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Writing Learning Outcomes!

A guideline

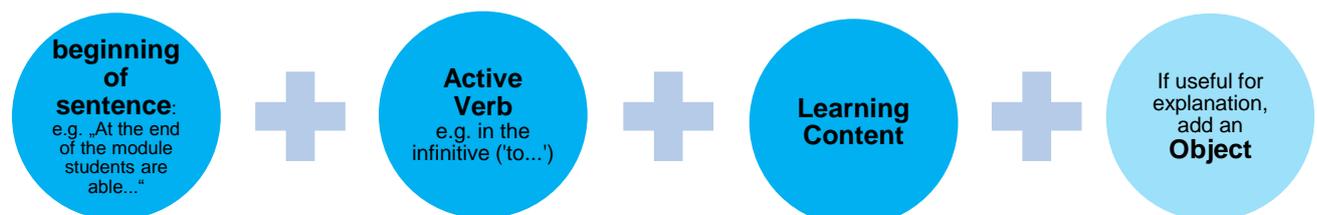
What are Learning Outcomes?

Learning outcomes in higher education are statements of what students are expected to demonstrate and to have acquired after the successful completion of the courses of a module/learning unit¹.

How do I write Learning Outcomes?

For the formulation of learning outcomes, the abilities and the knowledge that the students should have acquired as a result of the course/module/learning unit have to be clear. Three steps can be distinguished:

1. Define content and outcomes (aims)²
2. Choose the active verb appropriate for learning outcome and level of difficulty.
3. Formulate the learning outcome following this pattern:



¹ Institutions that use the European Credit Transfer System often name their learning units “modules”. In this article we therefore use module as a synonym for learning units in Higher Education Institutions.

² Note that the learning outcomes of a course (and of a module) are to contribute to the overall outcomes of the study programme’s qualification profile and that the shift from input (content) to output (knowledge, abilities) is to be performed.

Example:

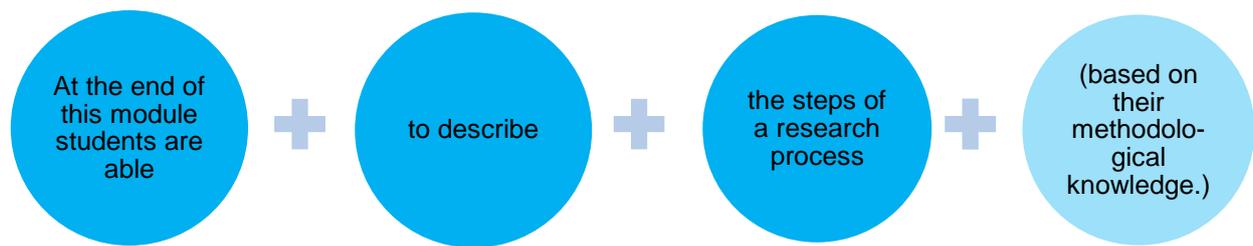


Fig. 1

Diagram for the Formulation of Learning Outcomes

For the formulation of learning outcomes, the following (or a similar) beginning of a sentence is possible: „At the end of this module / On successful completion of the module students are/should be able to..."

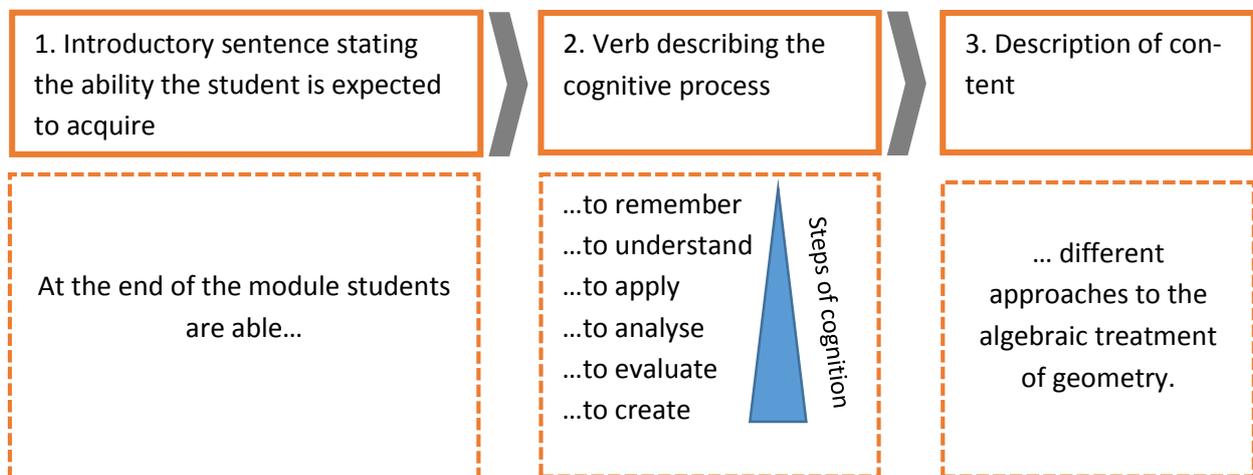


Fig. 2

Guidelines for the Formulation of Learning Outcomes

- For a module of average size, the formulation of approximately six learning outcomes is common,
- learning outcomes can be arranged in bullet points,
- ideally, a learning outcome should contain of one sentence (if necessary, more than one sentence can be used for clarity),
- complicated sentences should be avoided. Simple and unambiguous terms should be used when describing the content to ensure an easy understanding by everyone (internal and external),
- learning outcomes should neither be too general nor too specific,
- learning outcomes must be capable of being assessed (in the final examination),
- learning outcomes are formulated from the students' perspectives (no teaching objectives),
- learning outcomes within a study programme (not within a module) should be located at every level (of taxonomy), not just at the lower levels.

Tool: Classification of Learning Outcomes

Learning outcomes are located at different levels which can be described with verbs and which are arranged by ascending degrees of difficulty or of control. Anderson/Krathwohl, in their taxonomy, chose six levels, as shown in the example below. However, other systems of reference may be used as well.



Fig. 3

Tool: Verbs for the Formulation of Learning Outcomes

When formulating learning outcomes, the more general verbs of a stage model as seen above should not be employed. Instead, active verbs specifically describing the learning outcome's "level of competence" should be used. Here, it can be helpful to take into account the wording of the module's examination questions. Lists in which verbs are arranged in accordance to their respective levels of competence can be another useful tool in the formulating of learning outcomes. In the following, some examples are given of cognitive and affective verbs, which are the most commonly conveyed types in the area of higher education.

Affective Verbs

Level and Definition	Illustrative Verbs	Example
Receiving refers to the student's willingness to attend to particular phenomena of stimuli (classroom activities, textbook, music, etc.). Learning outcomes in this area range from the simple awareness that a thing exists to selective attention on the part of the learner. Receiving represents the lowest level of learning outcomes in the affective domain.	asks, chooses, describes, follows, gives, holds, identifies, locates, names, points to, selects, sits erect, replies, uses	Listening to discussions of controversial issues with an open mind. Respecting the rights of others. Listen for and remember the name of newly introduced people.
Responding refers to active participation on the part of the student. At this level he or she not only attends to a particular phenomenon but also reacts to it in some way. Learning outcomes in this area may emphasize acquiescence in responding (reads assigned material), willingness to respond (voluntarily reads beyond assignment), or satisfaction in responding (reads for pleasure or enjoyment). The higher levels of this category include those instructional objectives that are commonly classified under "interest"; that is, those that stress the seeking out and enjoyment of particular activities.	answers, assists, complies, conforms, discusses, greets, helps, labels, performs, practices, presents, reads, recites, reports, selects, tells, writes	Completing homework assignments. Participating in team problem-solving activities. Questions new ideals, concepts, models, etc. in order to fully understand them.
Valuing is concerned with the worth or value a student attaches to a particular object, phenomenon, or behavior. This ranges in degree from the simpler acceptance of a value (desires to improve group skills) to the more complex level of commitment (assumes responsibility for the effective functioning of the group). Valuing is based on the internalization of a set of specified values, but clues to these values are expressed in the student's overt behavior. Learning outcomes in this area are concerned with behavior that is consistent and stable enough to make the value clearly identifiable. Instructional objectives that are commonly classified under "attitudes" and "appreciation" would fall into this category.	completes, describes, differentiates, explains, follows, forms, initiates, invites, joins, justifies, proposes, reads, reports, selects, shares, studies, works	Accepting the idea that integrated curricula is a good way to learn. Participating in a campus blood drive. Demonstrates belief in the democratic process. Shows the ability to solve problems. Informs management on matters that one feels strongly about.

<p>Organization is concerned with bringing together different values, resolving conflicts between them, and beginning the building of an internally consistent value system. Thus the emphasis is on comparing, relating, and synthesizing values. Learning outcomes may be concerned with the conceptualization of a value (recognizes the responsibility of each individual for improving human relations) or with the organization of a value system (develops a vocational plan that satisfies his or her need for both economic security and social service). Instructional objectives relating to the development of a philosophy of life would fall into this category.</p>	<p>adheres, alters, arranges, combines, compares, completes, defends, explains, generalizes, identifies, integrates, modifies, orders, organizes, prepares, relates, synthesizes</p>	<p>Recognizing own abilities, limitations, and values and developing realistic aspirations. Accepts responsibility for one's behavior. Explains the role of systematic planning in solving problems. Accepts professional ethical standards. Prioritizes time effectively to meet the needs of the organization, family, and self.</p>
<p>Characterization by a value or value set. The individual has a value system that has controlled his or her behavior for a sufficiently long time for him or her to develop a characteristic "life-style." Thus the behavior is pervasive, consistent, and predictable. Learning outcomes at this level cover a broad range of activities, but the major emphasis is on the fact that the behavior is typical or characteristic of the student. Instructional objectives that are concerned with the student's general patterns of adjustment (personal, social, emotional) would be appropriate here.</p>	<p>acts, discriminates, displays, influences, listens, modifies, performs, practices, proposes, qualifies, questions, revises, serves, solves, uses, verifies</p>	<p>A person's lifestyle influences reactions to many different kinds of situations. Shows self-reliance when working independently. 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.</p>

Fig. 4

Cognitive Verbs

Level and Definition	Illustrative Verbs	Example
<p>Knowledge is defined as the remembering of previously learned material. This may involve the recall of a wide range material, from specific facts to complete theories, but all that is required is for the student to bring to mind the appropriate information. Knowledge represents the lowest level of learning outcomes in the cognitive domain.</p>	<p>arrange, define, describe, duplicate, identify, label, list, match, memorize, name, order, outline, recognize, relate, recall, repeat, reproduce, select, state</p>	<p>Memory of specific facts, terminology, rules, sequences, procedures, classifications, categories, criteria, methodology, principles, theories and structure. Recite a policy. Quote prices from memory to a customer. Know the safety rules. Describe the painting.</p>
<p>Comprehension is defined as the ability to grasp the meaning of material. This may be shown by translating material from one form to another (words to numbers), by interpreting material (explaining or summarizing), and by estimating future trends (predicting consequences or effects). These learning outcomes go one step beyond the simple remembering of material, and represent the lowest level of understanding.</p>	<p>classify, convert, defend, describe, discuss, distinguish, estimate, explain, express, extend, generalize, give examples, identify, indicate, infer, locate, paraphrase, predict, recognize, rewrite, report, restate, review, select, summarize, translate</p>	<p>Stating problem in own words. Translating a chemical formula. Understanding a flow chart. Translating words and phrases from a foreign language. Explains in one's own words the steps for performing a complex task. What is the subject or theme?</p>
<p>Application refers to the ability to use learned material in new and concrete situations. This may include the application of such things as rules, methods, concepts, principles, laws, and theories. Learning outcomes in this area require a higher level of understanding than those under comprehension.</p>	<p>apply, change, choose, compute, demonstrate, discover, dramatize, employ, illustrate, interpret, manipulate, modify, operate, practice, predict, prepare, produce, relate, schedule, show, sketch, solve, use, write</p>	<p>Taking principles learned in math and applying them to figuring the volume of a cylinder in an internal combustion engine. Use a manual to calculate an employee's vacation time. If you could interview the artist, what questions would you ask?</p>
<p>Analysis refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved. Learning outcomes here represent a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material.</p>	<p>analyze, appraise, break down, calculate, categorize, compare, contrast, criticize, diagram, differentiate, discriminate, distinguish, examine, experiment, identify, illustrate, infer, model, outline, point out, question, relate, select, separate, subdivide, test</p>	<p>Discussing how fluids and liquids differ. Detecting logical fallacies in a student's explanation of Newton's 1st law of motion. Recognize logical fallacies in reasoning. Gathers information from a department and selects the required tasks for training. Explain what you think the artist is trying to say about the subject matter.</p>
<p>Synthesis refers to the ability to put parts together to form a new whole. This may involve the production of a unique communication (theme or speech), a plan of operations (research proposal), or a set of abstract relations (scheme for classifying information). Learning outcomes in this area stress creative behaviors, with major emphasis on the formulation of new patterns of structures. Integrate.</p>	<p>arrange, assemble, categorize, collect, combine, comply, compose, construct, create, design, develop, devise, design, explain, formulate, generate, integrate, manage, modify, organize, plan, prepare, propose, rearrange, reconstruct, relate, reorganize, revise, rewrite, set up, summarize, synthesize, tell, write</p>	<p>Writing a comprehensive report on a problem-solving exercise. Planning a program or panel discussion. Writing a comprehensive term paper. Integrates training from several sources to solve a problem. What ways would you render the subject differently?</p>

<p><i>Evaluation</i> is concerned with the ability to judge the value of material (statement, novel, poem, research report) for a given purpose. The judgments are to be based on definite criteria. These may be internal criteria (organization) or external criteria (relevance to the purpose), and the student may determine the criteria or be given them. Learning outcomes in this area are highest in the cognitive hierarchy because they contain elements of all of the other categories, plus conscious value judgments based on clearly defined criteria.</p>	<p>appraise, argue, assess, attach, choose, compare, conclude, contrast, defend, describe, discriminate, estimate, evaluate, explain, judge, justify, interpret, relate, predict, rate, select, summarize, support, value</p>	<p>Making judgments based on internal evidence or external criteria. Evaluating alternative solutions to a problem. Detecting inconsistencies in the speech of a student government representative. Explain and justify a new budget. Hire the most qualified candidate. What is your opinion of the painting? Why?</p>
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Fig. 5

Sources of Figures

Fig. 1: own figure

Fig. 2: Levels of Taxonomy: <http://img.docstoccdn.com/thumb/orig/127058647.png>.

Fig. 3: Translation of „Schema zur Formulierung von Lernergebnissen“. TUM (Hrsg.). In: Wegweiser zur Erstellung von Modulbeschreibungen. Version 2, Stand November 2014 https://www.lehren.tum.de/fileadmin/w00bmo/www/Downloads/Themen/Studiengaenge_gestalten/Dokumente/TUM_Wegweiser_Modulbeschreibungen_Stand_November_2014.pdf.

Fig. 4: Learning Taxonomy – Krathwohl's Affective Domaine. University of Connecticut. http://assessment.uconn.edu/docs/LearningTaxonomy_Affective.pdf.

fig. 5: Learning Taxonomy – Bloom's Cognitive Domain. University of Connecticut. http://assessment.uconn.edu/docs/LearningTaxonomy_Cognitive.pdf.

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