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## Outcomes-oriented Teaching and Learning & Constructive Alignment

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### 1. Intended learning outcomes and their significance

Intended student learning outcomes (ILOs, sometimes also referred to as course objectives) describe the **knowledge** and **competencies** ("skills") that students are expected to acquire. **Outcomes orientation** therefore means that teaching focuses on **successful student learning**, and not only on the content covered in a course.<sup>[1]</sup>

At the programme level, the curriculum working group determines the qualification parameters for graduates and outlines the learning outcomes for program modules. At the course level, it is up to the instructor to formulate ILOs based on the specified outcomes in the respective module. ILOs provide orientation for students and serve as starting point for teachers in their course planning. As course instructor, you decide what your students should **know** and **be able to do** upon course completion.

Clearly defined learning outcomes are the linchpin of a **coherent course concept** (see: 4. *Constructive Alignment*). As you design your course, your ILOs justify the selection of teaching/learning methods and types of assessment. At the same time, they serve as a means of **communication**, because by formulating ILOs you illustrate what you expect from your students. For students, ILOs serve as signposts and **points of reference** that help them recognise and sort the relevance of individual components (e.g. *why read a certain theory, why present calculation steps in detail, what do I need this knowledge for*) and to focus on core aspects of the course. By linking the course contents with students' personal learning experiences, intended learning outcomes have the potential to engage and motivate learners.

ILOs are formulated as **discipline-specific**, as well as **generic** knowledge and competencies. *Knowledge* refers to **knowing course content** accurately, while *competencies* refer to the **ability to act or do something**. This article will provide you with advice on how to formulate ILOs, an introduction to taxonomies of learning outcomes, and a discussion on the connection between learning outcomes, teaching/learning methods, and types of assessment (*Constructive Alignment*).

## 2. Tips for Formulating Intended Learning Outcomes

To ensure that your intended learning outcomes are effective, please consider the following points:<sup>[2]</sup>

- Intended learning outcome refer to both **knowledge** and **competencies** ("skills").
- ILOs are formulated from the **students' perspective** (*what will the student be able to do?*)<sup>[3]</sup>
- Choose formulations that can show the **degree** to which students **attain** ILOs.
- Choose **precise, active verbs** (*define, explain, solve, etc.* rather than vague terms such as know, understand, research, etc.)
- Consider which and how many ILOs your students can **realistically** achieve in your course and select the most important ones.

**Note:** What students know, understand, and grasp is not immediately apparent. Teachers cannot readily determine whether students "have" certain knowledge. It only becomes apparent when **demonstrated**. The intended learning outcomes should therefore describe exactly how students can **show what they have learned**. Below you will find some examples:

"Upon completion of course XY, students will be able to

- list typical elements of baroque architecture."
- explain individual steps of a method and carry them out correctly."
- explain the carbon cycle."
- solve complex equations."
- analyse the results of lab experiments, identify possible sources of error, interpret the results and write them up in a lab report."
- interpret historical events with the help of primary and secondary literature."
- develop hypotheses and test these using appropriate methods."
- identify and describe rhetorical figures and apply them in a brief text."

## 3. Taxonomies of learning outcomes: Supporting students in achieving course objectives

**Taxonomies of learning outcomes** are practical tools for formulating ILOs. The most commonly used is **Bloom's Taxonomy**,<sup>[4]</sup> in which cognitive skill levels (*knowing, understanding, applying, analysing, creating, evaluating*) are ordered in actionable lists. You can use these as a thinking and

structuring aid when formulating learning outcomes (*please see below for a detailed table for download*).<sup>[5]</sup> In the university context, the **cognitive** domain is naturally at the centre. It is therefore the most detailed one and is also what teachers in higher education usually refer to when speaking about taxonomies of learning outcomes.

#### For download:

[Intended learning outcome table \(/fileadmin/user\\_upload/p\\_infopool/Downloads/Learning\\_Objectives\\_Table/Learning\\_Objectives\\_Table\)](/fileadmin/user_upload/p_infopool/Downloads/Learning_Objectives_Table/Learning_Objectives_Table)

In addition to the cognitive domain, Bloom's taxonomy includes a **psychomotor** and an **affective** domain. The psychomotor domain is particularly relevant for teaching in a lab, for example, where motor skills are essential (*psychomotor ILOs are assigned to the following levels: imitate, manipulate, precision, articulate, naturalise*).<sup>[6]</sup> The affective domain refers to attitudes, interests and values (*ILOs are assigned to the following levels: receiving, responding, valuing, organising, characterising by a value or a value set*).<sup>[7]</sup>

#### Further reading:

- For an in-depth discussion of these three domains see:  
<https://thesecondprinciple.com/instructional-design/threedomainsoflearning/>
- Further details and actionable lists are available here for the affective domain:  
<https://global.indiana.edu/documents/Learning-Taxonomy-Affective.pdf>

As shown in the taxonomies, competency development occurs **step by step** on the basis of **competency levels** or **phases**, which we recommend you consider when formulating learning outcomes. Competencies identified through assessments usually **change over time**. On the one hand, this applies to the different phases of a study program, on the other hand it also applies to different assignments within a course. A typical process extends, for example, from acquisition and understanding of content (*i.e. knowledge about it*) to the appropriate **application** of this knowledge (*competence*). The focus is therefore on the **development process** and not on "completed knowledge".

**Tip:** You can include this development process into your course planning by sequencing intended learning outcomes accordingly.<sup>[8]</sup> This means that you first determine what the students should know and be able to do after completing your course (**ultimate outcomes**) and then define the path to this goal through **mediating outcomes**.<sup>[9]</sup> Such a roadmap can help you in your planning, e.g. in deciding what assignments to include at what point. Intermediate goals offer students orientation and support in gradually developing their competencies.

## 4. Constructive Alignment

Aligning **learning outcomes, teaching/learning methods**, and **assessment** supports student learning. "**Constructive Alignment**" according to John Biggs<sup>[10]</sup> is a theoretical approach that facilitates the **coherent** design (*i.e. alignment*) of these **aspects of a teaching/learning concept**. The activities of a course should be structured in such a way that provides the best support to learners in **achieving the teaching/learning outcomes**.

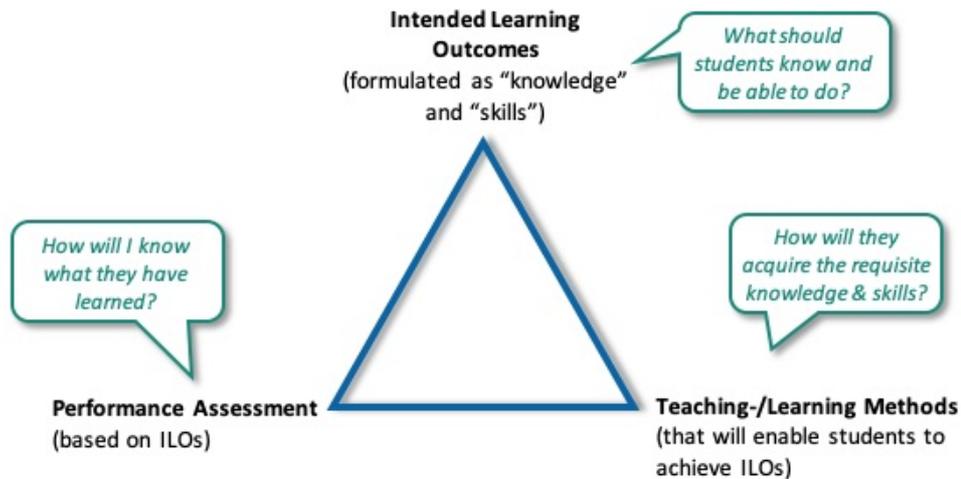
### John Biggs described the procedure as follows:

"In setting up an aligned system, we specify the desired outcomes of our teaching in terms not only of topic content, but in the *level of understanding* we want students to achieve. We then set up an environment that maximises the likelihood that students will engage in the activities designed to achieve these intended outcomes. Finally, we choose assessment tasks that will tell us how well individual students have attained these outcomes, in terms of graded levels of acceptability."<sup>[11]</sup>

When planning a course, the first step is to define the **learning outcomes as competencies**. Following this set of goals, you decide on teaching/learning methods that **support your students in achieving the ILOs**, and then you choose a suitable form of assessment that makes visible to what extent students **attained the ILOs**.

### Tip:

There are different approaches to the order of choosing teaching/learning methods and types of assessment. According to John Biggs' Constructive Alignment, teaching/learning methods are determined prior to assessment (*see above*), whereas the concept of "**backward design**" by Grant Wiggins and Jay McTighe<sup>[12]</sup> is to first determine the visible evidence of successful learning (*i.e. assessment*) and then decide on the ways and means of achieving this (*teaching/learning methods*). It is important—and both approaches agree on this point—that the selection of further steps always follows the previously defined intended learning outcomes.



**Tip: Communicate** your teaching/learning concept to your students, including the intended learning outcomes, types of assessment and teaching/learning methods (*including the use of digital media*) at the outset of the course. This is important so that students can gain a realistic notion of the course. However, we recommend you present and discuss **individual activities, assignments, and means of assessment** in the context of constructive alignment repeatedly throughout the semester. This way, students can better understand **why** they are doing the respective activities and assignments, what **function** these have both in the course, and for their own learning progress. Ideally, you discuss these aspects in class because you can create immediate relevance and clear up possible misunderstandings and ambiguities. An additional written version (*as a printout and/or electronically on Moodle*) is recommended, so that students can refresh their memories as needed.<sup>[13]</sup>

#### Further reading:

- [Outcomes-oriented Choice of Methods](https://infopool.univie.ac.at/en/home-page/teaching-advising/outcomes-oriented-choice-of-methods/)

(<https://infopool.univie.ac.at/en/home-page/teaching-advising/outcomes-oriented-choice-of-methods/>)

## References

- [1] See for example Svinicki, Marilla D. and Wilbert J. McKeachie, eds. *McKeachie's Teaching Tips: Strategies, Research and Theory for College and University Teachers*. 14<sup>th</sup> ed., Belmont, CA: Wadsworth Cengage Learning, 2014, 6ff.
- [2] See for example Davis, Barbara Gross. *Tools for Teaching*. 2<sup>nd</sup> ed., San Francisco, Jossey-Bass, 2009, 7f.
- [3] See Nilson, Linda B. *Teaching at Its Best: A Research-Based Resource for College Instructors*, 4<sup>th</sup> ed. San Francisco: Jossey-Bass, 2016, 18.
- [4] Bloom, Benjamin S. „Taxonomy of Educational Objectives: The Classification of Educational Goals; Handbook I: Cognitive Domain“. In Engelhart, M. D., E. J. Furst, W. H. Hill, und D. R. Krathwohl (eds.), *Taxonomy of educational objectives: the classification of educational goals; Handbook I: Cognitive domain*. New York: David McKay, 1956.
- [5] The first version from the 1950s was modified and expanded several times over the years. Much of the criticism focused on the hierarchical basis of cognitive levels. See for example Anderson, Lorin W., and David R. Krathwohl, Hrsg. *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. New York: Longman, 2001; Fink, Dee L. *Creating Significant Learning Experiences: An Integrated Approach to Designing College Courses*. San Francisco: Jossey-Bass, 2003.
- [6] Dave, R.H. „Psychomotor levels“. In *Developing and Writing Behavioral Objectives*, edited by R.J. Armstrong, 20-21. Tucson, Arizona: Educational Innovators Press, 1970; Simpson elaborated a different taxonomy: Simpson, Elizabeth J. *The Classification of Educational Objectives in the Psychomotor Domain*. Washington, DC: Gryphon House, 1972. For a comparison, see, for example, [www.edpsycinteractive.org/topics/behavior/psymtr.html](http://www.edpsycinteractive.org/topics/behavior/psymtr.html) (last accessed 30. 08. 2020).
- [7] See, for example, <https://global.indiana.edu/documents/Learning-Taxonomy-Affective.pdf> [last accessed 30.08.2020]; Krathwohl, David R., Benjamin S. Bloom, und Masia, B.B. *Taxonomy of Educational Objectives: Handbook II: Affective Domain*. New York: David McKay Co, 1964.
- [8] Nilson. *Teaching at Its Best*, 24f [3].
- [9] In the late 1990s, Grant Wiggins and Jay McTighe developed a similar process that starts with ILOs, which they called "Backward Design". Wiggins, Grant and Jay McTighe, *Understanding by Design*. 2. Aufl. Alexandria, VA: Association for Supervision and Curriculum Development, 2005. See also this video featuring Grant Wiggins: [https://www.youtube.com/watch?time\\_continue=15&v=4isSHf3SBuQ&feature=emb\\_logo](https://www.youtube.com/watch?time_continue=15&v=4isSHf3SBuQ&feature=emb_logo) [last accessed 01.09.2020]
- [10] Biggs, John, and Catherine Tang. *Teaching for Quality Learning at University. What the Student Does*. 4<sup>th</sup> ed. New York: Society for Research into Higher Education & Open University Press, 2011.
- [11] Biggs, John. "Aligning teaching for constructing learning", 2003. Available online at [https://www.researchgate.net/publication/255583992\\_Aligning\\_Teaching\\_for\\_Constructing\\_Learning](https://www.researchgate.net/publication/255583992_Aligning_Teaching_for_Constructing_Learning) [last accessed 01.09.2020].
- [12] Wiggins und McTighe, *Understanding by Design* [9].
- [13] See for example Breen-Wenninger, Barbara. „Studierendenzentriertheit umsetzen, kompetenzorientiert lehren“. In *Berufsbegleitende Studiengänge als Herausforderung für Curriculumentwicklung und Hochschuldidaktik*, edited by Haag, J., J.Weißböck, and W. Gruber, 53-57. Beiträge zum 2. Tag der Lehre an der FH St. Pölten am 12.4.2013. St. Pölten, 2013.

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