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Multilevel Local, Nation- and Regionwide Education and Training in Climate Services, Climate Change Adaptation and Mitigation



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Competence-based learning 1: Qualifications, Competences, Learning Outcomes

Marek Frankowicz

Outline

- **Basic terms of competence-based learning:**
 - qualifications,
 - competences,
 - learning outcomes.
- **Writing learning outcomes:**
 - Bloom's taxonomy (also mentioning other taxonomies),
 - Programme LOs,
 - Course LOs

EQF

The **European Qualifications Framework (EQF)** is a common **European** reference **framework** whose purpose is to make **qualifications** more readable and understandable across different countries and systems.

COUNCIL RECOMMENDATION

of 22 May 2017

on the European Qualifications Framework for lifelong learning and repealing the recommendation of the European Parliament and of the Council of 23 April 2008 on the establishment of the European Qualifications Framework for lifelong learning

(2017/C 189/03)

qualification means a formal outcome of an assessment and validation process which is obtained when a competent authority determines that an individual has achieved learning outcomes to given standards

learning outcomes means statements regarding what a learner knows, understands and is able to do on completion of a learning process, which are defined in terms of knowledge, skills and responsibility and autonomy

knowledge means the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. In the context of the EQF, knowledge is described as theoretical and/or factual

skills means the ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments)

responsibility and autonomy means the ability of the learner to apply knowledge and skills autonomously and with responsibility

competence means the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development;

national qualifications system means all aspects of a Member State's activity related to the recognition of learning and other mechanisms that link education and training to the labour market and civil society. That includes the development and implementation of institutional arrangements and processes relating to quality assurance, assessment and the award of qualifications. A national qualifications system may be composed of several subsystems and may include a national qualifications framework

national qualifications framework means an instrument for the classification of qualifications according to a set of criteria for specified levels of learning achieved, which aims at integrating and coordinating national qualifications subsystems and improve the transparency, access, progression and quality of qualifications in relation to the labour market and civil society;

international qualification means a qualification awarded by a legally established international body (association, organisation, sector or company) or by a national body acting on behalf of an international body that is used in more than one country and that includes learning outcomes assessed with reference to standards established by an international body;

validation of non-formal and informal learning means the process of confirmation by a competent authority that an individual has acquired learning outcomes acquired in non-formal and informal learning settings measured against a relevant standard and consists of the following four distinct phases: identification through dialogue of particular experiences of an individual, documentation to make visible the individual's experiences, a formal assessment of those experiences and certification of the results of the assessment which may lead to a partial or full qualification;

formal recognition of learning outcomes means the process of granting official status by a competent authority to acquired learning outcomes for purposes of further studies or employment, through (i) the award of qualifications (certificates, diploma or titles); (ii) the validation of non-formal and informal learning; (iii) the grant of equivalence, credit or waivers;

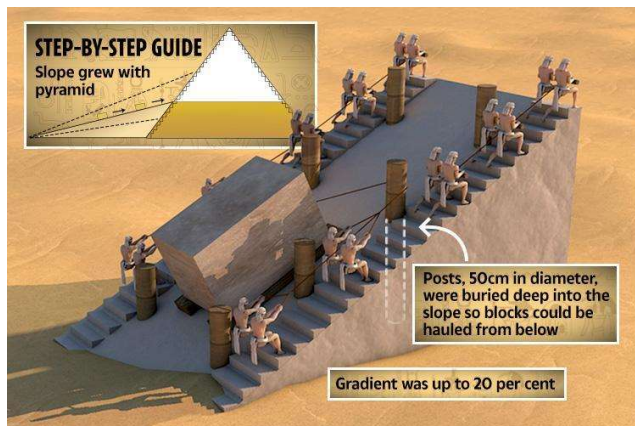
credit means confirmation that a part of a qualification, consisting of a coherent set of learning outcomes has been assessed and validated by a competent authority, according to an agreed standard; credit is awarded by competent authorities when the individual has achieved the defined learning outcomes, evidenced by appropriate assessments and can be expressed in a quantitative value (e.g. credits or credit points) demonstrating the estimated workload an individual typically needs for achieving related learning outcomes;

credit systems means a transparency tool for facilitating the recognition of credit(s). These systems can comprise, inter alia, equivalences, exemptions, units/modules that can be accumulated and transferred, the autonomy of providers who can individualise pathways, and the validation of non-formal and informal learning;

credit transfer means the process of allowing individuals who have accumulated credit in one context to have it valued and recognised in another context.

Learning outcomes: initial remarks

- *Nihil novi sub sole...*
- I do believe that even ancient Egyptians and Babylonians were aware of the importance of learning outcomes...
- LO in craftsmanship: „Meisterstück“ etc.



LO in the world

MIT <http://tll.mit.edu/help/intended-learning-outcomes>

CALTECH (example) http://www.astro.caltech.edu/academics/learning_outcomes.html

Harvard <http://bokcenter.harvard.edu/syllabus-design>

Oxford (przykład) <https://www.medsci.ox.ac.uk/study/medicine/electives/learningoutcomes>

Cambridge <http://www.educationalpolicy.admin.cam.ac.uk/curricula-and-assessment/learning-aims-and-outcomes>

Heidelberg (example) https://www.uni-heidelberg.de/md/studium/interesse/faecher/msc_tmr_modulehandbook_students.pdf

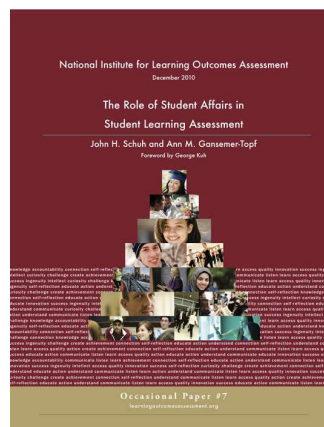
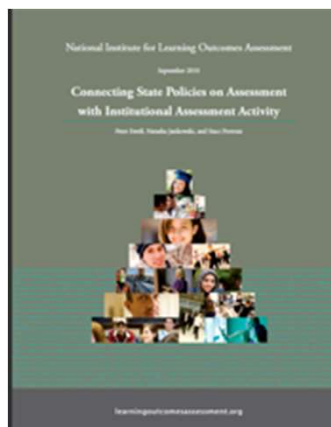
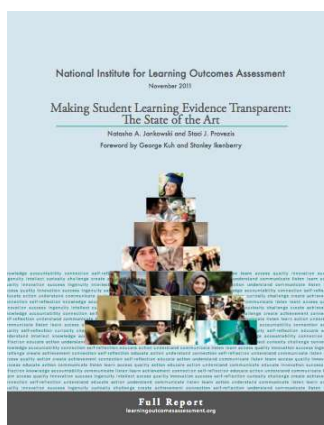
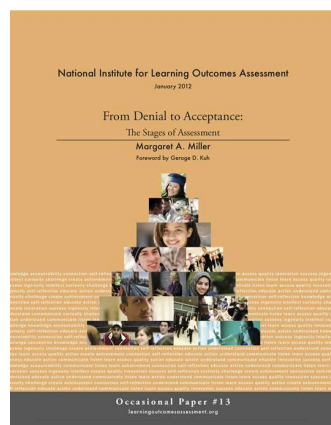
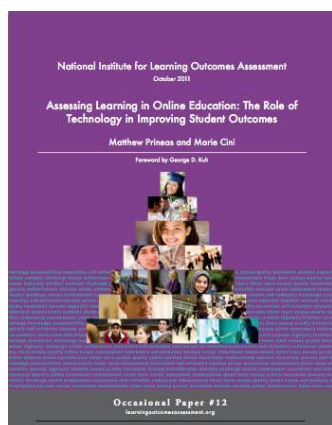
Vienna (example) https://ssc-physik.univie.ac.at/fileadmin/user_upload/SSC/ssc_physik/Formulare/Bachelor/BachelorCurriculum_English_Version090504clean-1.pdf

Tokyo (example) <http://gps.c.u-tokyo.ac.jp/introduction/>

National Institute for Learning Outcomes Assessment

Making Learning Outcomes Usable & Transparent

<http://www.learningoutcomeassessment.org/>

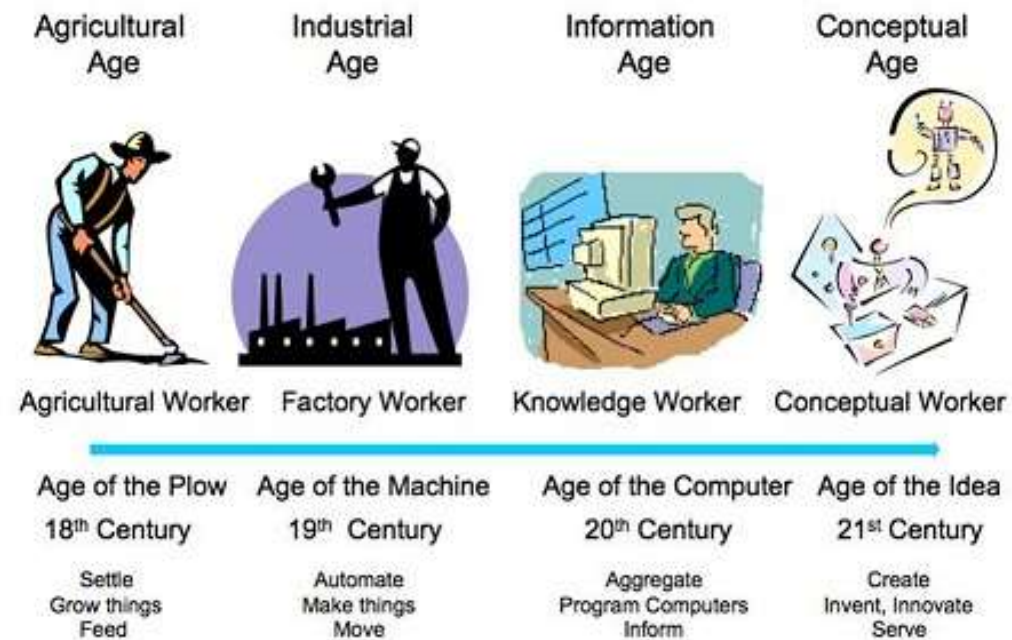




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Conceptual Age



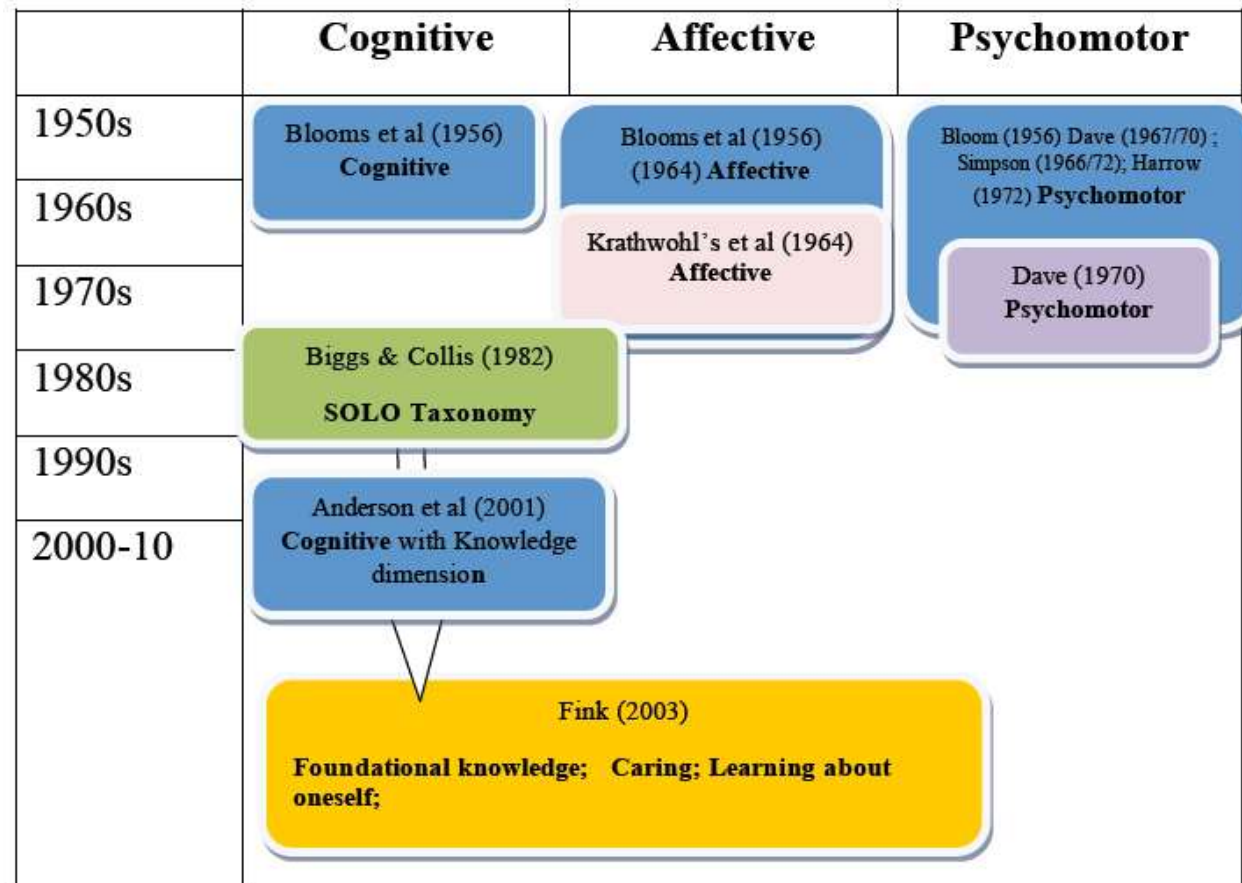
Graduate Attributes (DUT, Ireland)

Engaged	Enterprising	Enquiry-Based	Effective	Expert
<ul style="list-style-type: none"> • Socially responsible • Civically responsible • Curious • Motivated self-starters • Active team players • Reflective practitioners • Global citizens 	<ul style="list-style-type: none"> • Independent thinkers • Creative • Career-educated • Self-starters • Innovators • Entrepreneurs • Well organised 	<ul style="list-style-type: none"> • Critical thinkers • Digitally literate • Inquisitive • Problem solvers • Creators of new knowledge • Analytical 	<ul style="list-style-type: none"> • Excellent communicators • Information literate • Self managers • Decision makers • Resilient • Reflective practitioners 	<ul style="list-style-type: none"> • Experiential learners • Discipline knowledge • Practice-based learners • Work-based learners • Ethical • Leaders • Project managers



ENHANCING EMPLOYABILITY

Various taxonomies of learning



Geraldine O'Neill, Feargal Murphy: Guide to Taxonomies of Learning, www.ucd.ie/teaching

Bloom's Taxonomy: Cognitive Domain

Bloom

1. Knowledge
2. Comprehension
3. Application
4. Analysis
5. Synthesis
6. Evaluation

Anderson et al.

1. Remember
2. Understand
3. Apply
4. Analyse
5. Evaluate
6. Create

Bloom's Taxonomy: Psychomotor Domain

Bloom

1. Imitation
2. Manipulation
3. Precision
4. Articulation
5. Naturalisation

Dave, Ferris & Aziz

1. Perception/Observing
2. Guided Response/ Imitation
3. Mechanism
4. Complex Response
5. Adaptation
6. Origination

Bloom's Taxonomy: Affective Domain

1. Receiving
2. Responding
3. Valuing
4. Organisation & Conceptualisation
5. Characterisation by Value

Writing LO: action words

Examples:

Knowledge → define, describe, list

Comprehension → classify, **explain**, illustrate

Application → apply, prepare, use

Analysis → analyse, deduce, compare

Synthesis → design, **explain**, formulate

Evaluation → assess, criticise, justify

Examples of LO

- **List** the criteria to be taken into account when caring for a patient with tuberculosis
- **Classify** reactions as exothermic and endothermic
- **Relate** energy changes to bond breaking and formation
- **Compare** classical and quantum harmonic oscillator
- **Organise** a patient education programme
- **Discuss** the role of Internet in physics teaching
- **Design** a poster presentation
- **Examine** a patient
- **Use** MS Office effectively and skilfully
- **Display a willingness** to communicate well with patients
- **Resolve** conflicting issues between personal beliefs and ethical considerations

Ten steps towards lo (NSHU 2006)

- WRITE:** Step 1. **Formulate: What?** Subject-related content in LO
Step 2. **Formulate: How?** The format of LO (active verbs etc.)
- REVISE:** Step 3. **Focus** distinguish between LO and other descriptions
Step 4. **Specify** make LO observable and clear
Step 5. **Refine** distinguish between learning activities and results
Step 6. **Clarify** vague outcomes
Step 7. **Limit** the number of LO
- CHECK:** Step 8. **Adjust** check that LO can be assessed
Step 9. **Estimate** student learning time
Step 10. **Calibrate** check the module in relation to other modules

Some hints

- Ask yourself:
 - What do you want students to be able to do?
 - What do you want students to know?
 - What do you want students to appreciate/value?
- Take into account issues of global significance: students should be able to
 - Investigate the world
 - Recognize perspectives
 - Communicate ideas
 - Take action

LO at the program level

- Describe what the learner can accomplish as a result of completing a program
- They should be aligned with the institution's mission
- They should focus on **broad conceptual knowledge** and **higher order skills**
- They represent the minimum requirements to complete a program

LO at the module/course level

- Describe what the learner can accomplish as a result of completing a module/course
- They should be aligned with the program LO
- They represent the minimum requirements to complete a module

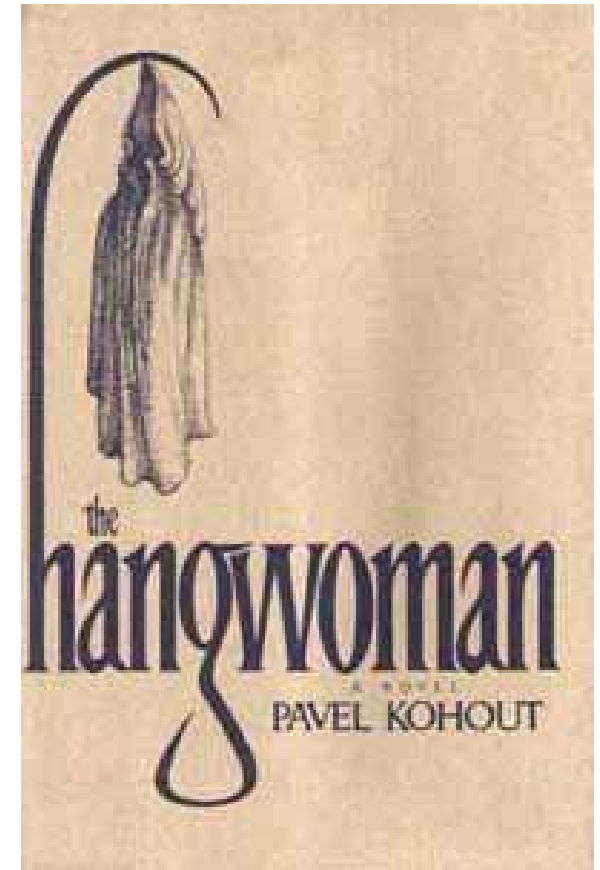
LO for different groups of learners

- „Traditional” students
- Adult learners
- International students

**One can formulate
LO
for any possible
and impossible
subject**

Pavel Kohout „Hangwoman”

Unable to gain admittance to high school and hampered by conflicting guidance from her counselors, fifteen-year-old Lizinka Tachezy follows the offhanded advice of a friend: attend hangman's school and learn the art and science of killing.



„Hangwoman” - modules

- CURCLASEX – Curriculum in Classical Execution
- CURMODEX – Curriculum in Modern Execution
- HAN – Hanging
- GENTO – General Torture
- EXITS – Examinations and Tests
- PRAYING – Practical Utilization and Training
- UNSTOP – Unspecified Study Topics

„Hangwoman” – study program

September	Theory of hanging
October	Knot and Neck
November	Preparation of Hanging Team
December	Preparation of Hanging Device
January	Preparation of Condamned
February	Special hanging techniques
March	Strangulation
April	Legislation and Common Practices Home and Abroad
May	Practical Placement – Assisting the Execution

Telekinesis: the supposed ability to move objects at a distance by mental power or other non-physical means



Course Module on Telekinesis

Characteristics	Learning Outcomes
Knowledge: Scope and depth	Explains basic mechanisms of telekinesis, calculates the amount of physical energy necessary to move concrete objects, determines trajectory of objects moved by psychical forces, chooses appropriate psychokinetic technique depending on the object to be moved and on the external conditions
Knowledge: Context	Takes into account interference with other forces, psychological influence of telekinesis on unprepared people etc.
Application of knowledge	Is able to move different objects in different directions
Communication skills	Discusses on telekinesis with specialists and can explain telekinetic effects to non-specialists

Course Module on Telekinesis

Characteristics	Learning Outcomes
Organization of work	Collaborates with other persons to move massive objects
Self-Learning	Permanently improves own skills and knowledge on telekinesis
Critical approach	Is aware of own limitations, does not try to move immovable objects, such as mountains
Responsibility	Does not move objects without consent of their owners, applies strict safety regulations etc.
Professional Role	Observes professional code of conduct, does not disclose professional secrecy



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Thank you!