



# Developing Learning Outcomes:

A Guide for University of Toronto Faculty



UNIVERSITY OF  
TORONTO

CENTRE FOR TEACHING SUPPORT & INNOVATION

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*Please note that in addition to the content of this guide, we have also provided links to different resources that you can access for further information. The nature of websites is that they are always changing and so it is possible that the links will not work. If you find that one of the links in this document is broken, please contact [ctsi.teaching@utoronto.ca](mailto:ctsi.teaching@utoronto.ca).*

# WHAT ARE LEARNING OUTCOMES?



... think first about what is essential that students know or be able to do after the course or program – what students need to know and could make powerful use of to enhance their lives and more effectively contribute to society. We believe that such reflection will lead instructors to focus on a broad synthesis of abilities that combine knowledge, skills and values into a whole that reflects how people really use knowledge. “

*So, what's a learning outcome anyway?* Mark Battersby, p. 1

Learning outcomes are statements that describe the knowledge or skills students should acquire by the end of a particular assignment, class, course, or program, and help students understand why that knowledge and those skills will be useful to them. They focus on the context and potential applications of knowledge and skills, help students connect learning in various contexts, and help guide assessment and evaluation.

Good learning outcomes emphasize the application and integration of knowledge. Instead of focusing on coverage of material, learning outcomes articulate how students will be able to employ the material, both in the context of the class and more broadly.

## Example of Learning Outcomes:

By the end of this course, students will be able to:

- identify and describe the political, religious, economic, and social uses of art in Italy during the Renaissance
- identify a range of works of art and artists
- analyze the role of art and of the artist in Italy at this time
- analyze the art of the period according to objective methods
- link different materials and types of art to the attitudes and values of the period
- evaluate and defend their response to a range of art historical issues

For more examples of learning outcomes, please see Appendix A.

## LEARNING OUTCOMES VS. LEARNING OBJECTIVES?

The distinction between learning outcomes and learning objectives is not universally recognized, and many instructors may find that the term 'learning outcomes' describes what they have already understood by the term 'learning objectives'. Some scholars make no distinction between the two terms; those who do usually suggest that learning outcomes are a subset or type of learning objective. Learning objectives, for example, may outline the material the instructor intends to cover or the disciplinary questions the class will address. By contrast, learning outcomes should focus on what the student should know and realistically be able to do by the end of an assignment, activity, class, or course. The same goals addressed by learning objectives can be equally addressed by learning outcomes, but by focusing on the application and integration of the course content from the perspective of the student, learning outcomes can more explicitly and directly address expectations for student learning.

Many instructors may find that the reflective process of developing learning outcomes is something that they have already incorporated into their course planning processes. The phrase 'learning outcomes' thus simply offers a more precise term for discussing the creation of learning aims and expectations that centre on application and integration of course content.



## WHY DEVELOP LEARNING OUTCOMES?

***"...students already know they want a degree. The challenge is to help students become highly intentional about the forms of learning and accomplishment that the degree should represent."***

***College Learning for the New Global Century, AAC&U, p. 29***

Learning outcomes are valuable to learners, instructors, and administrators. Mark Battersby (1999) of the Learning Outcomes Network explains that learning outcomes are more than simply several sentences appended to existing lesson plans or curricula; instead, the development of learning outcomes and their use within a unit of instruction shapes learning and assessment activities and can enhance student engagement and learning.

Because of their ability to benefit many groups in postsecondary education, the development of learning outcomes has become an increasing priority for instructors and institutions over the course of the last decade. Establishing a focus on integrated, generalizable, and transferable skills complements contemporary demands on graduates and builds a foundation for lifelong learning. As government and public attention on the products of higher education increases, learning outcomes help to define the goals and essential aspects of higher education within the institution, to students, and to the general public.

FOR STUDENTS	FOR INSTRUCTORS	FOR INSTITUTIONS & ADMINISTRATORS
<ul style="list-style-type: none"> <li>• By focusing on the application of knowledge and skills learned in a course and on the integration of knowledge and skills with other areas of their lives, students are more connected to their learning and to the material of the course.</li> <li>• The emphasis on integration and generalizable skills helps students draw connections between courses and between coursework and other kinds of knowledge, enhancing student engagement.</li> <li>• Students understand the conditions and goals of their assessment.</li> </ul>	<ul style="list-style-type: none"> <li>• The process of developing learning outcomes itself offers an opportunity for reflection on the content of the course in the context of its potential applications. Developing learning outcomes means that the context of the learning will always be emphasized, and courses focus on the knowledge and skills that will be most valuable to the student now and in the future.</li> <li>• Learning outcomes point to useful methods of assessment.</li> <li>• Learning outcomes allow instructors to set the standards by which the success of the course will be evaluated.</li> </ul>	<ul style="list-style-type: none"> <li>• In order to determine what is essential for students to know, an instructor must consider the particular course or unit in the context of future coursework and the curriculum as a whole. This contributes to the development of a coherent curriculum within a decentralized institution while maintaining instructor autonomy, and helps to ensure that students are prepared for future work and learning.</li> <li>• The application and integration of learning emphasized by learning outcomes reflect and support the contemporary nature and priorities of the university, enhancing student engagement, uncovering opportunities for interdisciplinary, and providing guidance and support for students with many different kinds of previous academic preparation.</li> <li>• Learning outcomes provide structures from which courses and programs can be evaluated and can assist in program and curricular design, identify gaps or overlap in program offerings, and clarify instructional, programmatic, and institutional priorities.</li> </ul>

# TOOLS FOR DEVELOPING LEARNING OUTCOMES

Learning outcomes should outline the most central and essential elements of a particular course or program. They will also shape assessment. As such, the process of developing learning outcomes offers an opportunity for reflection on what is most necessary to help learners gain this knowledge and these skills. Considering (1) key words for the course, (2) desired types of learning, and (3) the context in which the knowledge and skills gained in the course will be used, including possible applications, provides a foundation for the development of learning outcomes.

## 1. Language: Articulating your outcomes

To begin the process of developing learning outcomes, it may be useful to brainstorm some key words central to the disciplinary content and generalizable skills taught in the course. In addition to the information about context and types of learning provided below, you may wish to consider the following questions as you develop this list of key words:

- What are the essential things students must know to be able to succeed in the course?
- What are the essential things students must be able to do to succeed in the course?
- What knowledge or skills do students bring to the course that the course will build on?
- What knowledge or skills will be new to students in the course?
- What other areas of knowledge are connected to the work of the course?

## 2. Educational objectives: Addressing levels of learning

Scholars working in pedagogy and epistemology offer us taxonomies of learning that can help make learning outcomes more precise. These levels of learning can also help develop assessment and evaluation methods appropriate to the learning outcomes for the course.

### Bloom's Taxonomy of Educational Objectives

Bloom's Taxonomy of Educational Objectives is particularly useful because it associates particular verbs with each level of learning. Although Bloom's Taxonomy is a hierarchy, each type of learning can be a valuable aspect of a course. Ultimately, however, learning outcomes should focus on the "higher order thinking" found in the highest levels of the Taxonomy: analyze, evaluate, and create. Bloom's Taxonomy was developed in 1956, and was revised in 2001 by Bloom's colleagues, Lorin Anderson and David Krathwohl. The revised Taxonomy is presented here.

For additional examples of verbs aligned with each type of learning, please see Appendix B.

	USEFUL VERBS
1) <b>Remember:</b> <i>recall</i> of information	define, identify, list, name, recall, repeat, state
2) <b>Understand:</b> <i>demonstration</i> of comprehension	classify, describe, locate, report, restate, summarize
3) <b>Apply:</b> <i>applying</i> knowledge in a new context	employ, illustrate, solve, use
4) <b>Analyze:</b> <i>supporting</i> assertions through the use of evidence and arguments; <i>identifying causes</i> and <i>patterns</i>	compare, contrast, criticize, distinguish, examine, question, test
5) <b>Evaluate:</b> coming to a <i>judgment</i> on the value of information or the validity of arguments	appraise, argue, assess, defend, predict, select, support
6) <b>Create:</b> <i>combining</i> or <i>grouping</i> knowledge to come to <i>new</i> conclusions	assemble, collect, construct, develop, formulate, organize, propose

For an alternative taxonomy, please also see information on the Structure of Observed Learning Outcomes (SOLO) taxonomy in Appendix C. For more information about Bloom's original and the revised Taxonomy of Educational Objectives, please see Appendix C.

[Information about Bloom's revised taxonomy drawn from Anderson & Krathwohl (2001).]

### **Content, skills, values**

These three areas can be used to identify and describe different aspects of learning that might take place in a course. Content can be used to describe the disciplinary information covered in the course. This content might be vital to future work or learning in the area. A learning outcome focused on content might read:

By the end of this course, students will be able recall **the 5** major events leading up to the Riel Rebellion and describe their role in initiating the Rebellion.

Skills can refer to the disciplinary or generalizable skills that students should be able to employ by the conclusion of the class. A learning outcome focused on skills might read:

By the end of this course, students will be able to define the characteristics and limitations of historical research.

Some learning outcomes might articulate desired values: attitudes or beliefs that are imparted or investigated in the course of learning in a field or discipline. In particular, value-oriented learning outcomes might focus on ways that knowledge or skills gained in the course will enrich students' experiences throughout their lives. A learning outcome focused on values might read:

By the end of this course, students will be able to articulate their personal responses to a literary work they have selected independently.



More guidance is needed to support effective program planning and tie the goals of individual programs to the overall degree objectives.... Appropriate statements of learning objectives would help faculty with curriculum planning and ensure that our [programs of study] are coherent.

*Curriculum review and renewal final report, University of Toronto Faculty of Arts & Science, p. 19.*



### 3. Context - Connecting your outcomes

Learning outcomes help instructors and learners focus on the potential applications of the knowledge and skills gained in the course. In turn, this helps students perceive the value of their learning, and helps instructors develop appropriate assessment tools. In developing learning outcomes, some questions that allow for reflection on the context of the learning taking place in the course might include:

#### *How does this course fit into the student's program or curriculum?*

- If the course is part of the major or specialization, what knowledge or skills should students have coming into the course? What knowledge or skills must they have by its conclusion in order to proceed through their program?
- How can this course contribute to the student's broad learning and the student's understanding of other subjects or disciplines?

- What are the priorities of the department or faculty within which the course takes place? How does the particular focus of the course contribute to those broader goals?
- Does the course play a particular role within the student's program (introductory, elective, summative)? How is the course shaped by this role?

#### *How does this course fit into the student's personal or professional future?*

- What knowledge or skills gained in this course will serve students throughout their lives? How will the class shape the student's general understanding of the world?
- Which careers commonly stem from education in this field? What are the skills or knowledge essential to these careers? What kinds of work are produced in those careers?
- How can this course enrich a student's personal or professional life? How can the student employ the knowledge and skills gained in the class to make his or her own life, or the lives of others, better?
- Where will the student encounter the subject matter of the course elsewhere in his or her life? In what situations might the knowledge or skills gained in the course be useful to the student?

# CHARACTERISTICS OF GOOD LEARNING OUTCOMES

Good learning outcomes focus on the application and integration of the knowledge and skills acquired in a particular unit of instruction (e.g. activity, course program, etc.), and emerge from a process of reflection on the essential contents of a course. More specifically, good learning outcomes:

- Are very **specific**, and use **active language** – and verbs in particular – that make expectations clear. This informs students of the standards by which they will be assessed, and ensures that student and instructor goals in the course are aligned. Where possible, avoid terms like understand, demonstrate, or discuss that can be interpreted in many ways. Please see Appendix B for a list of useful verbs.

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VAGUE OUTCOME	MORE PRECISE OUTCOME
By the end of the course, I expect students to increase their organization, writing, and presentation skills.	By the end of the course, students will be able to: <ul style="list-style-type: none"> <li>• produce professional quality writing</li> <li>• effectively communicate the results of their research findings and analyses to fellow classmates in an oral presentation</li> </ul>
By the end of this course, students will be able to use secondary critical material effectively and to think independently.	By the end of this course, students will be able to evaluate the theoretical and methodological foundations of secondary critical material and employ this evaluation to defend their position on the topic.

- Should be **flexible**: while individual outcomes should be specific, instructors should feel comfortable adding, removing, or adjusting learning outcomes over the length of a course if initial outcomes prove to be inadequate.
- Are **focused on the learner**: rather than explaining what the instructor will do in the course, good learning outcomes describe knowledge or skills that the student will employ, and help the learner understand why that knowledge and those skills are useful and valuable to their personal, professional, and academic future.
- Are **realistic**, not aspirational: all passing students should be able to demonstrate the knowledge or skill described by the learning outcome at the conclusion of the course. In this way, learning outcomes establish standards for the course.
- Focus on the **application** and **integration** of acquired knowledge and skills: good learning outcomes reflect and indicate the ways in which the described knowledge and skills may be used by the learner now and in the future.
- Indicate useful **modes of assessment** and the specific elements that will be assessed: good learning outcomes prepare students for assessment and help them feel engaged in and empowered by the assessment and evaluation process.
- Offer a **timeline** for completion of the desired learning.

Each assignment, activity, or course might usefully employ between approximately five and ten learning outcomes; this number allows the learning outcomes to cover a variety of knowledge and skills while retaining a focus on essential elements of the course.



*When writing your outcomes, keep in mind...*

**Learning outcomes should be SMART(TT):**

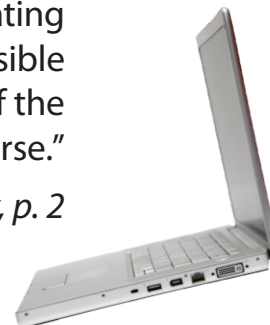
<p><b>S</b> PEAK TO THE LEARNER</p>	<p>learning outcomes should address what the learner will know or be able to do at the completion of the course</p>	<p>The SMART(TT) method of goal setting is adapted from <b>Blanchard, K., &amp; Johnson, S.</b> (1981). <i>The one minute manager</i>. New York: Harper Collins.</p>
<p><b>M</b> EASURABLE</p>	<p>learning outcomes must indicate how learning will be assessed</p>	
<p><b>A</b> PPLICABLE</p>	<p>learning outcomes should emphasize ways in which the learner is likely to use the knowledge or skills gained</p>	
<p><b>R</b> EALISTIC</p>	<p>all learners who complete the activity or course satisfactorily should be able to demonstrate the knowledge or skills addressed in the outcome</p>	
<p><b>T</b> IME - BOUND</p>	<p>the learning outcome should set a deadline by which the knowledge or skills should be acquired</p>	
<p><b>T</b> RANSPARENT</p>	<p>should be easily understood by the learner</p>	
<p><b>T</b> RANSFERABLE</p>	<p>should address knowledge and skills that will be used by the learner in a wide variety of contexts</p>	

# ASSESSMENT - FOLLOWING THROUGH ON LEARNING OUTCOMES

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“Key to the outcomes approach to assessment is the use of ‘authentic assessment’. This approach stresses creating assignments and assessments that simulate as much as possible the situations in which students would make use of the knowledge, skills and values emphasized in the course.”

*So, what’s a learning outcome anyway? Mark Battersby, p. 2*



Through assessment, learning outcomes can become fully integrated in course design and delivery. Because learning outcomes focus on the application and integration of knowledge and skills learned, learning outcomes point to appropriate modes of assessment and ensure that assessment focuses on the essential knowledge or skills of the course. Assignments and exams should match the knowledge and skills described in the course’s learning outcomes. A good learning outcome can readily be translated into an assignment or exam question; if it cannot, the learning outcome may need to be refined.

One way to match outcomes with appropriate modes of assessment is to return to Bloom’s Taxonomy of Educational Objectives: the verbs associated with each level of learning indicate the complexity of the knowledge or skills that students should be asked to demonstrate in an assignment or exam question. An outcome, for example, that asks students to recall key moments leading up to an historical event might be assessed through multiple choice or short answer questions. By contrast, an outcome that asks students to evaluate several different policy models might be assessed through a debate or written essay. Through assessment, learning outcomes can become fully integrated in course design and delivery.

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Learning outcomes may also point to more unconventional modes of assessment. Because learning outcomes can connect student learning with its application both within and outside of an academic context, learning outcomes may point to modes of assessment that parallel the type of work that students may produce with the learned knowledge and skills in their career or later in life.

The following worksheet might help you translate your instructional goals or objectives for a unit of instruction into an assessable learning outcome. Remember that each unit of instruction might have multiple learning outcomes.

UNIT OF INSTRUCTION	OBJECTIVE	OUTCOME	HOW DO YOU KNOW?	ASSESSMENT
E.g. lecture, activity, exam, course, workshop	<i>What content or skills will be covered in this instruction?</i>	<i>What should students know or be able to do as a result of this unit of instruction?</i>	<i>How will you be able to tell that students have achieved this outcome?</i>	<i>What kind of work can students produce to demonstrate this?</i>
<b>Examples:</b>				
Class activity	<ul style="list-style-type: none"> <li>• Identification and evaluation of severe weather patterns</li> <li>• Use of weather maps</li> </ul>	By completing this assignment, students will be able to accurately predict severe weather using a standard weather map	Student predictions will be compared with historical weather records	Based on this standard weather map, please indicate where you would expect to see severe weather in the next 24-hour period. Your results will be compared with historical weather records
Exam	Stylistic characteristics and common themes of Modernist literature	By the end of this unit, students will be able to identify the stylistic and thematic elements of Modernism	Students will be able to identify a passage from a Modernist novel they have not read	Read this passage. Identify which literary movement it represents and which qualities drew you to that conclusion

For a full-page version of this worksheet, please see Appendix D.

*For additional information on assessment:*

Astin, A. (1991). *Assessment for excellence*. Toronto: Collier Macmillan Canada.

Assessment. London: Educational Development Unit, London Metropolitan University.

<https://metranet.londonmet.ac.uk/fms/MRSite/psd/hr/capd/Assessment%20Framework/Assessment%20Framework/University%20Assessment%20Framework.pdf>

Core principles of effective assessment. Melbourne: Australian Universities Teaching Committee, Centre for the Study of Higher Education (Australia). <http://www.cshe.unimelb.edu.au/assessinglearning/docs/AssessingLearning.pdf>

# COURSE, PROGRAM, INSTITUTION: CONNECTING LEARNING OUTCOMES

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Learning outcomes can also be implemented at the program or institutional level to assess student learning over multiple courses, and to monitor whether students have acquired the necessary knowledge and skills at one stage to be able to move onto the next.

## **Series of courses**

Courses that require prerequisites may benefit from identifying a list of outcomes necessary for advancement from one level to another. When this knowledge and these skills are identified as outcomes as opposed to topics, assessment in the first level can directly measure preparation for the next level.

## **Program**

Many major and specialist programs identify a list of discipline-specific and multi-purpose skills, values, and areas of knowledge graduating students in the program will have. By articulating these as things that students will know or be able to do, the benefits of a program of study can be clearly communicated to prospective students, to employers, and to others in the institution.

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Athabasca University develops learning outcomes for all its undergraduate major programs. Its outcomes for the anthropology BA include:

### ***Knowledge Outcomes***

As a result of completing this program, students should be able to

- show evidence of a broad understanding of the past and present social, linguistic and cultural diversity of people and their biological diversity and evolution.
- show familiarity with the nature of the four fundamental fields within anthropology (archaeology, biological anthropology, anthropological linguistics and cultural anthropology) and their interrelationship. This familiarity will lead students to adopt a holistic and comparative approach to understanding human differences and similarities across the world and through time.
- demonstrate a familiarity with basic anthropological concepts, terminology and theory. This familiarity will lead students to an appreciation of anthropology's history and context. The application of anthropology to other discussions will become a part of students' general liberal arts and science university degree.

### ***Skills Outcomes***

As a result of completing this program, students should be able to

- show evidence of a familiarity with anthropological research methods and critically analyze their use in the research of other research methods.
- demonstrate a facility in critical thinking and reasoning by applying these skills to anthropological problems and issues.
- exhibit university-level skills in academic writing, including research and argumentation, and apply their academic writing skills to anthropological problems and issues.
- employ basic research skills to access and critically evaluate information that bears on anthropological topics from scholarly and popular sources, including electronic (web) sources, video and audio sources and printed sources.



### **Value Outcomes**

As a result of completing this program, students should be able to demonstrate a fundamental awareness of

- the cultural and social bases of human prejudice and discrimination (e.g., racism, ethnocentrism, sexism, anthropocentrism).
- anthropological insights and alternatives that foster tolerance for the diversity of human cultures, ways of life and the value of human diversity.

[From <http://www.athabasca.ca/programs/ba4anth/>]

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### **Institution**

Academic plans increasingly include a list of learning outcomes that apply across programs of study and even across degree levels. These outcomes provide an academic vision for the institution, serve as guidelines for new programs and programs undergoing review, and communicate to members of the university and the public at large the academic values and goals of the university. As previously discussed, the best learning outcomes address course-specific learning within the context of a student's broader educational experience.



One way to contribute to a coherent learning experience is to align course outcomes, when appropriate, with institutional priorities.

The University of Toronto's academic plan, *Stepping Up: A framework for academic planning at the University of Toronto, 2004-2010*, outlines institutional goals in relation to the learning experience of our undergraduate and graduate students. These priorities are further articulated in "Companion Paper 1: Enabling Teaching and Learning and the Student Experience". The skills outcomes meant to apply to all undergraduate programs follow.

Undergraduate students should leave the University of Toronto having acquired certain abilities, values, and commitments:

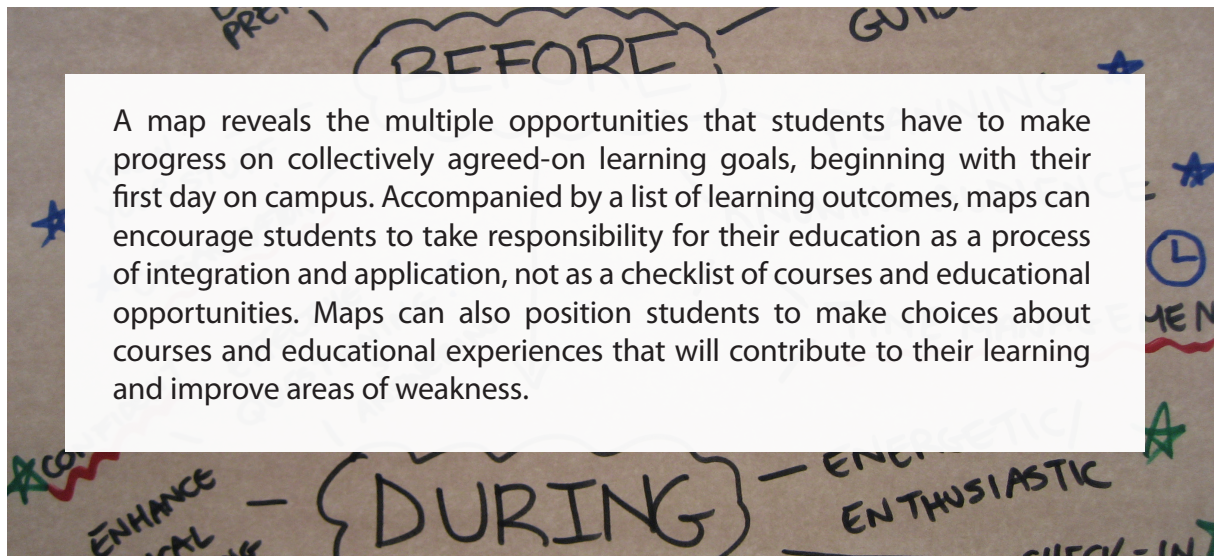
- knowing what one doesn't know and how to seek information
- able to think: that is, to reason inductively and deductively, to analyze and to synthesize, to think through moral and ethical issues, to construct a logical argument with appropriate evidence
- able to communicate clearly, substantively, and persuasively both orally and in writing
- able not only to answer questions through research and analysis but to exercise judgment about which questions are worth asking
- knowledgeable about and committed to standards of intellectual honesty and use of information
- knowing how to authenticate information, whether it comes from print sources or through new technologies
- able to collaborate with others from different disciplines in the recognition that multidisciplinary approaches are necessary to address the major issues facing society
- understanding the methods of scientific inquiry; that is, scientifically literate

[To see other learning outcomes from the U of T academic plan, please see

<https://www.studentlife.utoronto.ca/research/learningoutcomes.htm>]

## Curriculum mapping: translating between local and global learning outcomes

At the global program or institutional level, learning outcomes are often necessarily vague to allow for flexibility in their implementation and assessment. Consequently, in order to be effectively applied at the local level of a course or class, they must be reformulated for the particular setting. Similarly, learning outcomes from individual courses may be extrapolated and generalized in order to create program- or institution-wide learning outcomes. Both of these processes are most frequently accomplished through a technique called “curriculum mapping”. When moving from programmatic or institutional to course or class outcomes, curriculum mapping involves identifying which courses, portions of courses, or series of courses fulfill each programmatic or institutional learning outcome. The global learning outcomes can then be matched with course-specific outcomes that directly address the content and skills required for that particular subject material. Identifying and locating all the learning outcomes encountered by a student over the course of their program can help present learning as a coherent whole to students and others, and can help students make the connection between their learning in one course and that in another. Maki (2004) notes that understanding where particular pieces of learning take place can help students take charge of their own education:



For more information about and examples of curriculum mapping, please see Maki, P. (2004). Maps and inventories: Anchoring efforts to track student learning. *About Campus* 9(4), 2-9.

# FURTHER RESOURCES ON LEARNING OUTCOMES

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## Articles & Books:

Battersby, M. (1999). *So, what's a learning outcome anyway?* Vancouver: Centre for Curriculum, Transfer and Technology, British Columbia Ministry of Advanced Education.

*College learning for the new global century.* (2007). Washington, D.C.: Association of American Colleges & Universities.

Gosling, D & Moon, J. (2001). *How to use learning outcomes & assessment criteria.* London: Southern England Consortium for Credit Accumulation and Transfer (SEEC).

*Liberal education outcomes.* (2007). Washington, D.C.: Association of American Colleges & Universities.

Maki, P. (2004). Maps and inventories: Anchoring efforts to track student learning. *About Campus*, 9(4), 2-9.

Marsh, P.A. (2007). What is known about student learning outcomes and how does it relate to the Scholarship of Teaching and Learning? *International Journal for the Scholarship of Teaching and Learning*, 1(2).

ShIPLEY, D. (1994). Learning outcomes: Another bandwagon or a strategic instrument of reform. *College Quarterly*, 1(4).

## Websites:

*Developing learning outcomes and assessing them.* Atlanta: Teaching and Learning with Technology Center, Georgia State University. <http://www2.gsu.edu/~wwwltc/howto/developLO.htm>

*Guide to learning outcomes.* Birmingham: University of Central England. [www.infoskills2.pbworks.com/f/learning.ppt](http://www.infoskills2.pbworks.com/f/learning.ppt)

*Instructional objective writing assistant.* Atlanta: School of Civil and Environmental Engineering, Georgia Institute of Technology. <http://fie-conference.org/fie2000/papers/1186.pdf>

*Learning outcomes support.* Winnipeg: Red River College. <https://me.rrc.mb.ca/LearningOutcomeSupport/>

*Writing aims and learning outcomes.* Southampton: University of Southampton. <http://www.effectivepractitioner.nes.scot.nhs.uk/media/298809/4.%20learning%20outcomes.pdf>

# APPENDIX A: EXAMPLES OF LEARNING OUTCOMES

***Good learning outcomes are focused on what the learner will know or be able to do by the end of a defined period of time and indicate how that knowledge or skill will be demonstrated.***

Upon completing this assignment, students will be able to provide accurate diagrams of cells and be able to classify cells from microscopic images.

By the end of this course, students will be able to identify and develop data collection instruments and measures for planning and conducting sociological research.

By the end of this workshop, participants will be able to identify and classify their spending habits and prepare a personal budget.

By the end of this course, students will be able to:

- **predict** the appearance and motion of visible celestial objects
- **formulate** scientific questions about the motion of visible celestial objects
- **plan** ways to model and/or simulate an answer to the questions chosen
- **select** and integrate information from various sources, including electronic and print resources, community resources, and personally collected data, to answer the questions chosen
- **communicate** scientific ideas, procedures, results, and conclusions using appropriate SI units, language, and formats
- **describe, evaluate, and communicate** the impact of research and other accomplishments in space technology on our understanding of scientific theories and principles and on other fields of endeavour.

***One unit of instruction – whether a course, assignment, or workshop – might have multiple learning outcomes that span a range levels of learning as described by Bloom’s Taxonomy and indicated by relevant, active verbs.***

***Learning outcomes can address content, skills, and long-term attitudes or values.***

## **CONTENT**

By the end of this course, students will be able to categorize macroeconomic policies according to the economic theories from which they emerge.

By the end of this unit, students will be able to describe the characteristics of the three main types of geologic faults (dip-slip, transform, and oblique) and explain the different types of motion associated with each.

## **SKILLS**

By the end of this course, students will be able to ask questions concerning language usage with confidence and seek effective help from reference sources.

By the end of this course, students will be able to analyze qualitative and quantitative data, and explain how evidence gathered supports or refutes an initial hypothesis.

## **VALUES**

By the end of this course, students will be able to work cooperatively in a small group environment.

By the end of this course, students will be able to identify their own position on the political spectrum.



***Learning outcomes should use specific language, and should clearly indicate expectations for student performance.***

<b>VAGUE OUTCOME</b>	<b>MORE PRECISE OUTCOME</b>
By the end of this course, students will have added to their understanding of the complete research process.	By the end of this course, students will be able to: <ul style="list-style-type: none"> <li>• describe the research process in social interventions</li> <li>• evaluate critically the quality of research by others</li> <li>• formulate research questions designed to test, refine, and build theories</li> <li>• identify and demonstrate facility in research designs and data collection strategies that are most appropriate to a particular research project</li> <li>• formulate a complete and logical plan for data analysis that will adequately answer the research questions and probe alternative explanations</li> <li>• interpret research findings and draw appropriate conclusions</li> </ul>
By the end of this course, students will have a deeper appreciation of literature and literary movements in general.	By the end of this course, students will be able to: <ul style="list-style-type: none"> <li>• identify and describe the major literary movements of the 20th century</li> <li>• perform close readings of literary texts</li> <li>• evaluate a literary work based on selected and articulated standards</li> </ul>

***Learning outcomes are useful for all levels of instruction, and in a variety of contexts.***

***Beginning language course***

By the end of this course students will be able to:

- identify the most frequently encountered endings for nouns, adjectives and verbs, as well as some of the more complicated points of grammar, such as aspect of the verb
- translate short unseen texts from Czech
- read basic material relating to current affairs using appropriate reference works, where necessary
- make themselves understood in basic everyday communicative situations

***Graduate research methodologies class***

By the end of this course, students will be able to:

- identify key measurement problems involved in the design and evaluation of social interventions and suggest appropriate solutions
- assess the strengths and weaknesses of alternative strategies for collecting, analyzing and interpreting data from needs analyses and evaluations in direct practice, program and policy interventions
- identify specific strategies for collaborating with practitioners in developmental projects, formulation of research questions, and selection of designs and measurement tools so as to produce findings usable by practitioners at all levels
- analyze qualitative data systematically by selecting appropriate interpretive or quantified content analysis strategies

## - DEVELOPING LEARNING OUTCOMES-

- evaluate critically current research in social work
- articulate implications of research findings for explanatory and practice theory development and for practice/program implementation
- instruct classmates and others in an advanced statistical or qualitative data analysis procedure

### ***Teaching development course for faculty***

By the end of the course you will be able to:

- identify several learning style models and know how to use these models in your teaching
- construct and use learning objectives
- design a course and a syllabus
- implement the principles of Universal Instructional Design in the design of a course
- use strategies and instructional methods for effective teaching of small classes and large classes
- identify the advantages and disadvantages of different assessment methods
- construct a teaching portfolio

[Learning outcomes for CTSI course designed by Prof. Susan McCahan, "Fundamentals of University Teaching"]



# APPENDIX B: USEFUL VERBS FOR DEVELOPING LEARNING OUTCOMES

This list of useful verbs for creating learning outcomes is arranged according to Bloom's Taxonomy of Educational Objectives, which identifies different cognitive domains associated with levels of learning. Bloom's taxonomy was developed in 1956, and was revised in 2001 by Bloom's colleagues, Lorin Anderson and David Krathwohl. The revised taxonomy is presented here.



## REMEMBERING: *recall of information*

- arrange
- cite
- collect
- define
- describe
- duplicate
- enumerate
- find
- identify
- locate
- memorize
- record
- recognize
- match
- relate
- select
- name
- label
- list
- order
- quote
- recall
- repeat
- reproduce
- select
- show
- state

## UNDERSTANDING: *demonstration of comprehension*

- associate
- classify
- compare
- contrast
- convert
- describe
- estimate
- explain
- extend
- generalize
- give examples
- identify
- interpret
- justify
- locate
- outline
- paraphrase
- predict
- recognize
- report
- restate
- review
- select
- summarize
- trace
- translate

## APPLYING: *applying knowledge in a new context*

- apply
- calculate
- chart
- choose
- classify
- complete
- compute
- construct
- contribute
- develop
- discover
- dramatize
- employ
- experiment
- extend
- illustrate
- implement
- instruct
- interpret
- modify
- operate
- participate
- practice
- predict
- show
- solve
- teach
- test
- use

## ANALYZING:

identifying *causes and patterns*

*supporting assertions through the use of evidence and arguments*

- advertise
  - analyze
  - break down
  - categorize
  - classify
  - collect
  - compare
  - connect
  - contrast
  - correlate
  - criticize
  - diagram
  - differentiate
  - distinguish
  - divide
  - establish
  - examine
  - explain
  - identify
  - illustrate
  - infer
  - investigate
  - order
  - outline
  - prioritize
  - question
  - select
  - separate
  - verify
- 

## EVALUATING:

arguments

*coming to a judgment on the value of information or the validity of*

- appraise
  - argue
  - assess
  - choose
  - conclude
  - convince
  - criticize
  - critique
  - debate
  - decide
  - defend
  - determine
  - discriminate
  - evaluate
  - grade
  - integrate
  - interpret
  - judge
  - justify
  - predict
  - prioritize
  - rate
  - recommend
  - reframe
  - score
  - select
  - support
  - value
- 

## CREATING:

*combining or grouping knowledge to come to new conclusions*

- adapt
  - anticipate
  - arrange
  - assemble
  - collect
  - combine
  - compile
  - construct
  - decide
  - design
  - develop
  - facilitate
  - formulate
  - generate
  - generalize
  - imagine
  - incorporate
  - individualize
  - integrate
  - invent
  - modify
  - negotiate
  - organize
  - plan
  - propose
  - rearrange
  - reconstruct
  - reorganize
  - revise
  - select
  - structure
  - substitute
  - validate
- 

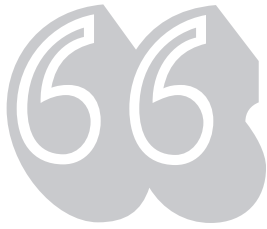
[Verbs correlating to Bloom's Taxonomy drawn from <http://www.coun.uvic.ca/learn/program/hndouts/bloom.html>]



# APPENDIX C: TAXONOMIES OF EDUCATIONAL OBJECTIVES

## Bloom's taxonomy

*Taxonomy Information and quotations in this summary, except where otherwise noted, are drawn from Krathwohl, D. R. (2002). A revision of Bloom's taxonomy: An overview. Theory into Practice, 41 (4), 212-261. Krathwohl participated in the creation of the original Taxonomy, and was the co-author of the revised Taxonomy.*



The Taxonomy of Educational Objectives is a framework for classifying statements of what we expect or intend students to learn as a result of instruction. The framework was conceived as a means of facilitating the exchange of test items among faculty at various universities in order to create banks of items, each measuring the same educational objective (p. 212)."

The Taxonomy of Educational Objectives provides a common language with which to discuss educational goals.

## Bloom's original taxonomy

Benjamin Bloom of the University of Chicago developed the Taxonomy in 1956 with the help of several educational measurement specialists.

Bloom saw the original Taxonomy as more than a measurement tool. He believed it could serve as a:

- common language about learning goals to facilitate communication across persons, subject matter, and grade levels;
- basis for determining in a particular course or curriculum the specific meaning of broad educational goals, such as those found in the currently prevalent national, state, and local standards;
- means for determining the congruence of educational objectives, activities, and assessments in a unit, course, or curriculum; and
- panorama of the range of educational possibilities against which the limited breadth and depth of any particular educational course or curriculum could be contrasted (Krathwohl, 2002).

Bloom's Taxonomy provided six categories that described the cognitive processes of learning: **knowledge, comprehension, application, analysis, synthesis, and evaluation**. The categories were meant to represent educational activities of increasing complexity and abstraction. Bloom and associated scholars found that the original Taxonomy addressed only part of the learning that takes place in most educational settings, and developed complementary taxonomies for the Affective Domain (addressing values, emotions, or attitudes associated with learning) and the Psychomotor Domain (addressing physical skills and actions). These can provide other useful classifications of types of knowledge that may be important parts of a course.

## The Affective Domain

1. Receiving
2. Responding
3. Valuing
4. Organization
5. Characterization by a value or value complex

From Krathwohl, Bloom, & Masia. *Taxonomy of Educational Objectives, the Classification of Educational Goals. Handbook II: Affective Domain.* (1973).

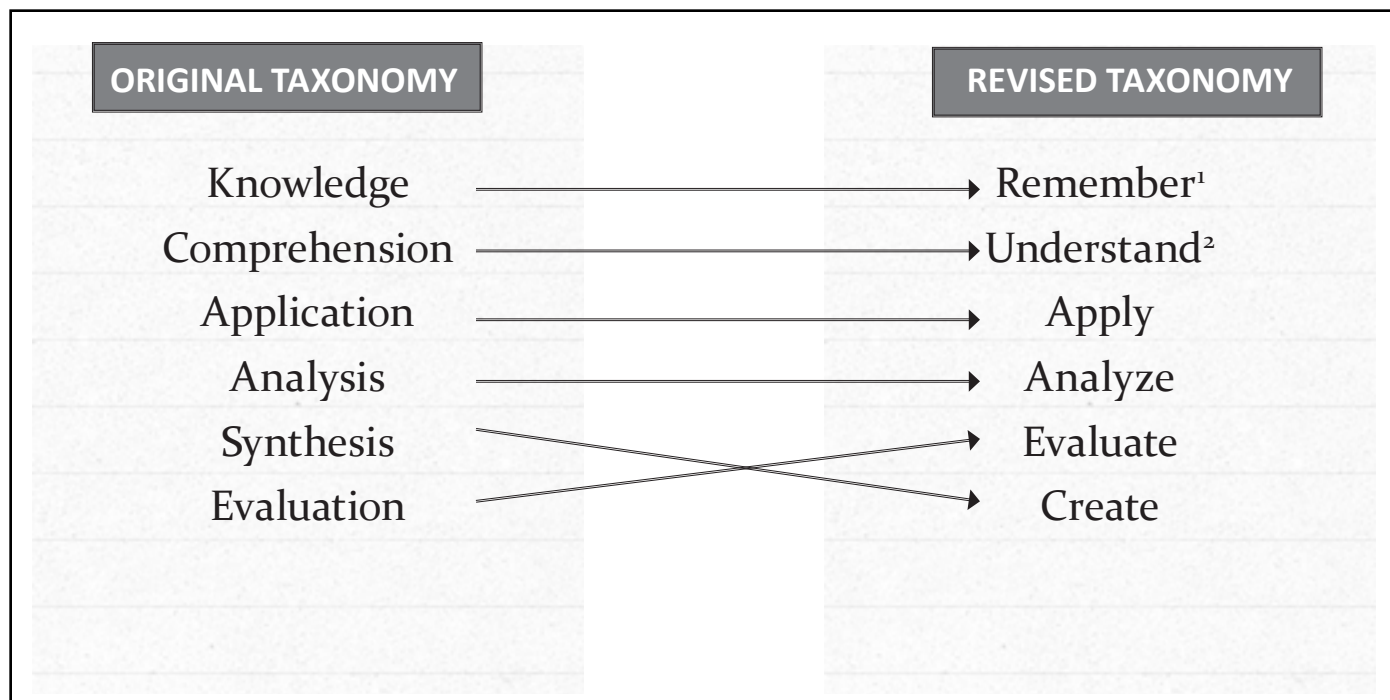
## Psychomotor Domain

1. Reflex movements
2. Basic-fundamental movements
3. Perceptual abilities
4. Physical abilities
5. Skilled movements
6. Nondiscursive communication

From Harrow. *A taxonomy of psychomotor domain: a guide for developing behavioral objectives.* (1972).

## The Revised Taxonomy

Bloom's Taxonomy was reviewed and revised by Anderson and Krathwohl, with the help of many scholars and practitioners in the field, in 2001. They developed the revised Taxonomy, which retained the same goals as the original Taxonomy but reflected almost half a century of engagement with Bloom's original version by educators and researchers.



[1] Unlike Bloom's original "Knowledge" category, "Remember" refers only to the recall of specific facts or procedures

[2] Many instructors, in response to the original Taxonomy, commented on the absence of the term "understand". Bloom did not include it because the word could refer to many different kinds of learning. However, in creating the revised Taxonomy, the authors found that when instructors use the word "understand", they were most frequently describing what the original taxonomy had named "comprehension".



# Structure of the Cognitive Process Dimension of the Revised Taxonomy

<p>1.0 <b>Remember</b> - Retrieving relevant knowledge from long-term memory</p> <ul style="list-style-type: none"> <li>• 1.1 Recognizing</li> <li>• 1.2 Recalling</li> </ul>	<p>4.0 <b>Analyze</b> - Breaking material into its constituent parts and detecting how the parts relate to one another and to an overall structure or purpose</p> <ul style="list-style-type: none"> <li>• 4.1 Differentiating</li> <li>• 4.2 Organizing</li> <li>• 4.3 Attributing</li> </ul>
<p>2.0 <b>Understand</b> - Determining the meaning of instructional messages, including oral, written, and graphic communication</p> <ul style="list-style-type: none"> <li>• 2.1 Interpreting</li> <li>• 2.2 Exemplifying</li> <li>• 2.3 Classifying</li> <li>• 2.4 Summarizing</li> <li>• 2.5 Inferring</li> <li>• 2.6 Comparing</li> <li>• 2.7 Explaining</li> </ul>	<p>5.0 <b>Evaluate</b> - Making judgments based on criteria and standards</p> <ul style="list-style-type: none"> <li>• 5.1 Checking</li> <li>• 5.2 Critiquing</li> </ul>
<p>3.0 <b>Apply</b> - Carrying out or using a procedure in a given situation</p> <ul style="list-style-type: none"> <li>• 3.1 Executing</li> <li>• 3.2 Implementing</li> </ul>	<p>6.0 <b>Create</b> - Putting elements together to form a novel, coherent whole or make an original product</p> <ul style="list-style-type: none"> <li>• 6.1 Generating</li> <li>• 6.2 Planning</li> <li>• 6.3 Producing</li> </ul>

One major change of the revised Taxonomy was to address Bloom's very complicated "knowledge" category, the first level in the original Taxonomy. In the original Taxonomy, the knowledge category referred both to knowledge of specific facts, ideas, and processes (as the revised category "Remember" now does), and to an awareness of possible actions that can be performed with that knowledge. The revised Taxonomy recognized that such actions address knowledge and skills learned throughout all levels of the Taxonomy, and thus added a second "dimension" to the Taxonomy: the knowledge dimension, comprised of factual, conceptual, procedural, and metacognitive knowledge.

## Structure of the Knowledge Dimension of the Revised Taxonomy

- **Factual knowledge** – The basic elements that students must know to be acquainted with a discipline or solve problems in it.
- **Conceptual knowledge** – The interrelationships among the basic elements within a larger structure that enable them to function together.
- **Procedural knowledge** – How to do something; methods of inquiry; and criteria for using skills, algorithms, techniques, and methods.
- **Metacognitive knowledge** – Knowledge of cognition in general as well as awareness and knowledge of one’s own condition.

The two dimensions - knowledge and cognitive - of the revised Taxonomy combine to create a taxonomy table with which written objectives can be analyzed. This can help instructors understand what kind of knowledge and skills are being covered by the course to ensure that adequate breadth in types of learning is addressed by the course.

### TAXONOMY TABLE

	Remember	Understand	Apply	Analyze	Evaluate	Create
Factual						Objective 1
Conceptual		Objective 2				
Procedural				Objective 3		
Metacognitive			Objective 4			

## Structure of Observed Learning Outcomes (SOLO) taxonomy

Like Bloom’s taxonomy, the Structure of Observed Learning Outcomes (SOLO) taxonomy developed by Biggs and Collis in 1992 distinguishes between increasingly complex levels of understanding that can be used to describe and assess student learning. While Bloom’s taxonomy describes what students *do* with information they acquire, the SOLO taxonomy describes the *relationship* students articulate between multiple pieces of information.

Atherton (2005) provides an overview of the five levels that make up the SOLO taxonomy:

- 1. Pre-structural:** here students are simply acquiring bits of unconnected information, which have no organization and make no sense.
- 2. Unistructural:** simple and obvious connections are made, but their significance is not grasped.
- 3. Multistructural:** a number of connections may be made, but the meta-connections between them are missed, as is their significance for the whole.
- 4. Relational level:** the student is now able to appreciate the significance of the parts in relation to the whole.
5. At the **extended abstract** level, the student is making connections not only within the given subject area, but also beyond it, able to generalize and transfer the principles and ideas underlying the specific instance.

[From Atherton, J. (2005). Learning and teaching: SOLO taxonomy. <http://www.learningandteaching.info/learning/solo.htm>

# APPENDIX D: WORKSHEETS

## Translating objectives into assessable outcomes

The following worksheet might help you translate your instructional goals or objectives for a unit of instruction into an assessable learning outcome. Remember that each unit of instruction might have multiple learning outcomes.

<b>Unit of Instruction</b> <i>E.g. lecture, activity, exam, course</i>	<b>Objective</b> <i>What content or skills will be covered in this unit of instruction?</i>	<b>Outcome</b> <i>What should students know or be able to do as a result of this unit of instruction?</i>	<b>How do you know?</b> <i>How will you be able to tell that students have achieved this outcome?</i>	<b>Assessment</b> <i>What kind of work can students produce to demonstrate this?</i>