

Learning Objectives

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What are Learning Objectives?

Learning Objectives are statements that describe what a learner will be able to do as a result of learning. They are sometimes called learning outcomes. Learning Objectives are also statements that describe what a learner will be able to do as a result of teaching. Some definitions stress that a learning objective is a sort of contract that teachers make with learners that describes what they will be able to do after learning that they could not do before, the 'added value' of teaching. However the connection between teaching and learning is not a simple one. Just because knowledge or skills are taught does not mean that particular knowledge or skills are learned. Many factors can interfere with the achievement of objectives: the existing knowledge of the learner, the relevance or usefulness of the material presented, the skills of the teacher.

What are the difference between Aims and Objectives?

Aims are general statements concerning the overall goals, ends or intentions of teaching. Objectives are the individual stages that learners must achieve on the way in order to reach these goals. For example a teacher might have an aim that a student should be able to take blood pressure using a sphygmomanometer. However to achieve this aim a series of objectives must be met. eg to explain procedure to patient, to position cuff correctly, to inflate to correct pressure etc, etc.

A lecturer might have as an overall aim that students should understand the relationship between protein structure and function. To achieve this aim the following objectives might have to be met: describe amino acid structure, list common categories of amino acid, explain how peptide bonds are formed, describe how covalent, ionic and hydrophobic interactions create secondary and tertiary structures, etc, etc.

- Aims are general, objectives are specific.
- There are more objectives than aims.
- Aims are like strategy, objective are like tactics.

Aims and objectives can form hierarchical structures so that in complex curricula aims at one level might be seen as objectives at another.

What are the main categories of learning objectives?

Learning objectives are aimed at the three domains of learning: knowledge, skills and attitudes. These are also termed the cognitive, psychomotor and affective domains of learning.

How do you write aims and learning objectives?

As a teacher you will need to decide what you want your learners to be able to DO after they have learned something that you have taught. Many things can be potentially learned during a teaching episode but you will use your judgement to focus on the most important outcomes for your learners at that stage of their course. For instance if you want them to be able to take blood pressure using a sphygmomanometer after you have demonstrated the procedure that would constitute your aim. But to achieve that they will have to have attained a series of objectives on the way. Some of these objectives might include the basic knowledge behind cardiovascular physiology such as the sequence of the cardiac cycle, systole, diastole, cardiac output, stroke volume etc. etc. Further skill objectives might include communicating with patients, explaining procedures etc. Finally the skills of the procedure itself broken down into suitable steps. So the aims and objectives for one possible teaching sequence might look like the following:

Aims:

The student should be able to measure blood pressure on a colleague/patient using a sphygmomanometer and a stethoscope (to an accuracy of +/- 10mm Hg).

Objectives:

1. Can describe the cardiac cycle and explain the terms systole, diastole, cardiac output, stroke volume.
2. Can effectively communicate instructions to patient concerning the procedure.
3. Fits and inflates cuff to appropriate pressure.
4. Releases pressure carefully and uses stethoscope to listen to brachial artery and Korotkow sounds.
5. Deflates cuff.
6. Records systolic and diastolic pressure correctly.

In the case of more knowledge orientated aims and objectives imagine you are going to give a lecture with the aim of ensuring that students understand the relationship between protein structure and function and the various factors that

influence enzyme reactions. Here you need to break the knowledge down into smaller components that logically build towards the final goal.

Aims:

To understand the relationship between protein structure and function and the factors that influence enzyme reactions.

Objectives:

1. State the different categories of amino acid.
2. Explain what a peptide bond is and how polypeptides are formed.
3. State the four levels of protein structure and explain how the sequence of amino acids leads to the final three dimensional configuration of the protein.
4. Explain how variations in pH, ion concentration and temperature influence the three dimensional configuration of a protein.
5. State that an enzyme is a protein designed to catalyse a specific chemical reaction.
6. State that an enzyme speeds up the rate of a chemical reaction by lowering the activation energy of the transition complex and that it does not influence the equilibrium or overall energy change of a reaction.
7. Explain how variations in pH, ion concentration and temperature influence catalytic activity.
8. Describe how enzyme activity can be regulated by other molecules.

Note that objectives do not include the word 'know' or 'understand'. They do include active verbs such as 'state', 'explain', 'outline', 'list' or 'describe'. Know and understand do not specify any overt 'doing' and although knowing and understanding underpin learning, objectives are always written using active doing verbs. They are statements of what you want your learners to do. At the end of the day being a doctor, nurse or dentist is about doing things not just knowing things.

Examples of learning objectives verbs

The following lists contains examples of verbs which describe the sorts of things you want your students to be able to do and may help you to write useful learning objectives.

Knowledge

analyse	arrange	calculate	circle	cite
classify	compare	contrast	compare	define
describe	diagram	differentiate	group	identify
interpret	itemize	label	list	match
name	outline	plan	record	revise

select	Solve	state	tabulate	give examples
evaluate	recognise			

Skills

Adjust	assemble	chart	collect	use
Draw	employ	establish	illustrate	imitate
Interact	locate	maintain	measure	modify
Operate	organise	rearrange	return	set up
Practice	manipulate	master	fit	perform
Demonstrate				

Attitudes

accept	adopt	advocate	approve	assess
challenge	characterise	choose	criticise	defend
evaluate	formulate	judge	justify	manage
model	persuade	recommend	resolve	select
specify	value	re-assure	empathise	

How can I modify learning objectives to make them more demanding?

Learning objectives can be made more difficult or demanding depending on the degree of understanding or levels of experience of learners. You can change the active verb to a more complex one or you can add specific conditions or limits.

For example simple objectives might be to list or state facts, formulae or definitions, essentially recalling information from memory and reproducing it. More complex objectives might ask learners to apply or use knowledge in a particular context that might not have been met before. This is more cognitively demanding and really tests whether learners have deeply understood concepts. Finally the highest levels of objectives ask learners to solve complex problems by, for example evaluating or analyzing evidence or synthesizing information. To critically evaluate the causes of something involves not only a deep understanding of detailed factual information but also an ability to make complex judgments about the validity of evidence.

Conditions that could be added to objectives might include modifications to the circumstances in which they are carried out. 'Given a diagram of the inner ear correctly labels X, Y and Z is easier than having to draw a diagram from scratch. Similarly 'describe quantitatively' is more demanding than just 'describe' and 'describe quantitatively using data from published studies' implies a familiarity with the primary literature that only the advanced student might have.

Certain objectives can be modified by the degree to which they need to be completed. Explain in detail is more complex than in outline. Measure to 95% accuracy is harder than simply measuring without any degree of accuracy given.

Why do we have to use learning objectives?

There are a number of ways of thinking about this question. The quickest answer is that all teachers in higher education have to use learning objectives. The Quality Assurance Agency (the quality control branch of the Higher Education Funding Council) specify that all taught sessions must have learning objectives. QAA observers, when conducting a subject review, use an observation protocol that includes monitoring the learning objectives of the teacher. QAA observers have the right to watch any teacher teach and can ask them what their learning objectives are.

A related view revolves around questions of quality and audit. If you don't know what you're trying to produce how can you be sure your teaching methods and techniques are working? If you have no objective standards how can you monitor your teaching effectiveness and how can you improve? Since all teachers must evaluate their teaching they must know what their output is.

From a curriculum perspective the learning objectives from each taught session should fit together coherently building towards the overall aims of each module and the whole curriculum. If learning objectives are not known for each session then it is impossible to see how the whole curriculum fits together. It becomes impossible for teachers in different phases of the curriculum to see what students have learned in other areas making managing and auditing the curriculum more difficult. In the case of the medical curriculum having many sessions without pre-defined learning objectives leads to a 'hidden' curriculum rather than the goal of an integrated curriculum.

What are the advantages of using learning objectives?

From an educational perspective learning objectives define learning outcomes and focus teaching. They help to clarify, organize and prioritize learning. They help students evaluate their own progress and encourage them to take responsibility for their learning.

I want my students to 'read around the subject'. Don't learning objectives narrow the range of student learning?

Medicine is such an enormous subject that some boundaries have to be placed on the learning required to become a pre-registration house officer. The General Medical Council in Tomorrow's Doctors specifically recommended a reduction in factual knowledge. Specific aims and learning objectives are therefore essential in defining core knowledge, skills and attitudes. Students are free to learn more if they so wish but learning objectives should define the 'bottom line'. Individual teachers may wish that students learn more about their own favourite areas but this has to be seen in the context of the overall curriculum and has to be argued with the appropriate module co-ordinator or curriculum committee. On the other hand if it is decided that 'reading around the subject' is a fundamental requirement of some components of the module then appropriate learning objectives can be defined for this outcome.

We have module objectives, why do we need objectives for individual teaching sessions?

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More information?

If you need more information about using learning objectives, or require help in writing them for your teaching sessions then please contact Dr David Matheson on

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