

## Thinking Critically

### What are higher-order thinking skills?

University students are encouraged to think in critical, analytical, and evaluative ways. A key question for university students is: *How do I know what I know?*

Developing higher order thinking skills requires a conscious effort on the part of the student. Successful students examine their assignment tasks carefully so that they know what levels of thinking are being called for.

### Bloom's six levels of thinking

Bloom (1956), in his *Taxonomy of educational objectives: The classification of educational goals*, describes a progression of thinking skills in an ascending order of difficulty.

These levels were:

- 1 knowledge
- 2 comprehension
- 3 application
- 4 analysis
- 5 synthesis
- 6 evaluation.

A recent revision of Bloom's hierarchy (Anderson et al., 2001) replaces Bloom's original skills, which are expressed as nouns, with the verbs: *remember, understand, apply, analyse, evaluate, and create*.

The study also shows that within each of these categories there are various levels of difficulty. Tests of knowledge may require the student to locate information or to recall something that was learned a day earlier or ten years ago.

A comprehension exercise may require a student to interpret material, provide examples for a theory, summarise the main points of an article, or explain directions.

The skill of application may be demonstrated by carrying out a procedure, applying a formula, or implementing a lesson plan.

Analysing may require students to set priorities, to develop a plan, to recognise patterns or perspectives, or to weigh up evidence.

Evaluating is the process of drawing balanced conclusions based on the available evidence or criteria, of recognising similarities or inconsistencies, or simply working out the best way to get something done.

Creating is the process of coming up with something new. This could include developing an hypothesis, a new theory, or an invention.

**For further information:**

- Contact the Academic Skills Adviser on your campus
- Visit our web pages on myACU.

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**Some examples of questions that reflect an ascending order of thinking skills.**

**Remember**

- Who wrote *A Tale of Two Cities*?
- Describe a hexagon.
- Who was the first Prime Minister of Australia?

**Understand**

- What is meant by *operant conditioning*?
- In what ways are fraternal twins different from identical twins?
- Describe a strategy for saving household water.

**Apply**

- Calculate the cost of wall-to-wall carpeting for a room that is 3.5 metres wide and 4.2 metres long when the carpet costs \$55 per square metre.
- Draw a map of New South Wales illustrating the main river systems.
- Give a five-minute demonstration on how to use PowerPoint.

**Analyse**

- Why was Julius Caesar assassinated?
- Why is Anzac Day significant for Australians?
- Compare two works of art by Degas with two by Monet. Which artist has more appeal for you? Give reasons for your choice.

**Evaluate**

- Are antibiotics over prescribed?
- Why is a supervision policy necessary for effective school management?
- To what extent was nationalism the cause of World War 1?

**Create**

- Design an advertisement for the sale of an educational computer game.
- Develop a procedure for the safe evacuation of a hospital ward in case of fire.
- Write a short story for children between the ages of three and five which will encourage them to care for native flora and fauna.