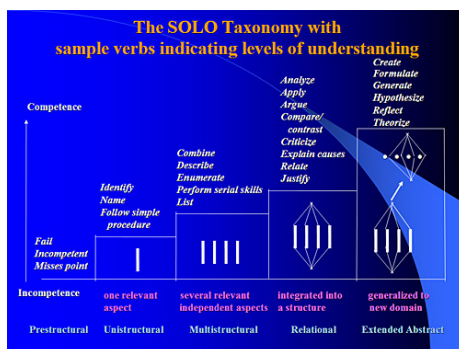


Three learning models: A cognitive level approach to programme design

This approach to designing PLOs takes its steer from theories in cognition and learning. The programme learning outcomes (PLOs) are designed taking into account the cognitive levels you want your students to perform at, which in turn are determined to an extent by the degree level or year of education. These cognition-oriented taxonomies and models also help in ordering or sequencing the PLOs so they reflect how a student's understanding and knowledge will develop through the programme.

There are several such frameworks; we outline three taxonomies or models that are useful in terms of charting cognitive levels and progression through the programme. All of them have their respective pros and cons, which are important to be aware of. We would recommend a discussion with your Eden Centre [department adviser](#) to decide which cognitive level model is best suited to your programme or learning context. With their guidance, you will be able to work out which aspects of which taxonomy or which combination can inform your design of the PLOs.

SOLO taxonomy



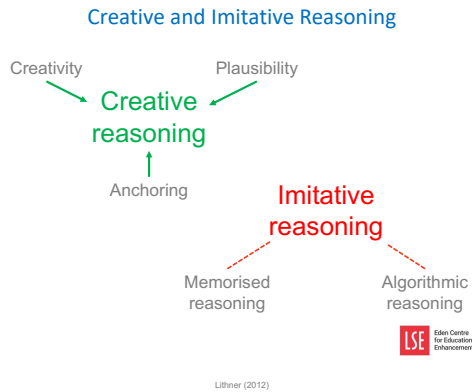
The SOLO taxonomy by Biggs is particularly useful to chart cumulative understanding through a programme. The list provides a non-exhaustive set of examples for each level/domain. The domains are not watertight, and sometimes courses can straddle more than one domain.

- Pre-structural: pre-sessional course
- Unistructural: Y1 core/foundation courses and some Y2 courses
- Multistructural: Y2/Y3 courses
- Relational: Y3 courses that are more advanced such as advanced theory, advanced applications and methods courses, courses that take comparative and multidisciplinary approaches, capstone courses, integrative projects
- Extended abstract: Dissertation, research courses, capstone courses, integrative projects

As with a number of learning taxonomies, the SOLO model can be interpreted as implying that learning is linear or hierarchical, which we know is not the case. SOLO

can have limited applicability in programmes that are highly specialised or technical as there may not be sufficient scope to move across multiple domains.

Creative and imitative reasoning

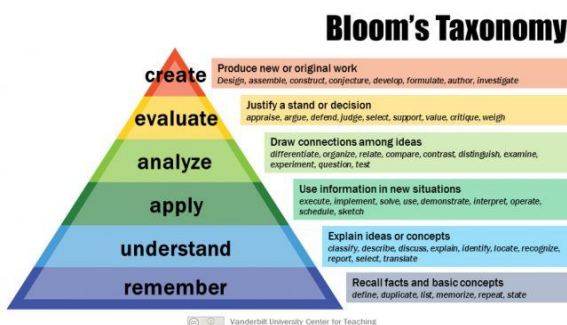


Lithner's model* is useful for mapping quantitative courses based on the reasoning skills students are expected to acquire through the programme. It shows that there is a need for developing basic skills in a programme, and depending on the programme aims, they can form the foundation for more advanced quantitative skills. This allows programme directors and course convenors to build progression into the programme/course structure over different terms and years. This model is useful for programmes with an integral quantitative component as it explicitly references cognitive skills relevant to quantitative topics/disciplines.

As Lithner's model was developed exclusively for mathematics, it will need to be combined with another model or taxonomy to ensure the social science-nature of an LSE education is foregrounded explicitly in the PLOs.

*This graphic was produced by Mark Baltovic for *Teaching Quantitative Subjects*, a workshop he runs for the [PGCertHE](#) and [PoTHE](#)

Bloom's taxonomy



Bloom's taxonomy, rebooted by Anderson and Krathwol in 2001, is the most commonly used model of curriculum design. The simplicity of the taxonomy is its strength, but as a result of its origins in 1956, the taxonomy does not lend itself to the nuance and complexity required in a 21st century education. Unfortunately, in practice, it is often reduced to a formulaic approach that places undue importance on verbs as is evident from the graphic above. For example, the bottom two levels

are considered to be lower level skills, when in fact understanding complex or counter-intuitive concepts or processes can involve high-level cognitive skills.

Review your list of PLOs in light of one or more of these models – are the PLOs set at the right level of education (this is especially important for Master’s programmes – are they M-level?), are students being encouraged to work across a range of cognitive levels or are most of the assessments clustered around one or two cognitive levels? Modify, amend your PLOs accordingly, and make a note of any outstanding issues or questions to discuss with your colleagues or [Eden Centre department adviser](#).

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