

Everything you need to know about Learning Outcomes!



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Dr Declan Kennedy,
Department of Education,
University College Cork

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1. What are Learning Outcomes.
2. How do I write Learning Outcomes?
3. What are the benefits and potential problems of Learning Outcomes?
4. How do I link Learning Outcomes, Teaching and Learning Activities and Assessment?

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What are learning outcomes?

- 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)

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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.

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From the definitions 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.

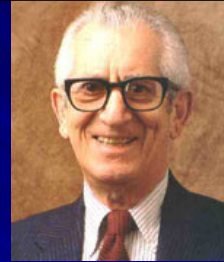
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How do I write Learning Outcomes?



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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.

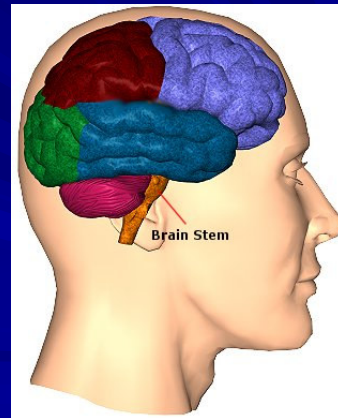
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Bloom's Taxonomy of Educational Objectives

- 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.

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



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- 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!



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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.

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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.

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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.

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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.
- **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.

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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.

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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.

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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.

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.

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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.

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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.

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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.

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Bloom Revisited: Anderson and Krathwohl (2001)

Bloom (1956)

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

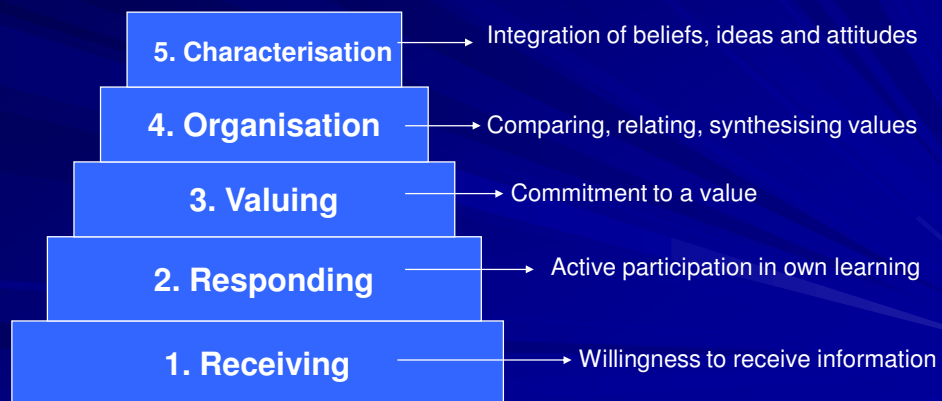
Anderson and Krathwohl (2001)

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

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Two other domains in Bloom's Taxonomy

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



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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.



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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.

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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).



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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

- The student is able to perform a comprehensive history and physical examination of patients in the outpatient setting and the general medical wards, excluding critical care settings.
- The student is competent in performing 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).

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■ **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)

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What is the relationship between Learning Outcomes and Competences?

- Difficult to find a precise definition for the term "competence".
- "Some take a narrow view and associate competence just with skills acquired by training" (Stephen Adam, 2004)
- In Tuning project, the term competence is used to represent a combination of attributes in terms of knowledge and its application, skills, responsibilities and attitudes and an attempt is made to describe the extent to which a person is capable of performing them
- ECTS Users' Guide describes competences as "a dynamic combination of attributes, abilities and attitudes. Fostering these competences is the object of educational programmes. Competences are formed in various course units and assessed at different stages. They may be divided in subject-area related competences (specific to a field of study) and generic competences (common to any degree course)" (ECTS, 2005)
- Advice – if you have to write competences use the language of learning outcomes to describe competences.

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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.....

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Words of advice

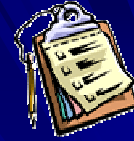


- “The key word is DO and the key need in drafting learning outcomes is to use active verbs”. (Jenkins and Unwin, Fry et al.)
- Avoid verbs like “know”, “understand”, “be familiar with”, “be exposed to” (Osters and Tiu)
- “Try to avoid ambiguous verbs such as “understand”, “know”, “be aware” and “appreciate”. (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).

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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?
- ☐ Have I used only one active verb per learning outcome?

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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.

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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.

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Examples of Programme Learning Outcomes

On completion of this programme, it is expected that the students will 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]

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Further Example of Programme Learning Outcomes

On completion of this programme, it is expected that students will 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]

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What are the benefits and potential problems of Learning Outcomes?



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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 define the assessment criteria more effectively.
- Help to provide guidance to employers about the knowledge and understanding possessed by graduates of programmes.
- Help to start discussion on Teaching and Learning in third level institutions.

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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.

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How do I link Learning Outcomes to Teaching and Learning Activities and Assessment?



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Assessment of Learning Outcomes

- Having designed modules and programmes in terms of learning outcomes, we must now find out if our students have achieved these intended learning outcomes.
- *How will I know if my students have achieved the desired learning outcomes? How will I measure the extent to which they have achieved these learning outcomes?*
- Therefore, we must consider how to match the method of assessment to the different kinds of learning outcomes e.g. a Learning Outcome such as "Demonstrate good presentation skills" could be assessed by the requirement that each student makes a presentation to their peers.
- When writing learning outcomes the verb is often a good clue to the assessment technique.
- How can we design our examination system so that it tests if learning outcomes have been achieved?



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- Important to ensure that there is alignment between teaching methods, learning outcomes and assessment criteria.
- Clear expectations on the part of students of what is required of them are a vitally important part of students' effective learning (Ramsden, 2003)
- This correlation between teaching, learning outcomes and assessment helps to make the overall learning experience more transparent and meaningful for students.



Teaching for understanding
→
←
Learning outcomes



There is a dynamic equilibrium between teaching strategies and Learning Outcomes.

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Formative Assessment

- ❑ Assessment **FOR** learning – gives feedback to students and teachers to help modify teaching and learning activities, i.e. helps inform teachers and students on progress being made.
- ❑ Assessment is integrated into the teaching and learning process.
- ❑ Clear and rich feedback helps improve performance of students (Black and Williams, 1998).
- ❑ Usually carried out at beginning or during a programme, e.g. coursework which gives feedback to students.
- ❑ Can be used as part of continuous assessment, but some argue that it should not be part of grading process (Donnelly and Fitzmaurice, 2005)



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Summative Assessment

- Assessment that summarises student learning at end of module or programme – Assessment
- Sums up achievement – no other
- Generates a grade or mark.
- Usually involves assessment using examination.
- Only a sample of the Learning Outcomes can be assessed – cannot assess all the Learning Outcomes



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Continuous Assessment

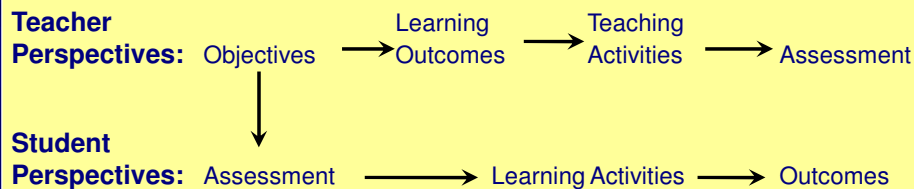
- A combination of summative and formative assessment.
- Usually involves repeated small assessments.
- Marks recorded.
- Little or no feedback given.



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It is important that the assessment tasks mirror the Learning Outcomes since, as far as the students are concerned, the assessment *is* the curriculum: "From our students' point of view, assessment always defined the actual curriculum" (Ramsden, 1992).

Biggs (2003) represents this graphically as follows:



"To the teacher, assessment is at the end of the teaching-learning sequence of events, but to the student it is at the beginning. If the curriculum is reflected in the assessment, as indicated by the downward arrow, the teaching activities of the teacher and the learner activities of the learner are both directed towards the same goal. In preparing for the assessment, students will be learning the curriculum" (Biggs 2003)

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Programme Accreditation

- Module descriptors with clearly written Learning Outcomes – see handout (1) CIT.
- Framework for Accreditation e.g. Engineer's Ireland.
- Mapping of Programme Areas vs Programme Outcomes – see handout (2) CIT.
- Mapping of Module Learning Outcomes vs Programme Learning Outcomes

	Prog. Outcome 1	Prog. Outcome 2	Prog. Outcome 3	Prog. Outcome 4	etc
Module 1		√			
Module 2	√				
Module 3			√		
Module 4				√	
Module 5	√				
Module 6		√		√	

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Steps involved in linking Learning Outcomes, Teaching and Learning Activities and Assessment

1. Clearly define the learning outcomes.
2. Select teaching and learning methods that are likely to ensure that the learning outcomes are achieved.
3. Choose a technique or techniques to assess the achievement of the learning outcomes.
4. Assess the learning outcomes and check to see how well they match with what was intended

If the learning outcomes are clearly written, the assessment is quite easy to plan!



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Linking Learning Outcomes, Teaching and Learning Activities and Assessment

Learning Outcomes	Teaching and Learning Activities	Assessment
Cognitive (Demonstrate: Knowledge, Comprehension, Application, Analysis, Synthesis, Evaluation)	Lectures Tutorials Discussions Laboratory work	•End of module exam. •Multiple choice tests. •Essays. •Reports on lab work and research project. •Interviews/viva. •Practical assessment. •Poster display.
Affective (Integration of beliefs, ideas and attitudes)	Clinical work Group work	•Fieldwork. •Clinical examination. •Presentation. •Portfolio.
Psychomotor (Acquisition of physical skills)	Seminar Peer group presentation etc.	•Performance. •Project work. •Production of artefact etc.

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Learning outcomes Module ED2100	Teaching and Learning Activities	Assessment 10 credit module Mark = 200
Cognitive <ul style="list-style-type: none"> •Recognise and apply the basic principles of classroom management and discipline. •Identify the key characteristics of high quality science teaching. •Develop a comprehensive portfolio of lesson plans 	Lectures (12) Tutorials (6) Observation of classes (6) of experienced science teacher (mentor)	End of module exam. Portfolio of lesson plans (100 marks)
Affective <ul style="list-style-type: none"> •Display a willingness to co-operate with members of teaching staff in their assigned school. •Participate successfully in Peer Assisted Learning project 	Participation in mentoring feedback sessions in school (4) Participation in 3 sessions of UCC Peer Assisted Learning (PAL) Programme. Peer group presentation	Report from school mentor End of project report. (50 marks)
Psychomotor <ul style="list-style-type: none"> •Demonstrate good classroom presentation skills •Perform laboratory practical work in a safe and efficient manner. 	Teaching practice 6 weeks at 2 hours per week. Laboratory work	Supervision of Teaching Practice Assessment of teaching skills (50 marks)

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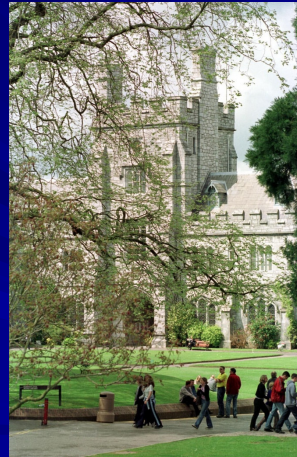
Learning Outcomes in UCC

- UCC participated in the European Universities Association Network on Quality in Teaching and Learning in 2003 – 2004. "Implementing a Learning Outcomes Approach to Teaching" – Quality Culture Project IV (EUA).
- Network of six EU universities involved.
- Headed up by Prof. Aine Hyland, Education Dept. and Dr Norma Ryan Quality Promotion Unit UCC. An 18 month project - the report was published in 2005. The project concentrated on Learning Outcomes rather than Competences
- A number of international conferences on Bologna Agreement held in UCC – how I became involved.

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The Teaching and Learning Centre Ionad Bairre

- Set up in October 2006 – Dr Bettie Higgs and Marian McCarthy.
- Has provided a continuous series of lunchtime seminars on Teaching and Learning throughout each academic year.
- “Taking a Learning Outcomes approach to Teaching and Learning”
- “Learning Outcomes-how can we be sure they have been achieved?”
- “Getting to Grips with Assessing Creative and Original Student work - Unpredictable Learning Outcomes”
- Drop-in workshops on Learning Outcomes.



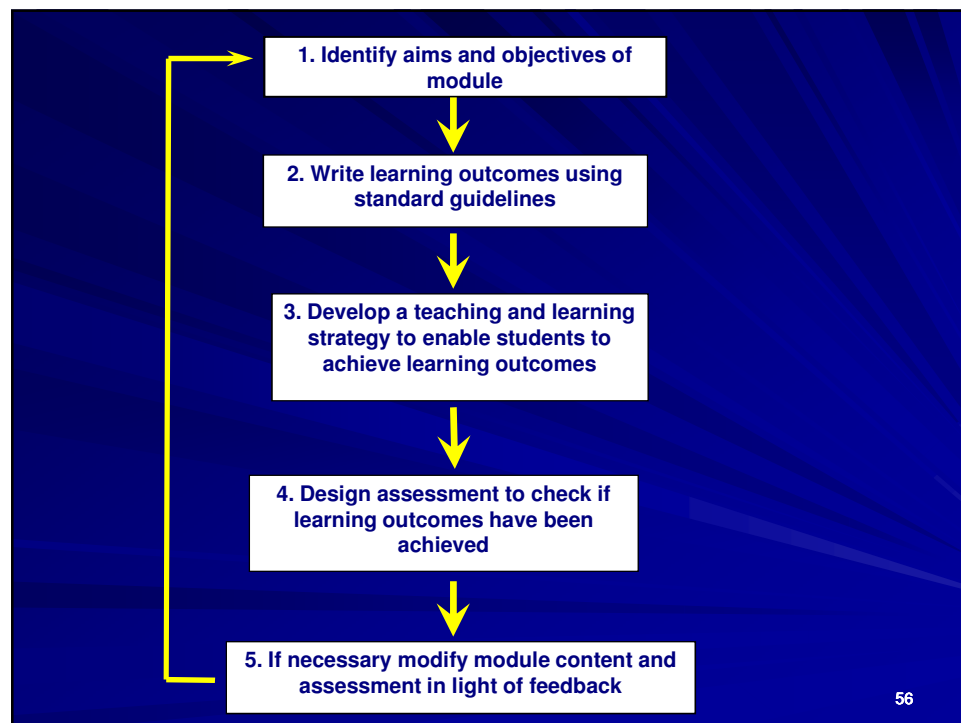
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Postgraduate Certificate in Teaching and Learning in Higher Education

- Initiated in October 2004.
- To date 3 cycles of the Postgraduate Certificate course has been completed involving 150 staff.
- A total of 80 staff members have completed the Postgraduate Diploma course.
- The MA in Teaching and Learning at Higher Education has been completed by 8 staff members.
- Has provided a great resource throughout the university – seminars based in individual Departments.

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The Experience of using Learning Outcomes



“Writing Learning Outcomes is a Process not an Event”

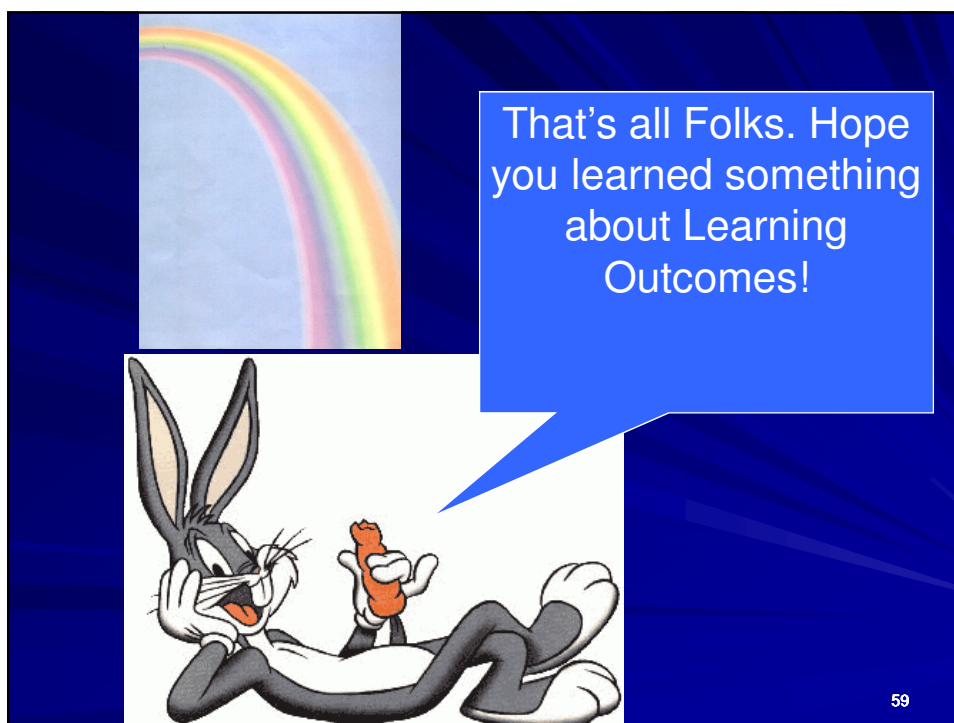


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At the end of this talk you should be able to:

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.
6. Discuss the linking of Learning Outcomes to Teaching and Learning activities and Assessment.

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