

Learning outcomes in UCC



International
Symposium
on
**Implementing
Learning Outcomes**
UCC
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1. What are Learning Outcomes?
2. How do I write Learning Outcomes?
3. How do I link Learning Outcomes to Teaching and Assessment?
4. What are the benefits and potential problems of Learning Outcomes?

1. 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)

Working Definition

Learning outcomes are statements of what a student should know, understand or be able to do at the end of a learning activity.

- 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.

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*.

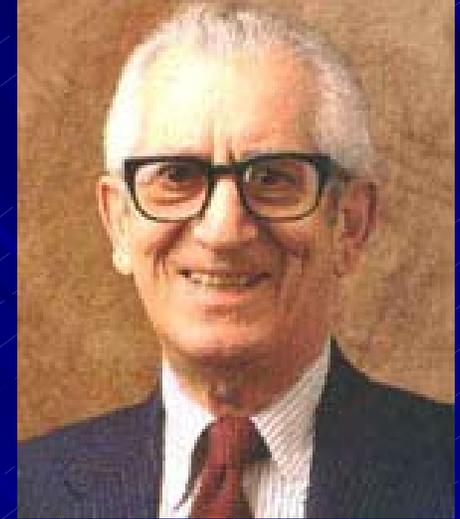
■ Outcomes: Focus on what we want the student to be able to do - use of terms like define, list, name, recall, analyse, calculate, design, etc.

Aims: Give broad purpose or general intention of the module.
Objectives: Information about what the teaching of the module hopes to achieve.

2. 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.

6. Evaluation

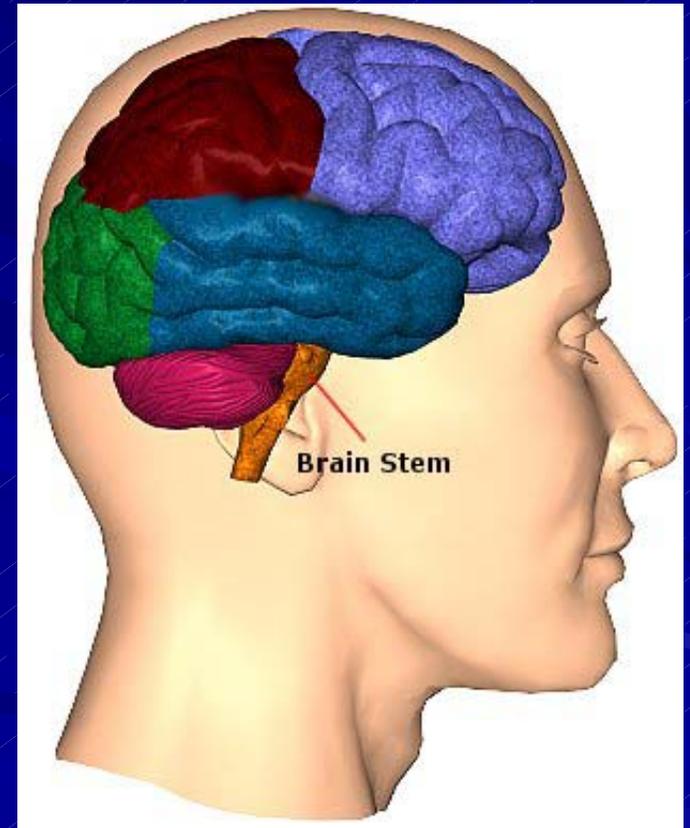
5. Synthesis

4. Analysis

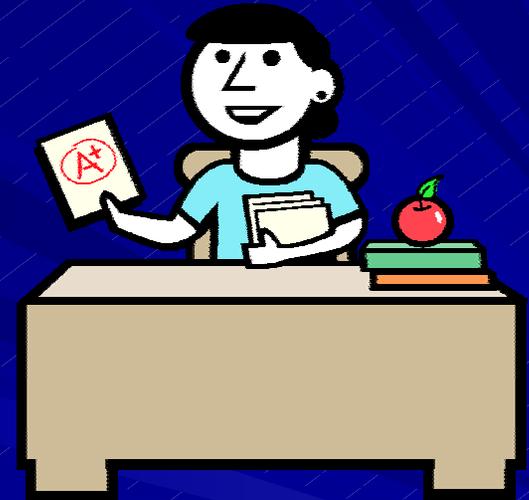
3. Application

2. Comprehension

1. Knowledge



- This area is commonly called the **cognitive** (“**knowing**”) **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

6. Evaluation

5. Synthesis

4. Analysis

3. Application

2. Comprehension

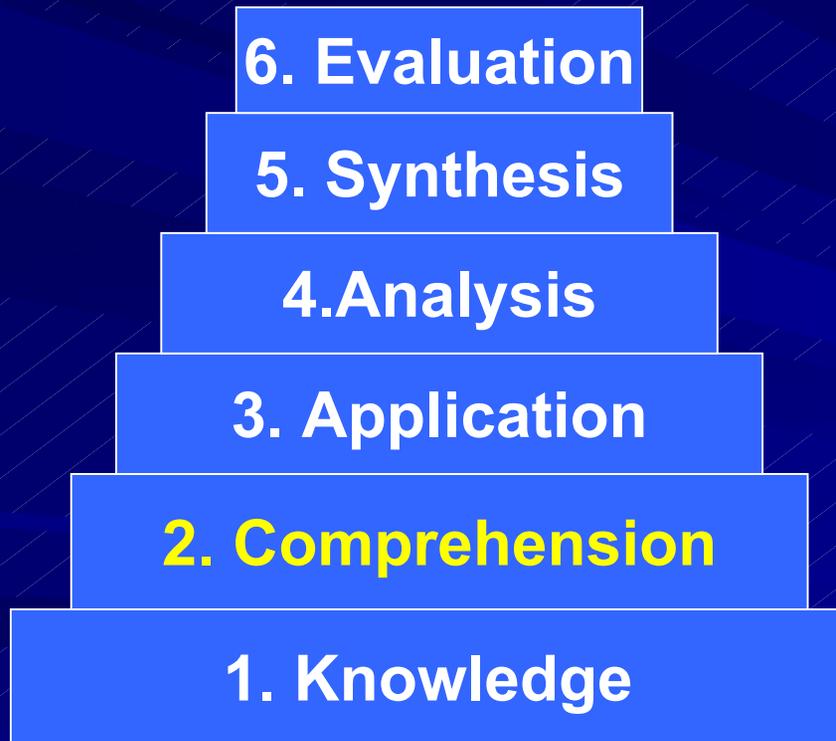
1. Knowledge

- Use action verbs like:
Arrange, collect, define, describe, duplicate, examine, find, identify, label, list, memorise, name, order, outline, present, quote, recall, recognise, 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.
- *Describe* the processes used in engineering when preparing a design brief for a client.

2. Comprehension - ability to understand and interpret learned information

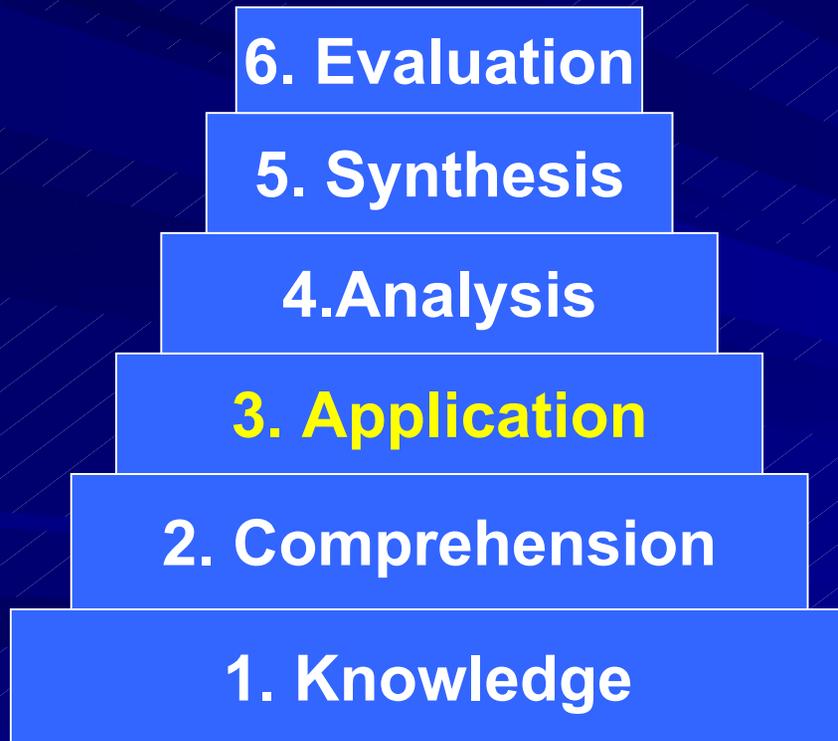


- Use action verbs like:
Associate, clarify, classify, contrast, describe, differentiate, discuss, distinguish, estimate, explain, express, extend, identify, illustrate, indicate, interpret, locate, predict, recognise, report, restate, review, select, translate.

Examples: Comprehension

- ***Differentiate*** between civil and criminal law
- ***Identify*** participants and goals in the development of electronic commerce.
- ***Predict*** the genotype of cells that undergo meiosis and mitosis.
- ***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.

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, discover, dramatise, employ, examine, experiment, find, illustrate, interpret, modify, operate, practice, predict, relate, schedule, select, show, sketch, solve, 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* an understanding of 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)

6. Evaluation

5. Synthesis

4. Analysis

3. Application

2. Comprehension

1. Knowledge

■ Use action verbs like:
Analyse, appraise, arrange, break down, calculate, categorise, classify, compare, connect, contrast, criticise, debate, differentiate, discriminate, distinguish, divide, examine, experiment, infer, inspect, investigate, order, question, separate, test.

Examples: Analysis

- *Analyse* why society criminalises certain behaviours.
- *Compare* and contrast the different electronic business models.
- *Debate* the economic and environmental effects of energy conversion processes.
- *Calculate* gradient from maps in m, km, % and ratio.
- *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

6. Evaluation

5. Synthesis

4. Analysis

3. Application

2. Comprehension

1. Knowledge

- Use action verbs like:
Argue, arrange, assemble, collect, compose, construct, create, design, develop, formulate, generalise, integrate, manage, organise, plan, prepare, propose, relate, 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.
- *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

6. Evaluation

5. Synthesis

4. Analysis

3. Application

2. Comprehension

1. Knowledge

■ Use action verbs like:

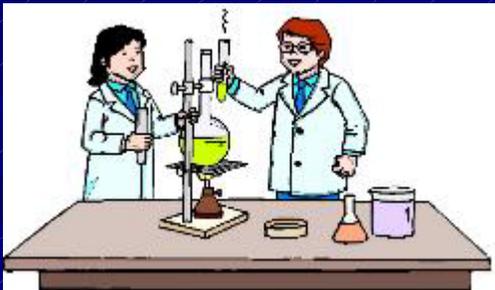
Appraise, argue, assess, attach, choose, compare, conclude, convince, criticise, defend, evaluate, judge, measure, predict, rate, recommend, revise, score, summarise, support, value.

Examples: Evaluation

- Assess the importance of key participants in bringing about change in Irish history
- Evaluate marketing strategies for different electronic business models.
- 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.

Two other domains in Bloom's Taxonomy

- **PSYCHOMOTOR (“Doing”) DOMAIN:** 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.*

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.

AFFECTIVE (“Feeling”) DOMAIN: involves attitudes. Active verbs for this domain: appreciate, accept, attempt, challenge, defend, dispute, join, judge, praise, question, share, support.



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

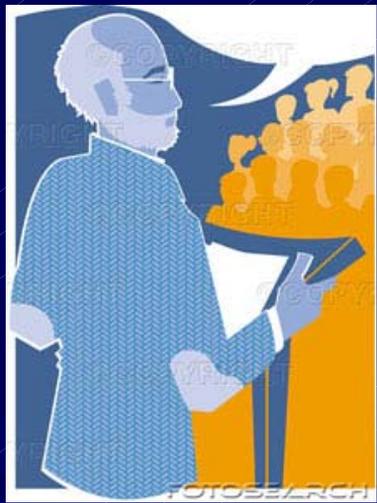


- “The key word is DO and the key need in drafting learning outcomes is to use active verbs”. (Jenkins and Unwin, Fry et al.)
- Avoid verbs like “know”, “understand”, “be familiar with”, “be exposed to” (Osters and Tiu)
- “Try to avoid ambiguous verbs such as “understand”, “know”, “be aware” and “appreciate”.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

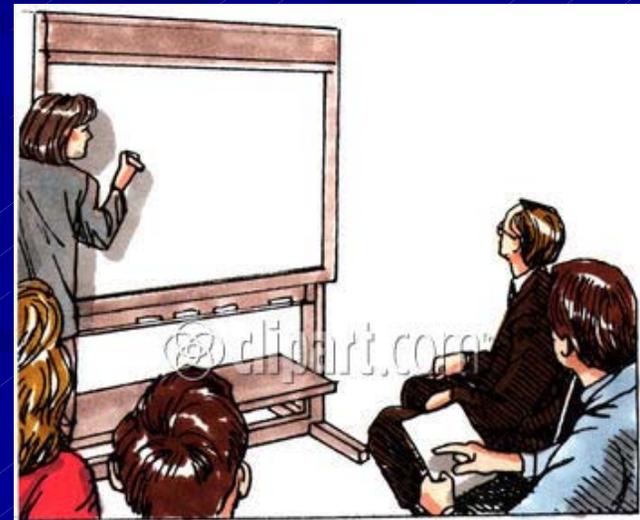
Checklist for writing learning outcomes



- 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?



3. How do I link Learning Outcomes to Teaching and Assessment?



- Important to ensure that there is alignment between teaching methods, learning outcomes and assessment criteria.
- This correlation between teaching, learning outcomes and assessment helps to make the overall learning experience more transparent and meaningful for students.



Teaching for understanding



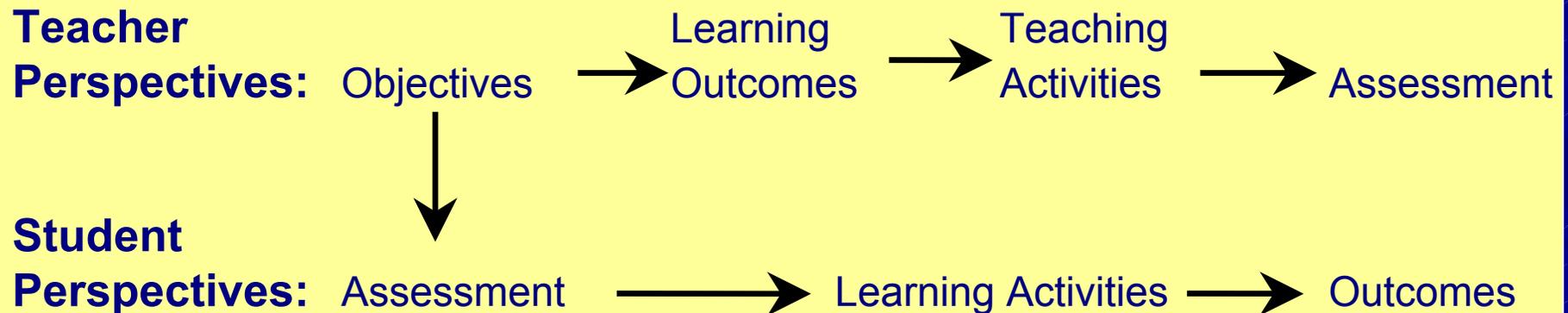
Learning outcomes



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

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).

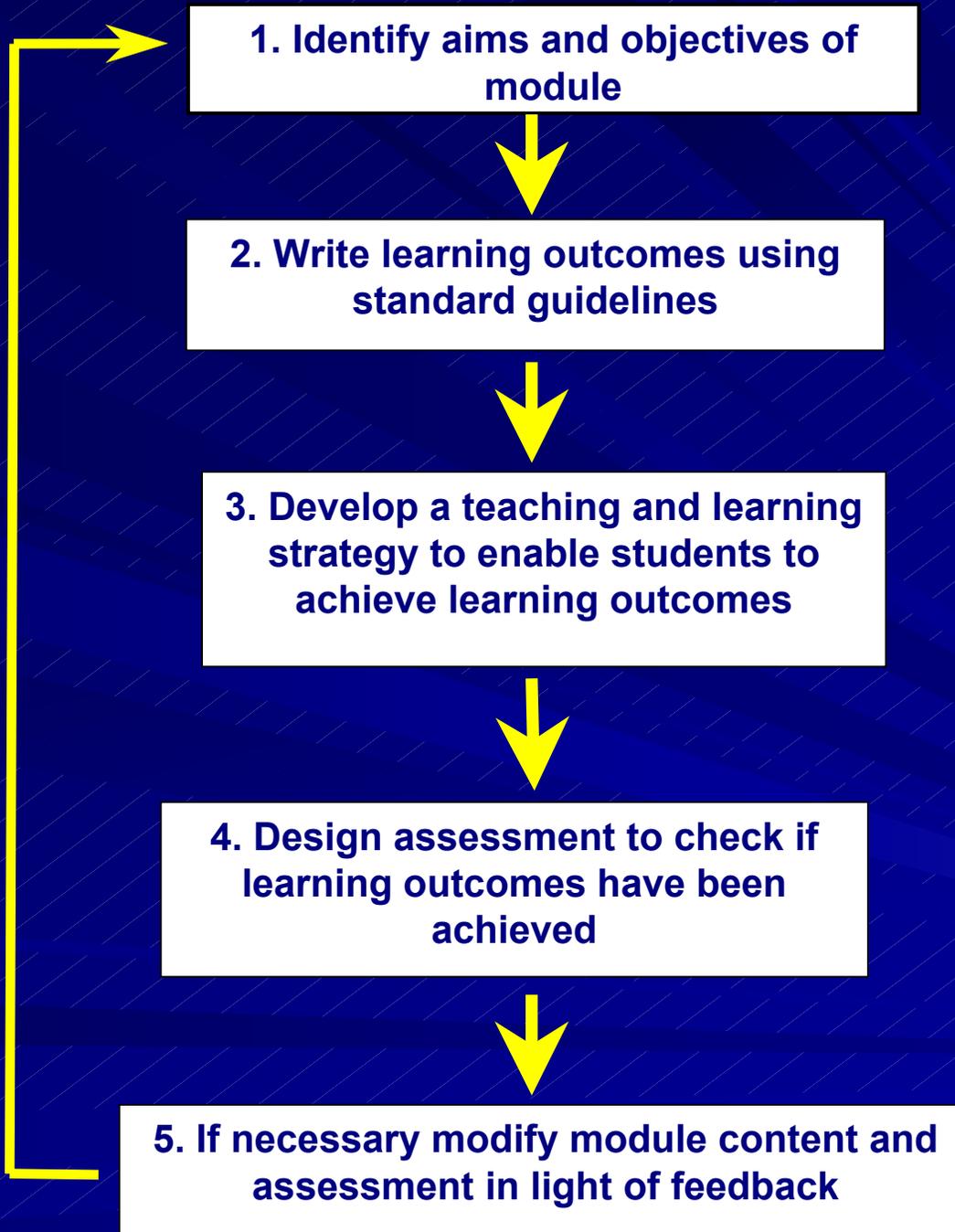
Biggs (2003) represents this graphically as follows:



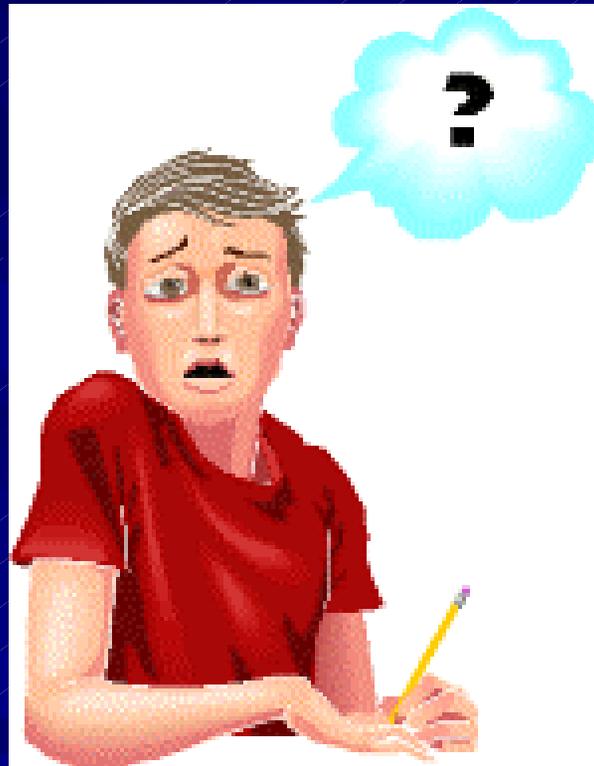
“To the teacher, assessment is at the end of the teaching-learning sequence of events, but to the student it is at the beginning. If the curriculum is reflected in the assessment, as indicated by the downward arrow, the teaching activities of the teacher and the learner activities of the learner are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

The Experience of using Learning Outcomes





4. What are the benefits and potential problems of Learning Outcomes?



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.
- 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. .

Potential problems with Learning Outcomes

- Could limit learning if learning outcomes written within a very narrow framework – lack of intellectual challenge to learners.
- 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. *Design* a checklist for writing learning outcomes.
5. *Recognise* the advantages of learning outcomes.
6. *Assess* the problems caused by poorly written learning outcomes.



That's all Folks.
Hope you learned
something about
learning outcomes!



References

- Baume, D. (1999). *Specifying Aims and Learning Outcomes* Milton Keynes: Open University.
- Biggs J, (2003) *Teaching and Learning in Higher Education: New Trends and Innovations*.
University of Aveiro, 13 – 17 April 2003
- Bingham, J. (1999) *Guide to Developing Learning Outcomes*, The Learning and Teaching Institute
Sheffield Hallam University, Sheffield.
- Fry, H., Ketteridge, S., Marshall (2000) *A Handbook for Teaching and Learning in Higher Education*.
London: Kogan Page.

- 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.
- Ramsden, P (2003) *Learning to teach in Higher Education*, London Routledge.