Aligning Assessment, Learning Activities and Teaching Strategies
using the 7 cognitive domains of Blooms Taxonomy as a guide

In curriculum that aligns SMART learning outcomes to assessments, the teaching and learning activities focus on enabling the students to achieve the outcomes.

Knowledge – the identification and recall of information

Action verbs for learning outcome statements:

- List
- Define
- Tell
- Describe
- Identify
- Show
- Label
- Collect
- Record
- Name
- Underline

Example questions

If you are assessing a learning outcome at the knowledge level of a taxonomy of learning, here are some examples of assessment questions:

- What is _________?
- Where is _________?
- How many _________?
- How would you explain/describe/show _________?
- What happened after _________?
- Can you identify/select/picture _________?
- Who or what were _________?
- How did _________ happen? (Describe it.)
- Can you outline _________?
• What did you notice about __________?
• What do you recall about __________?
• What does the term __________ mean?
• When did __________ take place? Where did it take place?

Practice activities for students
In order to successfully complete assignments that ask those questions, students need opportunities to practice in the following ways:
• Recalling and restating information.
• Recognizing or identifying information.
• Recalling and reproducing information.
• Restating concept definitions and principles.

Teaching activities
Here are some teaching activities to help students achieve a learning outcome at the knowledge level:
• Suggest prior knowledge to which students can link new and future information and knowledge.
• Chunk knowledge into groups, categories, or themes.
• Share strategies to improve memory such as mnemonic patterns, maps, charts, comparisons, groupings, highlighting of key words or first letters, visual images, and rhymes.
• Point out parts, main ideas, patterns, and relationships within sets of facts or information.

Comprehension – the organization and selection of facts and ideas
Active verbs for learning outcome statements:
• Interpret
• Predict
• Associate
• Estimate
• Differentiate
• Recognize
• Review
• Locate
• Extend
• Relate

Example questions
If you are assessing a learning outcome at the comprehension level of a taxonomy of learning, here are some examples of assessment questions:

• How would you compare/contrast?
• How would you summarize?
• Who do you think __________?
• What example could you give of __________?
• How would you explain __________?
• What might have happened next?
• In your own words, what does the term __________ mean?
• How would you explain __________ in nontechnical terms?
• Can you show us what you mean?
• What do you think the author/researcher is saying?

Practice activities for students
In order to successfully complete assignments that ask those questions, students need opportunities to practice in the following ways:

• Restate or paraphrase and summarize information or knowledge.
• Describe or explain phenomena or concepts using words different from those used in the initial teaching.
• Identify the correct meaning of concepts or terms.
• Add details or explanations to basic content.
• Relate new to previously learned content.
• Construct visual representations of main ideas (mind or concept maps, tables, flowcharts, graphs, diagrams, or pictures.)
Teaching activities

Here are some teaching activities to help students achieve a learning outcome at the comprehension level:

- Outline new or upcoming material in simple form.
- Concept-map or mind-map new or upcoming material.
- Explain with concrete examples, metaphors, questions, or visual representations.

Application – the use of facts, rules, and principles

Active verbs for learning outcome statements:

- Apply
- Calculate
- Illustrate
- Solve
- Modify
- Manipulate
- Discover
- Practice

Example questions

If you are assessing a learning outcome at the application level of a taxonomy of learning, here are some examples of assessment questions:

- How/why is __________ an example of __________?
- What would happen if __________?
- What can you use to show or explain __________?
- Which factors would you change if __________?
- What would be an example of __________?
- How would you solve __________?
- What approach would you use?
- How would you apply __________ in this situation?
Practice activities for students

In order to successfully complete assignments that ask those questions, students need opportunities to practice in the following ways:

- Paraphrase the procedures, principles, rules, and steps for using or applying the material.
- Practice applying the conceptual material to problems or situations.
- Practice choosing the types of problem-solving strategies for different situations.
- Solve simple, structured problems, then complex, unstructured ones.
- Practice recognizing the correct use of procedures, principles, rules, and steps with routine problems, then complex ones.
- Demonstrate the correct use of procedures, principles, rules, and steps with routine problems, then complex ones.

Teaching activities

Here are some teaching activities to help students achieve a learning outcome at the application level:

- Give multiple examples of a phenomenon that are meaningful to students.
- Define the procedures for use, including the rules, principles, and steps.
- Provide the vocabulary and concepts related to procedures.
- Explain steps as they are applied.
- Define the context, problems, situations, or goals for which given procedures are appropriate.
- Explain the reasons that procedures work for different types of situations or goals.
- Ensure students’ readiness by diagnosing and strengthening their command of related concepts, rules, and decision-making skills.
- Provide broad problem-solving methods and models.
- Begin with simple, highly structured problems; then gradually move to more complex, less structured ones.
- Use questions to guide student thinking about problem components, goals, and issues.
- Give students guidance in observing and gathering information, asking appropriate questions, and generating solutions.
Analysis – the separation of a whole into component parts

Active verbs for learning outcome statements:

- Connect
- Explain
- Classify
- Arrange
- Compare
- Select
- Relate
- Categorize
- Examine

Example questions

If you are assessing a learning outcome at the analysis level of a taxonomy of learning, here are some examples of assessment questions:

- Is the information based on fact or opinion?
- What is the underlying theme/meaning?
- What do you think _________?
- What conclusions can you draw?
- Can you explain what would have happened when _________?
- How are _________ and _________ alike? How are they different?
- How is _________ related to _________?
- What are the different parts of _________?
- What type of _________ is this? How would you classify it?
- What evidence does the author/researcher offer?
- How does the author/researcher structure the argument?
- What assumptions are behind the argument?
- What inferences can you draw about _________?
Practice activities for students

In order to successfully complete assignments that ask those questions, students need opportunities to practice in the following ways:

- Classify concepts, examples, or phenomena into correct categories.
- Use types of thinking strategies to analyze and evaluate their own thinking.
- Practice choosing the best type of thinking strategy to use in different real-world situations and explaining why their choice is superior.
- Detect and identify flaws and fallacies in thinking.
- Identify and explain instances of open- and closed-mindedness.
- Identify and explain instances of responsible versus irresponsible and accurate versus inaccurate applications of thinking strategies.
- Answer questions that require persistence in discovering and analyzing data or information.

Teaching activities

Here are some teaching activities to help students achieve a learning outcome at the analysis level:

- Point out the important and unimportant features or ideas.
- Point out examples and nonexamples of a concept, highlighting similarities and differences.
- Give a wide range of examples, increasing their complexity over time.
- Emphasize the relationships among concepts.
- Explain different types of thinking strategies, including how to think open-mindedly, responsibly, and accurately.
- Emphasize persistence when answers are not apparent.
- Ask students questions that require their persistence in discovering and analyzing data or information.
- Encourage students to self-evaluate and reflect on their learning.
- Ask questions that make students explain why they are doing what they are doing.
- Explain and model how to conduct systematic inquiry, detect flaws and fallacies in thinking, and adjust patterns of thinking.
Synthesis – the combination of ideas to form a new whole

Active verbs for learning outcome statements:

- Design
- Formulate
- Arrange
- Assemble
- Construct
- Organize
- Re-arrange
- Combine
- Integrate
- Compose
- Generalize

Example questions

If you are assessing a learning outcome at the synthesis level of a taxonomy of learning, here are some examples of assessment questions:

- What might be a solution to __________?
- Can you make a proposal that would __________?
- What theory can you come up with for __________?
- What might happen if __________?
- How many ways can you __________?
- How could you create/improve/develop __________?
- What conclusions can you come to about __________?
- What generalizations can you make about __________?
- How would you design/structure/organize a __________?
- How would you adapt/change the design/plan for __________?
- How can you resolve the differences/paradox/apparent conflict?
- What new model could accommodate these disparate findings?
Practice activities for students

In order to successfully complete assignments that ask those questions, students need opportunities to practice in the following ways:

• Resolve a situation or solve a problem that requires speculation, inquiry, and hypothesis formation.
• Solve problems using a novel approach.
• Design a research study to resolve conflicting findings.
• Develop products or solutions to fit within particular functions and resources.
• Manipulate concrete data to solve challenging thinking situations.
• Explain phenomena using metaphors and analogies.

Teaching activities

Here are some teaching activities to help students achieve a learning outcome at the synthesis level:

• Promote observation, analysis, description, and definition.
• Explain the process and methods of scientific inquiry.
• Explain and promote examples of how to identify a research problem, speculate about causes, formulate testable hypotheses, and identify and interpret results and consequences.
• Model inquiry and discovery processes.
• Encourage independent thinking, and avoid dead ends and simplistic answers.
• Show students examples of creativity to solve problems.
• Encourage students to take novel approaches to situations and problems.
• Give students examples of reframing a problem — turning it upside down or inside out or changing perceptions about it.
• Explain and encourage brainstorming.
• Pose questions and problems with multiple good answers or solutions.
• Give students opportunities for ungraded creative performance or behavior.
Evaluation – the development of opinions, judgments, or decisions

Active verbs for learning outcome statements:

- Assess
- Rank
- Test
- Measure
- Recommend
- Judge
- Summarize

Example questions

If you are assessing a learning outcome at the evaluation level of a taxonomy of learning, here are some examples of assessment questions:

- What might be a solution to __________?
- Can you make a proposal that would __________?
- What theory can you come up with for __________?
- What might happen if __________?
- How many ways can you __________?
- How could you create/improve/develop __________?
- What would you choose, and why?
- What are the relevant data, and why?
- Why do you approve or disapprove?
- Why do you think the conclusions are valid or invalid?
- What is your position/opinion, and how can you justify it?
- How would you rank/rate/prioritize the __________?
- How would you judge/evaluate __________?

Practice activities for students

In order to successfully complete assignments that ask those questions, students need opportunities to practice in the following ways:

- Evaluate the validity of given information, results, or conclusions.
- Draw inferences from observations, and make predictions from limited information.
• Explain how they form new judgments and how and why their current judgments differ from their previous ones.
• Identify factors that influence choice and interpretations, such as culture, experience, desires, interests, and passions, as well as systematic thinking.
• Detect mistakes, false analogies, relevant versus irrelevant issues, contradictions, and faulty predictions.
• Critique a research study.
• Use research and analysis to devise the best available solutions to problems, and explain why they are the best.
• Choose among possible behaviors, perspectives, or approaches, and provide justifications for these choices.

Teaching activities
Here are some teaching activities to help students achieve a learning outcome at the evaluation level:

• Create conflict or perplexity by posing paradoxes, dilemmas, or other situations to challenge students’ concepts, beliefs, ideas, and attitudes.
• Explain how to recognize and generate proof, logic, argument, and criteria for judgments.
• Explain and show students the consequences of choices, actions, or behaviors.
• Provide relevant human or social models that portray the desired choices, actions, or behaviors.
• Explain with examples how factors such as culture, experience, desires, interests, and passions, as well as systematic thinking, influence choice and interpretations.

Creation – compile information in a different way, combine elements in a new pattern, or propose alternative solutions
Creation is the highest level of Bloom’s and was not part of the original Taxonomy outlined by Benjamin Bloom in 1957; it was added in 2000.

There are many other taxonomies of learning, e.g. the SOLO Taxonomy, that may be used to scaffold learning. What’s important is that the learning outcomes are clearly written and that the assessments are aligned with the level of learning described in the outcome.
Active verbs for learning outcome statements:

- Create
- Build
- Design
- Propose
- Construct
- Compile
- Invent
- Adapt
- Discuss
- Solve

Example questions

If you are assessing a learning outcome at the creation level of a taxonomy of learning, here are some examples of assessment questions:

- How would you improve __________?
- Can you invent __________?
- How would you adapt __________ to create a different __________?
- In what way would you design __________?
- Can you construct a model __________?
- Can you think of an original way to __________?
- What would happen if __________?
- Can you develop a proposal which would __________?
- How else would you __________?

At this level, use a combination of teaching activities and practice activities outlined for all other levels of Bloom’s.