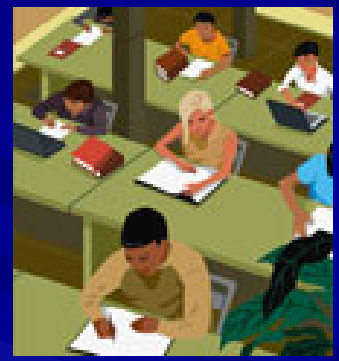
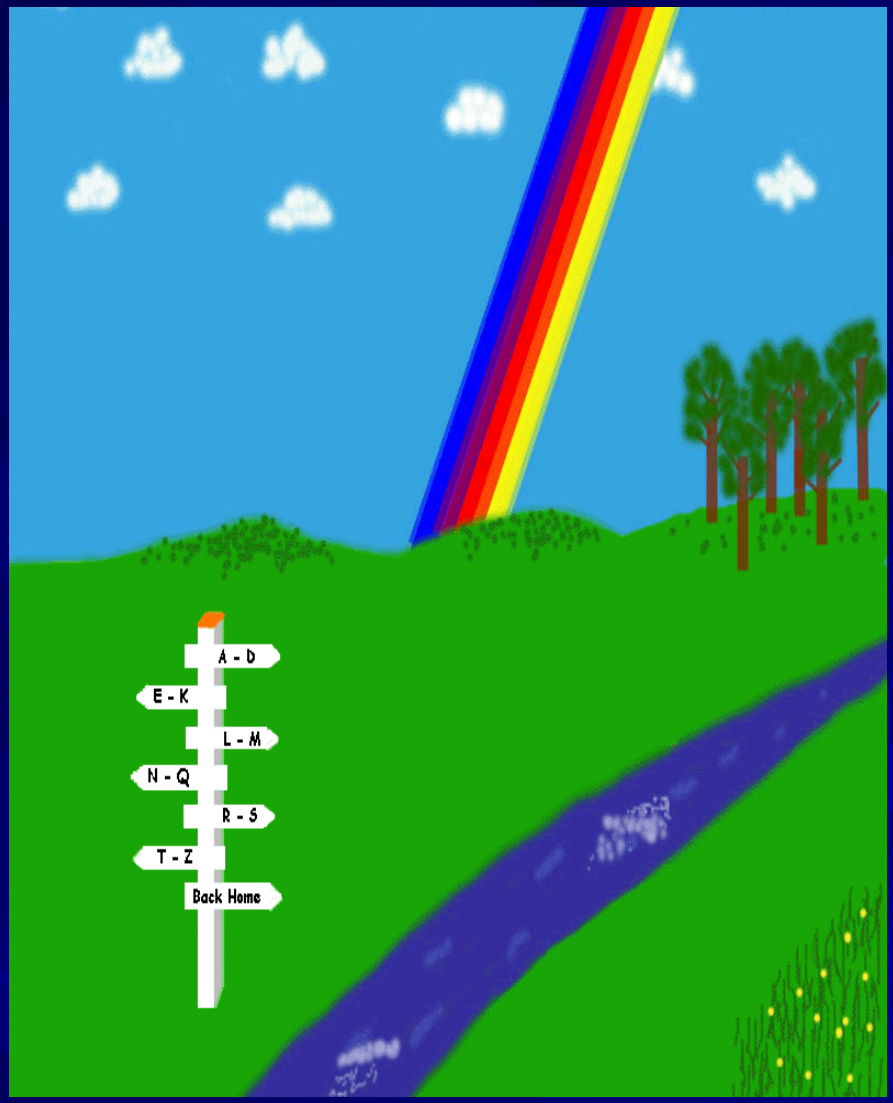
Learning Outcomes – What are they all about!



14 February 2011
Vytautas Magnus University

Dr Declan Kennedy,
Department of Education,
University College Cork



1. What are Learning Outcomes?
2. How do I write Learning Outcomes?
3. What are the benefits and potential problems of Learning Outcomes?

What are learning outcomes?

- Learning Outcomes are specific statements of what students should know and be able to do as a result of learning (Morss and Murray, 2005)
- Learning outcomes are statements of what is expected that a student will be able to DO as a result of a learning activity….(Jenkins and Unwin).
- Learning outcomes are explicit statements of what we want our students to know, understand or to be able to do as a result of completing our courses. (Univ. New South Wales, Australia)
- “Learning outcomes are statements that specify what learners will know or be able to do as a result of a learning activity. Outcomes are usually expressed as knowledge, skills or attitudes”. (American Association of Law Libraries).
- Learning outcomes are an explicit description of what a learner should know, understand and be able to do as a result of learning. (Learning and Teaching Institute, Sheffield Hallam University)

Working Definition

Learning outcomes are statements of what a student should know, understand and/or be able to demonstrate after completion of a process of learning

- The learning activity could be, for example, a lecture, a module or an entire programme.
- Learning outcomes must not simply be a “wish list” of what a student is capable of doing on completion of the learning activity.
- Learning outcomes must be simply and clearly described.
- Learning outcomes must be capable of being validly assessed.

Aims and Objectives

- The Aim of a module or programme is a broad general statement of teaching intention, i.e. it indicates what the teacher intends to cover in a programme, module or learning activity.
- Example of aim: To give students an introduction to organic chemistry

- The objective of a module or programme is a specific statement of teaching intention, i.e. it indicates one of the specific areas that the teacher intends to cover.
- Examples of objectives:

1. Give students an appreciation of the unique nature of carbon and it ability to bond to other carbon atoms.
2. To give students an understanding of the concept of hybridisation.
3. To ensure that students know some characteristic properties of alkanes and alcohols.
4. To make students familiar with a range of families of organic compounds: alkanes, alcohols, carboxylic acids and esters.

From the definition of Learning Outcome we see:

- Emphasis on the learner.
- Emphasis on the learner's ability to do something.

- Focus on teaching – aims and objectives and use of terms like *know, understand, be familiar with.*
- Outcomes: Focus on what we want the student to be able to do - use of terms like define, list, name, recall, analyse, calculate, design, etc.

• Aims: Give broad purpose or general intention of the module.
• Objectives: Information about what the teaching of the module hopes to achieve.
• Learning outcomes are not designed to replace the traditional way of describing teaching and learning but to supplement it.

Focus on Learning Outcomes – Bologna

- Bologna Agreement signed in Bologna, Italy in 1999 by 29 countries. A total of 46 countries have now signed up to this agreement.
- The overall aim of the Bologna Agreement is to improve the efficiency and effectiveness of higher education in Europe in terms of academic standards of degrees and quality assurance standards.
- One of the main features of this process is the need to improve the traditional ways of describing qualifications and qualification structures.

Bologna, Italy (1999)

What countries have signed the Bologna Agreement?

European Union - all 27 countries

Austria
Belgium
Bulgaria
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Ireland
Italy
Latvia
Lithuania
Luxembourg
Malta
Netherlands
Poland
Portugal
Romania
Slovakia
Slovenia
Spain
Sweden
United Kingdom

Non-European Union

Albania
Andorra
Armenia
Azerbaijan
Bosnia and Herzegovina
Croatia
Georgia
Holy See
Iceland
Liechtenstein
Montenegro
Moldova
Norway
Macedonia
Russia
Serbia
Switzerland
Turkey
Ukraine

What is the Bologna Process all about?

- Setting up of European Higher Education Area (EHEA) to ensure the increased international competitiveness of the European system of higher education.
- The Bologna Process is not based on a European Union initiative. The agreement is between both EU and non-EU countries.
- Setting up of system to make it easier to understand the description of qualifications and qualification structures.
- Every student graduating will receive a ***Diploma Supplement*** describing the qualification that the student has received. The purpose of the Diploma Supplement is to improve transparency and facilitate recognition. A standard format will be used to help compare qualifications and make them easier to understand. The Diploma Supplement will also describe the content of the qualification and the structure of the higher education system in which it was issued.

Learning Outcome in Bologna Process

- ‘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 European Higher Education Area.’

  Berlin Communique 2003

- ‘We adopt the overarching framework for qualifications in the EHEA, comprising three cycles (including, within national contexts, the possibility of intermediate qualifications), generic descriptors for each cycle based on **learning outcomes** and competences, and credit ranges in the first and second cycles.’

  Bergen Communique 2005

- ‘We underline the importance of curricula reform leading to qualifications better suited both to the needs of the labour market and to further study. Efforts should concentrate in future on removing barriers to access and progression between cycles and on proper implementation of ECTS based on **learning outcomes** and student workload.’
- ‘Qualifications frameworks are important instruments in achieving comparability and transparency within the EHEA and facilitating the movement of learners within, as well as between, higher education systems. They should also help HEIs to develop modules and study programmes based on **learning outcomes** and credits, and improve the recognition of qualifications as well as all forms of prior learning.’
- ‘We urge institutions to further develop partnerships and cooperation with employers in the ongoing process of curriculum innovation based on **learning outcomes**.’
- ‘With a view to the development of more student-centred, outcome-based learning, the next [Stocktaking] exercise should also address in an integrated way national qualifications frameworks, **learning outcomes** and credits, lifelong learning, and the recognition of prior learning.’

London Communiqué 2007

Bologna Process:

- As a step towards achieving greater clarity in the description of qualifications, by 2010 all modules and programmes in third level institutions throughout the European Union must be written in terms of learning outcomes.
- “Learning outcomes represent one of the essential building blocks for transparency within higher education systems and qualifications”

  - Bologna Working Group, p.18 (December 2004)
- Major contribution of exemplar material from staff taking “Postgraduate Certificate / Diploma in Teaching and Learning at Higher Education”.
- Staff training in UCC – lunchtime session and setting up of “Postgraduate Certificate / Diploma in Teaching and Learning at Higher Education”.
- To date, translated into Irish, Spanish, German, Albanian, Serbian, Russian, Lithuanian.

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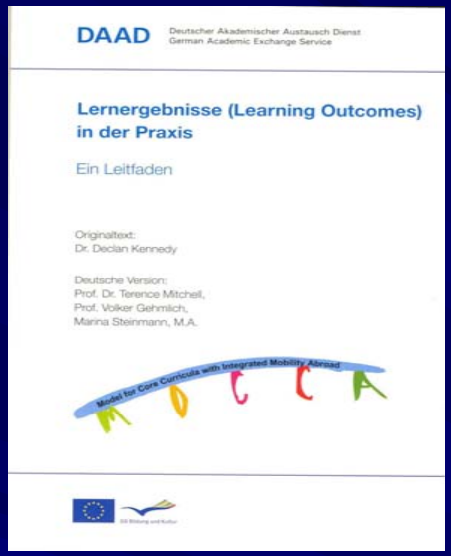
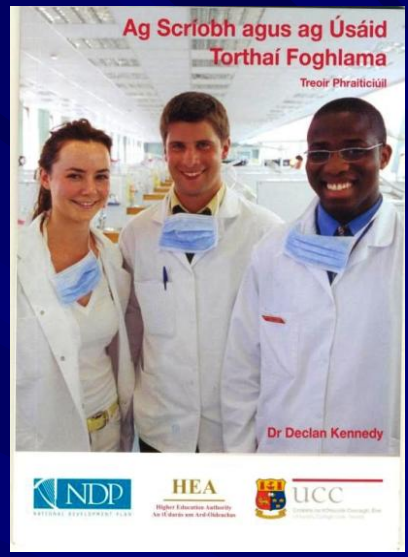

DAAD
Deutscher Akademischer Austausch Dienst
German Academic Exchange Service
Lernergebnisse (Learning Outcomes) in der Praxis
Ein Leitfaden
Originaltext:
Dr. Declan Kennedy
Deutsche Version:
Prof. Dr. Terence Mitchell,
Prof. Volker Gehmlich,
Marina Steinmann, M.A.
Model for Core Curricula with Integrated Mobility Abroad
MOTCCA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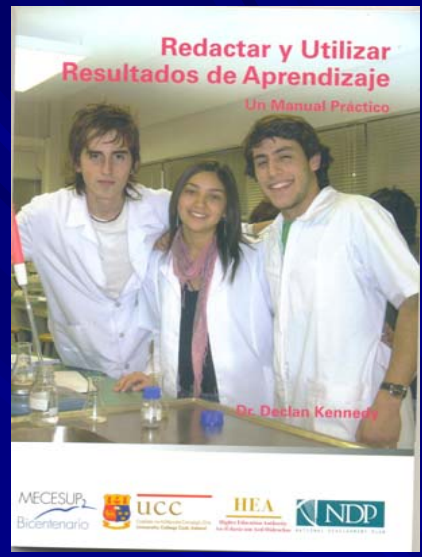
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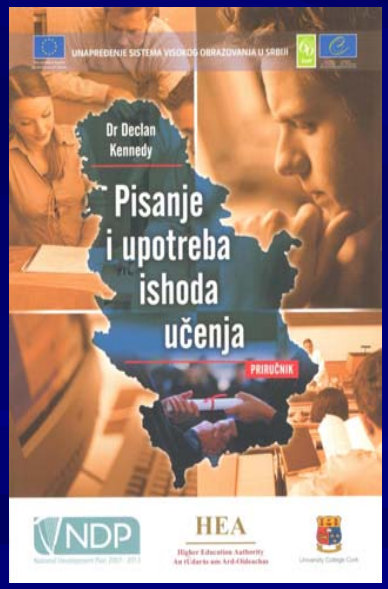
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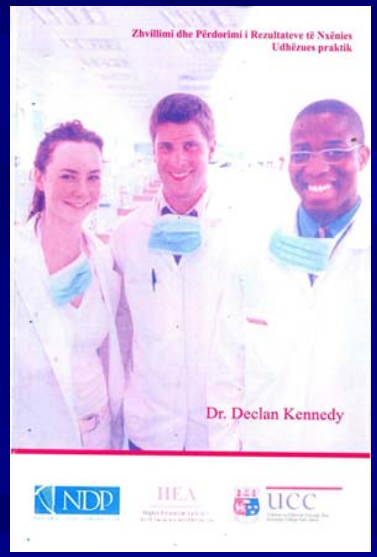
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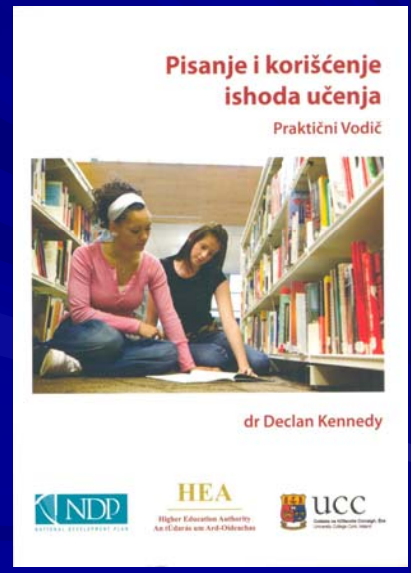
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Praktični Vodič
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UCC

Writing and Using Learning Outcomes: a Practical Guide



Declan Kennedy, Áine Hyland, Norma Ryan

Abstract

Given that one of the main features of the Bologna process is the need to improve the traditional ways of describing qualifications and qualification structures, all modules and programmes in third level institutions throughout the European Higher Education Area should be (re)written in terms of learning outcomes. Learning outcomes are used to express what learners are expected to achieve and how they are expected to demonstrate that achievement. This article presents a summary of developments in curriculum design in higher education in recent decades and, drawing on recent practical experience, suggests a user-friendly methodology for writing modules, courses and programmes in terms of learning outcomes.

The 10 Action Lines of Bologna Process

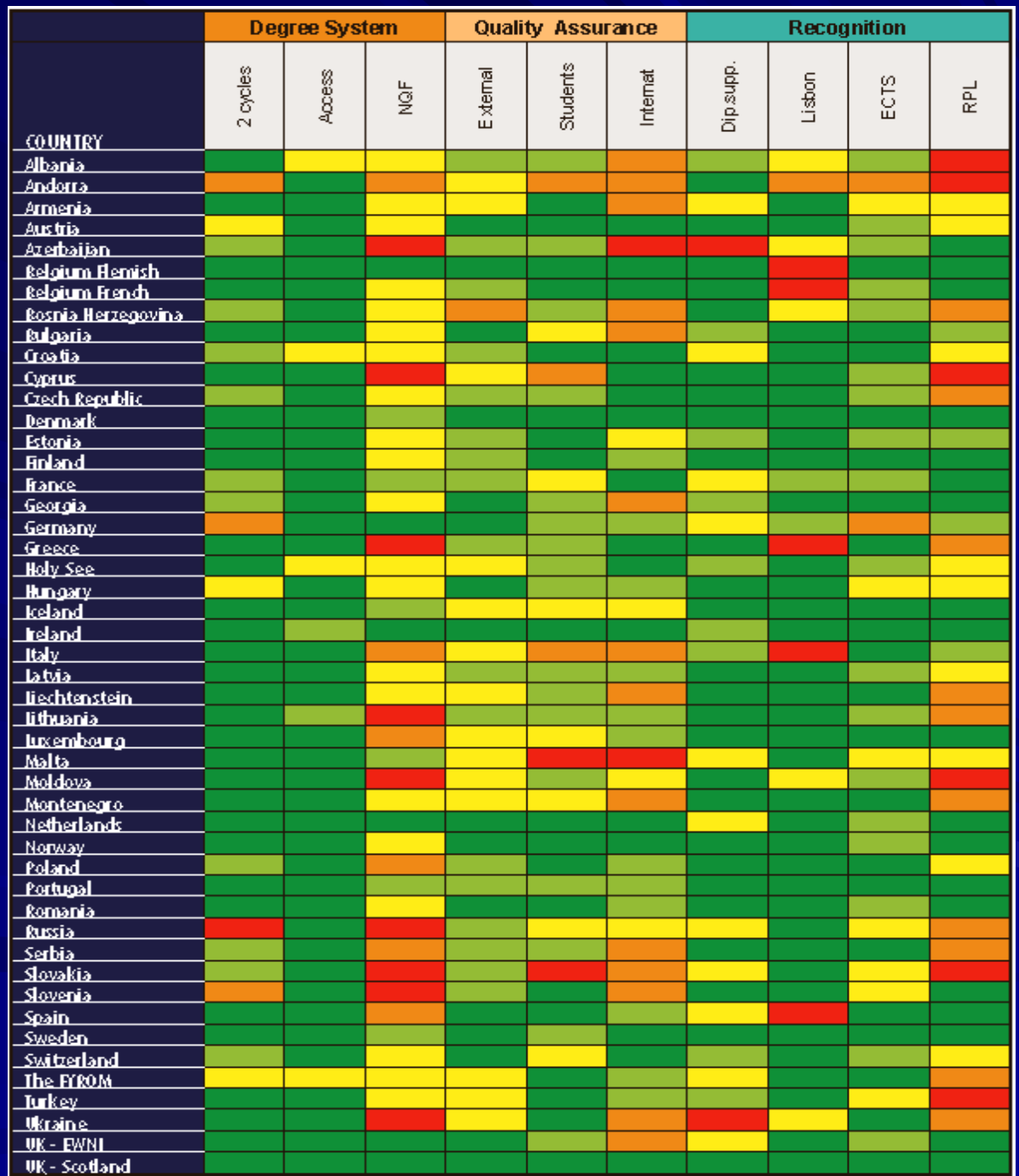
1. Adoption of a system of easily readable and comparable degrees
2. Adoption of a system based on three cycles
3. Establishment of a system of credits
4. Promotion of mobility
5. Promotion of European co-operation in quality assurance
6. Promotion of the European dimension in Higher education
7. Focus on Lifelong Learning
8. Inclusion of Higher Education Institutions and students
9. Promotion of the attractiveness of the European Higher Education Area
10. Doctoral Studies and the links between the European Higher education Area and the European Research Area

"The three Bologna cycles are based on generic descriptors of learning outcomes, so it is clear that describing higher education programmes in terms of learning outcomes is a precondition for achieving many of the goals of the Bologna Process by 2010. Learning outcomes are critically important in the development of national qualifications frameworks, systems for credit transfer and accumulation, the diploma supplement, recognition of prior learning and quality assurance."

- Bologna Process Stocktaking London 2007, p. 51.

"If the Bologna Process is to be successful in meeting the needs and expectations of learners, all countries need to use learning outcomes as a basis for their national qualifications frameworks, systems for credit transfer and accumulations, the diploma supplement, recognition of prior learning and quality assurance. This is a precondition for achieving many of the goals of the Bologna Process by 2010."

- Bologna Process Stocktaking London 2007, p. 2.


Degree System
Quality Assurance
Recognition
COUNTRY
2 cycles
Access
NQF
External
Students
Internat
Dip.supp.
Lisbon
ECTS
RPL
Albania
Andorra
Armenia
Austria
Azerbaijan
Belgium Flemish
Belgium French
Bosnia Herzegovina
Bulgaria
Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Georgia
Germany
Greece
Holy See
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Turkey
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UK - Scotland

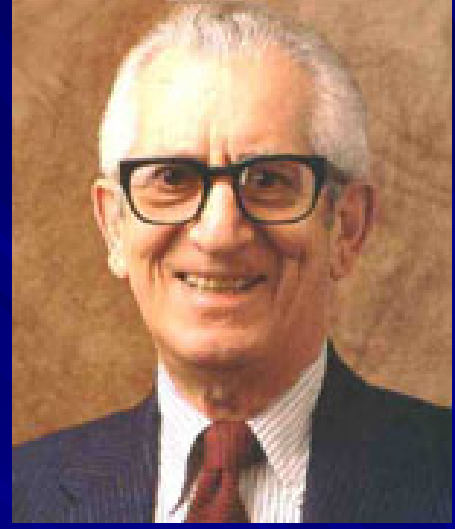
The Bologna Process 2020 -
The European Higher Education Area in the new decade

Communiqué of the Conference of
European Ministers Responsible for Higher Education,
Leuven and Louvain-la-Neuve, 28-29 April 2009

6. The Bologna Process is leading to greater compatibility and comparability of the systems of higher education and is making it easier for learners to be mobile and for institutions to attract students and scholars from other continents. Higher education is being modernized with the adoption of a three-cycle structure including, within national contexts, the possibility of intermediate qualifications linked to the first cycle and with the adoption of the European Standards and Guidelines for quality assurance. We have also seen the creation of a European register for quality assurance agencies and the establishment of national qualifications frameworks linked to the overarching European Higher Education Area framework, based on learning outcomes and workload. Moreover, the Bologna Process has promoted the Diploma Supplement and the European Credit Transfer and Accumulation System to further increase transparency and recognition.

How do I write Learning Outcomes?

Benjamin Bloom (1913 – 1999)

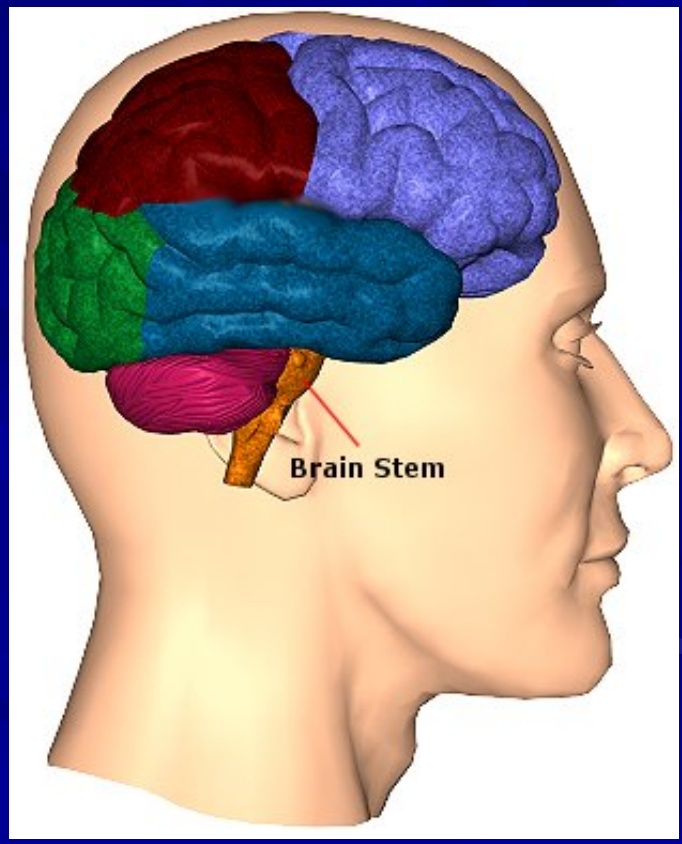


- He looked on learning as a process – we build upon our former learning to develop more complex levels of understanding
- Carried out research in the development of classification of levels of thinking behaviours in the process of learning. PhD University of Chicago in 1942.
- Worked on drawing up levels of these thinking behaviours from the simple recall of facts at the lowest level up to evaluation at the highest level.

Bloom's Taxonomy of Educational Objectives

- Bloom's taxonomy (1956) is a very useful aid to writing learning outcomes.
- The taxonomy consists of a hierarchy of increasingly complex processes which we want our students to acquire.
- Provides the structure for writing learning outcomes
- Bloom's Taxonomy is frequently used by teachers in writing learning outcomes as it provides a ready made structure and list of verbs.

Bloom (1956) proposed that knowing is composed of six successive levels arranged in a hierarchy.



- This area is commonly called the **cognitive (“knowing” or “thinking”) domain** (involving thought processes).
- Bloom suggested certain verbs that characterise the ability to demonstrate these processes.
- These verbs are the key to writing learning outcomes.
- The list of verbs has been extended since his original publication.
- The “toolkit” for writing learning outcomes!

1. Knowledge - ability to recall or remember facts without necessarily understanding them

- Use action verbs like:

  Arrange, collect, define, describe, duplicate, enumerate, examine, find, identify, label, list, memorise, name, order, outline, present, quote, recall, recognise, recollect, record, recount, relate, repeat, reproduce, show, state, tabulate, tell.

Examples: Knowledge

- *Recall* genetics terminology: homozygous, heterozygous, phenotype, genotype, homologous chromosome pair, etc.
- *Identify* and consider ethical implications of scientific investigations.
- *Describe* how and why laws change and the consequences of such changes on society.
- *List* the criteria to be taken into account when caring for a patient with tuberculosis.
- *Define* what behaviours constitute unprofessional practice in the solicitor – client relationship.
- Outline the history of the Celtic peoples from the earliest evidence to the insular migrations.
- *Describe* the processes used in engineering when preparing a design brief for a client.
- Recall the axioms and laws of Boolean algebra.

2. Comprehension - ability to understand and interpret learned information

- Use action verbs like:

Associate, change, clarify, classify, construct, contrast, convert, decode, defend, describe, differentiate, discriminate, discuss, distinguish, estimate, explain, express, extend, generalise, identify, illustrate, indicate, infer, interpret, locate, predict, recognise, report, restate, review, select, solve, translate.

Examples: Comprehension

- ***Differentiate*** between civil and criminal law
- ***Identify*** participants and goals in the development of electronic commerce.
- ***Discuss*** critically German literary texts and films in English.
- ***Predict*** the genotype of cells that undergo meiosis and mitosis.
- ***Translate*** short passages of contemporary Italian.
- Convert number systems from hexadecimal to binary and vice versa.
- ***Explain*** the social, economic and political effects of World War I on the post-war world.
- ***Classify*** reactions as exothermic and endothermic.
- ***Recognise*** the forces discouraging the growth of the educational system in Ireland in the 19th century.
- ***Explain*** the impact of Greek and Roman culture on Western civilisation.
- ***Recognise*** familiar words and basic phrases concerning themselves….when people speak slowly and clearly.

3. Application: ability to use learned material in new situations, e.g. put ideas and concepts to work in solving problems

- Use action verbs like:

Apply, assess, calculate, change, choose, complete, compute, construct, demonstrate, develop, discover, dramatise, employ, examine, experiment, find, illustrate, interpret, manipulate, modify, operate, organise, practice, predict, prepare, produce, relate, schedule, select, show, sketch, solve, transfer, use.

Examples application

- *Construct* a timeline of significant events in the history of Australia in the 19th century.
- *Apply* knowledge of infection control in the maintenance of patient care facilities.
- *Select* and employ sophisticated techniques for analysing the efficiencies of energy usage in complex industrial processes.
- *Show* proficiency in the use of vocabulary and grammar, as well as the sounds of the language in different styles…..
- *Relate* energy changes to bond breaking and formation.
- *Modify* guidelines in a case study of a small manufacturing firm to enable tighter quality control of production.
- *Show* how changes in the criminal law affected levels of incarceration in Scotland in the 19th century.
- *Apply* principles of evidence-based medicine to determine clinical diagnoses.

4. Analysis: ability to break down information into its components, e.g. look for inter-relationships and ideas (understanding of organisational structure)

- Use action verbs like:

Analyse, appraise, arrange, break down, calculate, categorise, classify, compare, connect, contrast, criticise, debate, deduce, determine, differentiate, discriminate, distinguish, divide, examine, experiment, identify, illustrate, infer, inspect, investigate, order, outline, point out, question, relate, separate, sub-divide, test.

Examples: Analysis

- *Analyse* why society criminalises certain behaviours.
- *Compare* and contrast the different electronic business models.
- *Categorise* the different areas of specialised interest within dentistry.
- *Debate* the economic and environmental effects of energy conversion processes.
- *Identify* and *quantify* sources of errors in measurements.
- *Calculate* gradient from maps in m, km, % and ratio.
- Critically *analyse* a broad range of texts of different genres and from different time periods.
- *Compare* the classroom practice of a newly qualified teacher with that of a teacher of 20 years teaching experience.
- Calculate logical functions for coders, decoders and multiplexers.

5. Synthesis - ability to put parts together

- Use action verbs like:

Argue, arrange, assemble, categorise, collect, combine, compile, compose, construct, create, design, develop, devise, establish, explain, formulate, generalise, generate, integrate, invent, make, manage, modify, organise, originate, plan, prepare, propose, rearrange, reconstruct, relate, reorganise, revise, rewrite, set up, summarise.

Examples: Synthesis

- *Recognise* and formulate problems that are amenable to energy management solutions.
- *Propose* solutions to complex energy management problems both verbally and in writing.
- Assemble sequences of high-level evaluations in the form of a program.
- Integrate concepts of genetic processes in plants and animals.
- *Summarise* the causes and effects of the 1917 Russian revolutions.
- *Relate* the sign of enthalpy changes to exothermic and endothermic reactions.
- *Organise* a patient education programme.

6. Evaluation: Ability to judge value of material for a given purpose

- Use action verbs like:

  Appraise, ascertain, argue, assess, attach, choose, compare, conclude, contrast, convince, criticise, decide, defend, discriminate, explain, evaluate, interpret, judge, justify, measure, predict, rate, recommend, relate, resolve, revise, score, summarise, support, validate, value.

Examples: Evaluation

- Assess the importance of key participants in bringing about change in Irish history
- Evaluate marketing strategies for different electronic business models.
- Appraise the role of sport and physical education in health promotion for young people.
- Predict the effect of change in temperature on the position of equilibrium…
- Summarise the main contributions of Michael Faraday to the field of electromagnetic induction.

Bloom Revisited: Anderson and Krathwohl (2001)

Bloom (1956)

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

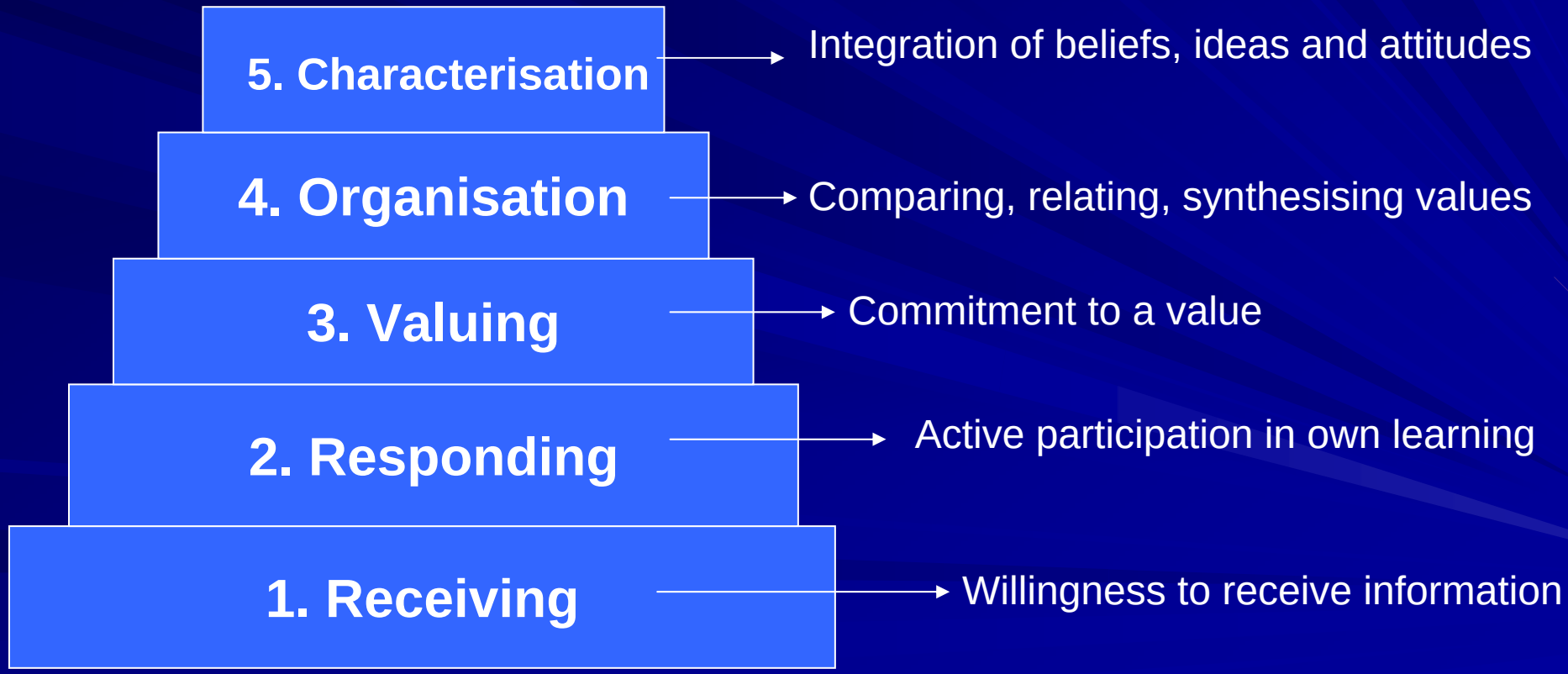
Anderson and Krathwohl (2001)

- To remember
- To understand
- To apply
- To analyse
- To evaluate
- To create

Analysis, Synthesis, Evaluation – Higher Order Thinking Skills

Two other domains in Bloom's Taxonomy

AFFECTIVE DOMAIN ("Feeling") concerned with value issues : involves attitudes.



Active verbs for affective domain

Appreciate, accept, assist, attempt, challenge, combine, complete, defend, demonstrate (a belief in), discuss, dispute, embrace, follow, hold, integrate, order, organise, join, share, judge, praise, question, relate, share, support, synthesise, value.

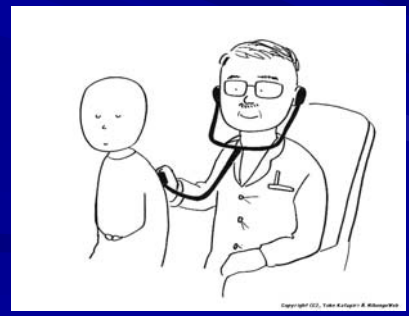
Examples of Learning Outcomes in Affective Domain

- Accept the need for professional ethical standards.
- Appreciate the need for confidentiality in the professional client relationship.
- Display a willingness to communicate well with patients.
- Relate to participants in an ethical and humane manner.
- Resolve conflicting issues between personal beliefs and ethical considerations.
- Embrace a responsibility for the welfare of children taken into care.
- Participate in class discussions with colleagues and with teachers.

PSYCHOMOTOR (“Doing”) DOMAIN:

Work never completed by Bloom.

Involves co-ordination of brain and muscular activity. Active verbs for this domain: bend, grasp, handle, operate, perform, reach, relax, shorten, stretch, differentiate (by touch), perform (skilfully).



Laboratory skills

- *Operate the range of instrumentation specified in the module safely and efficiently in the chemistry laboratory.*
- *Perform titrations accurately and safely in the laboratory.*
- *Construct simple scientific sketches of geological features in the field.*

Clinical Skills

- Perform a comprehensive history and physical examination of patients in the outpatient setting and the general medical wards, excluding critical care settings.
- Perform venipuncture and basic CPR.

Presentation skills

- Deliver an effective presentation.
- Demonstrate a range of graphic and CAD communication techniques.
- Perform basic voice and movement tasks (theatre studies).

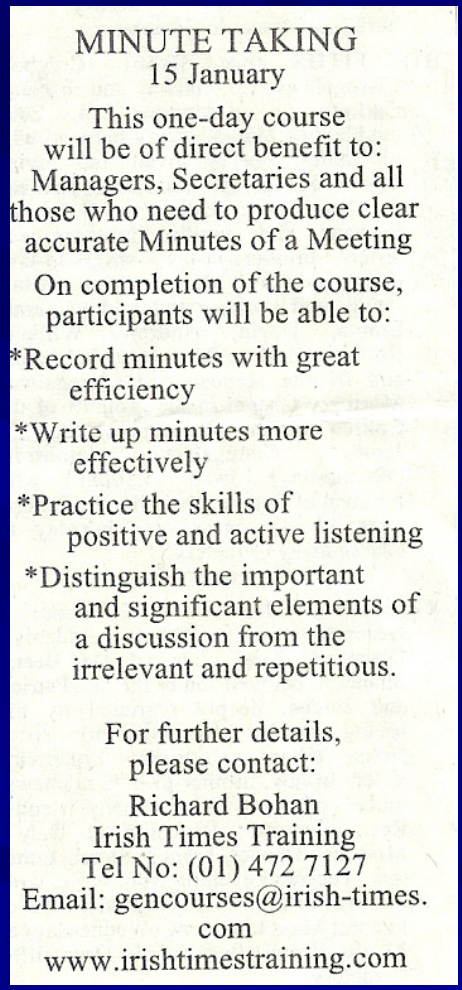
- **Module Title**: Dental Surgery – 5th Year Dental Students
- **Module Code**: DS5001

On successful completion of this module, students should be able to:

- Summarise relevant information regarding the patient's current condition to generate a differential diagnosis
- Formulate an appropriate treatment plan and justify the proposal giving due consideration to patient expectations and limitations
- Arrange appropriate tests and demonstrate the ability to interpret tests and reports
- Administer local anaesthetics safely and perform basic dento-alveolar surgical procedures in a professional manner showing good clinical governance
- Recognise, evaluate and manage medical and dental emergencies appropriately
- Differentiate between patients that can/can not be safely treated by a GDP
- Manage competing demands on time, including self-directed learning & critical appraisal
- Master the therapeutic and pharmacological management of patients with facial pain and oro-facial disease

(Learning outcomes written by Dr. Eleanor O'Sullivan)

Learning Outcomes in Advertising



MINUTE TAKING
15 January

This one-day course will be of direct benefit to: Managers, Secretaries and all those who need to produce clear accurate Minutes of a Meeting

On completion of the course, participants will be able to:

*Record minutes with great efficiency

*Write up minutes more effectively

*Practice the skills of positive and active listening

*Distinguish the important and significant elements of a discussion from the irrelevant and repetitious.

For further details, please contact:

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Learning Outcomes

- The ECTS credit system is the common currency for education.
- Learning Outcomes are the common language for education.
- Facilitate comparability across the various systems in different countries.
- Facilitate diversity – formal learning, informal learning, life long learning, etc.
- The term “competency” is commonly used to point the learner in the general direction but caution must be exercised when using this term.

The challenge of beginning the task of writing Learning Outcomes

- It is vital that learning outcomes are clearly written so that they are understood by students, colleagues and external examiners.
- When writing learning outcomes it may be helpful to you if you focus on what you expect students to be able to demonstrate upon completion of the module or programme.
- It is standard practice to list the learning outcomes using a phrase like “On successful completion of this module, students should be able to:” [list of learning outcomes]
- Avoid complicated sentences. If necessary use one than one sentence to ensure clarity.
- General recommendation: 5 – 8 learning outcomes per module.
- Avoid certain words…….

Words of advice …..

- “The key word is DO and the key need in drafting learning outcomes is to use active verbs”. (Jenkins and Unwin, Fry et al.)
- “They [Learning Outcomes] are statements describing observable behaviour and therefore must use ‘action verbs’”… Words like “appreciate” and “understand” do not help students because there are so many interpretations of their meaning. It is more transparent and helpful to be specific about expectations (Morss and Murray).
- Avoid verbs like “know”, “understand”, “be familiar with”, “be exposed to” (Osters and Tiu)
- “Try to avoid ambiguous verbs such as “understand”, “know”, “be aware” and “appreciate”. (Sheffield Hallam Guide).
- “Care should be taken in using words such as ‘understand’ and ‘know’ if you cannot be sure that students will understand what it means to know or understand in a given context” (Univ NSW).
- Certain verbs are unclear and subject to different interpretations in terms of what action they are specifying…… These types of verbs should be avoided: know, become aware of, appreciate, learn, understand, become familiar with. (American Association of Law Libraries).

Checklist for writing learning outcomes for modules

- Have I begun each outcome with an active verb?
- Have I avoided terms like *know*, *understand*, *learn*, *be familiar with*, *be exposed to*, *be acquainted with*, *be aware of* and *appreciate*?
- Have I included learning outcomes across the range of levels of Bloom's Taxonomy?
- Are my outcomes observable and measurable?
- Do all the outcomes fit within the aims and content of the module?

Writing Programme Learning Outcomes

- The rules for writing learning outcomes for programmes are the same as those for writing learning outcomes for modules.
- The general guidance in the literature is that there should be 5 – 10 learning outcomes for a programme and that only the minimum number of outcomes considered to be essential be included.
- Programme learning outcomes describe the essential knowledge, skills and attitudes that it is intended that graduates of the programme will be able to demonstrate.

Two types of Programme Learning Outcomes

1. The first type of learning outcome refers to those learning outcomes that can be assessed during the programme, i.e. within the various modules.
2. “Aspirational” or “desirable” learning outcomes indicate what a good quality student would be expected to achieve by the end of the programme. This type of learning outcome may not be assessed at all but gives an indication to employers and other agencies the type of standard of practical performance that graduates of the programme will display at the end of the programme.

Example of Programme Learning Outcomes [BSc(Ed)]

On successful completion of this programme, students should be able to:

- Recognise and apply the basic principles of classroom management and discipline.
- Identify the key characteristics of excellent teaching in science.
- Develop comprehensive portfolios of lesson plans that are relevant to the science curricula in schools.
- Evaluate the various theories of Teaching and Learning and apply these theories to assist in the creation of effective and inspiring science lessons.
- Critically evaluate the effectiveness of their teaching of science in the second-level school system.
- Display a willingness to co-operate with members of the teaching staff in their assigned school.
- Foster an interest in science and a sense of enthusiasm for science subjects in their pupils.
- Synthesise the key components of laboratory organisation and management and perform laboratory work in a safe and efficient manner.
- Communicate effectively with the school community and with society at large in the area of science education.

Further Example of Programme Learning Outcomes

On successful completion of this programme, students should be able to:

- Derive and apply solutions from knowledge of sciences, engineering sciences, technology and mathematics.
- Identify, formulate, analyse and solve engineering problems.
- Design a system, component or process to meet specified needs and to design and conduct experiments to analyse and interpret data.
- Work effectively as an individual, in teams and in multi-disciplinary settings together with the capacity to undertake lifelong learning.
- Communicate effectively with the engineering community and with society at large.

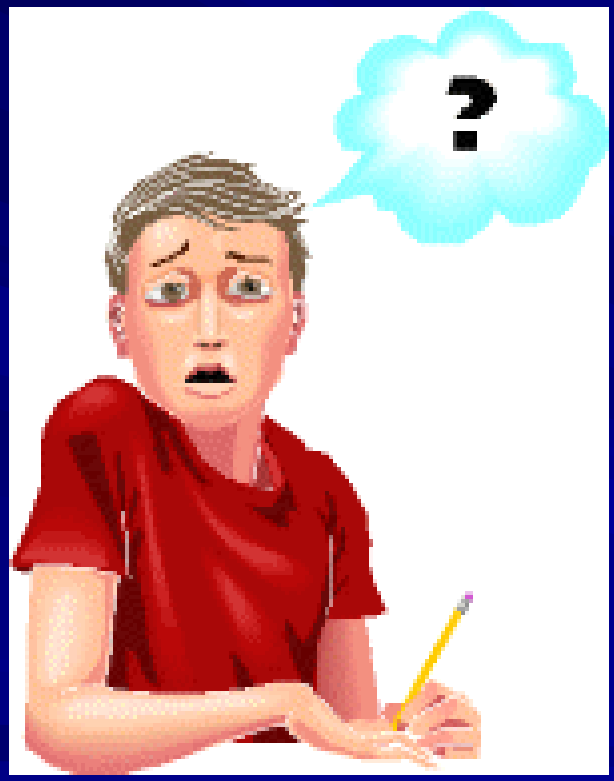
[Undergraduate engineering degree]

Further Example of Programme Learning Outcomes

On successful completion of this programme, students should be able to:

- Perform problem solving in academic and industrial environments.
- Use, manipulate and create large computational systems.
- Work effectively as a team member.
- Organise and pursue a scientific or industrial research project.
- Write theses and reports to a professional standard, equivalent in presentational qualities to that of publishable papers.
- Prepare and present seminars to a professional standard.
- Perform independent and efficient time management.
- Use a full range of IT skills and display a mature computer literacy. [Postgrad Comp Sc degree]

What are the benefits and potential problems of Learning Outcomes?



"Learning Outcomes represent one of the essential building blocks for transparent higher education systems and qualifications… It is important that there should be no confusions about their role, nature and significance or the educational foundations of the Bologna process will be weakened"

(Adams S, 2004)

“Learning outcomes represent what is formally assessed and accredited to the student and they offer a starting point for a viable model for the design of curricula in higher education which shifts the emphasis form input and process to the celebration of student learning”

(Allan J, 1996)

The benefits of Learning Outcomes

- Help to explain more clearly to students what is expected of them and thus help to guide them in their studies – motivation and sense of purpose
- Help teachers to focus more clearly on what exactly they want students to achieve in terms of knowledge and skills.
- Help teachers to clarify their thinking about what they want to achieve and the common language of learning outcomes helps to facilitates discussion with colleagues.
- Helps to define the assessment criteria more effectively.
- Help to provide guidance to employers about the knowledge and understanding possessed by graduates of programmes, i.e. show the value of the programme in terms of programme learning outcomes and module learning outcomes.
- Help to start discussion on Teaching and Learning in third level institutions.

Potential problems with Learning Outcomes

- Could limit learning if learning outcomes written within a very narrow framework – lack of intellectual challenge to learners.
- Learning outcomes should not be reductionist but rather expansive and intended to promote the higher order thinking skills.
- Danger of assessment-driven curriculum if learning outcomes too confined.
- Could give rise to confusion among students and staff if guidelines not adhered to when drawing up learning outcomes, etc.

At the end of this talk you should be able to:

1. *Describe* what is meant by the term *learning outcome*.
2. *Discuss* Bloom's Taxonomy of Educational Objectives.
3. *Apply* Bloom's Taxonomy to help you to write some learning outcomes.
4. Summarise the advantages of learning outcomes.
5. *Assess* the problems caused by poorly written learning outcomes.

That’s all Folks. Hope you learned something about Learning Outcomes!

References

- Adam, S. (2004) *Using Learning Outcomes*: *A consideration of the nature, role, application and implications for European education of employing learning outcomes at the local, national and international levels.* Report on United Kingdom Bologna Seminar, July 2004, Herriot-Watt University.
- Allan, J (1996) Learning Outcomes in Higher Education. Studies in Higher Education, 21 (1) 93 - 108
- Boam, R. and Sparrow, P. (Eds) (1992) *Designing and achieving competency*, London: McGraw-Hill
- Boni A and Lozano F (2007) The generic competences: an opportunity for ethical learning in the European convergence in higher education. Higher Education 54: 819 – 831.
- Baume, D. (1999). *Specifying Aims and Learning Outcomes* Milton Keynes: Open University.
- Biggs J, (2003) Aligning Teaching and Assessing to Course Objectives. *Teaching and Learning in Higher Education: New Trends and Innovations*. University of Aveiro, 13 – 17 April 2003
- Biggs, J. (2005) Teaching for Quality Learning at University (2003). Wiltshire: Open University Press ISBN 0335211682
- Bingham, J. (1999) *Guide to Developing Learning Outcomes*, The Learning and Teaching Institute Sheffield Hallam University, Sheffield.
- Black, P and William, D (1998) Inside the Black Box: Raising Standards through Classroom Assessment, London: Kings College.

- Bloom, B. S., Engelhart, M., D., Furst, E.J, Hill, W. and Krathwohl, D. (1956) *Taxonomy of educational objectives. Volume I: The cognitive domain.* New York: McKay.
- Bloom, B.S., Masia, B.B. and Krathwohl, D. R. (1964). *Taxonomy of Educational Objectives Volume II : The Affective Domain..* New York: McKay.
- Brown, R.B. (1993) 'Meta-competence: a recipe for reframing the competence debate', *Personnel Review*, 22(6): 25-36.
- Brown, R.B. (1994) 'Reframing the competency debate: management knowledge and meta-competence in graduate education', *Management Learning*, 25(2): 289-99.
- Burgoyne, J. (1988a) *Competency Based Approaches to Management Development*, Lancaster: Centre for the Study of Management Learning.

- Capel, S, Leask, M and Turner, T (1997). Learning to Teach in the Secondary School. London: Routledge.
- Chambers, D.W. (1994). Competencies: a new view of becoming a dentist. *J Dent Education* (58) 342-345
- Cockerill, T. (1989) 'The kind of competence for rapid change', *Personnel Management*, September, 52-56
- Council of Europe, Seminar on Recognition Issues in the Bologna Process, Lisbon, 2002. Available at: http://www.coe.int
- Dave, R H (1975) *Developing and Writing Behavioural Objectives* (R J Armstrong, ed.) Educational Innovators Press
- Donnelly, R and Fitzmaurice, M. (2005). Designing Modules for Learning . In: *Emerging Issues in the Practice of University Learning and Teaching*, O'Neill, G et al. Dublin : AISHE.

- Dooley, K. E., Lindner, J. R., Dooley, L. M. and Alagaraja, M. (2004). Behaviorally anchored competencies: evaluation tool for training via distance., *Human Resource Development International*, 7(3): 315-332.
- Elkin, G. (1990) 'Competency-based human resource development', *Industrial and Commercial Training*, 22(4): 20-25
- ECTS Users' Guide (2005) Brussels: Directorate-General for Education and Culture. Available online at: http://ec.europa.eu/education/programmes/socrates/ects/doc/guide_en.pdf
- ECTS Users' Guide (2009). [available online]
- European Commission (2008) European Qualifications Framework for Lifelong Learning
- Fry, H., Ketteridge, S., Marshall (2000) *A Handbook for Teaching and Learning in Higher Education*. London: Kogan Page.
- Fung M, Lee W and Wong S () A new measure of generic competencies.

- Hartel, .R.W. and E.A. Foegeding (2004). *Learning: Objectives, Competencies, or Outcomes*. Journal of Food Science Education, (3) 69 – 70.
- Hartle, F. (1995) *How to re-engineer your Performance Management Process*, London: Kogan Page
- Hendry, C., Arthur, M.B. and Jones, A.M. (1995) *Strategy through People: Adaptation and Learning in the Small-Medium Enterprise*, London: Routledge.
- HETAC (2006) *Explanatory Guidelines on the Direct Application to HETAC for a Named Award*. Dublin: Higher Education and Training Awards Council.
- Huba, M.E. & Freed, J. E. (2000). Learner-centered assessment on college campuses. Shifting the focus from teaching to learning. Needham Heights, MA: Allyn & Bacon.
- Jarvis, P. (1985) The sociology of adult and continuing education. London: Croom Helm.
- Jenkins, A. and Unwin, D. *How to write learning outcomes*. See the following URL:

http://www.ncgia.ucsb.edu/education/curricula/giscc/units/format/outcomes.html

- Kendall Phillips L. (1994) The Continuing Education Guide: the CEU and Other Professional Development Criteria. Iowa: Hunt Publishing.
- Kennedy D, Hyland A and Ryan N (2006) Writing and using Learning Outcomes, Bologna Handbook, Implementing Bologna in your Institution, C3.4-1, 1 – 30.
- Kennedy, D (2007) *Writing and Using Learning Outcomes – A Practical Guide*. Quality Promotion Unit, University College Cork. Available from www.NAIRTL.ie
- Kennedy D, Hyland A and Ryan N (2009) Learning Outcomes and Competences, Bologna Handbook, Introducing Bologna Objectives and Tools, B2.3-3, 1 – 18.
- McBeath, G. (1990) Practical Management Development: *Strategies for Management Resourcing and Development in the 1990s*, Oxford: Blackwell
- Messick, S. (1975) The standard problem: meaning and values in measurement and evaluation. American Psychologist October 1975 : 955-966
- Messick, S. (1982) Abilities and Knowledge in Educational Achievement Testing: The Assessment of Dynamic Cognitive Structures. Princeton: New Jersey: Education Testing Service.
- Miller, C, Hoggan, J., Pringle, S. and West, C. (1988) Credit Where Credit's Due. Report of the Accreditation of Work-based Learning Project. Glasgow. SCOTVEC.
- Mitriani, A., Dalziel, M and Fitt, D. (1992) *Competency Based Human Resource Management*, London: Kogan Page.
- Morss, K and Murray R (2005) Teaching at University. London: Sage Publications ISBN 1412902975

- Neary, M. (2002). Curriculum studies in post-compulsory and adult education. Cheltenham: Nelson Thornes.
- Oliver et al (2008). Curriculum structure: principles and strategy. European Journal of Dental Education. (12) 74 – 84.
- Ramsden, P (2005) *Learning to teach in Higher Education*, London: Routledge.
- Shuell, T. J. (1986) Cognitive conceptions of learning. Review of Educational Research, 56, 411 – 436.
- Smith, B. (1993) 'Building managers from the inside out: competency based action learning', *Journal of Management Development*, 12, 1: 43-8
- Tate, W. (1995) Developing Managerial Competence: A Critical Guide to Methods and Materials, London: Gower.
- Training Agency (1989) Development of Accessible Standards for National Certification Guidance: Note No. 1 Sheffield Employment Department/Training Agency.

- Van der Klink, M and Boon, J. (2002) Competencies: The triumph of a fuzzy concept. *International Journal Human Resources Development and Management*, 3(2), 125 – 137.
- Winterton J, Delamare-Le Deist F and Stringfellow E (2005) Typology of knowledge, skills and competences: clarification of the concept and prototype. CEDEFORP: Tolouse. Available at: http://www.ecotec.com/europeaninventory/publications/method/CEDEFOP_typology.pdf
- Wolf, A. (1989) Can competence and knowledge mix? In J. W Burke (ed). Competency-based Education and Training. Lewes: Falmer Press.
- Woodruffle, C. (1991). Competent by any other name., *Personnel Management,* September, 30-31.

References – Web Sites

Bologna Working Group on Qualifications Frameworks (2004). Report on "A Framework for Qualifications of the European Higher Education Area".

Bologna Process Stocktaking London 2007. Available at:
www.ond.vlaanderen.be/hogeronderwijs/**bologna**/documents/WGR**2007**/**Stocktaking**_report**2007**.pdf

DeSeCo projet : http://www.deseco.admin.ch/

ECTS Users' Guide (2005) Brussels: Directorate-General for Education and Culture. Available online at:
http://ec.europa.eu/education/programmes/socrates/ects/doc/guide_en.pdf

ECTS Key Features: http://www.bologna.msmt.cz/files/ECTSKeyFeatures.pdf

National Qualifications Frameworks Development and Certification – Report from Bologna Working Group on Qualifications Frameworks. May 2007
http://www.ond.vlaanderen.be/hogeronderwijs/bologna/documents/Working_group_reports_2007.htm

Framework website**:** **www.nfq.ie**

National Qualifications Authority of Ireland**:** **www.nqai.ie**

OECD; http://www.oecd.org/dataoecd/47/61/35070367.pdf

Tuning Educational Structures in Europe: http://tuning.unideusto.org/tuningeu/

Verification of Compatibility of Irish National Framework of Qualifications with the Framework for Qualifications of the European Higher Education Area - Summary of Final Report – November 2006
http://www.nqai.ie/en/International/VerificationofCompatibilityofIrishNationalFrameworkofQualifications/File,1797,en.doc

www.bologna.ie