



ACADEMIC SKILLS

THINKING CRITICALLY

In the everyday sense of the word, 'critical' has negative connotations. But at University, Critical Thinking is a positive process of understanding different points of view to your own, and evaluating their strengths and weaknesses so you can respond appropriately. The ability to think critically is something you learn, and it helps if you can develop specific attitudes and skills. (See the Handout 'Critical thinking - Attitudes and Skills').

In learning to think critically, it is helpful to understand some principles of recognising and evaluating the arguments you read and listen to. You should also try to be aware of your own reasoning processes, and recognise the values and assumptions you hold when interpreting the arguments of others, and when formulating your own arguments.

Argument

Academic argument does not mean conflict or competition; an argument is a set of reasons which support, or lead to, a conclusion.

A 'line of reasoning' is the logical progression of these reasons towards the conclusion made, e.g.:

Traditionally, Australian identity has been mythologised in images of the outback landscape and the figure of the bushman. However, the majority of the population has always lived on or near the coast, and enjoyed the beach as a pastime. These Australians have used the beach as an egalitarian public space which brings together a diverse range of mostly suburban people, and these aspects of beach culture have been represented in painting, film and literature since the 1930s. Therefore, twentieth century Australian cultural identity is more accurately described in terms of the suburban coast dweller, rather than the nineteenth century bushman.

The structure of this argument might be understood as:

Background statement (or 'target' to pit the argument against):

Traditionally, Australian identity has been mythologised in images of the outback landscape and the figure of the bushman.

+ Reason 1:

However, the majority of the population has always lived on or near the

coast, and enjoyed the beach as a pastime.

+ Reason 2:

These Australians have used the beach as an egalitarian public space which brings together a diverse range of mostly suburban people,

+ Reason 3:

and these aspects of beach culture have been represented in painting, film and literature since the 1930s.

= Conclusion:

Therefore, twentieth century Australian cultural identity is more accurately described in terms of the suburban coast dweller, rather than the nineteenth century bushman.

The three reasons together support the conclusion made.

In order to evaluate the strength, or quality, of this argument you need to examine the 'truth' of each reason given, and decide if all the pieces really do fit together logically.

Underlying Values and Assumptions (a 'worldview')

Most arguments are presented within a paradigm, or world-view. A paradigm is the 'pattern', or framework through which you make sense of the world.

A paradigm, or world-view, is based on certain values and assumptions. For example, a feminist world-view is based on the value that women should have equity with men, and this translates into a range of assumptions about the social, political and cultural rights of women.

When acknowledging the arguments put forward by others, try to evaluate the evidence and argument by recognising the paradigm through which it is presented.

More importantly, try to be aware of your own world-view and the paradigms through which you interpret the argument/evidence presented.

In this way, you not only challenge the arguments of others, but also test the validity of your own.

NB: A particular 'paradigm' or 'world-view' may be articulated in a 'theoretical framework', which is a body of formally developed theory (such as feminist theory).

The previous argument about Australian cultural identity has been made by someone whose worldview may value the contemporary over the historical, or reality over myth. It may also be worldview shaped by where that person grew up. The validity of a worldview can be assessed by exploring the extent and the quality of evidence justifying such a view.

Reasoning Processes

This section describes various reasoning processes and some common flaws in arguments.

Soundness

An argument is sound if:

- the reasons given are true or acceptable
- these reasons support the conclusion made

A sound argument may also be referred to as a valid argument. A well-known example of valid reasoning is this:

All men are mortal. (reason A)
Socrates is a man. (reason B)
Therefore, Socrates is mortal. (conclusion)

What makes this argument valid is that, logically, reason A and reason B 'add up' to ensure the validity of the conclusion. The use of logical thought here is bound up in language. Reason A suggests that 'mortal' is a broad category that includes 'men'. Reason B suggests that an even smaller element of the category of 'men' is 'Socrates'. If he belongs to the category of 'men', and 'men' belong to the category of 'mortal', then the conclusion must be true. In other words, the structure is sound.

An invalid argument is one in which the conclusion does not follow from the reasons, even though each reason may be true in itself, e.g.:

All men are mortal. (reason A)
Socrates is mortal. (reason B)
Therefore, Socrates is a man. (conclusion)

In this case, each reason and the conclusion are true statements in themselves, but structurally this argument is unsound. Reason A and reason B are not connected. Each reason suggests that 'men' and 'Socrates' are mortal, but they could be different types of mortal. There is no connection established between 'men' and 'Socrates'. Although each reason is a true statement in itself, they do not work together to guarantee the truth of the conclusion. This conclusion may also be true, but its truth in this argument is not a logical result of the reasons 'adding up'. Therefore, the argument is structurally unsound.

Sometimes we can be persuaded by an argument that appears to have a sound structure, e.g:

All men are tall. (reason A - untrue)
Socrates is a man. (reason B - true)
Therefore, Socrates is tall. (invalid conclusion)

Structurally, this argument 'adds up', like the first example above. Logically, the reasons ensure the conclusion, as above. It suggests that 'all men' belong to the category of 'tall', and Socrates belongs to the category of 'all men', so he must also belong to that broader category of 'tall'. The problem, however, is that the content of reason A is untrue; all men are not tall, so, reason A cannot contribute to the truth of conclusion. If Socrates was, in fact, a tall man, that would be a coincidental truth; it would not be a truth derived from the argument. So, despite the possible truth of

this conclusion, the argument is structurally invalid. This demonstrates how important it is to verify the truth of each part of an argument.

Some arguments are unsound because, although each statement is true in itself, there is no connection at all between them, or between them and the conclusion, e.g.:

All men are mortal. (reason A - true)
Socrates is a Greek man. (reason B - true)
Therefore, Socrates is a philosopher. (conclusion - true)

This argument is structurally unsound because the reasons are not connected to each other and do not lead to the conclusion.

In all of these examples, it has been assumed that you know the meanings of all the content referred to: man, mortal, tall, Greek, Socrates, philosopher. If you were not familiar with all these concepts, you might be tempted to accept all the arguments as valid. A critical thinker, however, will examine the content of each argument. (And the more you read and learn, the more you will 'know' about the content in your field.) The writer often provides examples and evidence to explain or justify the content they use, and this can help you, as a critical reader, to judge the validity of the content, and, thus, the argument as a whole.

Deductive and inductive reasoning

These reasoning processes are concerned with the method of thinking, and should not be confused with the way you present thinking in various forms of writing for different disciplines.

The basic distinction is that deductive reasoning, or deduction, begins with a general statement, or hypothesis, ('All men are mortal') and examines more specific possibilities of that generalisation ('Socrates is a man') to reach a specific conclusion (Therefore Socrates is mortal). The purpose of deductive arguments is to confirm the certainty of a proposition, or hypothesis.

Inductive reasoning, on the other hand, considers specific observations to arrive at broad generalizations. The researcher explores and measures specific situations in order to detect patterns or trends, and thereby develops a general conclusion or theory. This conclusion or theory is not necessarily certain; it remains open to the possibility of challenge. You may recognise this as the generally accepted process of academic argument.

Both deductive and inductive reasoning are used across various disciplines. For further information try websites such as:

<http://www.livescience.com/21569-deduction-vs-induction.html>

<http://sociology.about.com/od/Research/a/Deductive-Reasoning-Versus-Inductive-Reasoning.htm>

In an inductive argument, the evidence builds a case for the conclusion, e.g.:

Research shows that not all smokers get lung cancer, and, that some non-smokers also get lung cancer.
Therefore, smoking may not be the cause of lung cancer.

Inductive arguments may be evaluated as being either strong or weak. The argument above is weak; the evidence is vague, and the conclusion, while logical, is a broad generalisation.

A stronger version of this inductive argument would be:

*60% of all smokers in Australia get lung cancer.
10% of all people in Australia who get lung cancer are non-smokers. Therefore
we can conclude that:
A. smoking causes lung cancer for a high proportion of smokers.
B. most, but not all, lung cancer victims are smokers.*

This argument presents specific evidence and draws more cautious conclusions, which makes it a stronger argument, and more difficult to challenge.

Fact and opinion

A fact is something that is accepted as objective knowledge. Its truth can be objectively verified, e.g.

James Cook sailed up the east coast of Australia in 1770.

We know this for a fact from diaries, governmental records and other public documents of the time.

The objective truth of some facts can be potentially, rather than actually, known, e.g.

Anthropologists currently believe that the first Aboriginal people arrived in Australia 60,000 years ago.

This potentially objective fact is based on estimates from excavations and carbon dating.

An opinion is subjective knowledge. Its validity is based on value judgements, e.g.:

Government funding for Indigenous health is inadequate.

It is not 'wrong' to be subjective; academic arguments vary and can be challenged precisely because they evolve from different subjective worldviews. The worth of a subjective argument is determined by the strength of the evidence provided to support it. This kind of judgement creates intelligent debate, and is the process by which we develop knowledge.

When evaluating or challenging arguments, be clear of the distinction between an objective fact, and a subjective opinion (argument).

NB: by 'opinion' here, we mean 'view' or 'argument'. An academic 'opinion' is informed by rational research and evidence. Personal opinions expressed in everyday conversation may well be intelligent, but cannot be used in academic work unless substantiated by research and evidence.

Flaws in Reasoning

Jumping to conclusions: being too quick to draw a conclusion without really examining what is shown in the evidence. This can happen if you allow your emotions, 'gut response' or uninformed opinions about the issue shape pre-conceived ideas. Read an argument with an open mind.

Bias: a biased argument is one-sided. It seems to point, either negatively or positively, all one way. In other words, it omits or ignores relevant evidence which doesn't suit the author's purpose. A good academic argument respects points of view that might be different, or opposing, and includes them in the discussion by answering the challenge they pose. A biased argument shies away from doing this.

Fallacy: a misleading or false idea, and leads to flawed arguments.

Ad hominem: evaluating an argument on the basis of who is saying it, not on the basis of what is said.

Appeal to authority: accepting that a person with expert knowledge in one field must therefore have expert knowledge of all other fields.

Argument from ignorance: believing a proposition to be true simply because it can't be proved false.

Begging the question: an argument in which the conclusion is merely a restatement of the premise.

False cause: assuming that one thing caused another because they happened in sequence, or that simultaneous events are connected.

False dilemma: presenting two arguments, of which only one can possibly be true, and ignoring all other options.

Generalisation: drawing a conclusion that is broader than the evidence can support.

Irrelevance: the premise/reason/evidence in an argument may be related to the topic generally, but does not contribute to the conclusion.

Further explanations and exercises for these concepts can be found in the following sources

Butterworth, J. & Thwaites, G. (2005). *Thinking skills*. Cambridge: Cambridge University Press.

Cottrell, S. (2003). *The study skills handbook*. Basingstoke: Palgrave MacMillan Ltd