SOLO Taxonomy

WHAT IS IT?

Biggs and Collins (1982) developed the SOLO (Structure of Observed Learning Outcomes) taxonomy as a systematic way of describing how a learner's performance grows in complexity when mastering tasks. Performance levels of learners range from the lower end (Pre-structural) to the higher end (Extended Abstract) as shown in Diagram 1.

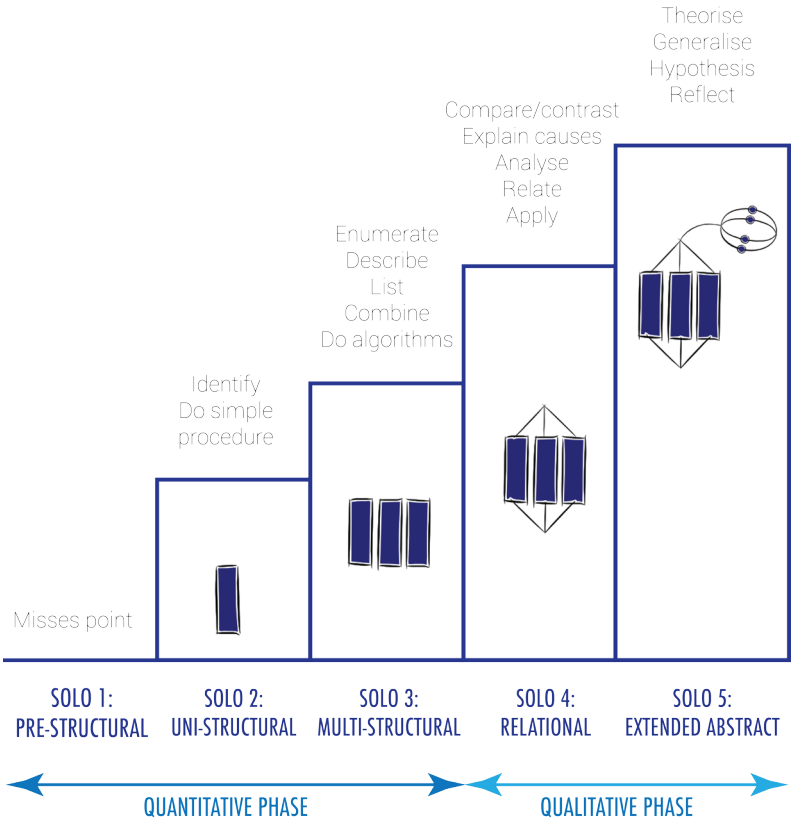

Diagram 1: Biggs and Collins (1982) SOLO Taxonomy levels

DESCRIPTORS

SOLO 1: Pre-Structural Level

- The student does not have any kind of understanding, uses irrelevant information and/or misses the point altogether

SOLO 2: Uni-Structural Level

- The student can deal with one single aspect and make obvious connections. The student can use terminology, recite (remember things), perform simple instructions/algorithms, paraphrase, identify, name or count.

SOLO 3: Multi-Structural Level

- The student can deal with several aspects but these disconnected. He/she is able to enumerate, describe, classify, combine, apply methods, structure, execute procedures, etc.

SOLO 4: Relational Level

- The student may understand relations between several aspects and how they might fit together to form a whole. The understanding forms a structure and may thus have the competence to compare, relate, analyze, apply theory, explain in terms of cause and effect.

SOLO 5: Extended Abstract Level

- The student may generalize structure beyond what was given, may perceive structure from many different perspectives, and transfer ideas to new areas. He/she may have the competence to generalise, hypothesise, criticize or theorise.

VERBS WHICH CAN DESCRIBE PERFORMANCE AT DIFFERENT SOLO LEVELS

SOLO LEVEL	VERBS
SOLO 1: Unistructural	Define, identify, name, draw, find, label, match, follow a simple procedure
SOLO 2: Multistructural	Describe, list, outline, complete, continue, combine, calculate
SOLO 3: Relational	Sequence, classify, compare and contrast, explain (cause and effect), analyse, form an analogy, organise, distinguish, question, relate, apply, describe
SOLO 4: Extended abstract	Generalise, predict, evaluate, reflect, hypothesis, theorise, create, prove, justify, argue, compose, prioritise, design, construct, perform, explain, apply, analyse

APPLYING SOLO TAXONOMY

The following is an example of the Intended Learning Outcomes (ILOs) written for a biology class using the SOLO taxonomy. (Note: Then term Intended Learning Outcomes is interchangeable with the terms Learning Outcomes and Learning Objectives).

At the end of the course, the student is expected to be able to...

- calculate (SOLO 2) recombination frequencies, segregation ratios, inbreeding coefficients, Hardy- Weinberg frequencies, evolutionary equilibria, heritabilities etc.
- explain (SOLO 4) and apply (SOLO 3) linkage analysis, including mapping of genes on chromosomes - describe (SOLO 3) and analyse (SOLO 4) simple patterns of inheritance (i.e. through analysis of pedigrees)
- describe (SOLO 3) and explain (SOLO 4) the concepts of genetic variation, mutation, inbreeding, genetic drift, and natural selection
- describe (SOLO 3) and explain (SOLO 4) evolutionary processes
- analyse (SOLO 4) the inheritance at several genes simultaneously
- explain (SOLO 4) how inbreeding and population mixture influence genetic structure (Adapted from Brabrand & Dahl, 2009).

WHAT IF I WANT MORE?

- Biggs, J.B., and Collis, K.F. (1982). Evaluating the Quality of Learning - the SOLO Taxonomy. New York: Academic Press.
- Biggs, J. (1999). Teaching for Quality Learning at University. SHRE and Open University Press.
- Brabrand, C., & Dahl, B. (2009). Using the SOLO taxonomy to analyze competence progression of university science curricula. Higher Education, 58(4), 531-549.
- Characteristics of Deep and Surface Approaches to Learning - University of New South Wales

CONSIDERATIONS

While the SOLO taxonomy can help identify levels of progression with learning, Biggs (1999) also identifies characteristics of students that signal whether they are adopting a deep or surface level approach to learning.

WHAT IF I NEED SUPPORT?

For further support contact ITaLI TeachAssist