Assessment design in the language of student cognition

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Cognitive instructions make the cognitive demands of the task explicit.

E.g. The question "How does the system react when….?" can be understood as "Describe how the system reacts when…" or "Explain why the system reacts when…" Both are consistent with the question and hence the question is ambiguous to the student.

Precision of language provides clarity of purpose.

Step 1: Identify necessary content

Step 2: Determine cognitive intent of questions (what you would like students to do)

Assert	Examine	Solve	Construct	Argue

Step 3: Select appropriate cognitive verbs

State List Describe Outline Suggest Recall	Analyse Calculate Compare Contrast Define Determine Distinguish Document Explain Explore Identify Interpret Investigate Measure Recognise	A cognitive instruction may lead with a verb but also imply the use of a range of others.	Annotate Apply / use Design Classify / categorise Conjecture Demonstrate Derive Discuss Estimate Exemplify Hypothesise Predict Present Summarise Synthesise	Analogise Deduce Evaluate Explain Induce Infer Generalise Justify Prove Rationalise

Step 4: Construct assessment using cognitive instructions where possible

• State the conditions under which… • Describe the process of… • List 4 characteristics of effective… • Suggest 2 alternative approaches.	• Calculate the value of… • Determine the optimum pathway… • Identify the most significant… • Analyse the graph and determine… • Reflect on your thinking and identify… • Explain why the graph is non-linear…	While questions are useful in many ways, they can also be ambiguous in terms of cognitive demands.	• Apply your understanding of… • Demonstrate the process of… • Derive the equation for… • Discuss the options for… • Predict the outcome of… • Synthesis the following information and explain how…	• Deduce from the data… • Evaluate the recommendations and decide… • Explain why this approach is the best considering… • Infer from the information provided… • Justify your approach or recommendation…

The range of questions above can collectively relate to a single stimulus, such as a diagram, case study, scenario, problem or piece of text, ensuring that a range of cognitive processes are targeted in the assessment design.

Designing assessment with a focus on cognitive verbs provides

- Clarity of cognitive demands the task is making on students
- Alignment with learning objects and critical thinking outcomes
- A means of determining the cognitive variety within the task

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