Cognitive Domain

This framework is useful for writing learning outcomes when you want your students to **acquire knowledge** or **develop intellectual abilities.** The seven levels of the taxonomy are listed in order of increasing complexity (see the first two columns of the table below). This means that at each level, the degree of difficulty or challenge increases for students. At the first level, students recall key terms or facts. At higher levels, students apply, analyze, or evaluate concepts and ideas. The most challenging task in the cognitive domain asks students to create new knowledge (e.g., integrate models or theories in an innovative way; design a machine or lab protocol).

When you write course level outcomes, keep in mind that **you can draw on different levels in the framework to establish learning goals for your students**. In some cases, remembering foundational information may be the key requirement of students in that course and your outcomes will draw on the lowest levels of the taxonomy. In other cases, you may want them to demonstrate more sophisticated intellectual skills. Remember that when you ask students to perform tasks like analyze (e.g., compare and contrast, deconstruct, etc.) or evaluate (e.g., critique, argue, defend, etc.), the lower levels of the taxonomy are already implicit in these tasks. For example, you must be able to recognize and explain given theoretical models before you would be able to apply or evaluate them.

Once you have determined the cognitive level(s) that you want your students to achieve by the end of the course, choose action verbs (see last two columns of the table) that suit your context in order to kick-start writing course outcomes. Do not forget that **action verbs are helpful indicators of the kinds of assessments that would best demonstrate achievement of learning outcomes**. For example, if you want students to be able to explain ideas or reasoning, assessments might include student presentations, critical essays, or short answer responses, and are less likely to include multiple choice or true/false tests.

Taxonomy	Definition	Verbs	Examples
Remembering	Recall or recognize knowledge or information from memory	Define, describe, identify, list, recall, recognize, reproduce	Identify the tissue types found in the human body. Recognize the main uses of the Spanish verb “ser” in the present tense. List the subfields of anthropology.
Understanding	Construct meaning through interpreting and explaining	Classify, compare, differentiate, distinguish, exemplify, explain, illustrate, infer, interpret, relate, restate, summarize, translate	Explain the functions of tissue types found in the human body. Distinguish the main uses of the Spanish verbs “ser” and “estar” in the present tense. Summarize theoretical and methodological differences among the subfields of anthropology.

Applying	Use concepts and carry out methods in novel situations	Adapt, calculate, implement, interpret, manipulate, modify, practice, predict, restructure, solve, transfer, translate, use	Predict the impact of sport-related injuries on musculoskeletal function. Implement the Spanish verb "ser" in the present tense to speak about profession, nationality, origin, and noun descriptions. Interpret human behaviour in the past and present using an anthropological perspective.
Analyzing	Determine the nature and relationship of distinguishable parts of theories, concepts, or materials	Attribute, calculate, compare, contrast, debate, deconstruct, deduce, differentiate, examine, inquire, investigate, organize, question	Investigate how environmental and socioeconomic factors influence recovery from sport-related injuries. Examine the grammatical and syntactical structure of a sentence with the verbs "ser" and "estar" in Spanish. Deconstruct racist notions about human difference using anthropological research and understanding.
Evaluating	Making judgements based on criteria or standards to justify a stance or decision	Argue, appraise, assess, conclude, critique, decide, defend, judge, recommend, support, validate	Assess treatment protocols for sport-related injuries. Defend a syntactical order for formulating affirmative or negative sentences using the Spanish verbs "ser" and "estar" from a set of examples. Support alternative sides to key debates in anthropology using scholarly evidence.
Creating	Generate new meaning or recognize new patterns to produce something original	Combine, compose, construct, design, develop, devise, formulate, generate, hypothesize, imagine, invent, plan, produce, propose	Design specialized treatment protocols for sport-related injuries. Develop affirmative and negative sentences using the verbs "ser" and "estar" in Spanish. Collect and interpret data on human behaviour/culture.

Affective Domain

The affective domain **describes five levels of learning outcomes related to students' feelings, emotions, and attitudes towards phenomena studied in class (e.g., ideas, beliefs, values, social practices/customs).** Like the cognitive domain, each level is listed in order of increasing complexity. For example, students move from basic awareness that an issue exists to embracing particular attitudes, values, and practices. The affective domain can be used in all disciplines. Definitions in the second column of the table below describe the level of the taxonomy, and the range of responses/behaviours that students might exhibit. Some levels of the taxonomy also include instructional objectives which provide reasons why an instructor might choose an outcome at that level.

Assessing affective outcomes can be challenging given that the learning involves emotions and attitudes. As the instructor, **consider what you expect to see from students that would indicate to you that the outcome has been achieved**. For example, you might want your students to self-reflect, engage in a process, or demonstrate a value in some way. You may be asking for a shift in perspective or adoption of a particular methodology. Whatever the goal, search for an assessment type that best captures the desired student action, expression, or response.

Taxonomy	Definition	Verbs	Examples
Receiving	Willingness to attend to particular phenomena (ideas, beliefs, values, social practices/customs). ***Ranging from*** simple awareness that a thing exists to selective attention on the part of the learner.	look, watch, listen, hear, be aware of, experience, identify	Listen openly to discussions on issues that involve different perspectives (e.g., on politics, religion, social care, etc.) Identify individual differences in opinions, beliefs, and values regarding disciplinary concepts.
Responding	Active participation with and reacting to phenomena. ***Ranging from*** acquiescence in responding (reads assigned material), willingness to respond (voluntarily reads beyond assignment), or satisfaction in responding (reads for pleasure or enjoyment). Higher levels of this category include ***instructional objectives*** that are commonly classified under "interest" (e.g., those that stress the seeking out, engaging in, and enjoying particular activities).	acknowledge, contribute, discuss, participate, practice, present, question, respond, react, read, reply, seek	Read about social practices different from one's own (e.g. marriage practices, child-rearing, care of elderly, etc.) Question new ideas and concepts in order to fully understand them. Practice inciting emotion through artwork or performance.
Valuing	The worth/value students attach to phenomena, objects, and behaviours.	accept, complete, demonstrate, express, initiate, lead, propose, share, show, take, work	Demonstrate an appreciation for the discipline by … (e.g., engaging with tasks, with peers, through self-reflection, etc.).

	Ranging from acceptance of a value (desires to improve group skills) to commitment (assumes responsibility for the effective functioning of the group). Valuing is based on the internalization of values, but clues to this internalization are expressed in the student's behaviour. Learning outcomes in this area are concerned with behaviour that is consistent and stable enough to make the value clearly identifiable. *Instructional objectives* are commonly classified under "attitudes" and "appreciation".		Complete an ethics proposal for a research project. Express evidence-based opinions in disciplinary discussions. Lead a team that respects individual strengths and diversity.
Organizing	Bringing together different values, resolving conflicts among them, and building internally consistent value systems. This involves comparing, relating, and synthesizing values. *Ranging from* the conceptualization of a value (recognizes the responsibility of each individual for improving human relations) to the organization of value systems (develops a vocational plan that satisfies her need for economic security and social justice). *Instructional objectives* relate to the development of a philosophy of life.	arrange, combine, compare, create, defend, explain, integrate, justify, modify, relate, synthesize	Synthesize differing perspectives on international education. Compare solutions to poverty by examining historical and modern approaches. Integrate cultural and medical models of wellness to address an aspect of healthcare. Justify a plan for social action on a chosen global change issue.
Internalizing values/ Characterizing	Student has a value system which influences their behaviour. Thus, behaviour is pervasive, consistent, and predictable. *Instructional objectives* are concerned with the student's general patterns of adjustment (personal, social, emotional).	act, adopt, behave, conduct, critique, influence, practice, resist, resolve, use	Adopt and reflect on behaviours that lower your ecological footprint. Conduct disciplinary research in an ethical manner. Use a disciplinary lens to critically question… (e.g., personal assumptions, current events, scientific research, representations of minorities in the media, etc.)

Psychomotor Domain

The psychomotor domain includes physical movement, coordination, and use of the motor-skills areas. Development of these skills requires practice and is measured in such terms as speed, precision, distance, procedures, or techniques in execution as well as the individual's capacity to make informed and independent performance-related choices. **Psychomotor abilities range from the ability to observe, describe, and imitate models of behaviour** to increasingly complex actions such as **evaluating and refining one's performance** based on established standards. Individuals who reach the final category of this domain should be able to **independently coach and mentor others**.

Taxonomy	Definition	Verbs	Examples
Observe	Students observe and begin to describe models of behaviour. Students recognize standards or criteria important to perform a skill or task correctly.	check, detect, hear, identify, observe, see, smell, taste, touch, notice, perceive, recognize, describe, document	Observe a nurse preceptor conduct catheterization and identify the key steps involved. Identify the key steps involved in collecting a non-destructive tree core sample. Observe a musical performance and identify correct posture and technique.
Imitate	Students begin to pattern behaviour after models and standards.	attempt, copy, demonstrate, follow, imitate, mimic, repeat, replicate, reproduce, trace, model, reenact, reproduce, try	Reenact the steps involved in assessing vital signs on a mannequin. Attempt to take a lake sediment core sample by mimicking the steps demonstrated by the instructor. Practice replicating proper form when sprinting based on models presented in class.
Respond	Students are able to incorporate outside feedback to improve skill development.	adapt, adjust, alter, calibrate, change, correct, develop, improve, incorporate, modify, practice, revise,	Adjust their approach to completing a focused physical exam of a patient with specific symptoms based on instructor and peer feedback. Respond to expert feedback about water sampling techniques by adjusting their approach to sampling and asking clarifying questions as needed. Incorporate masterclass feedback to improve choral conducting techniques.

Refine	Students evaluate their own performance and make corrections and adjustments.	calibrate, customize, detect, differentiate, discriminate, distinguish, manipulate, recognize, refine, reflect, select, address	Create a portfolio of acquired clinical skills and identify areas and strategies for future development. Reflect on the successes and failures of their own sampling strategy in their field notebook, including identifying strategies for improvement. Identify, implement, and reflect upon the effectiveness of specific strategies for increasing their own movement efficiency.
Internalize	Performance becomes second-nature or natural. Students can perform in a real life situation.	create, design, invent, compose, perform, produce, implement, execute, master	Administer medications safely according to practice and legal guidelines. Create and efficiently implement a biogeographical field sampling strategy using common tools in the course, including quadrats and measuring tapes. Independently select, rehearse, and perform a program of music for a public audience.
Coach	Students are able to instruct or train others to perform this skill in other situations.	demonstrate, illustrate, model, instruct, teach, train, give feedback, coach, lead, facilitate	Role play coaching a patient in changing their drainage tube dressing at home. Train a classmate to use their field sampling strategy by modelling the approach, observing the trainee attempt, and providing feedback. Plan and lead a small group lesson on a specific musical instrument.

References

Anderson, L. W. & Krathwohl, D. R. (Eds.). 2001. *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives* (abridged edition). New York, NY: Longman.

Bloom, B. S. (1956). *Taxonomy of educational objectives: The classification of educational goals, by a committee of college and university examiners. Handbook I: Cognitive Domain*. New York, NY. Longmans Green.

Harrow, A. (1972). *A taxonomy of psychomotor domain: A guide for developing behavioral objectives.* New York: David McKay.

Krathwohl. D. R., Bloom, B. S., and Masia, B. B. (1964). *Taxonomy of educational objectives, Book II. Affective domain*. New York, NY. David McKay Company.

Simpson, E. J. (1972). *The classification of educational objectives in the psychomotor domain.* Washington, DC: Gryphon House.