COMPETENCE CENTER
FOR INNOVATION IN
STUDIES AND TEACHING

HANDOUT: COMPETENCE-BASED DEGREE PROGRAM DESIGN

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INTRODUCTION

This handout is to be viewed as a recommendation for competence-based degree program design. For easier reading, we have not included references in the body of the text. The sources used can be found in the section Sources/Additional Reading.

With its Bologna reform, the European higher education sector agreed on a framework of comparable and compatible higher education degrees, called the European Qualifications Framework Framework (EQF). This framework is implemented in Germany using the German Qualifications Framework (DQR). For the higher education sector, the Qualifications Framework for German Higher Education Degrees (HQR) structures and organizes the various qualifications in the area of higher education. The HQR is compatible with the EQF and the DQR, which means that the qualifications in these frameworks are comparable with

one another. Learning outcomes are the central element of the HQR. The aim is to enable comparability, competitiveness, recognition, and mobility in the European Higher Education Area on the basis of learning outcomes, along with improving the employability of graduates. The necessary professional and general competences and skills are intended to ideally prepare students for a professional career.

Competence-oriented degree program design means giving students the opportunity to apply their knowledge. In designing a degree program, therefore, maintaining an outcome orientation – meaning the focus on a quantifiable learning outcome – is of key importance.

1. DEFINITION OF COMPETENCE DIMENSIONS

Degree program objectives and module objectives (learning outcomes) describe the competences that students will possess after successful completion of the module or program. Competences are defined as the knowledge, skills, and abilities required to perform specific tasks and solve problems.

In accordance with the Qualification Framework (HQR), the following four competence dimensions are to be anchored in the degree program and module objectives and, as such, in the curricula:
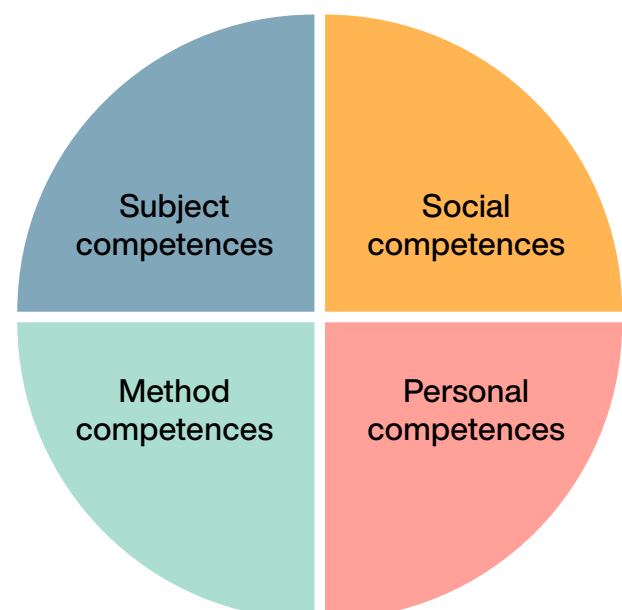

Figure 1 – Competence Dimensions (author's own figure)

▶ **Subject competences (knowledge and understanding)**

The knowledge required to perform subject-specific tasks and approach subject-specific problems. Examples include principles, theories in the specific field of study

▶ **Method competences (use, application, and generation of knowledge)**

The application of knowledge to independently solve the tasks and problems. This entails subject-specific methods. These include methods, empirical work, presentation and perceptual skills, and programming, as well as cross-disciplinary methods such as problem-solving techniques, future skills, and language skills.

▶ **Social competences (communication and cooperation)**

The purposeful communication and cooperation needed to work together. These skills include presentation, group work, argumentation, conflict resolution, and reflecting on and considering different points of view and the interests of others.

▶ **Personal competences (scientific self-understanding/professionalism)**

The development of the ability to act independently and responsibly, and to reflect on one's own actions and those of others. Examples include self-reflection, setting personal goals, managing oneself and handling stress, motivation, and developing a personal system of values, especially social responsibility.

2.DEGREE PROGRAM OUTCOMES

The degree program outcomes describe the essential requirements for the profile of the degree program.

The program outcomes specify the aims for *each of the four competence dimensions. A total of approximately ten program outcomes should be defined. It is not necessary to define an equal number of outcomes from all four competence dimensions.

The degree program outcomes are given to the graduates with their final documents, with the diploma supplement. They provide potential employers with information on the competences graduates have achieved upon completion of the degree program and the subject areas in which they possess expertise with their degree.

3.MODULE OUTCOMES

Module outcomes define the specific student learning outcomes in a module.

Not all four competence dimensions need to be represented in a module, but each module outcome should be assignable to at least one degree program outcome. The module should contribute to

multiple, but generally not all, degree program outcomes. In the higher semesters of the degree program, several program outcomes are generally addressed by one module. A maximum of ten module outcomes should be defined per module.

4. FORMULATING LEARNING OUTCOMES

Competence-based curriculum planning focuses on students' self-directed and self-determined learning: the "shift from teaching to learning" coined by Johannes Wildt in 2003. To define the learning outcomes and ensure they are verifiable, it is necessary to use a definition that is in alignment with this.

The outcome-oriented definition supports instructors in designing their instruction and facilitates the selection of teaching and assessment forms. In addition, concretely defining the teaching outcomes helps when it comes to forming suitable assessment questions.

4.1. CONSTRUCTIVE ALIGNMENT

Developed by John Biggs, the constructive alignment model involves aligning learning outcomes, teaching-learning methods, and assessment forms to help you with instructional planning, implementation, and evaluation. It also provides students with a framework of guidelines.

Constructive alignment can be summarized as follows: The defined learning outcomes are used to determine how the achievement of these learning outcomes can be assessed in the end. How the students can be prepared for the respective assessment, how the knowledge to be taught can be practiced, is also considered. This means that the class should be designed in such a way that the students learn all the knowledge and skills needed to be successful in the assessment. There is a recognizable connection between the learning outcomes, the learning activity, and the assessment.

The following questions are fundamental to the concept of constructive alignment:

- What learning outcomes or learning objectives are expected in the class?

- What assessment form can be used to assess the learning outcomes?

- What teaching and learning methods and learning activities will be used to achieve the learning outcomes?
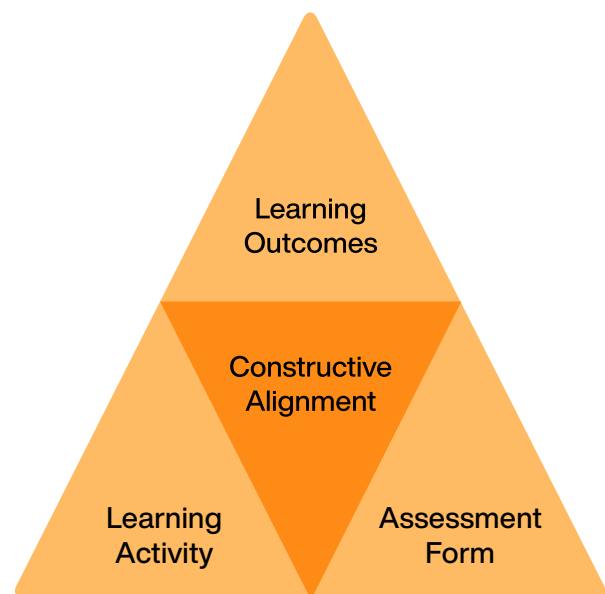

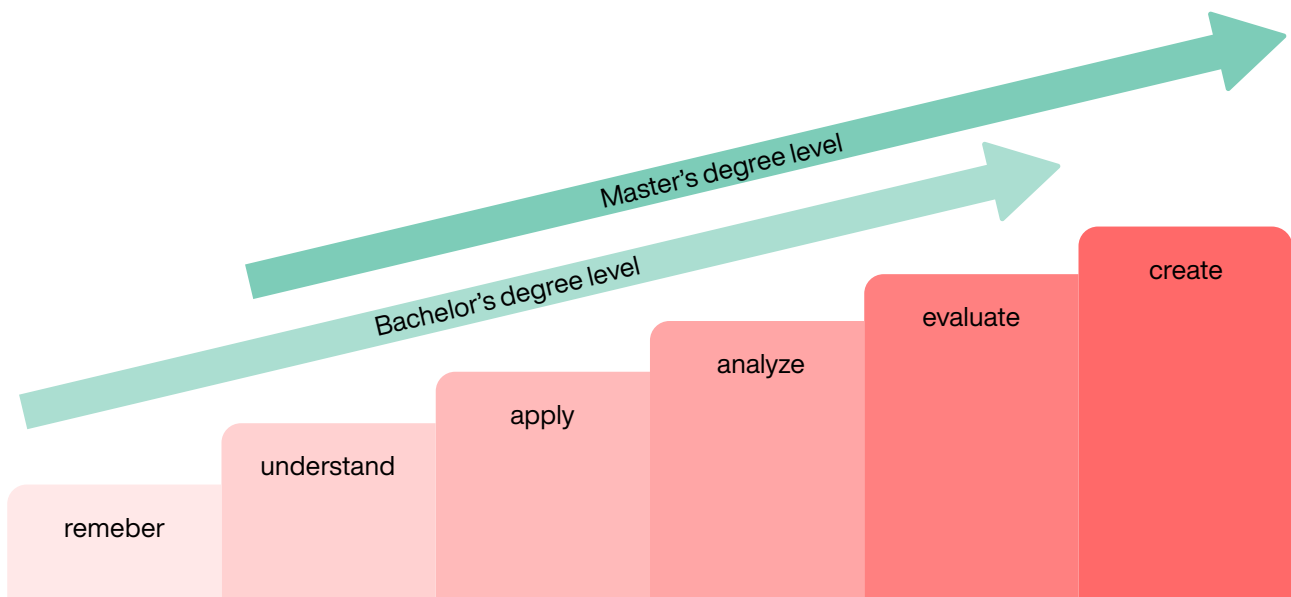Figure 2 – Constructive Alignment (author's own figure)

Figure 3 – Bloom's Taxonomy Levels Revised by Anderson & Krathwohl (author's own figure)

4.2. BLOOM'S TAXONOMY

The learning outcomes should be placed on the appropriate levels of the taxonomy corresponding to the degree level and the associated level of competence of the degree programs (bachelor level 6 (DQR), master level 7 (DQR)). Taxonomies help classify the learning outcomes. The most well-known taxonomy is Bloom's Taxonomy (1956) and its revision by Andersen and Kratwohl (2001), which is used at Mainz University of Applied Sciences.

You will find a table on Bloom's taxonomy (revised by Anderson & Krathwohl 2001) with a collection of verbs in the appendix. Formulating learning outcomes is not about describing class content, or input, it is about what students are able to do after completing a module or a degree program, the output. This means that the degree program or module is aligned with what students should be able to do at the end of the learning process. The learning outcomes should be formulated in specific and measurable terms.

When formulating the learning outcomes, the following points need to be kept in mind:

- The focus is on the outcome, not the content

- Learning outcomes should be observable and measurable

- The learning outcome is generally defined using an active verb

- Verbs that are not measurable or assessable, such as know, learn, understand, and can, are to be avoided

- Formulation according to the degree level, incorporating the revised Bloom's taxonomy (see explanation below)

- Learning outcomes should be achievable in the time available

- The learning outcome should start with the words: "Upon successful completion of the degree program or module, students will be able to... ."

5.EXAMPLES

5.1 LEARNING OUTCOMES EXAMPLE MODULE OUTCOME PROJECT MANAGE-MENT

Upon successful completion of the module, students will be able to:

- Describe and depict the basics of project management.

- Name the make-up of different forms of project organization structures and independently execute project planning.

- Plan projects on the basis of control capabilities in project controlling.

- Apply project management software commonly used in practice.

- Accomplish an assigned project in groups and present the results and discuss them with the class.

▶ **Note:** The learning outcomes need to be formulated in a measurable and outcome-oriented way. Accordingly, verbs such as know, since it is not measurable, and should, since it does not constitute a goal, should be avoided. The non-subject competences or key competences should also be formulated and integrated into the formulation of the outcomes.

5.2 DEGREE PROGRAM OUTCOME EXAMPLE BACHELOR'S DEGREE LEVEL

▶ **Subject competences (knowledge and understanding)**

Graduates have acquired extensive knowledge of business administration, which enables them to work in a scientifically sound manner and to act responsibly in their professional activities.

▶ **Method competences (use, application, and generation of knowledge)**

Graduates are able to formulate subject-related problems using established scientific methods and apply suitable concepts to take action. They are equipped with suitable methods to work in a scientifically sound, practice-oriented, and problem-solving manner and to further develop innovative projects.

▶ **Social competences (communication and co-operation)**

Graduates are able to communicate subject-related positions to experts and laypersons. They are able to develop solutions to problems in interdisciplinary teams in a target-oriented manner.

▶ **Personal competence (scientific self-understanding/professionalism)**

Graduates possess a sense of professional values. They are able to assume social responsibility in their discipline. They are able to handle stressful situations using targeted methods of self-organization and time management.

SOURCES/ADDITIONAL READING

DQR – The German Qualifications Framework for Lifelong Learning: https://www.dqr.de/dqr/shareddocs/downloads/media/content/german_eqf_referencing_report.pdf?__blob=publicationFile&v=2

HQR – The Qualifications Framework for German Higher Education Degrees: https://www.hrk.de/fileadmin/redaktion/hrk/02-Dokumente/02-03-Studium/02-03-02-Qualifikations-rahmen/HQR_EN.pdf

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Image on title page: Screenshot Pexels, royalty-free
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Figure 2: Constructive Alignment, author's own figure (p. 4
Figure 3: Bloom's Taxonomy Levels Revised by Anderson & Krathwohl, author's own figure (p. 5)

APPENDIX

Table of Bloom's Taxonomy (revised by Anderson & Krathwohl 2001)

Table of 200+ Blooms Verbs

Appendix: Bloom's Taxonomy (revised by Anderson & Krathwohl 2001)

Taxonomy level	Definition	Verbs	Example Students are able to:
remember	reproduce information	list, recite, outline, define, name, match, quote, recall, identify, label, recognize, state, cite, tell, describe, reproduce	· list basic concepts and terms used in economics.
understand	assign meaning to subject matter	describe, explain, paraphrase, restate, give examples, classify, summarize, contrast, interpret, infer, convert, illustrate, distinguish, discuss	· explain the basics of cost accounting.
apply	apply a method, execute a course of action	calculate, predict, apply, solve, illustrate, use, demonstrate, determine, model, perform, complete, implement, perform, plan, examine, configure, present	· apply proper accounting principles and prepare a balance sheet.
analyze	identify connections, detect contradictions	classify, order, break down, categorize, analyze, diagram, compare, contrast, criticize, simplify, separate, deduce, examine, associate	· separate microeconomic and macroeconomic problems.
evaluate	make qualitative and quantitative judgments on subject matter	assess, justify, differentiate, discriminate, distinguish, appraise, conclude, grade, persuade, argue, select, evaluate, weigh, order, organize, critique, defend, measure	· critically assess economic models with respect to their relevance for society.
create	propose new solutions, draft hypotheses	design, develop, formulate, build, invent, create, compose, prepare, produce, generate, derive, modify, hypothesize, devise, assemble, structure, simulate	· develop new financial products and services on the basis of field research.

Bachelor's degree level

Master's degree level

APPENDIX: 200+ BLOOMS VERBS

Remembering

Define
Identify
Describe
Label
List
Name
State
Match
Select
Locate
Memorize
Quote
Recall
Reproduce
Tabulate
Tell
Copy
Duplicate
Enumerate
Omit
Recite
Record
Repeat
Retell

Understanding

Explain
Describe
Interpret
Paraphrase
Summarize
Classify
Compare
Discuss
Distinguish
Predict
Associate
Convert
Demonstrate
Estimate
Express
Indicate
Infer
Relate
Restate
Select
Translate
Cite
Generalize
Give examples
Group
Illustrate
Order
Report
Represent
Rewrite
Show
Trace
Transform

Applying

Solve
Apply
Illustrate
Modify
Use
Calculate
Change
Demonstrate
Experiment
Relate
Complete
Construct
Dramatize
Interpret
Manipulate
Paint
Prepare
Produce
Report
Teach
Act
Administer
Articulate
Chart
Collect
Compute
Determine
Develop
Employ
Explain
Interview
List
Operate
Practice
Predict
Simulate

Analyzing

Analyze
Compare
Classify
Contrast
Distinguish
Infer
Separate
Categorize
Differentiate
Discriminate
Divide
Order
Subdivide
Survey
Advertise
Conclude
Correlate
Deduce
Devise
Diagram
Dissect
Estimate
Illustrate
Organize
Outline
Plan
Question
Test

Evaluating

Criticize
Evaluate
Order
Appraise
Judge
Support
Decide
Discriminate
Recommend
Assess
Convince
Defend
Find errors
Measure
Grade
Rank
Score
Select
Test
Argue
Conclude
Consider
Critique
Debate
Distinguish
Editorialize
Justify
Persuade
Rate
Weigh
Validate

Creating

Design
Compose
Create
Plan
Formulate
Invent
Hypothesize
Write
Compile
Construct
Develop
Integrate
Modify
Organize
Prepare
Produce
Rearrange
Rewrite
Adapt
Arrange
Assemble
Collaborate
Devise
Express
Facilitate
Make
Negotiate
Originate
Propose
Reorganize
Simulate
Structure