Didactic handout

Guideline for formulating learning outcomes

Project ISA:Dig

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Content

Foreword

The definition of competence-oriented, operationalized learning outcomes (together with the definition of qualification goals and the profile of the study program) is central for quality assurance in teaching and learning at the University of Passau.

This handout is a practical guide for working with learning outcomes at course and module level. The selected definitions aim to create a common conceptual understanding of the underlying theoretical approaches that are relevant for the competence-oriented course design. For the specific application of learning outcome formulations, backgrounds are explained and formulation guidelines defined. Selected examples serve to illustrate the principle of working with learning outcomes. The selected examples are primarily located at module level, but the procedure can also be transferred to other levels of study program development, such as qualification profiles or course designs.

1. Learning outcomes - What for?

Orientation basis for teachers and students

The explicit phrasing of learning outcomes for study programs, modules and courses serve as an orientation for teachers, students as well as prospective students. Learning outcomes contribute to the internal coherence of study programs by ensuring that the different levels are aligned and serve a common competence profile. Fig. 1 shows the different levels at which the identification and formulation of learning outcomes is applied in higher education practice.

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│          Study program level             │
└─────────────────────────────────────────┘
    ┌─────────────────────────────────┐
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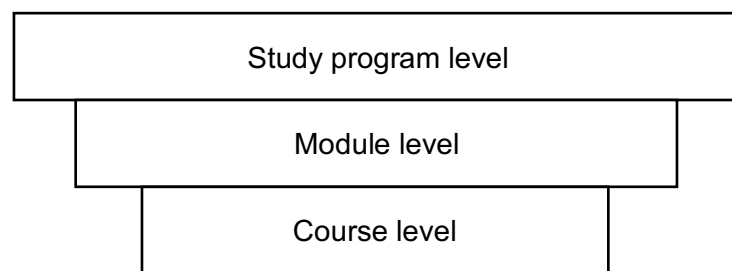
Fig. 1: Levels of learning outcomes

Learning outcomes at module level function as a means of differentiating the profile of a study program. Additionally, they serve as orientation regarding the selection and design of courses. Learning outcomes are an important measure to check one's own course within the modules for internal consistency and for matching the overall goal of the study program profile. Identifying competency-based learning outcomes helps students plan competency profiles and combine modules in a targeted manner. The following questions may be helpful in identifying module-level learning outcomes:

Which partial competencies can be (realistically) achieved with a module/course? To what extent does the course support students in achieving the learning outcomes of the module? Which learning activities do students need to develop a certain competence? Is the selected form of teaching and examination suitable and is the subject content appropriate?

Foundation for didactic planning

Learning outcomes are the central element in the didactic planning of courses and a significant help for structuring courses and subsequently for coordinating contents and methods, as well as selecting them according to didactic reduction and reconstruction. Focus are successful learning processes of the students.

Orientation for employers and prospective students

The outcome orientation of study content is not only a useful tool within the university: potential employers as well as people interested in studying get a better idea of which fields of activity can be served as graduates. For students, the designation of learning outcomes is an important orientational aid in their studies and one way of getting information about expectancies. They can see at a glance what level and kind of performance is required in the context of a module.

Necessary basis for the development of test and evaluation procedures

Defining expected learning outcomes is also a tool for selecting appropriate forms of assessment. Ideally, defined learning outcomes contribute to what is called "didactic coherence", also called "constructive alignment". This model by Biggs (ibid. 1996) involves the purposeful planning and alignment of learning outcomes, learning activities, and forms of assessment. Didactic coherence is considered a central quality characteristic of university teaching (e.g. Reeves 2006, p. 306). In order to fulfill the quality criterion of didactic coherence, the use of consistently and systematically formulated learning outcomes is an important instrument.

In addition to the question of how and in what way students can be didactically supported in achieving learning outcomes, there is always the question of how students' growth in competence can be compared and assessed, i.e. whether or to what extent a particular learning outcome has been achieved. A consistent formulation makes learning outcomes activatable, measurable and comparable. They form the foundation for differentiated evaluation. The prerequisite for measurability and comparability is the so-called operationalization as it will be presented in this handout.

Competency-based, operationalized learning outcomes....

- provide orientation for teachers and students;
- offer orientation for employers and prospective students;
- are a decisive instrument for the didactic planning and determination of forms of examination;
- serve transparency and comparability;
- form the foundation for evaluation and quality assurance.

2. Definition and distinction

Learning outcomes are defined in distinction to the so-called "teaching objectives". The term "learning outcomes" emphasizes the competence- and student-centered attitude in the field of learning and teaching at the University of Passau. Focus is on what students are able to do at the end of their studies or the skills they show in specific actions. Furthermore, the term learning outcomes refers to the Qualifications Framework for German Higher Education Qualifications (HQR), which is considered the binding frame of reference when modelling competencies in German higher education. For this purpose, the following definition serves as a frame of reference:

> **Learning outcomes** are understood as statements of what learners know, understand, and are able to do after completing a learning process (see European Union 2015, p. 10).

The definition of learning outcomes implies that there is no purely content-based perspective, Priorities do not lie on what content is selected for a course or a specific event, but rather on the individual competence development of the students. The initial position is the students' learning process. The focus is on what competencies students possess at the end of a learning process (i.e., a course/module/their studies). Learning outcomes describe what students have ideally achieved. These can be subject-specific as well as interdisciplinary competencies.

The conviction of competence and student orientation underlying the learning outcomes corresponds to the current state of teaching/learning research, which is known as "shift from teaching to learning".[1] This approach contrasts with purely content-based perspectives, which describes the planned teaching content from the perspective of the teacher (teaching objective). The following example illustrates the difference between understanding learning outcomes and teaching objectives:

Formulation as a teaching objective:	*Students will get an overview of the history of British literature.*
Formulation as a learning outcome:	*Students will identify and name the stages of development of British literature.*

> In terms of **student orientation,** the formulation of competency-based **learning outcomes** is preferable to pure content orientation.

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[1] On the "shift from teaching to learning" see for example: Wildt, J. (2007) or Felber (2013).

3. Classification of learning outcomes, taxonomy levels

The classification of learning outcomes is based on different models, some of which overlap. This formulation guide is based on Bloom's (1965) categorization. A distinction is made between cognitive, affective, and psychomotor learning objectives:

- **Cognitive learning objectives** are to be understood in terms of factual knowledge (numbers, data, facts, rules, models, etc.) and refer to facts and knowledge in the narrower sense.
- **Affective learning goals** refer to interests, attitudes/attitudes, and values that cannot be directly addressed and tested.
- **Psychomotor learning goals** are sometimes referred to as "practical" learning goals, which refer to actions that involve a motor skill. Classically, these include, for example, learning a musical instrument, a sport, or creating in the artistic-creative field.

For the operationalization of learning goals/learning outcomes, various models are used in higher education didactics, each of which identifies different levels or levels of cognition and is referred to as a taxonomy. Here, the learning goal taxonomy of Anderson & Krathwohl (2001) is used (see Fig. 2.), which is based on Bloom's learning goal taxonomy (1972).
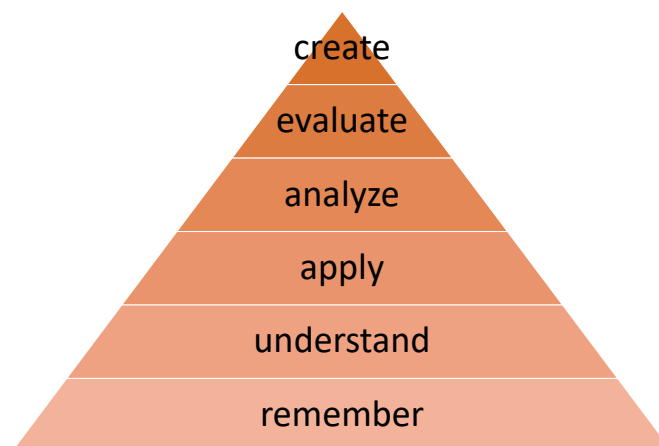

Fig. 2: Cognitive learning goal taxonomy according to Anderson and Krathwohl (2001).

The following formulation assistance refers predominantly to the formulation of cognitive learning outcomes, which is the most common type of learning outcome within higher education. However, depending on the discipline and the study program, psychomotor/practical and affective learning objectives also play an important role; their valid verification stays being a challenge.

4. Formulation of learning outcomes

Operationalization of learning outcomes goes hand in hand with clear and unambiguous wording. Learning outcomes should be formulated in such a way that they explicitly describe the expected skills of students after participating in a course/module. The following **formulation aids** can be used:

a) Describe an observable behavior.

> A desired (realistic) learning outcome is described based on the question 'What can students do at the end of a successful learning process?'. It is important to adequately assess which outcome can be achieved in a realistic way. The formulation should be short and precise, unnecessary technical vocabulary should be avoided. The formulation is done from the perspective of the students.

b) There is an active verb that is as expressive as possible.

> If possible, use active verbs that are as concrete as possible. For example, "define", "enumerate", "compare", "analyze". Ambiguous terms (e.g. "know", "understand") are to be avoided as too unspecific. A separate sentence with a separate verb is formed for each learning outcome.

c) The level of competence is recognizable.

> When selecting a suitable verb, it is important to consider the taxonomy levels in order to reflect the depth of learning and thus the level of demand. Verb tables can serve as orientation, as a kind of "toolbox" for the selection of suitable verbs. The following table is an example of verbs based on the taxonomy according to Anderson & Krathwohl (2001):

Taxonomy level	associated verbs
1. Know	*formulate, outline, point out, explain, name, define, enumerate, recite, designate, describe, name, recognize, identify, recall, repeat, reproduce, explain....*
2. Understand	*Present, summarize, deduce, interpret, contrast, structure, compare, classify, translate, describe relationships....*
3. Apply	*construct, combine, elaborate, design, use, implement, perform, modify, operate, transfer, experiment....*
4. Analyze	*test, evaluate, justify, infer, measure, correct, differentiate, characterize, structure, illustrate....*
5. Rate	*refute, combine, conceive, compose, relate, theorize, evaluate, assess....*
6. Create	*create, develop. invent, produce...*

d) Formulations that cannot be clearly assigned to a taxonomy level should be avoided:

"*understand*" is too global a term,

"*Know*" needs to be worded more concretely e.g. "Students list/name/explain concepts ...".

e) The quality of learning outcomes is measured by various criteria. They should be:

- realistic,
- specific,
- measurable (observable/testable).

f) The following **3-step scheme** may be helpful in formulating learning outcomes:

1. Introductory sentence	*Students who have successfully participated in Module XY,*	
2. Verb (taxonomy-oriented)	*explain*	Level of knowledge according to taxonomy: 1. knowledge
3. Description	*the most important basic concepts of business informatics.*	

5. Examples

After successful participation in module XY...

- students name the basic theories of A, B, and C.
- students identify basic features of theories A, B and C.
- students explain the most important key statements on the topics XY also to persons outside the field of science.
- students interpret the results of empirical studies and present them to a group.

By successfully completing Module XY...

- Students actively participate in professional discussions on the topic area XY and critically evaluate different positions.
- Students independently conduct and reflect on analyses of subject-specific discourses in Area A and B.
- students apply methods X, Y and Z independently.

Less suitable formulations	Instead: competence-oriented formulation - What are the students able to do after its completion?
The learning objective of Module XY is to achieve a basic understanding in the field of XY, incorporating key theories.	*Students explain the major theories in the field of XY. The theories are applied to the fields of action A, B, and C.*
The module teaches problem-solving skills.	*Students apply procedure XY (to be specified in more detail) to specific examples.*
Attending module XY ensures the acquisition of instrumental competence to develop solutions to problems and arguments in the subject area.	*Students make technical arguments.*
In addition to specific knowledge in the field of XY, the module should also lead to an in-depth critical examination of a scientific question.	*Students reproduce the fundamentals of subarea XY.* *They critically examine a scientific question.*
Module XY is designed to foster the ability to critically reflect on Model X in the context of contemporary issues.	*Students critically reflect on the application of Model X in the context of contemporary issues.*

Guiding questions

- Is there a description of what students are able to do at the end of the learning process (of the course/module etc.)?
- Is the learning outcome observable?
- Is the learning outcome formulated with an active verb?
- Is the learning outcome specific and clear?
- Is the aspiration level (according to taxonomy) recognizable?
- Is the formulated learning outcome realistically achievable within the given framework?

Meaningfully formulated learning outcomes support the conception of professional university teaching. This handout is to be seen as a guide for this. For more information, please visit the ISA:Dig project website, which is currently under construction.

https://uni-passau.de/isadig

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Further reading

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