Student Outcomes and Performance Indicators

Performance indicators are a means to focus on specific expectations of a program. They facilitate the curriculum delivery strategies, and assessment procedures. There is an important first step that must come before the development of performance indicators, and that is deciding on student outcomes. These are usually communicated to students in the program description, and are stated in terms that inform the students about the general purpose of the program and expectations of the faculty. The primary difference between student outcomes and performance indicators is that student outcomes are intended to provide general information about the focus of student learning and are broadly stated of the outcome, not measurable, while performance indicators are concrete measurable performances students must meet as indicators of achievement. Performance indicators are developed from program outcomes.

Sample student outcomes:
- Students will work effectively as a member of a team.
- Students can apply the principles of math and science to a technical problem.
- Students will have an appreciation for the need to be lifelong learners.
- Students will have effective communication skills.

Performance indicators indicate what concrete actions the student should be able to perform as a result of participation in the program. Once program outcomes have been identified, the knowledge and skills necessary for the mastery of these outcomes should be listed. This will allow the desired behavior of the students to be described, and will eliminate ambiguity concerning demonstration of expected competencies. Performance indicators are made up of at least two main elements; action verb and content (referent). The expected behavior must be specified by name, using an observable action verb such as demonstrate, interpret, discriminate, or define.

Sample performance indicators:
- Students will know a professional code of ethics. (Remembering)
- Students will be able to describe the problem solving process. (Understanding)
- Students will solve research problems through the application of scientific methods. (Applying)

**COGNITIVE** learning is demonstrated by knowledge recall and the intellectual skills: comprehending information, organizing ideas, analyzing data, applying knowledge, choosing among alternatives in problem-solving, and creation of new products or ideas.

<table>
<thead>
<tr>
<th>Level</th>
<th>Illustrative Verbs</th>
<th>Category Definition</th>
<th>Cognitive processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remember</td>
<td>Arrange, Define, Describe, Duplicate, Identify, Label, List, Match, Name, Order, Outline, Recite, Recognize, Relate, Repeat, Reproduce, Select, State, Tabulate, Tell</td>
<td>retrieve relevant knowledge from long-term memory</td>
<td>Recognizing (identifying), recalling (retrieving)</td>
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<tr>
<td>Understand</td>
<td>Classify, Compare, Compute, Convert, Contrast, Defend, Describe, Differentiate, Distinguish, Estimate, Explain, Extrapolate, Generalize, Interpolate, Locate, Paraphrase, Predict, Recognize, Review, Summarize, Translate</td>
<td>construct meaning from instructional messages including oral, written and graphical communication</td>
<td>Interpreting, exemplifying, classifying, summarizing, inferring, summarizing, comparing</td>
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<tr>
<td>Apply</td>
<td>Apply, Change, Choose, Calculate, Classify, Demonstrate, Determine, Employ, Examine, Illustrate, Interpret, Modify, Operate, Practice, Predict, Prepare, Produce, Restructure, Schedule, Sketch, Solve, Use</td>
<td>Carry out or use a procedure in a given situation</td>
<td>Executing, implementing</td>
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<tr>
<td>Analyze</td>
<td>Analyze, Appraise, Break down, Calculate, Categorize, Compare, Contrast, Criticize, Debate, Diagram, Differentiate, Discriminate, Distinguish, Examine, Experiment, Identify, Infer, Inventory, Relate, Separate, Subdivide, Test</td>
<td>break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose</td>
<td>Differentiating, organizing, attributing</td>
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<tr>
<td>Evaluate</td>
<td>Appraise, Argue, Assess, Choose, Compare, Contrast, Criticize, Defend, Discriminate, Estimate, Evaluate, Explain, Interpret, Judge, Measure, Predict, Rank, Rate, Recommend, Select, Support, Validate</td>
<td>make judgments based on criteria and standards through checking and critiquing</td>
<td>Checking, critiquing</td>
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<tr>
<td>Create</td>
<td>Arrange, Assemble, Construct, Collect, Compose, Create, Design, Develop, Formulate, Integrate, Manage, Organize, Plan, Prepare, Prescribe, Produce, Propose, Specify, Synthesize, Write</td>
<td>putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure</td>
<td>Generating, planning, producing</td>
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**AFFECTIVE** learning is demonstrated by behaviors indicating attitudes of awareness, interest, attention, concern, and responsibility, ability to listen and respond in interactions with others, and ability to demonstrate those attitudinal characteristics or values which are appropriate to the test situation and the field of study.

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<tr>
<td>Receiving</td>
<td>asks, chooses, describes, follows, gives, holds, identifies, locates, names, points to, selects, sits erect, replies, uses</td>
<td>willingness to receive or attend</td>
<td>listening to discussions of controversial issues with an open mind, respecting the rights of others</td>
</tr>
<tr>
<td>Responding</td>
<td>answers, assists, complies, conforms, discusses, greets, helps, labels, performs, practices, presents, reads, recites, reports, selects, tells, writes</td>
<td>active participation indicating positive response or acceptance of an idea or policy</td>
<td>completing homework assignments, participating in team problem-solving activities</td>
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<tr>
<td>Valuing</td>
<td>completes, describes, differentiates, explains, follows, forms, initiates, invites, joins, justifies, proposes, reads, reports, selects, shares, studies, works</td>
<td>expressing a belief or attitude about the value or worth of something</td>
<td>accepting the idea that integrated curricula is a good way to learn, participating in a campus blood drive</td>
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<tr>
<td>Organization</td>
<td>adheres, alters, arranges, combines, compares, completes, defends, explains, generalizes, identifies, integrates, modifies, orders, organizes, prepares, relates, synthesizes</td>
<td>organizing various values into an internalized system</td>
<td>recognizing own abilities, limitations, and values and developing realistic aspirations</td>
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<tr>
<td>Characterization by a value or value complex</td>
<td>acts, discriminates, displays, influences, listens, modifies, performs, practices, proposes, qualifies, questions, revises, serves, solves, uses, verifies</td>
<td>the value system becomes a way of life</td>
<td>a person's lifestyle influences reactions to many different kinds of situations</td>
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PSYCHOMOTOR learning is demonstrated by physical skills: coordination, dexterity, manipulation, grace, strength, speed; actions which demonstrate the fine motor skills such as use of precision instruments or tools, or actions which evidence gross motor skills such as the use of the body in dance or athletic performance.

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<td>Perception</td>
<td>chooses, describes, detects, differentiates, distinguishes, identifies, isolates, relates, selects, separates</td>
<td>using sense organs to obtain cues needed to guide motor activity</td>
<td>listening to the sounds made by guitar strings before tuning them, recognizing sounds that indicate malfunctioning equipment</td>
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<tr>
<td>Set</td>
<td>begins, displays, explains, moves, proceeds, reacts, responds, snows, starts, volunteers</td>
<td>being ready to perform a particular action: mental, physical or emotional</td>
<td>knowing how to use a computer mouse, having instrument ready to play and watching conductor at start of a musical performance, showing eagerness to assemble electronic components to complete a task</td>
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<td>Guided response</td>
<td>assembles, builds, calibrates, constructs, dismantles, displays, dissects, fastens, fixes, grinds, heats, manipulates, measures, mends, mixes, organizes, sketches</td>
<td>performing under guidance of a model: imitation or trial and error</td>
<td>using a torque wrench just after observing an expert demonstrate a its use, experimenting with various ways to measure a given volume of a volatile chemical</td>
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<tr>
<td>Mechanism</td>
<td>(same list as for guided response)</td>
<td>being able to perform a task habitually with some degree of confidence and proficiency</td>
<td>demonstrating the ability to correctly execute a 60 degree banked turn in an aircraft 70 percent of the time</td>
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<tr>
<td>Complex or overt response</td>
<td>(same list as for guided response)</td>
<td>performing a task with a high degree of proficiency and skill</td>
<td>dismantling and re-assembling various components of an automobile quickly with no errors</td>
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<tr>
<td>Adaptation</td>
<td>adapts, alters, changes, rearranges, reorganizes, revises, varies</td>
<td>using previously learned skills to perform new but related tasks</td>
<td>using skills developed learning how to operate an electric typewriter to operate a word processor</td>
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<tr>
<td>Origination</td>
<td>arranges, combines, composes, constructs, creates, designs, originates</td>
<td>creating new performances after having developed skills</td>
<td>designing a more efficient way to perform an assembly line task</td>
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<table>
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<tr>
<th>Learning levels</th>
<th>Level Indicators</th>
<th>Assessment Task</th>
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</table>
| Knowledge       | Define, Describe, Label, Recite, Select, State, Write, Identify | Remembering previous learned information:  
- Complete multiple choice  
- Fill in the blank  
- Provide oral response  
- Complete true/false  
- Develop a list  
- Choose among alternatives (could be a list) |
| Comprehension   | Match, Paraphrase, Restate, Illustrate, Compare, Predict, Defend, Explain | Grasping the meaning of Information previously presented:  
- Give an analogy  
- Create an outline  
- Summarize in own words  
- Create a concept map  
- Draw a diagram  
- Graph the answer  
- Match term with a definition |
| Application     | Apply, Change, Make, Model, Show, Calculate, Examine, Solve, Use | Using principle/formula/processes previously learned:  
- Compute an answer  
- Solve a problem similar to previous problems  
- Solve a problem in a new setting  
- Create a model  
- Write an essay that requires the use of the concepts/processes learned  
- Use theory or principle to explain an event or phenomena |
| Analysis        | Analyze, Compare/contrast, Differentiate, Categorize, Distinguish, Relate | Breaking down objects or ideas into simpler parts and seeing how the parts relate and are organized:  
- Deconstruct a model  
- Identify differences  
- Group like items together  
- Identify what is missing  
- Identify cause and effect  
- Perform a SWOT analysis  
- Discuss an event/ perspective from multiple perspectives  
- Present the potential impact resulting from a decision or choice |
| Evaluation      | Evaluate, Select, Recommend, Rank, Critique, Judge, Assess | Making judgments based on internal evidence or external criteria:  
- Choose best among options and defend your choice  
- Rank from best to worse using establish criteria  
- Develop criteria for judgment and apply to a solution  
- Recommend and defend choice for action  
- Present the pros and cons of an approach  
- Determine the degree of success or failure of an action or event |
| Create          | Make, Generate, Build, Form, Construct, Design, Fashion, Produce | Making or producing something based on previously learned information and processes:  
- Create an end-of program capstone project  
- Complete a summative class project  
- Write a summative paper in a course  
- Write an end-of program thesis  
- Write an end-of program dissertation  
- Design an original approach to a situation or problem  
- Write a short story, poem, play  
- Use a form of artistic expression to respond to an exigence  
- Develop a curriculum that integrates multiple disciplines  
- Conduct independent research |
Adapted from:
A Guide to Developing and Delivering Measurable Student Learning Outcomes
(Canada College)

How do I know if a performance indicator is well-written?

1. Does the performance indicator support the intended outcome?
2. Does the performance indicator describe what students should know (cognitive), do (behavioral, performance), or think (affective, attitudinal)?
3. Is the performance indicator:
   a. Specific?
   b. Measurable/identifiable?
   c. A result of learning?
4. Do you have or can you create activities which enable students to learn the desired performance indicator?
5. Is the performance indicator a “leading indicator” for the outcome?
6. Can students’ demonstration on the performance indicator be used to make decisions on how to improve the program?

As a result of participating in the learning activity, students will be able to:

________________ (performance indicator) ____________.

https://www.canadacollege.edu/inside/research/slos/documents/STUDENT%20SERVICES%20SLO%20GUIDE%20BOOK.pdf