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Aligning Program and Course Learning Outcomes to the Student Learning Experience: A Guide for Faculty

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Contents

What is the purpose of this document?

During conversion to semesters, colleges developed and submitted program and course proposals for their curriculum. An important part of this process was creating, reviewing, and editing program and course learning outcomes. The purpose of this document is to help faculty align their outcomes to the student learning experience when they are developing proposals for course or program changes. While the examples are intended to illustrate common areas for improvement, most examples are not pulled from specific campus programs nor are they intended to be "perfect."

What are Program Learning Outcomes and Student Learning Outcomes?

Program Learning Outcomes (PLOs) are broad statements of what the students are expected to do, know, or develop as values as a result of the degree program. While relating to the PLOs, Student Learning Outcomes (SLOs) should specifically define what students should be able to do upon completion of the course. The Student Learning Outcomes are the basis for selecting the course materials, activities, assignments and assessments. The SLOs are shared with the students in the course syllabus.

Both program and course learning outcomes focus on the <u>results</u> of student learning instead of on <u>teaching</u> or the <u>learning</u> process.

Why are program and student learning outcomes critical in higher education?

Program Learning Outcomes are important because they let students know the broad knowledge, skills, and abilities they will have after completing the program

Student Learning Outcomes are important because they

- Provide students goals and let them know the specific knowledge, skills, and abilities they will have attending the course.
- Enables good quality assessment design to demonstrate evidence of student learning.
- Encourages good course design making it easier to align to relevant activities, assignments, and assessment strategies.

What are Key characteristics of a well designed <u>program</u> learning outcome?

- Relates to and supports the program mission.
- Tailored specifically to a program and how that program's faculty envisions student learning.
- Clearly articulated.
- Focuses on high-priority learning – what is most important for a student to be able to know or do after completing your program.
- Uses active verbs describing how students can demonstrate their learning.
- Represent the level and type of competence appropriate to the educational degree (e.g. Bachelor, Masters, Doctorate).
- Is measurable; helps guide the selection of assessment methods.

What are some common problems with program learning?

- Writing program outcomes to fit ILOs.
- Writing too many program learning outcomes (problem too detailed)
- Program Learning outcomes too specific or too broad.
- Writing a vague outcome that does not provide enough information about the program components. *Example*: ~~Students should know the historically important systems of psychology.~~ <u>Evaluate the psychoanalytic, gestalt, behaviorist, humanistic and cognitive approaches to psychology.</u>

- Using vague verbs such as "understand" and "appreciate" that do not measure understanding nor are explained in terms of what students should be able to do at the end of the program in measureable, concrete terms that reflect the achievement of an undergraduate degree.
  Example:
  ~~Appreciate~~ Summarize the relationship between innovation and industry growth.
  ~~Understand~~ Apply microeconomic tools and concepts to address public policy issues.
  ~~Understand~~ Assess the role of technologies in the process of technological change.
- Using the same verb for every outcome without differentiating between levels of learning. For example, while "demonstrate" is a relevant verb to describe an outcome, it is also the most frequently used verb when writing outcomes, and sometimes used as a "placeholder."
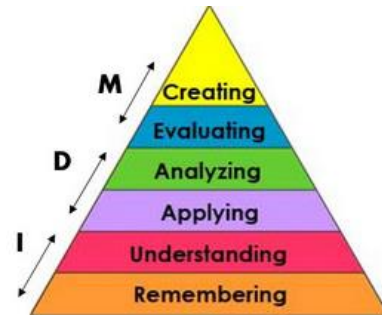 *Example:*
  ~~Demonstrate~~ Recall core knowledge in biological, psychological, and sociocultural ……..
  ~~Demonstrate the ability to~~ Solve problems by applying…
  ~~Demonstrate the ability to be empathetic.~~ Display empathy to others.

More accurate PLO statements help guide faculty in the selection of assessment methods.

- **Solve** problems by applying…
- **Display** empathy to others.
- Recall core knowledge in biological, psychological, and sociocultural …

- PLO's that are too detailed. Example:
  ~~Perform independently in the professional role. Develop their professional knowledge and skills. Know their values and biases. Understand their impact on others. Know ethical standards. Work well with others.~~ Follow professional and ethical standards when providing care to patients.

What are the key characteristics of well-designed <u>student</u> learning outcomes?

- Can be taught and assessed.
- Describes a learning result rather than a teaching process.
- Describes what the student will be able to demonstrate.
- Is measurable.
- Is specific.
- Addresses no more than a single result
- Is clear (meaning faculty, students, administrators, and people outside the unit are all able to understand it).
- Is clearly linked to the appropriate PLOs.
- Is reasonable, given the level of the course and students.
- Uses action verbs that specify definite, observable behaviors

What are some common problems with student learning outcomes?

- Outcomes that are not written at the level of the course
- Using vague verbs such as "understand" and "appreciate" that don't measure understanding nor explained in terms of what students should be able to do in more concrete terms.
- Using the same verb for every outcome without differentiating between levels of learning (remember, understand, apply, analyze, evaluate, create)
- Writing the same outcomes for a cluster of courses
- Confusing outcomes with learning processes. "Complete a thesis" is a learning process, not an outcome.

What is curriculum mapping?

A curriculum map is a table or matrix that shows where learning outcomes are fostered in a program. It is developed by program faculty to chart the relationship between the program outcomes (PLOs) and what is taught in the core courses. It can provide a basis for making decisions about teaching and learning at both the course and the program levels. It can also be useful to faculty in the process of conversion from quarters to semesters, as it focuses attention on how what we are teaching relates to what we have stated as our goals for students to attain.

What is the value of curriculum mapping?

The curriculum mapping process helps determine any gaps or unintended repetitions by charting what is planned and what is actually occurring in individual courses and across the program. By explicitly identifying which learning outcomes are addressed in each course, programs can more easily determine whether the program addresses all learning outcomes in a balanced way, or whether there are gaps or an overemphasis on any particular learning outcome. The curriculum map also makes it easier for faculty to check the sequencing of courses throughout the program to assure students the opportunity to achieve mastery of the program's PLOs.

What does a sample curriculum map look like?

Example	Program Learning Outcomes			
**Courses	PLO #1	PLO #2	PLO #3	PLO #4
100*		I	I	
110*	I, D			I, D
200		D		
202*		D		
300	D			
310		M		
405*	M		M (A)	M
499*	M (A)	M (A)	M (A)	M (A)

* Required course for major

Students who graduate with a BS in Veterinary Science will be able to:

PLO #1: Identify (action verb) key components of animal anatomy, biology and physiology (description)

PLO#2: Write and speak clearly and persuasively on veterinary science issues

PLO#3: Critically and creatively analyze research data and formulate a testable hypothesis

PLO#4: Generate a personal ethical position regarding treatment of animals

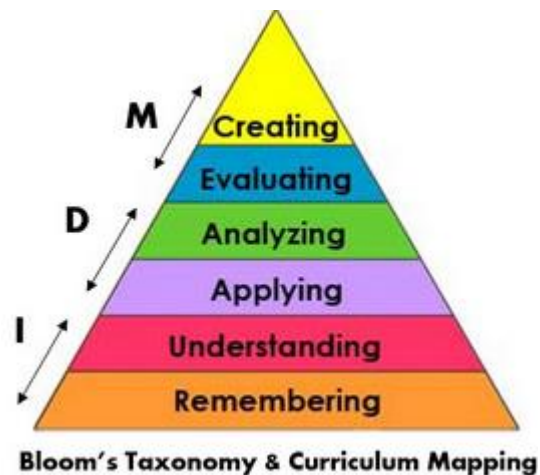**Course numbering guidelines (see Curriculum Map #1 template)

- **I** = Introduced
- **D** = Developed and practiced with feedback
- **M** = Demonstrated at the mastery level appropriate for graduation
- **(A)** = Assessment of mastery (this will be included in your assessment plan)

Learning Taxonomies: Tool #2 to build and refine Student Learning outcomes

Bloom's Taxonomy is used by faculty to help create clear and meaningful learning outcomes. It describes, in ascending order, the levels of student thinking that must be required for more beginning levels of instruction (introduction), through intermediate levels of instruction (development) to the highest levels of instruction (mastery).

M — Creating
Evaluating
D — Analyzing
Applying
I — Understanding
Remembering

Bloom's Taxonomy & Curriculum Mapping

While freshmen can generally be expected to achieve at the more introductory levels of remembering and understanding, as students progress through their college years, they are developing and mastering learning and can be expected to achieve higher order thinking: analyzing, evaluating, and creating. Graduate students are expected to achieve the highest levels of thinking. This aligns with the concepts Introduce, Develop and Master which faculty used to complete their curriculum maps for each program, showing the relationship between program learning outcomes and what is taught in core courses. The image above shows how Bloom's levels of thinking relate to our curriculum maps, with the lower levels of thinking generally associated with Introducing (I), the mid-levels of thinking generally associated with Developing (D) and the upper levels of thinking generally associated with Mastering (M).

Cognitive domain Taxonomy

Definitions	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating
Bloom's Definition	Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers	Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas.	Solve problems to new situations by applying acquired knowledge, facts, techniques, and rules in a different way.	Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations.	Present and defend opinions by making judgements about information, validity of ideas, or quality of work based on a set of criteria.	Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.
Verbs	Choose Define Find How Label List Match Name Omit Recall Relate Select Show Spell Tell: *What* *When* *Where* *Which* *Who* *Why*	Classify Compare Contrast Demonstrate Explain Extend Illustrate Infer Interpret Outline Relate Rephrase Show Summarize Translate	Apply Build Choose Construct Develop Experiment Identify Interview Make use of Model Organize Plan Select Solve Utilize	Analyze Assume Categorize Classify Compare Conclude Contrast Discover Dissect Distinguish Divide Examine Function Infer Inspect Simplify Survey Take part in Test for	Agree Appraise Assess Choose Compare Conclude Criteria Decide Deduct Defend Determine Disprove Estimate Evaluate Explain Influence Interpret Judge Justify Mark Measure Opinion Prioritize Prove Rate Recommend Rule on Select Support Value	Adapt Build Change Choose Combine Compile Compose Construct Create Delete Design Develop Discuss Elaborate Estimate Formulate Imagine Improve Invent Make up Maximize Minimize Modify Originate Plan Predict Propose Solve Suppose Test

Adapted from Anderson, Lorin W., David R. Krathwohl, and Benjamin Samuel Bloom. A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives. Allyn & Bacon, 2001.

The Relationship Between Learning Outcomes and Levels of Learning

While we having been discuss only the Cognitive Domain so far, there are also the Affective and Psychomotor domains of learning. Learn more here about the affective and psychomotor learning domains which, depending on your discipline, can also be used to design effective learning experiences.

Some instructors also find it helpful to consider the levels of thinking for students as they interact with the dimensions of knowledge required in the discipline. You can view an interactive model of Bloom's Taxonomy here showing the link between level of thinking required for a given Student Learning Outcome (SLO) and the dimension of knowledge that SLO assumes.

Affective domain Taxonomy

While the cognitive domain focuses on knowledge, the affective domain (Krathwohl, Bloom, Masia, 1973) includes the manner in which we deal with things emotionally, such as feelings, values, appreciation, enthusiasm, motivations, and attitudes. The five major categories are listed from the most complex behaviors (Internalizes Values) to the simplest behavior (Receiving Phenomena):

Affective Domain Category		Example and Key Words (verbs)
Internalizes Values (characterization): Has a value system that controls their behavior. The behavior is pervasive, consistent, predictable, and most important characteristic of the learner. Instructional objectives are concerned with the student's general patterns of adjustment (personal, social, emotional).		**Examples:** Shows self-reliance when working independently. Cooperates in group activities (displays teamwork). Uses an objective approach in problem solving. Displays a professional commitment to ethical practice on a daily basis. Revises judgments and changes behavior in light of new evidence. Values people for what they are, not how they look. **Key Words:** acts, discriminates, displays, influences, modifies, performs, qualifies, questions, revises, serves, solves, verifies

Organization: Organizes values into priorities by contrasting different values, resolving conflicts between them, and creating a unique value system. The emphasis is on comparing, relating, and synthesizing values.		**Examples:** Recognizes the need for balance between freedom and responsible behavior. Explains the role of systematic planning in solving problems. Accepts professional ethical standards. Creates a life plan in harmony with abilities, interests, and beliefs. Prioritizes time effectively to meet the needs of the organization, family, and self. **Key Words:** compares, relates, synthesizes

Valuing: The worth or value a person attaches to a particular object, phenomenon, or behavior. This ranges from simple acceptance to the more complex state of commitment. Valuing is based on the internalization of a set of specified values, while clues to these values are expressed in the learner's overt behavior and are often identifiable.	**Examples:** Demonstrates belief in the democratic process. Is sensitive towards individual and cultural differences (value diversity). Shows the ability to solve problems. Proposes a plan to social improvement and follows through with commitment. Informs management on matters that one feels strongly about. **Key Words:** appreciates, cherish, treasure, demonstrates, initiates, invites, joins, justifies, proposes, respect, shares
Responds to Phenomena: Active participation on the part of the learners. Attend and react to a particular phenomenon. Learning outcomes may emphasize compliance in responding, willingness to respond, or satisfaction in responding (motivation).	**Examples:** Participates in class discussions. Gives a presentation. Questions new ideals, concepts, models, etc. in order to fully understand them. Know the safety rules and practice them. **Key Words:** answers, assists, aids, complies, conforms, discusses, greets, helps, labels, performs, presents, tells
Receiving Phenomena: Awareness, willingness to hear, selected attention.	**Examples:** Listen to others with respect. Listen for and remember the name of newly introduced people. **Key Words:** acknowledge, asks, attentive, courteous, dutiful, follows, gives, listens, understands

Adapted from http://www.nwlink.com/~donclark/hrd/Bloom/affective_domain.html

Psychomotor domain taxonomy

While the cognitive domain focuses on knowledge, and the affective domain on attitude, the psychomotor domain (Simpson, 1972) includes physical movement, coordination, and use of the motor-skill areas. Development of these skills requires practice and is measured in terms of speed, precision, distance, procedures, or techniques in execution. Thus, psychomotor skills range from manual tasks, such as digging a ditch or washing a car, to more complex tasks, such as operating a complex instrument or dancing. They are listed from the most complex behavior (Origination) to the simplest (Perception):

Psychomotor Domain Category	Example and Key Words (verbs)
Origination: Creating new movement patterns to fit a particular situation or specific problem. Learning outcomes emphasize creativity based upon highly developed skills.	**Examples:** Constructs a new theory. Develops a new and comprehensive training programming. Creates a new gymnastic routine. **Key Words:** arranges, builds, combines, composes, constructs, creates, designs, initiate, makes, originates.
Adaptation: Skills are well developed and the individual can modify movement patterns to fit special requirements.	**Examples:** Responds effectively to unexpected experiences. Modifies instruction to meet the needs of the learners. Perform a task with a machine that it was not originally intended to do (machine is not damaged and there is no danger in performing the new task). **Key Words:** adapts, alters, changes, rearranges, reorganizes, revises, varies.

Complex Overt Response (Expert): 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 are 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.	**Examples:** Maneuvers a car into a tight parallel parking spot. Operates a computer quickly and accurately. Displays competence while playing the piano. **Key Words:** assembles, builds, calibrates, constructs, dismantles, displays, fastens, fixes, grinds, heats, manipulates, measures, mends, mixes, organizes, sketches.
Mechanism (basic proficiency): 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	**Examples:** Use a personal computer. Repair a leaking faucet. Drive a car. **Key Words:** assembles, calibrates, constructs, dismantles, displays, fastens, fixes, grinds, heats, manipulates, measures, mends, mixes, organizes, sketches.
Guided Response: The early stages in learning a complex skill that includes imitation and trial and error. Adequacy of performance is achieved by practicing.	**Examples:** Performs a mathematical equation as demonstrated. Follows instructions to build a model. Responds hand-signals of instructor while learning to operate a forklift. **Key Words:** copies, traces, follows, react, reproduce, responds
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).	**Examples:** Knows and acts upon a sequence of steps in a manufacturing process. Recognize one's abilities and limitations. Shows desire to learn a new process (motivation). NOTE: This subdivision of Psychomotor is closely related with the "Responding to phenomena" subdivision of the Affective domain. **Key Words:** begins, displays, explains, moves, proceeds, reacts, shows, states, volunteers.
Perception (awareness): The ability to use sensory cues to guide motor activity. This ranges from sensory stimulation, through cue selection, to translation.	**Examples:** Detects non-verbal communication cues. Estimate where a ball will land after it is thrown and then moving to the correct location to catch the ball. Adjusts heat of stove to correct temperature by smell and taste of food. Adjusts the height of the forks on a forklift by comparing where the forks are in relation to the pallet. **Key Words:** chooses, describes, detects, differentiates, distinguishes, identifies, isolates, relates, selects.

Adapted from http://www.nwlink.com/~donclark/hrd/Bloom/psychomotor_domain.html

Diagnosing an SLO

Student Learning Outcomes should clearly align with Program Learning Outcomes. See examples of how the SLOs relate to PLOs from some sample Kinesiology, Business, Communications, English Literature and Social work programs here.

Examples of Student Learning Outcomes (SLOs)

A. From a Kinesiology program:

One of the **PLOs** is:

> *Students will be able to develop, implement, and evaluate health promotion programs for specific target programs.*

One course syllabus related to that PLO has these **SLOs**:

1. Explain models currently used in health promotion programming;
2. Conduct a needs assessment;
3. Develop a program rationale;
4. Specify how to recruit and select advisory committee members;
5. Write program goals and objectives;
6. Create a marketing brochure;
7. Predict factors that may prevent program success;
8. Develop methods to evaluate program success.

B. From a Business program:

One of the **PLOs** is:

Students will understand and apply financial management principles and practices.

One course syllabus related to that PLO has these **SLOs**:

1. Analyze and interpret changes in the operating profitability of a firm using the rate of return on assets and its components, profit margin and total assets turnover.
2. Analyze and interpret changes in the rate of return on common shareholders' equity, including the conditions when a firm uses financial leverage successfully.
3. Explain the importance of effective working capital management
4. Apply analytical tools for assessing short-term liquidity risk.
5. Explain the benefits and risks of financial leverage
6. Apply analytical tools for assessing long-term solvency risk.

C. From a Communications program:

One of the **PLOs** is:

Students will explain the major developments in the history of communication technology, demonstrating how innovation and institutionalization occur in different settings.

One course syllabus related to that PLO has these **SLOs**:

1. Write an analysis comparing and contrasting, different technologies across different cultural contexts.
2. Summarize the major technological developments in communication from prehistory to the present.
3. Describe the uses, strengths, and weaknesses of one modern communication technology.

D. From an English Literature program:

One of the **PLOs** is:

Students will be able to analyze a given piece of literature.

One course syllabus related to that PLO has these **SLOs**:

1. Explain the themes, symbols, metrics, and other conventions common to this period of literature.
2. Describe how the historical and social context of the times influenced a given piece of literature.
3. Analyze a given piece of literature by comparing it to other works of that historical timeframe.

E. From a Social Work program

One of the **PLOs** is:

Apply critical thinking skills within the context of professional social work practice.

One course syllabus related to that PLO has these **SLOs**:

1. Analyze media coverage for information regarding social problems, policies, and programs.
2. Describe various programs in public assistance, social insurance, and social services.
3. Identify the personal, professional and political values that influence a particular policy formulation, implementation, and evaluation.

Outcomes Alignment: Kinesiology program

PLO #4 Students will be able to develop, implement, and evaluate health promotion programs for specific target programs.
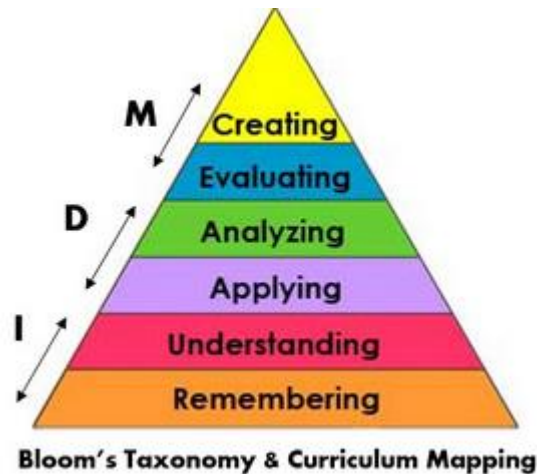
Example	Program Learning Outcomes			
Courses	PLO #1	PLO #2	PLO #3	**PLO #4**
100		I	I	
110	I, D			I, D
200		D		
202		D		
300	D			
310		M		
405	M		M (A)	M
499	M (A)	M (A)	M (A)	**M (A)**

Student Learning Outcomes for Course 499, PLO #4

- **Predict f**actors that may prevent program success
- **Create** a marketing brochure
- **Develop** a program rationale
- **Develop** methods to evaluate program success
- **Construct** program goals and objectives
- **Conduct** a needs assessment
- **Summarize** how to recruit and select advisory committee members
- **Explain** models currently used in health promotion programming

Bloom's Taxonomy & Curriculum Mapping

Curriculum Alignment

Examples of course learning outcomes which connect to relevant course activities, assignments, and assessment strategies.

Course outcomes	Relevant activities	Relevant assignment	Relevant assessment strategies
Analyze literary works for their structure and meaning	• Writing to learn • Scaffold writing assignments with feedback	Final paper	Rubrics for the level of **analysis**
Critically reflect on social justice rooted in community-based experiences	• Class presentation by community partner • Conduct research on social justice topic and local community partner • Complete a local service learning experience	• Write reflective/research paper • Conduct class presentation synthesizing all components	Assessed by community partner using criteria **on critical reflections**
Identify soil texture and structure	Field trip for sample collection	• Test samples in lab • Complete practice quizzes and discuss	Final essay exam where soil samples **are identified**
Critically evaluate the choreography, performance, and theatrical elements of a dance performance	• Observe instructor critique filmed dance performance segments. • Watch film performances and analyze elements with feedback. • In pairs, attend and evaluate campus dance rehearsals and report back to class.	Attend a live campus performance	**A comprehensive written critique of each of the elements**
Compare and contrast the multiple determinants of behavior (environmental, biological, and genetic)	• Use team-based learning • Present problem-based scenarios to teams • Analyze mini-case studies • Conduct research for scenario provided	Conduct poster session for program faculty and students	Criteria for posters **that demonstrate compare/contrast for the content learned**
Develop and present an integrated marketing communications advertising campaign	• Working in teams, students develop campaign with local business owners • Campaign submitted in stages • Students practice assessing campaign examples	• Campaign presented in class • Final written campaign submitted	Campaign **development and presentation** assessed by peers (and faculty) for presence of elements

Sources

Adapted from, "From Program Outcomes to Course Outcomes: Examples." Skidmore College, Curriculum Coordinating Council. Sarasota Springs, NY. seattlecentral.edu/~crc/Assessment/IA_Program_to_Course_Outcomes.htm. Last updated April 19, 2006 by Geoff Mathay. Accessed 22 Aug. 2016.

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