**A 4-step guide to designing effective learning outcomes**

Learning Outcomes are designed to shift the focus from subject content and delivery to student development and achievement. When effectively designed and constructively aligned to related learning, teaching, and assessment strategies and processes, they constitute the heart of an effective learning design process. This 4-step guide has been produced to inform the design and development of modules and programmes at Aston in conjunction with the Aston Design Principles[[1]](#footnote-1). Information is designed to be useful for those new to curriculum development and design and as a reference source for those with more experience.

1. ***Understanding the design context***

The Aston Design Principles outline the expectation that:

* Modules will not have more than four learning outcomes;
* Modules will not have more than two items\* of assessment (independent of the size of the module);

Exceptions to these principles are often approved for delivery but require a clear rationale to be presented during the validation and approval process.

It is also important to understand the disciplinary context and to ensure that approaches to module design are considered with respect to a wider programme of study and developments within the subject. For example, all module learning outcomes need to map to relevant programme level outcomes.

1. ***Considering key learning outcome design principles***

When learning outcomes are reviewed through validation and approval processes, the following short series of ‘do’s’ and ‘don’ts’ reflect some of the key aspects of design being considered:

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| **DO:** | **DON’T** |
| * Ensure learning outcomes are understandable and measurable in an applied context. | * Use ‘Understand’ as an outcome. As highlighted by Knight & Yorke (2003: 48)[[2]](#footnote-2), “Understanding cannot be judged, then, by evaluating the learner’s retention of data or information; rather, assessment tasks would need to have the student apply data or information appropriately.” * Lose the distinction between module aims and outcomes (E.g. *“Students will explore theories of…”*). Module Aims highlight the intentions of a module whilst learning outcomes articulate what a student will be able to do on successful completion of a module. |
| * Consider learning outcomes as a ‘map’ for the related teaching programme[[3]](#footnote-3) and ensure constructive alignment with a student’s wider programme of study | * Design modules in isolation or overlook connection to relevant programme level outcomes. * Overlook the alignment with related assessment design and opportunities for enriching the student and staff experience. |
| * Actively consider the different functions and applications of knowledge | * Become too narrowly focused on the recall of information at the expense of application. |
| * Write learning outcomes in the future tense[[4]](#footnote-4) | * Focus on historic events (E.g. “Will have presented”). |
| * Adhere to the Aston Design Principles or develop a clear rationale for any variation * Structure learning outcomes conventionally and ensure alignment by academic level (See Point 3 below) | * Overload or overcomplicate a module (E.g. include compound learning outcomes that would be better expressed separately). |

1. ***Structuring effective learning outcomes***

Learning Outcomes should include a suitable precursor statement – *On successful completion of the module you/the student will be able to: -* and comprise:

* An **active verb**
* An **object** of the verb
* A qualifying phrase providing **context**

E.g*. On successful completion of the module, you will be able to*:  
**Examine critically** (verb) **theoretical frameworks and research (**object) **relevant to neonatal development (**context)**.**

1. ***Ensuring effective alignment by level***

Learning outcomes require the **active verb**, **object** and qualifying **context** to be aligned to the relevant level of academic study and reflect the distinctive qualities of the discipline concerned. Appendix 1 (below) presents a series of key taxonomies relevant to curriculum design in UK higher education, including perhaps the most significant, the Framework for Higher Education Qualifications (FHEQ) of the UK Quality Code. Individual Subject Benchmark Statements[[5]](#footnote-5) provide further detail and descriptors mapped to different levels in UK higher education.

Appendix 1 is not intended to imply explicit alignment along the horizontal axis as each taxonomy is designed to sequence vertically, and all terminology is subject to being situated within a given context and related standards framework; E.g. ‘evaluating’, ‘describing’, identifying’, and ‘interpreting’, and related standards thereof, are very different depending on whether the context is the two-times-table or quantum mechanics. Furthermore, ‘creating’, ‘composing’, ‘predicting’, or ‘synthesising’ can be considered very differently if the context is baking a cake or composing proficient symphonic music. Nevertheless, the combined taxonomy provides a useful reference framework for active verbs to ensure effective alignment by level in the design of learning outcomes.

***Further considerations***

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|  | Cognitive processes | | | | | |
| Knowledge dimensions | **Remember** | **Understand** | **Apply** | **Analyse** | **Evaluate** | **Create** |
| Factual |  |  |  |  |  |  |
| Conceptual |
| Procedural/  Practical |
| Metacognitive |

Figure 1. Dimensions of knowledge and levels of process (Adapted from Anderson, L. W. and Krathwohl, D. R., et al (Eds.) (2001).

As well as variation by context, it is also important to note that ‘Knowledge’ and related standards of operation and application can also be considered in terms of factual recall, conceptual interpretation, practical application, and metacognitive functions (See Figure 1 above), and is never simply a matter of being to ‘remember things’. There is a graduation and development of cognitive capability implicit within all university programmes. Factual knowledge and understanding most commonly need to be gained before application and higher level cognitive and intellectual development can progress. This is the typical approach for example with respect to ‘research’ in undergraduate programmes; students are taught how to research (remember, understand) and work towards developing original research questions in the later stages of study (apply, analyse, evaluate, create).

Nevertheless, there is considerable evidence of the educational merits of problem-based learning and of the value of practice-based research activity as an introduction to discipline[[6]](#footnote-6). Rather than waiting for two years before developing a dissertation proposal, there are potential benefits from beginning with a process of questioning and exploring with uncertainty. Consider for example attending your first pottery class. First, you try to make your first pot (create), you then reflect on your results and experience of making (analyse and evaluate), you then use your new understanding to engage with discussion with the tutor (apply), and, through dialogue and practice, you develop your craft (Understand), and repeat and refine your successes (Remember).

Depending on context, all taxonomies are adaptable and subject to reinterpretation. For example, ‘creativity’ is consistently identified as a higher-level capability (Level 7 in the FHEQ) but the research literature demonstrates the potential to consider creativity in more graduated and in more detailed ways. Figures 2 and 3 below present conceptual frameworks for different stages and levels of creativity, and different facets of creativity.

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|  | **Example** | **Key benefit** | **Anticipated frequency** |
| **Big-C** | Jimi Hendrix | Global impact | Whenever it occurs/unpredictable |
| **Pro-c** | Professional guitarist | Career success/employability | On demand/when required |
| **Little-c** | Amateur guitarist in a band | Self-efficacy, better mental health | Appropriate to context |
| **Mini-c** | Child learning to play the guitar | Crucial element in learning | Whenever it occurs/unpredictable |

Figure 2. Levels of creative accomplishment (Adapted from Kaufman and Beghetto’ s 4-C model, 2009[[7]](#footnote-7)).

The 4-C model highlights that creativity is multifaceted and not definable in singular or simple terms. Mini-c creativity is common and reflects everyday activity, whilst Big-C remains unpredictable and statistically rare. The ‘Standard Definition’ of creativity (Runco, 2012[[8]](#footnote-8)) identifies creativity as anything ‘new and useful’ and the 4-C model highlights how this can be understood in terms of different levels of ‘new and useful’.

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|  | Fluency: how MANY IDEAS  Flexibility: VARIATION IN IDEAS  Originality: UNUSUALNESS  Elaboration: Level of detail  Usefulness: value |

Figure 3. Levels of creativity (Adapted from Peter Nilsson, 2011. Taxonomy of Creative Design) / Guilford and Torrance.

As well as recognising that creativity is evident at different levels (of originality and usefulness), Figure 3 above highlights that creativity involves different developmental processes and that it can be judged in different ways.

**Appendix 1: Comparative typology of cognitive skills by level. Adapted from FHEQ, Bloom, and Anderson and Krathwohl (2001).**

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| UK HE LeveL | Framework for Higher Education Qualifications (FHEQ)[[9]](#footnote-9) | | Bloom’s Taxonomy (1956) | | SOLO TAXONOMY (after Biggs and collis, 1982) | | Anderson and Krathwohl’s Taxonomy (2001)[[10]](#footnote-10) | |
| 8 | **Creation and interpretation of new knowledge** | Creating and interpreting, acquiring, conceptualising, advancing | **Evaluation** | Judge, evaluate, conclude, deduce, argue, estimate, validate, appraise, criticise, infer | **Extended abstract** | Evaluate, theorise, generalise, predict, create, imagine, hypothesise, reflect | **Creating** | Reorganising, deriving, synthesising |
| 7 | **Comprehe nsive understanding** | Creating, self-directing, proposing | **Synthesis** | Compose, produce, design, prepare, predict, modify, plan, invent, formulate, propose, organise, originate, derive | **Evaluating** | Judging, critiquing, recommending, evaluating |
| 6 | **A systematic and conceptual understanding** | Deploying, problem-solving, appreciating uncertainty and ambiguity, managing | **Analysis** | Analyse, compare, contrast, categorise, investigate, detect, survey, experiment, discriminate, inspect | **Relational** | Compare, contrast, explain causes, sequence, classify, analyse, relate, analogise, apply, formulate questions | **Analysing** | Determining, interrelating, differentiating, attributing, organising, illustrating |
| 5 | **Critical understanding** | Applying, critically evaluating and analysing, initiating, communicating to specialist and non-specialist audiences | **Application** | Apply, develop, operate, organise, restructure, demonstrate, practice, exhibit | **Multistructural** | Define, describe, list, do algorithm, combine | **Applying** | Executing, implementing, applying, presenting |
| 4 | **Knowledge** | Presenting, evaluating, interpreting, arguing, communicating | **Comprehension** | Discuss, describe, illustrate, represent, review, differentiate, conclude | **Unistructural** | Define, identify, do simple, procedure | **Understanding** | Constructing, interpreting, exemplifying, summarising, inferring, comparing |
|  |  |  | **Knowledge** | Know, identify, relate, explain, express, define, recall, repeat, recognise | **Prestructural** |  | **Remembering** | Recognising, recalling |

1. Design and approval of new programmes leading to an award within the framework for higher education qualifications process document. Available via: <https://www2.aston.ac.uk/clipp/quality/a-z/prog-approval/index> [↑](#footnote-ref-1)
2. Knight, P. & Yorke, M. (2003). Learning, Curriculum and Employability in Higher Education. Taylor & Francis. [↑](#footnote-ref-2)
3. See Race, P., Brown, S. & Smith, B. (2005) 500 Tips on Assessment: 2nd edition. Routledge. Some notes available here: <http://www2.port.ac.uk/departments/services/dcqe/developingyouracademicpractice/downloads/filetodownload,177019,en.pdf> [↑](#footnote-ref-3)
4. Higher Education Academy Guide to Writing Learning Outcomes: <https://www2.aston.ac.uk/clipp/documents/Quality/Programme%20Approval/HEA%20writing_learning_outcomes.pdf> [↑](#footnote-ref-4)
5. <http://www.qaa.ac.uk/quality-code/subject-benchmark-statements> [↑](#footnote-ref-5)
6. See for example Healey, M. (2005) Linking research and teaching: exploring disciplinary spaces and the role of inquiry-based learning. IN, In Barnett, R (ed) (2005) Reshaping the University: New Relationships between Research, Scholarship and Teaching. McGraw Hill / Open University Press, pp.67-78: <https://delta.wisc.edu/Events/BBB%20Balance%20Healey.pdf> [↑](#footnote-ref-6)
7. Kaufman, J. & Beghetto, R. (2009). Beyond Big and Little: The Four C Model of Creativity. Review of General Psychology, American Psychological Association 2009, Vol. 13, No. 1, 1–12: <https://s3.amazonaws.com/jck_articles/Kaufman%2C+Beghetto+-+2009+-+Beyond+big+and+little+The+four+c+model+of+creativity.pdf> [↑](#footnote-ref-7)
8. Runco, M. A & Garett, J. J (2012) The Standard Definition of Creativity. Creativity Research Journal, 24(1): 92-96. London: Taylor & Francis. <https://www.researchgate.net/publication/254301596_The_Standard_Definition_of_Creativity> [↑](#footnote-ref-8)
9. <https://www.qaa.ac.uk/docs/qaa/quality-code/qualifications-frameworks.pdf> [↑](#footnote-ref-9)
10. <https://thesecondprinciple.com/teaching-essentials/beyond-bloom-cognitive-taxonomy-revised/> [↑](#footnote-ref-10)