Faculty Hub

Course Design Process
Step One:

Developing Learning Outcomes

Why Develop Learning Outcomes?

Clear, concise and measurable learning outcomes will facilitate and drive course development, by focusing design efforts on the essential skills, knowledge and attitudes students will need, in order to exercise the competency(ies).

Learning outcomes are key to creating an aligned course, or a course in which content, context, instructional strategies, learning activities, and assessment all work together to support students' development of the ministerial competency(ies).

Identifying the essential knowledge and skills needed to be developed in your course(s) and then communicating these outcomes to students, will help clarify what is expected of them. Writing good learning outcomes is the first step in the course design process, setting the stage for and driving a well-organized course.

What are Learning Outcomes?

Learning outcomes are always described in terms of the **learner** and highlight the end state – the **result** of the lesson, module, course, semester or program. **Learning outcomes articulate what students should be able to do by the end of a unit, a lesson or a course.**

They are:

- Observable and measurable
- Results oriented / clearly written / specific
- Communicate what a successful learning performance looks like

Learning outcomes answer the question: **"What should students be able to do at the end of the course?"**

Examples of Learning Outcomes:

NOT MEASURABLE	GOOD	BETTER
Understand the significance of the Neolithic Revolution.	Explain the significance of the Neolithic Revolution.	Explain the characteristics of the Neolithic Revolution and its impact on the early civilizations.
Become familiar with evolutionary theory about human behavior.	Evaluate the origins of evolutionary theory about human behavior.	Evaluate the evidence for various frameworks surrounding evolutionary theory about human behavior.
Understand bonding and molecular structure theories.	Use bonding and molecular structure theories.	Use bonding and molecular structure theories to predict chemical properties of elements and compounds.
Understand the derivative of a function at a point.	Interpret the derivative of a function at a point as the slope of the tangent line.	Interpret the derivative of a function at a point as the slope of the tangent line and estimate its value from the graph of a function.
Gain an appreciation for the development of art in its global context.	Make cross-cultural comparisons of historical art works from 1400-1945.	Make cross-cultural comparisons of historical art works Europe, North America, Japan, China, Korea, and parts of Africa from 1400-1945.

Source: coursemapguide.com

When exercising a competency, students mobilize their knowledge, skills, attitudes and abilities to do something: solve a problem, perform a task, generate ideas, analyse situations, etc.

The most effective learning outcomes articulate what students should be able to do **as a result of** the knowledge, skills and attitudes they have developed. They are **precise**, **observable** and **measurable**.

Aligning Learning Outcomes to Competencies

Competency  Outcomes

The main distinction between a competency and a true learning outcome is that a learning outcome is written so that it can be measured or assessed.

Here is an example of a competency and the corresponding learning outcomes:

Competency: To perform musical works **

Elements of the competency*: (the performance criteria are not shown here but, should be aligned with the outcomes as well)*

1. Apply sight reading technique
2. Apply instrumental or vocal technique
3. Express oneself in various musical styles
4. Display a sense of artistry when performing
5. Demonstrate critical self-evaluation.

Outcomes aligned to the competency to be developed:

At the end of this course, students should be able to:

- Perform a rehearsed classical piece on the piano in front of an audience
- Accompany a singer on the piano
- Perform a jazz piece
- Improvise a jazz solo

Assessment aligned to the learning outcomes:

Here are potential assessments that are summative in nature (all outcomes are evaluated):

1. Play Mozart's Concerto #24 on the piano and
2. Sight read and accompany a jazz singer on the piano play a solo during this performance

Question: Do you see the link between the competency that is exercised, “To perform a musical piece” and the expected outcomes? Do you see how the assessment is tied to the outcomes? Would a student be able to see these links?

Note: Competency statements are not "vague" - they are general

Why? Because competencies may be exercised in a variety of different situations – the knowledge and skills developed are transferable. Had the competency been "To perform a musical piece on the Piano", it would limit its exercise. The statement “to perform a musical piece” applies to piano playing, saxophone, singing etc. The competency statement reflects the knowledge and skills that are leveraged when performing musical pieces, no matter the instrument. The knowledge and skills particular to the instrument(s) are left to the music department's choice of instrument(s) and to the course(s) developing them.

A competency is general so that it can be exercised in a variety of situations - the learning outcomes, on the other hand, are specific, concise and measurable.

Now that we know what we expect students to be able to do by the end of the course(s) that develop the competency “to perform a musical piece”, we can start developing the content: the learning activities and, formative and summative assessments.

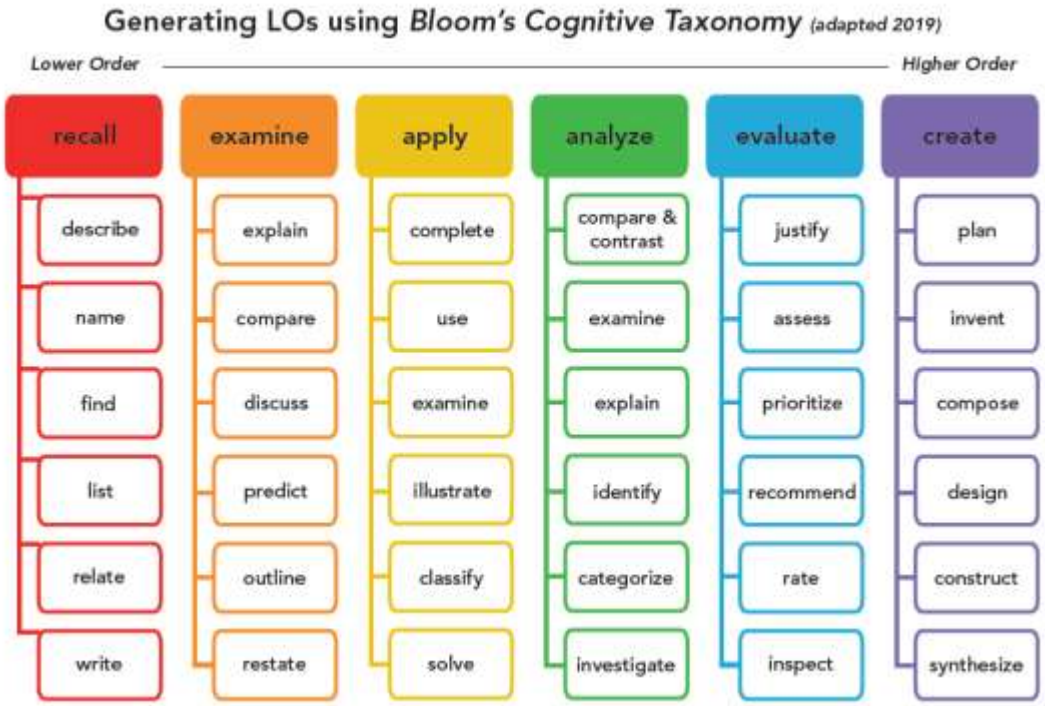
Writing Learning Outcomes

Learning outcomes include the following:

- Action verb
- Subject content
- Level of achievement
- Condition of performance (if applicable)

Bloom’s Taxonomy is useful for identifying verbs to describe learning outcomes depending on the level at which the competency is to be exercised. The ministerial objectives and standards that define competencies, make use of Bloom’s taxonomy.

Examples of verbs include but are not limited to:



Source: http://maasd.edublogs.org/2012/26/linking-ipads-blooms-taxonomy/

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LOW LEVEL THINKING SKILLS ← → HIGH LEVEL THINKING SKILLS

Knowledge

Recall /regurgitate facts without understanding. Exhibits previously learned material by recalling facts, terms, basic concepts and answers.

Key words:

Choose, Copy, Define, Duplicate, Find, How, Identify, Label, List, Listen, Locate, Match, Memorise, Name, Observe, Omit, Quote, Read, Recall, Recite, Recognise, Record, Relate, Remember, Repeat, Reproduce, Retell, Select, Show, Spell, State, Tell, Trace, What, When, Where, Which, Who, Why, Write

Actions:

Describing, Finding, Identifying, Listing, Locating, Naming, Recognising, Retrieving

Outcomes:

Definition, Fact, Label, List, Quiz, Reproduction, Test, Workbook, Worksheet

Questions:

Can you list three ...?
Can you recall ...?
Can you select ...?
How did _____ happen?
How is ...?
How would you describe ...?
How would you explain ...?
How would you show ...?
What is ...?
When did ...?
When did _____ happen?
Where is . . . ?
Which one ...?
Who was ...?
Who were the main . . . ?
Why did ...?

Comprehension

To show understanding finding information from the text. Demonstrating basic understanding of facts and ideas.

Key words:

Ask, Cite, Classify, Compare, Contrast, Demonstrate, Discuss, Estimate, Explain, Express, Extend, Generalise, Give examples, Illustrate, illustrate, Indicate, Infer, Interpret, Match, Observe, Outline, Predict, Purpose, Relate, Rephrase, Report, Restate, Review, Show, Summarise, Translate

Actions:

Classifying, Comparing, Exemplifying, Explaining, Inferring, Interpreting, Paraphrasing, Summarising

Outcomes:

Collection, Examples, Explanation, Label, List, Outline, Quiz, Show and tell, Summary

Questions:

Can you explain what is happening . . . what is meant . . .?
How would you classify the type of ...?
How would you compare ...?contrast ...?
How would you rephrase the meaning ...?
How would you summarise ...?
What can you say about ...?
What facts or ideas show ...?
What is the main idea of ...?
Which is the best answer ...?
Which statements support ...?
Will you state or interpret in your own words ...?

Application

To use in a new situation. Solving problems by applying acquired knowledge, facts, techniques and rules in a different way.

Key words:

Act, Administer, Apply, Associate, Build, Calculate, Categorise, Choose, Classify, Connect, Construct, Correlation, Demonstrate, Develop, Dramatise, Employ, Experiment with, Group, Identify, Illustrate, Interpret, Interview, Link, Make use of, Manipulate, Model, Organise, Perform, Plan, Practice, Relate, Represent, Select, Show, Simulate, Solve, Summarise, Teach, Transfer, Translate, Use

Actions:

Carrying out, Executing, Implementing, Using

Outcomes:

Demonstration, Diary, Illustrations, Interview, Journal, Performance, Presentation, Sculpture, Simulation

Questions:

How would you use...?
What examples can you find to ...?
How would you solve _____ using what you have learned ...?
How would you organise _____ to show ...?
How would you show your understanding of ...?
What approach would you use to...?
How would you apply what you learned to develop ...?
What other way would you plan to ...?
What would result if ...?
Can you make use of the facts to ...?
What elements would you choose to change ...?
What facts would you select to show ...?
What questions would you ask in an interview with ...?

Analysis

To examine in detail. Examining and breaking information into parts by identifying motives or causes; making inferences and finding evidence to support generalisations.

Key words:

Analyse, Appraise, Arrange, Assumption, Breakdown, Categorise, Cause and effect, Choose, Classify, Differences, Discover, Discriminate, Dissect, Distinction, Distinguish, Divide, Establish, Examine, Find, Focus, Function, Group, Highlight, In-depth discussion, Inference, Inspect, Investigate, Isolate, List, Motive, Omit, Order, Organise, Point out, Prioritize, Question, Rank, Reason, Relationships, Reorganise, Research, See, Select, Separate, Similar to, Simplify, Survey, Take part in, Test for, Theme, Comparing

Actions:

Attributing, Deconstructing, Integrating, Organising, Outlining, Structuring

Outcomes:

Abstract, Chart, Checklist, Database, Graph, Mobile, Report, Spread sheet, Survey

Questions:

What are the parts or features of ...?
How is _____ related to ...?
Why do you think ...?
What is the theme ...?
What motive is there ...?
Can you list the parts ...?
What inference can you make ...?
What conclusions can you draw ...?
How would you classify ...?
How would you categorise ...?
Can you identify the difference parts ...?
What evidence can you find ...?
What is the relationship between ...?
Can you make a distinction between ...?
What is the function of ...?
What ideas justify ...?

Synthesis

To change or create into something new. Compiling information together in a different way by combining elements in a new pattern or proposing alternative solutions.

Key words:

Adapt, Add to, Build, Change, Choose, Combine, Compile, Compose, Construct, Convert, Create, Delete, Design, Develop, Devise, Discover, Discuss, Elaborate, Estimate, Experiment, Extend, Formulate, Happen, Hypothesise, Imagine, Improve, Innovate, Integrate, Invent, Make up, Maximise, Minimise, Model, Modify, Original, Originate, Plan, Predict, Produce, Propose, Reframe, Revise, Rewrite, Simplify, Solve, Speculate, Substitute, Suppose, Tabulate, Test, Theorise, Think, Transform, Visualise

Actions:

Constructing, Designing, Devising, Inventing, Making, Planning, Producing

Outcomes:

Advertisement, Film, Media product, New game, Painting, Plan, Project, Song, Story

Questions:

What changes would you make to solve...?
How would you improve ...?
What would happen if...?
Can you elaborate on the reason...?
Can you propose an alternative...?
Can you invent...?
How would you adapt _____ to create a different...?
How could you change (modify) the plot (plan)...?
What could be done to minimise (maximise)...?
What way would you design...?
Suppose you could _____ what would you do...?
How would you test...?
Can you formulate a theory for...?
Can you predict the outcome if...?
How would you estimate the results for...?
What facts can you compile...?
Can you construct a model that would change...?
Can you think of an original way for the ...?

Evaluation

To justify. Presenting and defending opinions by making judgements about information, validity of ideas or quality of work based on a set of criteria.

Key words:

Agree, Appraise, Argue, Assess, Award, Bad, Choose, Compare, Conclude, Consider, Convince, Criteria, Criticise, Debate, Decide, Deduct, Defend, Determine, Disprove, Dispute, Effective, Estimate, Evaluate, Explain, Give reasons, Good, Grade, How do we know?, Importance, Infer, Influence, Interpret, Judge, Justify, Mark, Measure, Opinion, Perceive, Persuade, Prioritise, Prove, Rate, Recommend, Rule on, Select, Support, Test, Useful, Validate, Value, Why

Actions:

Attributing, Checking, Deconstructing, Integrating, Organising, Outlining, Structuring

Outcomes:

Abstract, Chart, Checklist, Database, Graph, Mobile, Report, Spread sheet, Survey

Questions:

Do you agree with the actions/outcomes...?
What is your opinion of...?
How would you prove/disprove...?
Can you assess the value/importance of...?
Would it be better if...?
Why did they (the character) choose...?
What would you recommend...?
How would you rate the...?
What would you cite to defend the actions...?
How would you evaluate ...?
How could you determine...?
What choice would you have made...?
What would you select...?
How would you prioritise...?
What judgement would you make about...?
Based on what you know, how would you explain...?
What information would you use to support the view...?
How would you justify...?
What data was used to make the conclusion...?

Bloom's Taxonomy: Teacher Planning Kit

Source: https://www.cebm.net/wp-content/uploads/2016/09/Blooms-Taxonomy-Teacher-Planning-Kit.pdf

Lastly, here are some examples of learning outcomes from a variety of disciplines or fields of study[1]:

At the end of the course students should be able to:

Business & Leadership

- Negotiate with the client acceptable deliverables for the consulting period
- Develop and execute a work plan
- Use writing skills to maintain working documents that describe, plan, persuade, and coordinate work with others

Communication

- Plan presentations based on audience needs and expectations
- Project personal credibility and professionalism
- Synthesize information and ideas from multiple texts and sources
- Articulate a variety of ideas and attitudes
- Deliver oral presentations
- Communicate ideas in writing in a clear, coherent, and logical style

Computing

- Write SQL queries to retrieve information from a relational database
- Explain and apply data mining concepts
- Solve problems using matrix techniques and algorithms

Design

- Use typography as a form of poetic visual rhetoric that includes denotative and connotative voices
- To discover, manipulate, and create concrete examples of type used as image
- Analyze existing typographic systems and apply lessons learned to the creation of your own system
- Articulate ideas well both visually and verbally
- Articulate the difference between designing for an experience and designing for interaction, and create examples of each
- Develop a design specification for discrete scenic elements
- Generate concept designs for these elements using various approaches
- Generate schematic and fabrication drawings

[1]Many examples listed here are adapted from Portland Community College – please note that not all learning outcomes presented on the PCC site are concise, precise and measurable. Presented here are some of the better formulated learning outcomes.

Economics

- Critique the theories and methods of regional economic development in their application to a region
- Recommend a regional development strategy based on a theoretical critique and economic analysis
- Apply microeconomic principles to explain why environmental problems occur
- Apply microeconomic principles to determine economically efficient allocations of environmental resources
- Use microeconomic and macroeconomic concepts to evaluate the consequences of public policies that are intended to improve the use of environmental resources
- Identify the characteristics of public goods and how they differ from private goods
- Evaluate the extent to which government should interfere in markets
- Identify characteristics of market failures and from where they come

English (Source: Lorne Roberts, English teacher, Dawson College)

- Create a clear, defensible thesis statement about a literary work, consisting of a theme and a debatable claim about that theme
- Organize a literary analysis into a clear written expression, through a formal argumentative essay of 750 words

Finance (Source: Tepper School of Business)

- Set up and solve linear, quadratic, and stochastic optimization problems that fit an investor's goals and constraints (e.g., short-term time horizon, long-term time horizon, dynamic consumption)
- Assess the strengths and limitations of xxx models for a given business problem

Languages

- Introduce oneself appropriately with different levels of formality according to the situation in Spanish
- Talk about daily routines and educational experience in German
- Describe family relationships and members in Italian
- Communicate preferences, likes and dislikes in French
- Participate in a situation where items are bought or exchanged in French
- Discuss celebrations and personal relationships in (insert language, e.g. French)

Mathematics

- Develop short but rigorous proofs of true mathematical statements and construct counterexamples for false statements
- Formulate real life problems (word problems) into mathematical language, and solve them by using multivariate analysis techniques

Organic Chemistry

- Recognize the structures of amino acids, carbohydrates, lipids, and nucleic acids.
- Predict the net charge on ionizable groups at any given pH
- Predict, in qualitative terms, the role of molecular forces in stabilizing protein-drug complexes and the potential effect of chiral centers on drug activity
- Construct expression plasmids for the expression of potential drug targets in E. Coli
- Interpret DNA sequencing data

Physics

- Use matrix mechanics to calculate properties of systems with spin angular momentum
- Carry out basic calculations related to systems of two spin-1/2 particles, such as the hydrogen atom
- Use wave mechanics in 1 dimension to describe continuous degrees of freedom such as position and momentum for a quantum system and

Psychology

- Recognize and recall major terms and concepts in cognitive psychology
- Describe and explain major methods and theories in cognitive psychology
- Apply theories or findings in abnormal psychology to real world situations

Research and Data Analysis

- Read and interpret empirical results in published research
- Identify the assumptions needed to infer causal relationships and assess their plausibility
- Identify and clearly define a problem/issue
- Generate and organize qualitative and qualitative evidence to support arguments and recommendations

Systems

- Generate systems specifications from a perceived need
- Produce interface specifications for a system composed of numerous subsystems
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Visual & Digital Arts

- Animate a 3D character
- Demonstrate emotion on a 2D character
- Play a 10 minute classical music piece from memory
- Create a sculpture to represent a contemporary social issue

Writing

- Write a story using journalistic style
- Research a topic, develop a position, and communicate your view using subjective and objective voice