Critical thinking

Critical thinking is a way of thinking, understanding and expressing ourselves.

Critical thinking is about using your ability to reason. It's about being active in your learning and questioning ideas, arguments and findings.

In an academic argument ideas are organised into a line of reasoning. The writer aims to persuade the reader that their point of view is valid. Being able to understand and create structured, reasoned arguments is central to critical thinking.

"Good critical thinking includes recognising good arguments even when we disagree with them, and poor arguments even when these support our own point of view." *Cottrell, S. (2005) Critical Thinking Skills p47 New York, Palgrave.*

Try to constantly evaluate what you read, hear, think, experience and observe. Assess how well ideas, statements, claims, arguments and findings are backed up so that you can make a reasoned judgement about how convincing they are.

Criticising the experts

At first, students often feel anxious about criticising ideas that they come across in their reading or in lectures. They feel that it's disrespectful to challenge established academics.

In fact, it is essential to critique what you read - but always make sure you back up your argument with evidence.

Critical thinking means analysing ideas, observations, experience and reasons, exploring the evidence and carefully considering whether something makes sense and is accurate.

You might consider whether ideas or findings can be applied in a particular context and, if so, how useful or effective this would be. Often, you will compare and contrast what academics say about a subject so you can come up with your own argument.

Using critical thinking skills

You will need to demonstrate your critical thinking skills in various ways:

Critical reading

Ask questions about the text as you read. This will keep you focused and help you to understand it. Think about where you focus best on your reading. This may be at home or in a calm place away from distractions, such as the Library.

Evaluating arguments

When reading a text containing an argument, try to evaluate whether it makes sense and is well supported.

Critical writing

Make sure that your writing is clear and your argument well structured.

TIPS

Always ask questions about what you hear, think, believe, observe, read and experience. It's central to being a successful critical thinker.

Explore ideas and observations you come across by talking through your responses, questions and criticisms with other students. Recording yourself talking can work too.

If you are not sure how to think, read and write critically, ask for help.

Don't expect to become an instant expert in critical thinking. Just as critical thinking itself is a process, becoming a critical thinker is a process.

Critical thinking checklist

Identify what's important:

- What are the key ideas, problems, arguments, observations, findings, conclusions?
- What evidence is there?
- Distinguish critical from other types of writing (eg descriptive); fact from opinion; bias from reason

Evaluate what you find:

- Explore the evidence - does it convince?
- What assumptions are being made and inferences drawn?
- Is there engagement with relevant, up to date research?
- How appropriate are the methods of investigation?
- Is there a consistent and logical line of reasoning?
- Do you agree with what's being said? Why?
- How is language being used (emotive, biased etc.)?

Look beyond what you're reading/hearing:

- What other viewpoints, interpretations and perspectives are there? What's the evidence for these? How do they compare?
- How does your prior knowledge and understanding relate to these ideas, findings, observations etc.?
- What are the implications of what you're reading/hearing?

Clarifying your point of view:

- Weigh up the relevant research in the area
- Find effective reasons and evidence for your views
- Reach conclusions on the basis of your reasoning
- Illustrate your reasons with effective examples

Note - Critical thinking skills need to be understood and developed in the context of your subject discipline - check this out with your tutors.

Know your skills

- To be a successful student it helps if you are as aware as possible of how you currently learn. This meta-cognitive awareness puts you in a good position to see gaps and areas for development. You may want to use this checklist to reflect on your current critical thinking skills.
- Academic enquiry is dynamic in nature - don't necessarily expect to 'wrap everything up' and reach water-tight conclusions.

Evaluating arguments-HOW TO…..

- This section gives you guidance on how to evaluate an argument in a text or in your own essay. Check the following aspects:

References to other academics

- Always consider academic writing in the context of the academic field - what do other writers say about the subject?

  • Does the writer consider different points of view fairly?
  • Has the author failed to refer to another writer whose argument could be used to support or undermine their argument?

- For your own assignments, make sure you research what has already been written on the subject.

Appropriate evidence

- Arguments need to be supported by evidence to be effective. Types of evidence include other authors' ideas, statistics and surveys. When evaluating an argument, think about whether the appropriate type of evidence has been used to support it.

  • Is there enough evidence?
  • Is the evidence biased?
  • If a poll/survey has been done, is the sample representative?
  • Is the evidence used up to date/relevant?

- When doing research for your own writing, assess the credibility of the sources you read. This may be especially important when using websites.
- **Style**
- In everyday life, we often try to persuade people by using emotive language (by using words such as 'great', 'fantastic'). Emotive language may make an argument appear stronger than it really is, and it is inappropriate in academic writing. As a reader you need to examine the author's argument to make sure it is justified.

  • Does the argument use emotional appeal rather than relying on the force of reason?
  • Is the author's 'voice' conveyed through unsubstantiated personal opinion rather than through engaging with the argument?

Logic

In logic an argument can be valid or invalid. In a valid argument the conclusion follows on from the premises (propositions, statements or assumptions upon which the argument is based). If all the premises in an argument can be proved to be true and the conclusion can be shown to follow on from the premises, then the conclusion will necessarily be true. In examining an argument consider whether the premises (or steps) in an argument follow on from one another, and whether the premises are true.

- Are the prepositions, assumptions or statements upon which the argument is based true?
- Does the conclusion necessarily follow from the premises?

- ***Examples of logic***
- This is a valid argument:
- John is a human.
  All humans have brains.
  Therefore, John has a brain.
- This is an invalid argument. The conclusion does not follow from the premises:
- John is a fast runner.
  John is a University of Sussex student.
  Therefore, all University of Sussex students are fast runners.
- Sometimes, the conclusion does not follow from the premises but in isolation it is still valid. In this case though, the argument is invalid:

- All seagulls are birds.
  Some birds fly.
  Therefore, all seagulls fly.

This page is taken from the University of Plymouth critical thinking guide (2008), adapted from Warburton, N. (1998) *Thinking, from A to Z*. London: Routledge

Activity FOR STUDENTS

Read the passages below.

1. What feedback would you give to the authors about the clarity of their arguments?
2. How could their arguments be made clearer?
3. How, if at all, could the author make it more appropriate as an academic piece of writing?

- Passage 1

Frequently, researchers have sought to provide neuropsychological explanations for apparent gender differences in certain intellectual abilities, such as spatial skills and verbal skills. However, a number of investigations have shown that the social context of schooling is itself of considerable importance. Some studies of mathematics in children are a case in point. In one series of investigations involving thousands of children in Taiwan, Japan and the United States (Lummis and Stevenson, 1990), mothers tended to rate the achievement of young boys in mathematics as better than that of girls, even though the research did not in fact find gender differences in tests of children's general mathematical concepts

and skills. Furthermore, mothers showed this pattern especially in the case of their kindergarten children - children who had yet to experience any formal mathematics instruction!

References:

Banerjee, R. (2005). Gender identity and the development of gender roles, Ch. 5 pp173 In S. Ding & K. Littleon (Eds.), Children's personal and social development. Oxford, UK: Blackwell.

Feedback

This is a good example where evidence has been given to back up a point of view being presented. The passage is written in an appropriate academic style. Inappropriate emotive language has not been used.

PASSAGE 2

Girls and boys natural abilities in maths do not reflect the number from either sex going on to study maths at higher education level. I am currently studying maths at university and the number of women on my course is significantly lower than the number of men. I think this is a result of the outdated and outrageous attitude still prevalent in schools, which suggests that boys are more suited to scientific pursuits. Teachers and parents are not as encouraging of girls who wish to pursue science or maths further than A-level, and this means that fewer girls apply to university. This is certainly a waste of great talent.

Feedback

This is not written in an academic style. Emotive language is used (e.g. outrageous). The writing is very personal and written in the first person (e.g. 'I think', 'I am'), which is inappropriate in this kind of academic writing. The writing needs to have more clear evidence to illustrate the author's points.

More research is needed. Whilst the individual's experience at university is relevant, it would be better if they provided evidence to support their own research (e.g. they could quote the percentage of girls versus boys entering university to study mathematics in a given year). They could also provide empirical evidence to support their argument.

PASSAGE 3

During the last fifty years researchers have explored gender differences and their relation to academic achievement and several theories have been proposed to explain why girls do less well at maths than boys. Boaler (1997) suggests that girls underachievement in maths is due to the teaching methods in schools which favour boys. This theory is supported by Byrne who explains that underachievement in maths 'springs from adverse conditioning in the primary years' (Byrne, 1978). It is clear that if we want to increase the numbers of girls entering higher education to study maths we need to change the way they are taught in schools.

References:
Byrne, E. M. (1978) Women and Education, Routledge, [online]. Available from http://books.google.co.uk/books?id=xNoNAAAAQAAJ&pg=PA35&dq=girls+maths#PPA36,M1 [accessed 17 December 2008]

Boaler, J, (1997) Reclaiming School Mathematics: the girls fight back. Gender and Education, Vol. 9, No. 3, pp. 285 - 305 [online]. Available from http://pdfserve.informaworld.com/869886_751307726_713668555.pdf [accessed 17 December 2008] This is an article in an electronic journal

Feedback

In this case the evidence used to support the argument is outdated. Although Byrne's work may still be relevant, it is important to consider how teaching in schools has changed since 1978.

The writer should avoid using absolute terms - obviously not all underachievement in maths by girls is attributable to just the teaching methods (e.g. social / cultural norms, personal/or individual differences etc).

The conclusion assumes a correlation between academic achievement in maths and numbers entering higher education to study maths. This is not discussed or supported with evidence. The argument could be improved by including evidence showing that girls who do well at maths in school are likely to go on to study maths at higher education.