



Discipline-specific knowledge and capabilities



Communication skills



Digital literacy



Critical thinking



Problem solving



Self-management



Teamwork



Global citizenship



ABSTRACT

Critical thinking is one of Deakin University's eight Graduate Learning Outcomes. Mastery of critical thinking is important for all Deakin University graduates as every career will require some application of critical thinking. Critical thinking is a vital skill for graduates entering a dynamic workforce. Critical thinking will also aid them with developing self-management skills and prepare them well for lifelong learning. It is essential that units and courses teach the process of critical thinking and provide opportunities for students to evidence their critical thinking skills so that these can be demonstrated as a skillset to prospective employers.

The following information will assist Deakin academics to explore, create and re-imagine what teaching and assessing critical thinking skills means.

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WHAT IS CRITICAL THINKING?

Critical thinking is a multi-step process. It can be defined as an active, intellectual process where the individual will observe, analyse and reflect on new knowledge and integrate it into their current understanding. Critical thinking can be applied in a variety of learning platforms such as reading, written work and discussions. The definition of critical thinking has slight variations, which can be found at the following website. This website includes the definition from the National Council for Excellence in Critical Thinking: <http://www.criticalthinking.org/pages/defining-critical-thinking/766>.

Critical thinking is not a negative process, even though many link critical thinking with criticism. Instead it is more useful to link critical thinking with criteria or standards against which the information is compared (Tittle 2011). Criteria are noted in the section: Examples of critical thinking rubrics.

CHARACTERISTICS OF A CRITICAL THINKER

Once an individual has mastered the process of critical thinking they will normally be described as having the characteristics listed: open minded

- questioning
- empathetic
- honest
- analytical
- objective

Many of the characteristics mentioned here are also shared with the characteristics of a good **problem solver** [[link to problem solving resource sheet](#)]

WHY IS TEACHING CRITICAL THINKING IMPORTANT?

Critical thinking is a vital skill for any graduate to demonstrate as it is necessitated in all workplaces. During their studies, students will need to draw on critical thinking for assessments and to develop their learning. It is also necessary for students when making decisions around the choice of majors and electives or when selecting activities for skill and personal development. Critical thinking will enable students to make an informed evaluation of knowledge, developing skills as an individual learner and gradually decreasing their reliance on University resources. This type of critical thinking, when integrated with current knowledge can lead to creation of new knowledge.

Critical thinking is important as it plays a central role in other key graduate skills or graduate learning outcomes such as **problem solving**, decision making and **communication** [[link to these resource sheets](#)]. Critical thinking is sometimes mentioned synonymously with problem solving which can be misleading. Critical thinking is a component of problem solving, but it is not necessary to have a problem *per se* to undertake critical thinking.



TEACHING CRITICAL THINKING

Critical thinking can be taught. Teaching it involves breaking down the process or thinking of it as a number of steps. Each step needs to be explained and practiced explicitly and students given opportunity for undertaking this practice as part of formative assessment (Tittle 2011). Although the steps can be taught, the actual process, however, of thinking cannot. The academic needs to take the role of facilitator (instead of instructor) in supporting students to develop an explicit understanding of the critical thinking process. They then need to allow students time to practice and to receive feedback (Black 2009).

It is also necessary to remember that critical thinking can initially be a confronting process therefore teaching critical thinking should involve two parts:

1. provide students with a critical thinking protocol or process (Table 1)
2. provide opportunities for students to apply this process.

Figure 1 and Table 1 each outline five parts of a scaffolded approach to critical thinking that is also reflected in the **Deakin Graduate Learning Outcome Minimum Standards**. These separate parts are commonly discussed in the literature, although the number of steps and classifications vary.

Setting up any initial student task that elicits critical thinking should:

- be **small** so as not to overwhelm students
- focus on a **single step** in the critical thinking process; further steps can then be built into the process
- be **non-threatening**, i.e. should not include confronting or controversial material where students may feel uncomfortable about expressing a point of view
- include **teamwork** to assist with hearing, discussing and analysing other views (Brookfield 2012)
- be **formative** and not be linked to summative assessment.

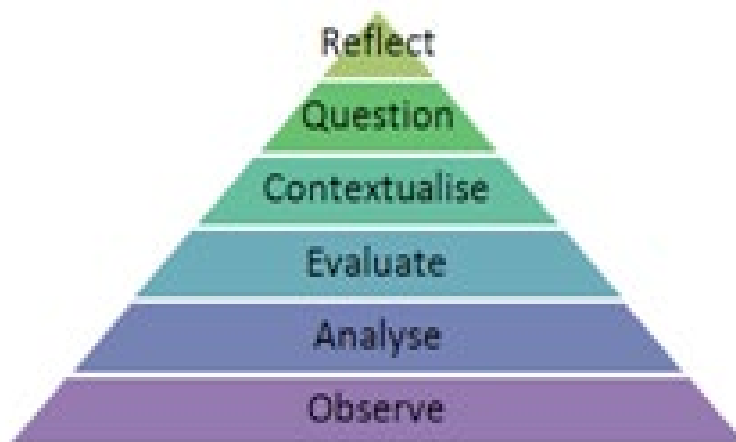
There is one other important component of critical thinking which is *time*. Critical thinking is a process and as such requires considerable time to undertake well. It also requires time for students to develop the skills necessary for critical thinking and this should be factored into each course.



Table 1: Steps of critical thinking process

CRITICAL THINKING STAGE	DESCRIPTION
Observe	<ul style="list-style-type: none">• determine what information is available• gather information from a variety of sources• ascertain what information currently exists• explore the different perspectives• identify similarities or contradictions?
Analyse	<ul style="list-style-type: none">• break down the information into the main themes or arguments
Evaluate	<ul style="list-style-type: none">• discriminate the value of the information• prioritise important information• differentiate opinion from fact
Question	<ul style="list-style-type: none">• consider possible alternatives• develop new hypotheses
Contextualise	<ul style="list-style-type: none">• contextualise information in relation to:<ul style="list-style-type: none">– historical consideration– ethical considerations– political considerations– cultural considerations– environmental considerations– specific circumstances (Rhodes 2010)
Reflection	question and test conclusions reflect on possible outcomes [link to Reflective practice section of Self-management]

Figure 1: Steps of critical thinking



(Thyer, E 2013)



TOOLS USED IN TEACHING CRITICAL THINKING

Critical thinking is fundamental to scholarly work. Universities have always undertaken to teach these skills in some form or to some degree through the history of academia. Nowadays, some universities provide introductory units to support students in developing critical thinking skills. The outline of one such course at University of Sydney provides a number of tools for teaching critical thinking. Deakin Study Support Unit also provides resources on critical thinking to which academics can refer students.

Applying the critical thinking process to tasks that provide students with a clear context (for example, future workplace) can assist their analysis. This would include:

- written essays analysing a problem within the workplace
- problem based learning
- case studies
- simulations
- work integrated learning through placement or practicum.

An example of critical thinking in the health discipline would be asking students to critically analyse the actions of a nurse when treating a gravely ill patient. The students would already be familiar with the context of the hospital in relation to policies and ethical considerations. Some other examples of critical thinking assignments for different disciplines are presented here:

- Paul and Elder (2000) provides a handbook for teaching critical thinking which includes a **template for a critical thinking assignment**. An adaptation of this template can be found at The Critical Thinking Community website.
- Geoff Upton from Flinders University provides a **guide to critical thinking for a first years** marketing unit.

CRITICAL THINKING AND ACADEMIC READING

Once students have started to develop critical thinking skills they will then need to apply these to readings and draw on these to complete their assignments in their course. Critical thinking in academic reading is useful for students as it takes the process of reading from passive to active. Deakin Study Support Unit provides resources for applying critical thinking to reading.

The University of Wollongong also provides extensive resources for teaching critical thinking for reading and writing. This link provides examples of comparative critical reading of an academic journal, a popular journal and a newspaper article.

The University of Canberra provides a list of questions that students can use when reading texts to focus their critical thinking (Table 2).



Table 2: Questions to guide critical thinking when reading

- What are the main points of this text?
- Can you put them in your own words?
- What sorts of examples are used? Are they useful? Can you think of others?
- What factors (ideas, people, things) have been included? Can you think of anything that has been missed out?
- Is a particular bias or framework apparent? Can you tell what 'school of thought' the author belongs to?
- Can you work out the steps of the argument being presented? Do all the steps follow logically?
- Could a different conclusion be drawn from the argument being presented?
- Are the main ideas in the text supported by reliable evidence (well researched, non-emotive, logical)?
- Do you agree or disagree with the author? Why?
- What connections do you see between this and other texts?
- Where does it differ from other texts on the same subject?
- What are the wider implications – for you, for the discipline?

(University of Canberra, retrieved 20 June 2013, <<http://www.canberra.edu.au/studyskills/learning/critical>>.

It is also important to provide students with a variety of texts to read and encourage self-directed learning regarding this point. Additionally, the reading of peers' **work [link to section on peer and self-assessment in self-management]** is also as it provides an opportunity for students to recognise critical thinking in others and model this in their own work.

CRITICAL THINKING AND ACADEMIC WRITING

Once students are capable of critically analysing what they read, they need to start formulating their own arguments as part of assignment writing. Deakin Study Support Unit provides resources for applying critical thinking to academic writing and assignment writing.

The University of Canberra provides a list of questions that students can use when applying the critical thinking process to academic writing (Table 3). As teachers, these might help frame the questioning or structuring of prompts designed to elicits critical thinking skill development.

Table 3: Questions to guide critical thinking when undertaking academic writing

- Work out what sort of critical thinking will be involved – comparing? Problem solving? Looking for cause and effect? Evaluating?
- What is the lecturer/task looking for?
- If you want to say something which is new or unusual, or which your lecturer may disagree with, make sure you have EXTRA evidence and support.
- Make sure everything you say is backed up by evidence and references.
- Link what you are saying into the overall field of the discipline.
- Think about why this essay topic is worth writing about – what makes it particularly significant.
- Look at both sides of an argument

(University of Canberra, retrieved 20 June 2013, <<http://www.canberra.edu.au/studyskills/learning/critical>>.



ASSESSING CRITICAL THINKING

When assessing critical thinking, academics need to return to the concept that critical thinking relates to criteria. They should assess each of the criteria they have taught students as part of the critical thinking process (Table 4) to ensure robustness.

Table 4: Criteria to assess in the critical thinking process

CRITICAL THINKING STAGE	ASSESSMENT CRITERIA DID THE STUDENT...
Observe	...gather an appropriate number of resources? ...provide resources from diverse sources? If not, did they discuss why?
Analyse	...identify all major themes?
Evaluate	...identify arguments that are opinion only compared to those that are evidence-based? ...classify the most important arguments?
Question	...pose questions that are unanswered by the literature?
Contextualise	...consider the analysis and evaluation in light of the specific context
Reflect	...test the question that they posed (this step may not always be included, especially at lower levels)

Examples of critical thinking rubrics

Both holistic and analytical rubrics are available for assessing critical thinking, although analytic rubrics are likely to be of greater use as they enable an assessor to mark each component of the critical thinking process (for example, evaluating) separately.

A Deakin University rubric integrating the Australian Qualification Framework and the American Association of Colleges and Universities (AAC&U) VALUE rubric indicating minimum standards for critical thinking is available at AQF levels 7 (Bachelor), 8 (Graduate Certificate) and 9 (Masters). The original AAC&U VALUE rubric for critical thinking is available at: <http://www.aacu.org/value/rubrics/pdf/CriticalThinking.pdf>

The University of North Iowa provides an extensive list of critical thinking rubrics. Rubrics for specific areas of critical thinking are listed below:

- self-assessment critical thinking rubric
- holistic critical thinking rubric

CONCLUSION

Critical thinking is integral to scholarly activity. It is, like many skills, developed through time and experiences. Students need to be challenged in many ways in order to facilitate the development of this learning outcome. Employers seek graduates who have sharp critical thinking skills as these need to be applied to various vocational based activities. Through careful and explicit planning of tasks and activities, academics provide a fundamental basis for the development of critical thinking skills in students that they then take on to develop further as part of their professional and lifelong learning pathways.



FURTHER READINGS & OTHER RESOURCES

Books

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Leicester, M 2010, *Teaching critical thinking skills*, Continuum, London, retrieved 20 June 2013. http://encore.deakin.edu.au/iii/encore/record/C__Rb2494528

Deakin resources

Deakin University, *Critical analysis*, Deakin University, Vic., retrieved 20 June 2013. <http://www.deakin.edu.au/current-students/study-support/study-skills/handouts/critical-analysis.php>

Deakin University, *Critical thinking skills video*, Deakin University, Vic., retrieved 20 June 2013. <http://www.deakin.edu.au/itl/pd/tl-modules/teaching-approach/diversity/topic04vid04.php>

(Critical thinking skills video that provides an insight into International student difficulties with using critical thinking).

Journal articles

Alwehaibi, HU 2012, 'Novel program to promote critical thinking among higher education students: empirical study from Saudi Arabia', *Asian Social Science*, vol. 8, no. 11, pp. 193–204, retrieved 20 June 2013. <http://dx.doi.org/10.5539/ass.v8n11p193>

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The Critical Thinking Community 2011. <http://www.criticalthinking.org/pages/defining-critical-thinking/766>

YouTube and other clips

Critical thinking skills 1994, DVD, Learning Resource Center, South Campus, Florida Community College at Jacksonville. Script by Jay Smith. (Available through the Deakin library).

How can I help students develop critical thinking skills? 2012, Streaming video, Kanopy, Subiaco, WA. Presented by Debi Moon & Rob Jenkins. (Video available to be streamed from the Deakin Library), retrieved 20 June 2013. http://encore.deakin.edu.au/iii/encore/record/C__Rb2682279

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Deakin University 2013, ‘Deakin Learning Futures agenda 2020: stage 2: assessment and learning design’, *Deakin graduate learning outcomes*, Deakin graduate learning outcome minimum standards, Deakin Learning Futures, Deakin University, Vic., pp. 1–9, retrieved 20 June 2013. http://www.deakin.edu.au/_data/assets/pdf_file/0004/19327/clo-rubric-aqf7.pdf

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Peirce, P 2006, 'Designing rubrics for assessing higher order thinking', *Workshop presented at the AFACCT Howard Community College Columbia*, Maryland, 13 January, retrieved 20 June 2013. **<http://openedpractices.org/files/Designing%20CT%20rubrics%20several%20with%20repeats.htm>**

Reichenbach: An Introduction to Critical Thinking. Chapter 2 Study Guide - Six steps of Critical Thinking available at: **http://www.mhhe.com/socscience/philosophy/reichenbach/m1_chap02studyguide.html**

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DEVELOPMENT OF THE CRITICAL THINKING TEACHING RESOURCE

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