European Commission
ERASMUS MUNDUS

With the support of the Erasmus Mundus programme of the European Union

UNIQUE
University Quality Exchange

Ref.: 545457-EM-1-2013-1-AT-ERA MUNDUS- EMA3

Competence Based Teaching

Voronezh, 12th of May 2015

FH JOANNEUM
University of Applied Sciences

wusaustria
right to education

Aston University
Birmingham

Universitat d'Alacant
Universidad de Alicante

UIBE 1951

POLYTECHNIC OF NAMIBIA

BIMTECH
BIRLA INSTITUTE OF MANAGEMENT TECHNOLOGY

TECNOLÓGICO DE MONTERREY

Competence Based Teaching

Questions and Aims:

Why do we need it ? - What is it ? - How does it work ?

"With labour markets increasingly relying on higher skill levels and transversal competences, higher education should equip students with the advanced knowledge, skills and competences they need through their professional lives.“

(The Bologna Process 2020)

Why do we need it?

Зачем это нужно?

Making course design more efficient

Working with competence based teaching makes it easier to set up curricula, to define learning outcomes and to compare the content of different courses.

Competence based teaching is, even though it does, as all new tools require some additional work at the beginning, very helpful for reducing the workload in the planning phase of courses.

- Easier curriculum set-up
- Comparing courses with each other is much easier and overlapping can be better avoided
- Saves time for each professor on the long run

International comparability

Leading universities all over Europe actively apply the concept of competence based teaching for their programs and research.

Competence based teaching has become a necessary precondition for cooperation and comparison with these universities and a major element of the European higher education area.

Up to date teaching methodology

Increased international comparability and cooperation

A strong link to employers and alumni

With the introduction of the Bologna process, many EU universities have experienced increased interest from the professional and commercial sectors

Competence based teaching has proven to be the most efficient tool to establish a strong connection between higher education and employers especially if this connection was not well established before.

- Better alumni employability
- Increased cooperation with industry
- Teaching will be more directly connected to practical use

What is a competence?

The International Board of Standards for Training and Performance Instruction (IBSTPI) defines a competence as **"a knowledge, skill, or attitude that enables one to effectively perform the activities of a given occupation or function to the standards expected in employment"**

A knowledge, skill or attitude

to effectively perform

to the standards expected in employment

What is a competence?

A competence has three states in time:

Before teaching starts it is an **objective.**
During teaching it is a **learning activity** reference.
After teaching it is a **result**.

The description of the competence stays the same throughout the whole life cycle.

E.g.: Independently gather and select sources and relevant information to develop original research.

Specific Competences

Specific competences are those, which **should be possessed by those students which studied the programme**, but not by students of other fields of study.

Specific competences **“belong” to a field of studies** and students of this field can be discerned from other students by possessing these specific competences.

Specific competences strongly depend on the field of study.

Examples for specific competences

Interpret visual and aesthetical elements of architectural design language, such as rhythm, system of proportion, scale, color harmony and visual perception.

(Architecture)

Implement methods and techniques for correct examination of patients with impaired locomotors apparatus in physiotherapy.

(Physiotherapy)

Identify key properties and important factors for cultivation of arable plants and vegetables.

(Agroeconomy)

General Competences

General competences are those, which **should be possessed by all alumni (or students) of an university.**

General competences do **not "belong" to a field of studies, they are common to all students of an university**.

These are the so called "soft-skills" which many employers are looking for and which many universities put into their diploma supplements.

Example:

Teamwork and Relationship Building (i.e., ability to work in teams and to utilize appropriate interpersonal skills to build relationships with colleagues, team members and external stakeholders)

How to define competences ?

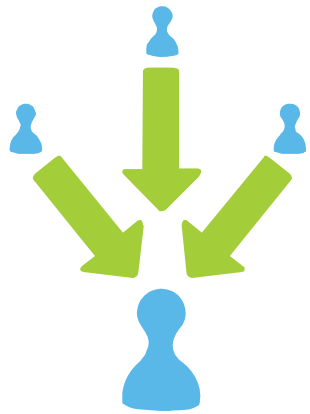
Defining competences

As a first step **specific and general competences need to be defined for each degree program.** There is a number of relevant stakeholders / sources which should be involved in this process

National legislation

EHEA requirements

University prerequisites



Labour market needs

Student needs

How to define a competence

A competence should always be defined in **describing the activity** that should be possible when having attained the competence. A competence description could start with the words:

“The ability to…”

A competence is **more than knowledge** it always refers an application of knowledge and the required skills and/or attitudes.

e.g.: Independently gather and select sources and relevant information to develop original research.

Note that: “to know about” is not a competence, just part of it.

Competence levels

Most competences need to be developed over time, they are learned step by step. To simulate this process we use **competence levels**

Gather and select information efficiently

- Independently select (with a plan of one's own) relevant information from a specific source (text, image, video) and with a well-defined objective.
- Select relevant information from pertinent sources with a well-defined objective.
- Independently select sources and relevant information, in one's own area of knowledge, to achieve specific objectives.
- Independently select sources and relevant information to achieve any type of objective in any area of knowledge.
- Independently gather and select sources and relevant information to develop original research that will provide new knowledge in one's own area of specialization.

Dublin Descriptors

Define the level of competence / qualifications students should have acquired when they have reached a certain academic level.

Students at entry level should:
… have the ability to identify and use data to formulate responses to well-defined concrete and abstract problems;

Students at Bachelor level should:
… have the ability to gather and interpret relevant data (usually within their field of study) to inform judgements that include reflection on relevant social, scientific or ethic issues;

Students at Master level should:
… have the ability to integrate knowledge and handle complexity, and formulate judgments with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgements;

Catalogues and Matrices

The Competence Catalogue

- The competence catalogue includes all **the general and the specific competences** of a degree programme. Together they make up the profile of the future graduates.

- Each single competence will be **related to one or more courses** of the degree programme by the competence matrix later on.

- The competence catalogue is the **basis for the competence based teaching approach**. All other steps refer to it.

University Competence Catalogue		
Course A	Specific competences for course A.	Generic competences of the University.
Course B	Specific competences for course B.	
....	...	
Course N	Specific competences for course N.	

Why is it important to have a catalogue of competences?

The competence catalogue is the basis of a university programme and represents it's learning goals. The list can be read in different ways:

- it is the **profile of the degree** and of the future graduate;
- it reflects the **commitment to society**, the result teaching;
- it is the **guide for all teaching activities** within the programme;
- it is the **starting and end point of the teaching-learning process**.

Academic courses, subjects and learning activities will be planned with a view to competences and learning outcomes will be assessed in terms of competences, i.e., the extent to which each student has acquired the proposed competences.

What is a competence matrix?

Competence Matrix

A competence matrix is set up using the courses of a programme as rows and the competences as columns.

			GC - 1	GC - 2	SC - 1	SC - 2	SC - 3	SC - 4
Basic part	M1.B.1	Business foreign language	x		x			
	M1.B.2	History and methodology of science and production	x			x		
	M1.B.3	Philosophical problems of science and technology		x				
	M1.B.4	Economic justification of scientific researches						
	M1.B.5	Mathematical modelling in mechanical engineering		x			x	
	M1.B.6	Computer technologies in science and production					x	

Competence Matrix

The courses are taken from the curriculum. The competences from the competence catalogue.

The Competence Matrix **shows which competences are taught in which courses**. Usually the assigned competences are set up together with the course design and discussed with the respective professors before the course starts.

If a competence is taught in a course, the respective square is marked (here with an x).

Competences might be taught in just one or in several courses. In turn courses might contain one or several competences.

The core of the concept

Remember:

A competence has three states in time:

Before teaching starts it is an **objective.**
During teaching it is a **learning activity** reference.
After teaching it is a **result.**

The description of the competence stays the same throughout the whole life cycle.

E.g.: Independently gather and select sources and relevant information to develop original research.

Assigning learning activties

After the competence matrix has been set up, each professor, teaching a course, has the task **to develop learning activities** which allow to teach the connected general and specific competences (at the specified level).

E.g.: A course might be connected to (among others):

- Prepare and give presentations (oral or written) in English about one's own area of knowledge.
- Be able to make arrangements to ensure reliability and safety of mechanical engineering production, its stable operations based on advanced systems and international standards

The development of an teaching activity, which will include a student presentation (in English) about a topic connected to the specific competence involved, is an obvious choice, but by far not the only one.

Assigning learning activities

The **general and specific competences** and the connected learning activities are the core of each course syllabus.

The **competences involved cannot be changed by the professors**, after the matrix has been set up, without changing and possibly compromising the matric structure.

This is, why professors should, as soon as possible, but latest before the matrix is approved, be involved in the process.

The **learning activities are the responsibility of the respective professor**. Different professors will use different approaches to teach the same competencies.

Assessment

From the various learning activities, **one or several are selected as assessment activities**, which are than graded. Usually the assessment activities and the connected assessment key are defined in the syllabus and provided to the students before the course starts:

e.g.

30% Seminar paper.

30% Presentation of the paper in English.

40% Analysing a case in final exam.

Assessment

Each of this activities **could be connected to one or several competencies**. For the example above, the

Presentation of the paper in English (30%)

Could include a general competence “English Language” and a specific competence “Reliability and Safety”. If the learning activity was designed correctly each competence can be graded.

E.g.:

Quality of language and presentation (max. 15pts)

Quality of research and correctness of information (max. 15pts)

Assessment

The grade of the course will be calculated as usual, by summarizing the points the student reached in diverse assessment activities.

Additionally it is possible to **grade a general or specific competence** by summarizing all the points earned in that competences (from different courses) and in this way achieving a grade for the competence.

E.g.: English language competence was graded in three courses. A maximum of 50pts could have been reached. A student reached 14+14+19 (=47pts), an excellent result.

Collecting this information allows to define a diploma supplement, in which general competences of the student could be mentioned.

Thank you very much!

Rupert Beinhauer
FH JOANNEUM
International Management
Eggenberger Allee 11
8020 Graz

0043 316 5453 6822
rupert.beinhauer@fh-joanneum.at

Erasmus Key Action 3

European Commission
ERASMUS MUNDUS

With the support of the Erasmus Mundus programme of the European Union

UNIQUE
University Quality Exchange

Ref.: 545457-EM-1-2013-1-AT-ERA MUNDUS- EMA3

Duration: 30 Months

Project Management:
FH JOANNEUM: Coordinator *Claudia Linditsch, MA*

FH JOANNEUM University of Applied Sciences

wusaustria right to education

Aston University Birmingham

Universitat d'Alacant
Universidad de Alicante

UIBE 1951

POLYTECHNIC OF NAMIBIA

BIMTECH BIRLA INSTITUTE OF MANAGEMENT TECHNOLOGY

TECNOLÓGICO DE MONTERREY