

## A framework for assessment

Assessment should be linked to the desired student learning outcomes. It is useful to have a shared framework for looking at assessment that:

- relates assessment to desired learning outcomes, i.e. what knowledge, skills and values you would like students to acquire;
- clearly distinguishes different levels of attainment; and
- shows why a variety of assessment strategies is necessary.

Although the term ‘learning outcome’ is often used interchangeably with terms such as ‘learning objectives’, ‘educational objectives’, and ‘instructional objectives’, there are some differences that are worth mentioning. Learning outcomes are student-oriented, referring specifically to what students are expected to achieve or learn at the end of the course. Objectives are usually used to describe course design in terms of what teachers want to teach or how they view the course as contributing to the content areas covered by the entire programme.

### *The SOLO taxonomy*

What does the work of a person with a high level of understanding look like? In order to judge whether students clearly understand concepts, it is necessary to examine the work they produce when they are trying to solve problems or explain complex concepts. In the 1980s, two researchers, John Biggs and Kevin Collis, developed a systematic way of describing levels of performance.

The Structural Observation of Learning Outcomes (SOLO) classification or taxonomy (Biggs & Collis, 1982; Biggs, 1999) describes a student’s understanding of a subject or topic in five levels of increasing complexity (though an intermediate category is often helpful). These are described in Table 1. In column 1 the terms originally used by Biggs and Collis (1982) are given in brackets. The images in column 2 were developed by Biggs to give a visual explanation of the differences between the levels. In column 3 a number of verbs have been included.

The SOLO categories can be described as:

- **Unanticipated extension:** Coherent whole is generalized to a higher level of abstraction. Students’ works under this category are well-structured with clear introduction and conclusion. Issues clearly identified; clear framework for organizing discussion or stages of problem solving; appropriate material selected. Evidence of wide reading from many sources. Clear evidence of sophisticated analysis or innovative thinking.
- **Logically related answer:** Work is well-structured with a clear introduction and conclusion. Framework exists which is well-developed. Appropriate material. Content has logical flow, with ideas clearly expressed. Clearly identifiable structure to the argument with discussion of differing views.
- **Intermediate:** Several concepts are integrated so coherent whole has meaning. Students’ works under this category are fairly well-structured. Some issues identified. Attempt at a limited framework. Most of the material selected is appropriate. Introduction and conclusion exists. Logical presentation attempted and successful in a limited way. Some structure to the argument but only limited number of differing views and no new ideas.
- **Multiple unrelated points:** Some aspects of task addressed but no relationship of facts or concepts. Students’ works under this category are poorly structured. A range of material has been selected and most of the material selected is appropriate. But the quality of work shows little attempt to provide a clear logical structure. Focus on a large number of facts with little attempt at conceptual explanations. Very little linking of material between sections in the report.
- **Single point:** Preliminary processing but task is not approached appropriately. Students’ works under this category have poor structure. One issue identified and this becomes the sole focus; no framework for organizing discussion. Dogmatic presentation of a single solution to the set task. This idea may be restated in different ways. Little support from the literature.

- **Missing the point:** Just that! No recognition of appropriate concept or relevant processing of information. Students' works under this category have poor structure, irrelevant detail and some misinterpretation of the question, showing little logical relationship to the topic and poor use of examples.

Figure 1 may be helpful in distinguishing basic and higher-order desired learning outcomes (after Biggs, 2003), and in designing assessment tasks that can provide evidence of that learning.

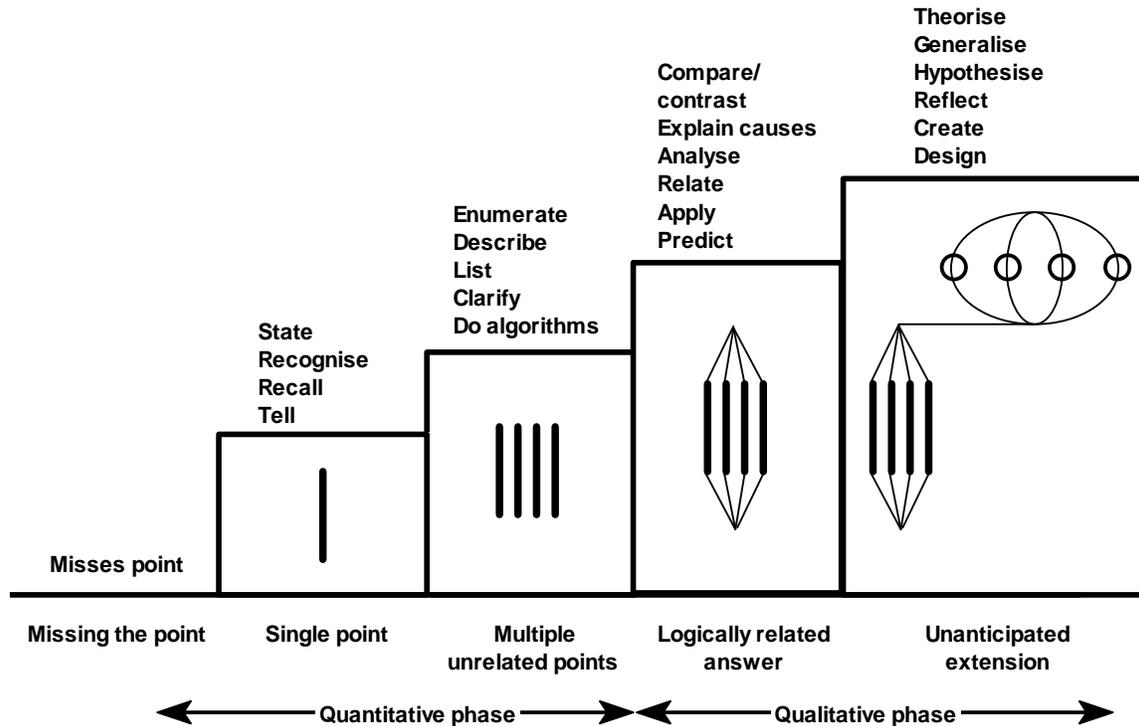


Figure 1: SOLO taxonomy (after Biggs, 2003)

## References

- Biggs, J. (1999). What the student does: Teaching for enhanced learning. *Higher Education Research & Development*, 18(1), 57–75.
- Biggs, J. B. (2003). *Teaching for quality learning at university* (2nd ed.). Buckingham: Society for Research into Higher Education & Open University Press.
- Biggs, J. B., & Collis, K. F. (1982). *Evaluating the quality of learning: the SOLO taxonomy (structure of the observed learning outcome)*. New York: Academic Press.

CLEAR, CUHK  
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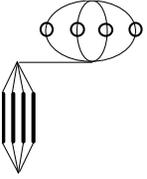
SOLO category	Representation	Type of outcome	Solution to problem	Structure of essay
Unanticipated extension (Extended abstract)		Create Synthesise Hypothesise Validate Predict Debate Theorise	Solution to problem which goes beyond anticipated answer.  Project or practical report dealing with real world ill-defined topic.	Well-structured essay with clear introduction and conclusion. Issues clearly identified; clear framework for organizing discussion; appropriate material selected. Evidence of wide reading from many sources. Clear evidence of sophisticated analysis or innovative thinking.
Logically related answer (Relational)		Apply Outline Distinguish Analyse Classify Contrast Summarise Categorise	Elegant solution to complex problem requiring identification of variables to be evaluated or hypotheses to be tested.  Well-structured project or practical report on open task.	Essay well-structured with a clear introduction and conclusion. Framework exists which is well-developed. Appropriate material. Content has logical flow, with ideas clearly expressed. Clearly identifiable structure to the argument with discussion of differing views.
Intermediate			Solution to multiple part problem with most parts correctly solved but some errors.  Reasonably well-structured project or practical report on open task.	Essay fairly well-structured. Some issues identified. Attempt at a limited framework. Most of the material selected is appropriate. Introduction and conclusion exists. Logical presentation attempted and successful in a limited way. Some structure to the argument but only limited number of differing views and no new ideas.
Multiple unrelated points (Multistructural)		Explain Define List Solve Describe Interpret	Correct solution to multiple part problem requiring substitution of data from one part to the next.  Poorly structured project report or practical report on open task.	Essay poorly structured. A range of material has been selected and most of the material selected is appropriate. Weak introduction and conclusion. Little attempt to provide a clear logical structure. Focus on a large number of facts with little attempt at conceptual explanations. Very little linking of material between sections in the essay or report.
Single point (Unistructural)		State Recognise Recall Quote Note Name	Correct answer to simple algorithmic problem requiring substitution of data into formula.  Correct solution of one part of more complex problem.	Poor essay structure. One issue identified and this becomes the sole focus; no framework for organizing discussion. Dogmatic presentation of a single solution to the set task. This idea may be restated in different ways. Little support from the literature.
Misses the point (Prestructural)			Completely incorrect solution.	Inappropriate or few issues identified. No framework for discussion and little relevant material selected. Poor structure to the essay. Irrelevant detail and some misinterpretation of the question. Little logical relationship to the topic and poor use of examples.

Table 1: Descriptions of the SOLO taxonomy