Guide to designing and writing learning outcomes for health professional education

The purpose of this document is to provide guidelines for designing learning outcomes. For those who wish to engage in designing outcomes, the first page provides a brief overview that is followed by step-by-step guidelines and examples. The debate on the pros and cons of adopting an outcomes-based approach continues (for example, see Bleakly et al, 2011)[1]

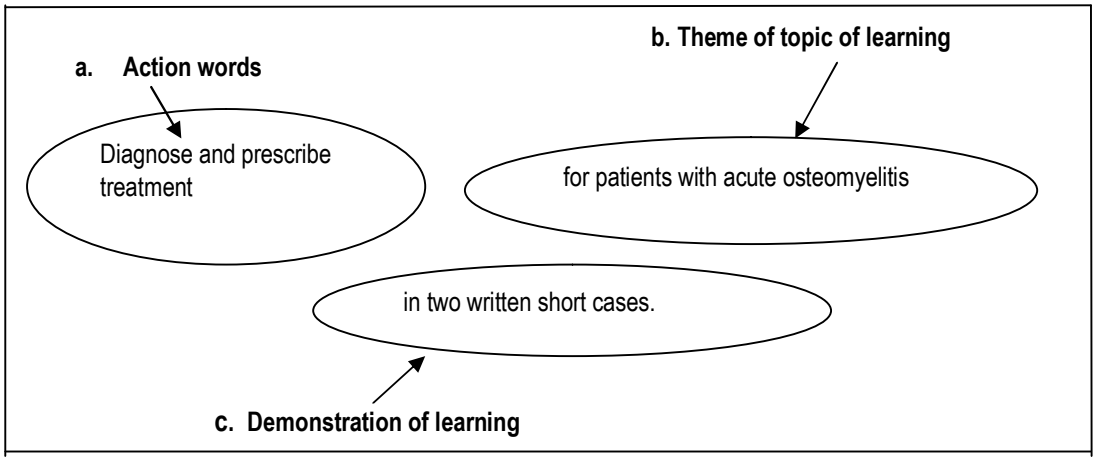
Brief overview

Learning outcomes are defined as statements of what a student is expected to know, understand and be able to do at the end of a period of learning and how that learning will be demonstrated[2]. A learning outcome therefore describes end-process behaviours, unlike learning objectives that describe intended content to be covered.

Core guidelines for designing outcomes

1. Two questions frame the construction of an outcome:
    - What should the student be able to do with the knowledge and skills acquired during the course?
    - What should the student demonstrate to illustrate their mastery of learning?

2. Learning outcomes contain 3 elements:
    a. action words (verbs)
    b. the theme, topic or learning content
    c. a method of demonstrating mastery of learning



3. The selection of action words is of critical importance and should indicate the level of complexity.
4. It is important to differentiate between specific learning outcomes, course outcomes and exit level outcomes to indicate whether the outcome is for an aspect of a course (specific learning outcome) or for an entire course (course outcome) or for the end of an entire programme, i.e. MB.ChB (exit level outcome).

Step-by-step guide

General principles

- In your own mind, clarify the difference between *course aims and objectives* (that describe the content you intend to teach) and *learning outcomes* (that describe what the student will be able to do after they have completed the course). In other words, aims and objectives are up front statements about the intended content and scope that the lecturer wishes to cover, whereas learning outcomes describe end competencies of what the student will be able to do with the knowledge, skills and attitudes acquired during the course[3].

- Outcomes start with a verb or an action word. Lists of outcomes are preceded by statement such as: *"By the end of the course, the student will be able to…",* followed by an action word such as: *"summarise relevant information regarding the patient's current condition to consider differential diagnosis"* or *" administer local aneasthetics safely"*[3,5.]

- Course outcomes serve to indicate how the student will be assessed. For this reason, outcomes should be measurable or should lead to the production of evidence of mastery of learning.

- Course outcomes should specify the minimum acceptable standard or threshold level for a student to pass[3]. As course outcomes express only the core and essential learning for a course, such information is usually captured in a small number of learning outcomes that are of central importance. The purpose of learning outcomes is not to provide an exhaustive overview of the course content but to summarise and express the core competencies that students will acquire during the course.

Designing learning outcomes for specific sections of the curriculum

1. Select an action word

The choice of the action word for the outcome is critically important. To guide the construction of outcomes, the use of Bloom's taxonomy, sometimes in adapted forms, is widely reported in the literature [3, 5]. Bloom's classification of levels of cognitive processing is helpful in determining the level of complexity of the outcome. An adaptation of the original taxonomy proposed by Birmingham University EDU is illustrated in the Table 1., below.

Table 1: Adaptation of Bloom's taxonomy by Birmingham University EDU5.

> > Increasing level of cognitive complexity > >

Knowledge & understanding		***Cognitive processing***			
Recalling important information	***Explaining important information***	***Solving closed-ended problems***	***Solving open-ended problems***	***Creating 'unique' answers to problems***	***Making critical judgments based on a sound knowledge base***
Knowledge	Comprehension	Application	Analysis	Synthesis	**Evaluation**
define	translate	interpret	distinguish	compose	judge
repeat	restate	apply	analyse	plan	appraise
record	discuss	employ	differentiate	propose	evaluate
list	describe	use	appraise	design	rate
recall	recognize	demonstrate	calculate	formulate	compare
name	explain	dramatize	experiment	arrange	revise
relate	express	practise	test	assemble	assess
underline	identify	illustrate	compare	collect	estimate
	locate	operate	contrast	construct	
	report	schedule	criticize	create	
	review	sketch	debate	set up	
	tell		question	organize	
			relate	manage	
			solve	prepare	
			examine		
			categorize		

2. Decide what the student should be able to do

For orthopaedic surgery, students are informed that they **must know** septic arthritis and acute, sub-acute and chronic osteomyelitis for the area of bone infection. To convert this information into a learning outcome, ask the question: What should the student be able to do with this knowledge? Should the wording of the outcome focus on processes such as *diagnose* or *describe a management plan*?

The first draft on an outcome could read:

By the end of the course the student will able to:

- *Accurately diagnose and prescribe appropriate treatment for patients with osteomyelitis.*

What should the student do to convince you that they are able to differentiate between the acute, sub-acute or chronic stages of osteomyelitis ?

You could add:

- *Diagnose and prescribe treatment for patients with osteomyelitis indicating differences in treatment during the acute, sub-acute or chronic stages of the disease.*

3. Decide what the student should demonstrate to the examiner as evidence of their learning

Consider how the student will be assessed and add the students' evidence of learning or the assessment format to the outcome. For instance, if the assessment opportunity will occur during a ward round as a verbal presentation the outcome could read:

- *Describe (or discuss) the diagnosis and management for a patient with sub-actue osteomyelitis, differentiating between treatment during the current and other stages of the disease.*

The outcome described above can also be a written assessment task, as 'describe or discuss' could be written or verbal tasks. It could thus be a short case for a portfolio. Other examples of assessment formats could be:

- *Demonstrate the ability to identify specified conditions by reviewing the presenting clinical picture in a multiple choice questions examination.*

- *Describe the symptoms and draw a diagnostic conclusion of a presented clinical case in an OSCE.*

4. When designing course outcomes

The examples above refer to specific and discrete parts of a bigger course curriculum. For the purpose of course outcomes, the number of specific learning outcomes are condensed into similar processes that are repeated in outcomes. The action words of outcomes are a summary of the process skills, for example:

By the end of the course, the student should be able to:

- *Demonstrate the ability to accurately diagnose the conditions of patients with specified neurological conditions, by presenting findings of five cases at the bedside.*
- *Describe effective management plans for patients with specified neurological conditions by submitting five case studies into a portfolio.*

5.Feasibility

Feasibility of the assessment format is important to consider during the design of course outcomes. For example, some lecturers view the inclusion of so-called 'soft skills' as important educational outcomes for courses. Consider the outcome below as an example of

how higher order thinking skills and psycho-social aspects could be integrated into an outcome.

- *Describe the process of clinical reasoning employed from history-taking to discharge of patients presenting with acute orthopaedic conditions in a paediatric setting/clinic in a long case. Explain your strategy for determining the psycho-social environment to which the patient will be discharged.*

Feasibility usually dictates the assessment format as resources determine how much time is available for student assessment and marking. An outcome that integrates higher order thinking skills and psycho-social aspects such as the example above is best assessed in the form of a long case, as the lecturer wants to determine how the student thinks as opposed to what the student knows. It may be possible for a busy clinician to mark 6 long cases, but it may not be possible to have time to mark a larger number of scripts. The resourcing and feasibility of the format of the assessment thus needs to be considered up front.

6. Ensuring multiple assessment formats

Course outcomes should include a range of assessment formats. Knowledge and understanding are usually assessed by means of a variety of written or oral assessment formats, whereas skills and attitudes are assessed practically in an OSPE or in a clinical setting (OSCE or Mini-CEX). The assessment of skills should include both manual or mechanical skills and process skills such as diagnostic and clinical reasoning. Attitudes such as professionalism are usually assessed through observation. Therefore, students are assessed by means of a range of assessment types. By stating the assessment format in the outcome, the course convenor ensures that the assessment blueprint for the course covers all aspects to be assessed.

References

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3. Kennedy D. 2007. Writing and using learning outcomes: a practical guide. University College Cork, Ireland
4. Bloom B (Ed) Engelhart M, Furst E, Hill W & Krathwohl D. 1956. Taxonomy of educational objectives: The classification of educational goals. Handbook 1: Cognitive domain. New York: David McKay.
5. University of Birmingham EDU. www.ssdd.bcu.ac.uk/outcomes/#2

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