Tuning
Educational Structures
in Europe

UK BOLOGNA SEMINAR

USING LEARNING OUTCOMES

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The Tuning Approach

A Case Study

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The TUNING project is a project by and for universities.

It is the Universities' response to the challenge of the Bologna Declaration

TUNING MOTTO

Tuning of educational structures and programmes on the basis of diversity and autonomy

Berlin Communiqué

(19 September 2003)

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Degree structure: adoption of a system essentially based on two main cycles

"Ministers encourage the member States to elaborate a framework of comparable and compatible qualifications for their higher education systems, which should seek to describe qualifications in terms of workload, level, learning outcomes, competences and profile. They also undertake to elaborate an overarching framework of qualifications for the Higher Education Area."

TUNING APPROACH:
learning outcomes and competences

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General tendencies in higher education:

- **Shift of paradigm: moving from a staff oriented approach to a student centred approach**
- **Less specialised academic education in the first cycle**
- **More flexibility in first and second cycle programmes**
- **Life Long Learning approach in teaching and learning**
- **Introduction of new approaches regarding teaching, learning and assessment: internship, apprenticeships, dual models and combinations of teaching and learning**

What should a student know, understand and be able to do to be employable?

Why Focus on learning outcomes and competences?

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1. To further the comparability and compatibility of programmes of studies and transparency in higher education

2. To accommodate diversity and autonomy in higher education.

3. To develop a common language which is understood by academics and stakeholders alike.

4. To facilitate the shift from a staff centred approach to a more learner oriented approach to education (from input to output).

5. To facilitate new forms of education as well as mutual recognition in a lifelong learning society.

6. To promote higher levels of employability and citizenship through education.

Learning outcomes: different pathways leading to comparable results

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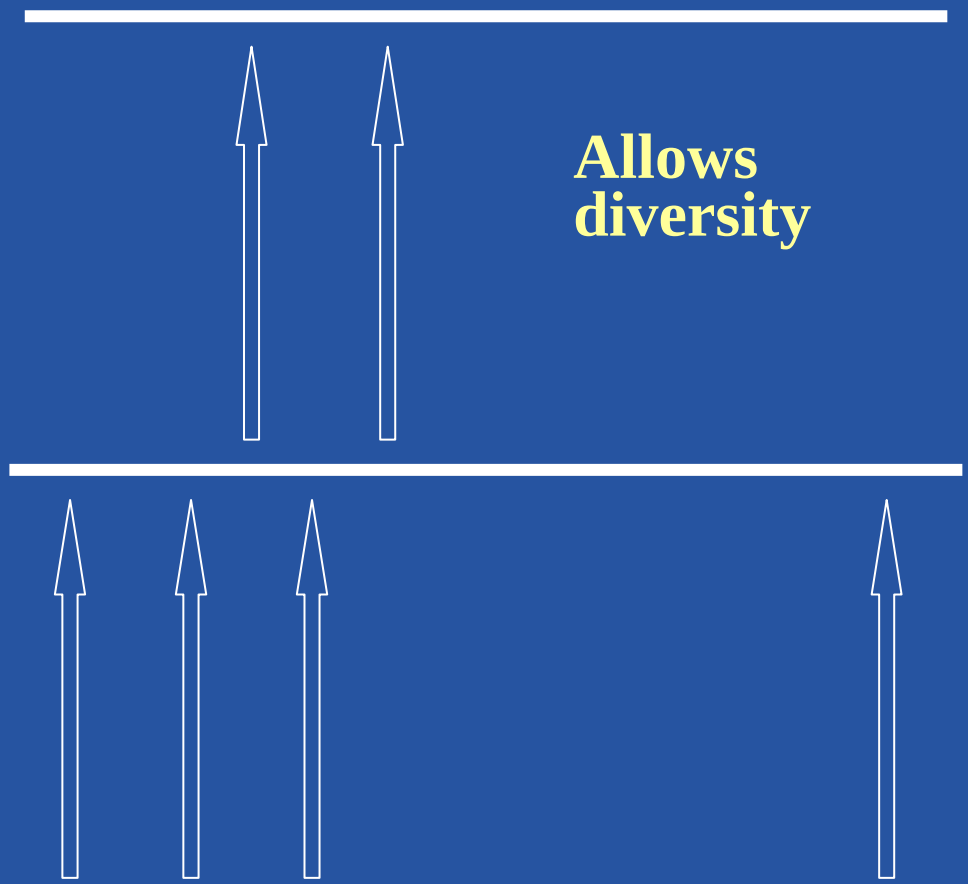
Second cycle learning outcomes:

Different pathways:
(60) 90 – 120 ECTS-credits

First cycle learning outcomes:

Different pathways:
180 – 240 ECTS-credits



Tuning definitions

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Learning outcomes:

Statements of what a learner is expected to know, understand and/or be able to demonstrate after completion of learning.

They can refer to a single course unit or module or else to a period of studies, for example, a first or a second cycle programme. Learning outcomes specify the requirements for award of credit.

[learning outcomes are formulated by academic staff]

Tuning definitions

Competences:

Competences represent a dynamic combination of attributes, abilities and attitudes.

Fostering these competences are the object of educational programmes.

Competences will be formed in various course units and assessed at different stages.

[competences are obtained by the student]

Tuning definitions

How are competences and learning outcomes related?

- Learning outcomes according to Tuning methodology should be formulated in terms of competences.
- Learning outcomes are requirements of a unit or a programme and are expressed in terms what the learner knows and is able to do at the end of the learning experience.
- Competences may be developed to a greater degree than the level required by the learning outcome.

LEARNING OUTCOMES AND COMPETENCES IN STUDY PROGRAMMES

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Example

Course unit/ learning outcome	Competence									
	A	B	C	D	E	F	G	H	I	F
Unit 1		X			X					
Unit 2	X			X			X			
Unit 3		X				X			X	
Unit 4	X		X							X

X = THIS COMPETENCE IS DEVELOPED AND ASSESSED AND IS MENTIONED IN THE LEARNING OUTCOME OF THIS UNIT

The TUNING Generic Competences

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Types to be distinguished:

- **Instrumental competences:** cognitive abilities, methodological abilities, technological abilities and linguistic abilities
- **Interpersonal competences:** individual abilities like social skills (social interaction and co-operation)
- **Systemic competences:** abilities and skills concerning whole systems (combination of understanding, sensibility and knowledge; prior acquisition of instrumental and interpersonal competences required)

The TUNING Generic Competences

Instrumental competences:

- Capacity for analyses and synthesis
- Capacity for organisation and planning
- Basic general knowledge
- Grounding in basic knowledge of the profession
- Oral and written communication in your native language
- Knowledge of a second language
- Elementary computing skills
- Information management skills (ability to retrieve and analyse information from different sources)
- Problem solving
- Decision-making

THE TUNING Generic Competences

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Interpersonal competences:

- Critical and self-critical abilities
- Teamwork
- Interpersonal skills
- Ability to work in an interdisciplinary team
- Ability to communicate with experts in other fields
- Appreciation of diversity and multiculturality
- Ability to work in an international context
- Ethical commitment

The TUNING Generic Competences

Systemic competences:

- Capacity for applying knowledge in practice
- Research skills
- Capacity to learn
- Capacity to adapt to new situations
- Capacity for generating new ideas (creativity)
- Leadership
- Understanding of cultures and customs of other countries
- Ability to work autonomously
- Project design and management
- Initiative and entrepreneur spirit
- Concern for quality
- Will to succeed

Weighted Ranking of the Most Important Generic Competences. All Subjects

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Graduates	Employers	Academics
▪ Capacity for analysis and synthesis ▪ Capacity to learn ▪ Capacity for applying knowledge in practice ▪ Elementary computing skills ▪ Capacity to adapt to new situations	▪ Capacity to learn ▪ Capacity for applying knowledge in practice ▪ Capacity for analysis and synthesis ▪ Capacity to adapt to new situations ▪ Interpersonal skills	▪ Basic knowledge of the field of study ▪ Capacity for analysis and synthesis ▪ Capacity to learn ▪ Capacity for generating new ideas (creativity) ▪ Capacity for applying knowledge in practice

Staff orientation versus student centred?

TUNING APPROACH:
learning outcomes and competences

Examples of subject specific competences:

History:

- Ability to identify and utilise appropriate sources of information for research projects.
- Ability to organise complex historical information in coherent form.

Chemistry:

- Ability to apply chemistry knowledge and understanding to the solution of qualitative and quantitative problems of an unfamiliar nature.

TUNING PHASE 2

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Subject-specific cycle descriptors

TWO EXAMPLES:

Mathematics and Business

Tuning Subject Area Groups

Mathematics first cycle descriptor

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On completion of a first cycle degree in Mathematics,students should be able to

- Show knowledge and understanding of basic concepts, principles, theories and results of Mathematics
- Understand and explain the meaning of complex statements using mathematical notation and language
- Demonstrate skill in mathematical reasoning, manipulation and calculation
- Construct rigorous proofs
- Demonstrate proficiency in different methods of mathematical proof.

Mathematics first cycle descriptors

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Level 1.

Content:

- The mathematics all scientists should know: basic algebra and arithmetic, linear` algebra and geometry, calculus, basic differential equations, basic statistics and probability.

Skills:

- a) understand the main theorems of Mathematics and their proofs
- b) solve mathematical problems that, while not trivial, are similar to others previously known to the students
- c) translate into mathematical terms simple problems stated in non-mathematical language, and take advantage of this translation to solve them.

Mathematics first cycle descriptor

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Level 2.

Content:

- Basic theory of the main “mathematical subjects” incorporating those listed in the Mathematics Line 2 paper from Tuning 1. Other mathematical subjects can also be included at this level.

Skills:

- provide proofs of mathematical results not identical to those known before but clearly related to them
- solve non-trivial problems in a variety of mathematical fields
- translate into mathematical terms problems of moderate difficulty stated in non-mathematical language, and then solve them.
- Solve problems in a variety of mathematical fields that require some originality
- Build mathematical models to describe and explain non-mathematical processes.

Mathematics second cycle descriptor

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On completion of a second cycle degree in Mathematics, students should be able to

- Read and master a topic in the mathematical literature and demonstrate mastery in a reasoned report and /or verbal report;
- Initiate research in a specialised field

No common content

Programmes directed to students with first cycle degrees in related fields, e.g., computer science, engineering, physics, economics.

Business first cycle descriptors

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Students should be able to:

- Use and evaluate tools for analysing a company in its environment
- Work in a subject specific field of a company, and be a specialist to some extent
- Interface with other functions
- Have self-awareness
- Be able to argue for the principles to be used in finding a solution to a problem mainly at an operational or tactical levels
- Defend the proposed solution
- Prepare for decision making at mainly operational and tactical levels
- Be a generalist in the subject field of business

Business second cycle descriptors

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Students should have:

- Skills enabling them to participate in strategic decision making
- Ability to do guided research
- Ability to work independently
- Skills to perform holistic judgement and abilities to make critical assessments on strategic solutions
- Skills to manage change
- International mobility and cultural understanding
- Ethical commitment

A methodology for designing, planning and implementing curricula

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Tuning approach:

- student centred
- definition of academic and professional profiles
- definition of learning outcomes
- identifying generic and subject specific competences
- output oriented curricula

Tuning methodology and model:

- appropriate for mono-disciplinary, inter- and multidisciplinary, integrated and joint degree programmes
- valid for graduates with wide range of profiles
- focussing on competences

LEARNING OUTCOMES AND COMPETENCES IN STUDY PROGRAMMES

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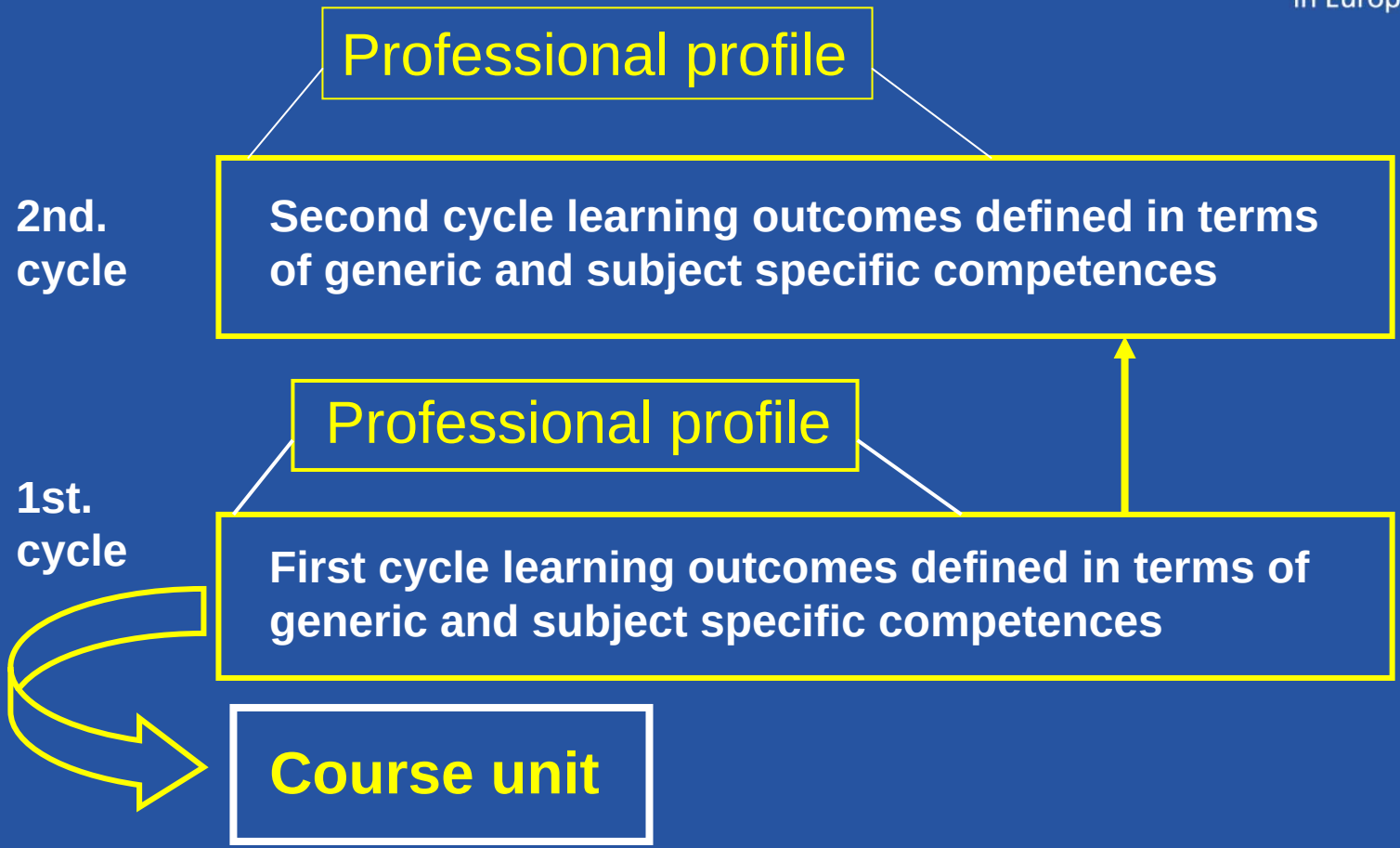

TUNING APPROACH:
learning outcomes and competences

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Steps in designing degrees:

1. Identification of social needs
2. Definition of academic and professional profiles: translation into learning outcomes and generic and subject specific competences
3. Translation into curricula
4. Translation into modules and approaches towards teaching, learning and assessment
5. Programme quality assurance: built in monitoring, evaluation and updating procedures

THE TUNING DYNAMIC QUALITY DEVELOPMENT CIRCLE

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Definition of academic and professional profiles

Identification of resources

Programme design: definition of learning outcomes / competences

Construction of curricula: content and structure

Selection of teaching and learning approaches

Selection of types of assessement

Evaluation and improvement **(on the basis of feed back and back forward)**

In Tuning terms:

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Definition of academic and professional / occupational profiles

- Professional profiles relate to existing maps of professions and corresponding professional bodies
- These profiles also relate to new emerging needs, which reveal potential openings for future employment and citizenship

In Tuning terms:

Definition of academic and professional profiles

The academic profiles relate to the academic, intellectual and practical level of achievement in degree programmes, recognized by the academic community

In Tuning academic and professional profiles are expressed in terms of learning outcomes and competences.

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In Tuning 2 the learning outcomes and competences have been linked to:

- ECTS credits based on student workload
- Approaches to teaching, learning and assessment
- Quality enhancement

STUDENT WORKLOAD: The Tuning approach

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A model for determining student workload:

- It is crucial that the teacher *and* the student focus on the learning outcomes to be achieved and the competences to be obtained.
- The teacher should reflect on which educational activities are more relevant for reaching the learning outcomes of the unit.
- The teacher should have a notion of the average student work time required for each of the activities selected for the unit.
- The student has a crucial role in the monitoring process to determine whether the estimated student workload is realistic.

STUDENT WORKLOAD: The Tuning approach

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The steps (1)

I. Modules or course units:

- non-modularized systems and modularized systems
- not too small, not too big
- learning outcomes are expressed in terms of competences
- workload is based on the total amount of activities a student is expected to do as part of the overall programme
- activities are planned to achieve learning outcomes and must respect agreed workload expressed in time (work hours)

STUDENT WORKLOAD: The Tuning approach

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The steps (2)

II. Planning and determining student workload:

- types of courses
- teaching and learning activities
- methods and techniques regarding assessment

Each of these has its own student time-related characteristics

- The teacher has to identify the time involved
- The identified workload should match the available number of credits for the unit

STUDENT WORKLOAD: The Tuning approach

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The Tuning model

Two types of forms suggested:

- **first one: for staff members to calculate the student workload**

  - learning activities and assessment to achieve desired learning outcomes (expressed in competences)

- **second one: for students to check whether the calculation of the staff fits reality for a typical student [time spent on the unit]**

  - total of class hours, execution of tasks: examinations / tests / writing of papers / giving presentations, etc. (including time to prepare)

QUALITY ENHANCEMENT IN STUDY PROGRAMMES

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Tuning is a tool for developing university quality culture in a transnational perspective, by focusing on:

- **design and delivery of degree programmes**
- **subject areas in a co-ordinated manner (individually and collectively)**
- **suitability of programmes to life and work in the European society/**

The project contributes to:

- **Generation of European reference points which feed back into national benchmarks and validation processes, thus facilitating recognition**

Tuning contributes to quality in terms of transparency, comparability, readability and relevance

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In the process, through:

- programme development based on consultation
- learning processes defined in relation to academic and professional profiles
- educational experiences planned for the achievement of learning outcomes and competences
- integration of mobility using ECTS tools
- providing criteria for evaluation

Tuning contributes to quality in terms of transparency, comparability, readability and relevance

In outcomes:

- based on academic and professional profiles
- expressed in learning outcomes and competences
- measured in student workload-based ECTS credits
- described in the Diploma Supplement

Websites

http://europa.eu.int/comm/education/socrates/

TuningProject

http://www.relint.deusto.es/TuningProject/index.htm

http://www.let.rug.nl/TuningProject/index.htm