and meaning, see parts and wholes

Synthesis

combine	compose	generalize	modify	invent	plan	substitute
create	formulate	integrate	rearrange	design	speculate	rewrite
adapt	anticipate	collaborate	compile	devise	express	facilitate
reinforce	structure	substitute	intervene	negotiate	reorganize	validate

Examples: discuss "what if" situations, create new ideas, predict and draw conclusions

Evaluation

assess	compare	decide	discriminate	measure	rank	test
convince	conclude	explain	grade	judge	summarize	support
appraise	criticize	defend	persuade	justify	reframe	

Examples: make recommendations, assess value and make choices, critique ideas

Affective Domain

Domain Attributes: interpersonal relations, emotions, attitudes, appreciations, and values

accepts	attempts	challenges	defends	disputes	joins	judges
contributes	praises	questions	shares	supports	volunteers	