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# LEARNING TO LEARN

## Creative thinking and critical thinking

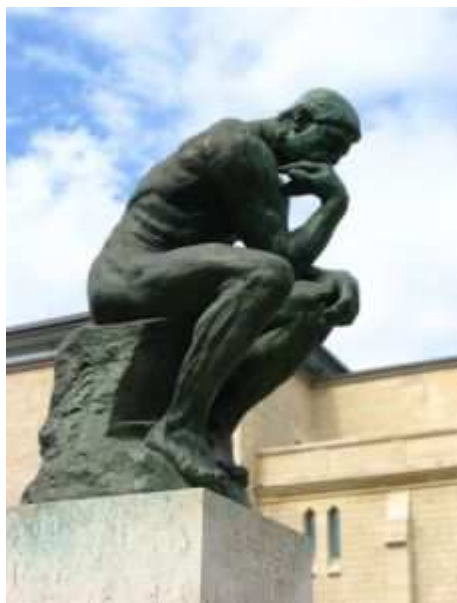
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*Office of the Vice-President for Learning Innovation and Registrar*

## LEARNING TO LEARN

### CREATIVE THINKING AND CRITICAL THINKING



#### **Introduction: understanding why creative and critical thinking skills are important**

In the introductory unit: **'The academic environment: adjusting to university life'**, the differences in approaches to learning in university were outlined. In order to develop the requisite deeper, more holistic approach to learning, it is essential to foster creative and critical thinking skills.

Many great breakthroughs and discoveries in art, science and innovation have resulted from combining creative and critical thinking skills. Approaches differ considerably between the skills used in creative thinking and those used in critical thinking. However, it is because of the synergy created by the combination of both sets of skills that they are being discussed in conjunction with one another in this unit. By applying creative and critical thinking approaches to your subject area you will enrich and deepen your learning experiences. Furthermore, creative and critical thinking skills can benefit many other areas of your life from problem solution to decision making.

This unit will introduce the processes and approaches involved in critical and creative thinking and explain how, when used together, they can benefit and enrich your learning. It is important to

point out that the guidelines provided in this unit are introductory and generic (in so far as that is possible!). You need to be aware of discipline-specific conventions in this regard. It may be that there are preferred ways of thinking in particular subject areas. All learning skills should ideally be developed within the particular parameters of your discipline(s). As you engage in the university learning experience you will progressively develop knowledge of subject-specific discourse, and through participating in it come to understand its particular conventions. In the meantime, if in doubt, check with your lecturers.

### **Learning objectives**

At the end of this unit you will:

- understand what is meant by creative thinking,
- have had an opportunity to engage in some creative thinking activities,
- understand what is meant by critical thinking,
- have learnt some strategies that you can apply to foster both creative and critical thinking skills,
- understand how you can combine approaches from both critical and creative thinking skills to enrich and deepen your learning experience,
- be able to establish the preferred ways of thinking in your subject area(s).

### **What is creative thinking?**

In the context of studying at university, creative thinking is about applying imagination to finding a solution to your learning task.

*Listen to this audio clip on creative thinking which is based on material from: 'Skills for Success: The Personal Development Handbook', by Stella Cottrell, (2003).*

[www.palgrave.com/skills4study/mp3s/Skills%20for%20Success\\_%20Creativity%20edited.mp3](http://www.palgrave.com/skills4study/mp3s/Skills%20for%20Success_%20Creativity%20edited.mp3)

Having listened to the audio clip, you will now understand that creativity is much more than the preserve of great artists, musicians, designers and inventors. In other words it does not take a

'special' kind of person to arrive at innovative ways of seeing and thinking. Creative thinking embodies a relaxed, open, playful approach and is less ordered, structured and predictable than critical thinking. Therefore it also requires some risk-taking as there is a chance that you will make 'mistakes' or not come up with an answer at all. You need to be prepared to cope with the resultant risk, confusion and disorder. If you are generally ordered and organised this may take some getting used to. Creative thinking skills are as much about attitude and self-confidence as about talent.

### **Some approaches involved in creative thinking skills**

Creative thinking skills involve such approaches as:

- Engaging in reflection. (See unit, '**Reflective learning/keeping a reflective learning journal**').
- Looking for many possible answers rather than one.
- Allowing yourself to make wild and crazy suggestions as well as those that seem sensible.
- Not judging ideas early in the process - treat all ideas as if they may contain the seeds of something potentially useful.
- Allowing yourself to doodle, daydream or play with a theory or suggestion.
- Being aware that these approaches necessarily involve making lots of suggestions that are unworkable and may sound silly.
- Making mistakes.
- Learning from what has not worked as well as what did.

*Think about the following quotation from Edward de Bono – author of 'Six Thinking Hats' (1985).*

*"The need to be right all the time is the biggest bar to new ideas. It is better to have enough ideas for some of them to be wrong than to be always right by having no ideas"*

Note: For more on de Bono's 'Six thinking hats', see unit, '**Solving problems and making decisions.**'

## Some creative thinking strategies



There is no limit to ways there are of thinking creatively. Some techniques you can begin with are listed hereunder.

- Brainstorm ideas on one topic onto a large piece of paper: don't edit these. Just write them down as soon as they come into your head.
- Allow yourself to play with an idea while you go for a walk or engage in other activities
- Draw or paint a theory on paper.
- Ask the same question at least twenty times and give a different answer each time.
- Combine some of the features of two different objects or ideas to see if you can create several more.
- Change your routine. Do things a different way. Walk a different route to college.
- Let your mind be influenced by new stimuli such as music you do not usually listen to.
- Be open to ideas when they are still new: look for ways of making things work and pushing the idea to its limits.
- Cultivate creative serendipity.
- Ask questions such as 'what if....?' Or 'supposing....?'
- Keep an ideas book. Inspiration can strike at any time! Ideas can also slip away very easily. If you keep a small notebook to hand you can jot down your ideas straight away and return to them later. Alternatively, you could use the voice recorder on your mobile phone, or send yourself a text message! For example, you may think of a really good idea for an assignment/project while you are listening to a lecture. You should record it as soon as you can after the lecture: otherwise, you could forget it entirely.

## Creative thinking challenges

There are many ways of 'practising' creative thinking skills through a variety of exercises and activities. These are designed to enable you to think laterally and inventively and ultimately to develop original approaches in defining and solving problems. Try a few of the activities outlined in the boxes below and reflect on how they encourage different ways of thinking and seeing. The activities in the first box are from [www.creativethinking.net](http://www.creativethinking.net)

1. [http://www.creativethinking.net/DX01\\_TheThogProblem.htm](http://www.creativethinking.net/DX01_TheThogProblem.htm)
2. [http://www.creativethinking.net/DX02\\_TheMatchstickProblem.htm](http://www.creativethinking.net/DX02_TheMatchstickProblem.htm)
3. [http://www.creativethinking.net/DX03\\_WhatDoYouSee.htm](http://www.creativethinking.net/DX03_WhatDoYouSee.htm)
4. [http://www.creativethinking.net/DE04\\_WordPatterns.htm?Entry=Good](http://www.creativethinking.net/DE04_WordPatterns.htm?Entry=Good)
5. [http://www.creativethinking.net/DE05\\_MakingAssociations.htm?Entry=Good](http://www.creativethinking.net/DE05_MakingAssociations.htm?Entry=Good)

<http://www.digicc.com/fido/>

*How did it come to pass that Albert Einstein was childlike his whole life? He loved to play games with numbers, always wondering why they behave the way they do. Sometimes, he was able to arrange numbers in such a way that they could trick you. Try the Fido Puzzle and help yourself find a feeling of playful awareness while playing with a few simple numbers that may trick you.*

## What is critical thinking?



Critical thinking has been described as:

*...reasonable reflective thinking focused on deciding what to believe or do. (Ennis, 1993)*

No one always acts purely objectively and rationally. We connive for selfish interests. We gossip, boast, exaggerate, and equivocate. It is "only human" to wish to validate our prior knowledge, to vindicate

our prior decisions, or to sustain our earlier beliefs. In the process of satisfying our ego, however, we can often deny ourselves intellectual growth and opportunity. We may not always want to apply critical thinking skills, but we should have those skills available to be employed when needed.

Critical thinking enables us to recognise a wide range of subjective analyses of otherwise objective data, and to evaluate how well each analysis might meet our needs. Facts may be facts, but how we interpret them may vary.

### **Main characteristics of critical thinking**

Critical thinking includes a complex combination of skills. According to Paul and Elder (2006) of the *Foundation for Critical Thinking*, the standards are: accuracy, precision, relevance, depth, breadth, logic, significance and fairness. Critical thinkers display the following characteristics:

- They are by nature skeptical. They approach texts with the same skepticism and suspicion as they approach spoken remarks.
- They are active, not passive. They ask questions and analyse. They consciously apply tactics and strategies to uncover meaning or assure their understanding.
- They do not take an egotistical view of the world. They are open to new ideas and perspectives. They are willing to challenge their beliefs and investigate competing evidence.

By contrast, passive, non-critical thinkers take a simplistic view of the world.

- They see things in black and white, as either-or, rather than recognising a variety of possible understandings.
- They see questions as yes-or-no with no subtleties.
- They fail to see linkages and complexities.
- They fail to recognise related elements.

Non-critical thinkers take an egotistical view of the world.

- They take *their* facts as the only relevant ones.
- They take *their own* perspectives as the only sensible ones.

- They take *their* goals as the only valid ones.

### **Some critical thinking strategies**

#### 1. Reflection

- engage in the reflective process. (See unit, '**Reflective learning/keeping a reflective learning journal**').

#### 2. Rationality

- rely on reason rather than emotion,
- require evidence, ignore no known evidence, and follow evidence where it leads,
- be concerned more with finding the best explanation than being right, and
- analyse apparent confusion and ask questions.

#### 3. Self-awareness

- weigh the influences of motives and bias, and
- recognise our own assumptions, prejudices, biases, or point of view.

#### 4. Honesty

- to think critically we must recognise emotional impulses, selfish motives, disreputable purposes, or other modes of self-deception.

#### 5. Open-mindedness

- evaluate all reasonable inferences,
- consider a variety of possible viewpoints or perspectives,
- remain open to alternative interpretations,
- accept a new explanation, model, or paradigm because it explains the evidence better, is simpler, or has fewer inconsistencies or covers more data,
- accept new priorities in response to a reevaluation of the evidence or reassessment of our real interests, and
- do not reject unpopular views out of hand.



## 6. Discipline

- be precise, meticulous, comprehensive, and exhaustive,
- engage in active listening and reading practices (See the units, '**Active listening: note-taking in lectures**', and, '**Active and critical reading**'),
- resist manipulation and irrational appeals, and
- avoid snap judgments.

## 7. Judgment

- recognise the relevance and/or merit of alternative assumptions and perspectives,
- recognise the extent and weight of evidence.

## Combining creative and critical thinking



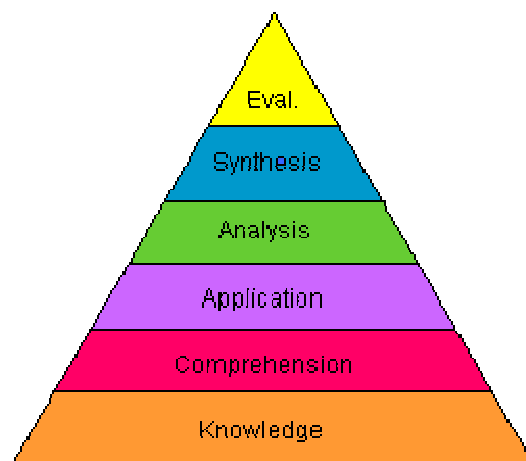
Both creative thinking and critical thinking skills are valuable and neither is superior. In fact, it has been shown that when either is omitted during the problem solving process, effectiveness declines. For example you could focus on a subject in a logical, analytical way for some time, sorting out conflicting claims, weighing evidence, thinking through possible solutions. Then, while daydreaming, or distracting the mind, but still holding the same problem lightly 'at the back of the mind', you may have a burst of creative energy and arrive at an 'Aha' moment – even though you were not trying so hard to find the answer. However, the daydream on its own did not achieve anything.

In 1956 Benjamin Bloom and a group of educational psychologists developed six levels of intellectual behaviour important in learning. These ranged from the simple to the more complex as follows, with number 1 being the simplest form of thinking.

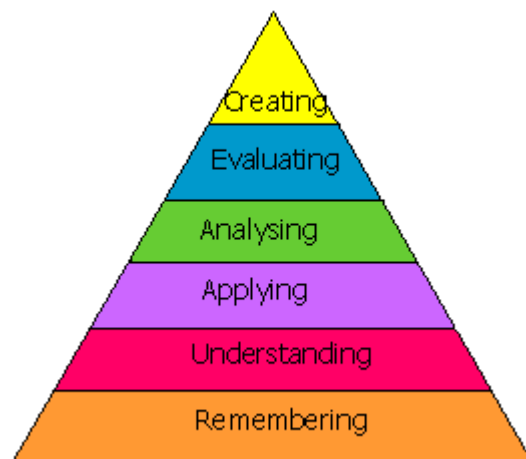
1. **Knowledge** (you demonstrate knowledge - things are memorised without necessarily having a full understanding e.g. listing, labelling, identifying, defining....)
2. **Understanding** (you understand information enough to describe it in your own words e.g. explaining, summarising, describing, illustrating.....)

3. **Application** (you find some practical use for the information and use it to solve problems e.g. using, applying, solving.....)
4. **Analysis** (you break complex ideas into parts and see how the parts work together e.g. analysing, categorising, seeing patterns, comparing, contrasting, separating, (re)organising parts.....)
5. **Synthesis** (you make connections with things you already know e.g. creating, designing, inventing, developing, hypothesising.....)
6. **Evaluation** (you judge something's worth e.g. judging, recommending, convincing, critiquing, justifying.....)

These are often represented as a pyramid as follows:



In a revision of this work, it was suggested by some analysts that 'synthesis' and 'evaluation' should be placed at the same levels of difficulty. Some even argued that 'analysis' should also be at the same level as 'synthesis' and 'evaluation'. In 2001, a former student of Bloom's and others revised the taxonomy. The result was a change in terms to better reflect the nature of the thinking required by each category as shown in the diagram below. 'Knowledge' became 'remembering', 'comprehension' became 'understanding', 'application' became 'applying', 'analysis' became 'analysing', 'evaluation' was moved down one level and became 'evaluating' and 'synthesis' was moved up one level and became 'creating'.



We can see that synthesis or creation equates with creative thinking and that evaluation or evaluating can be equated with critical thinking. While creative and critical thinking are key elements of university life, it is important not to feel intimidated by the complex combination of skills required: instead, try to make your learning an adventure in exploration! Both are higher order thinking skills and you will develop both gradually over time. It might be an idea to refer to Bloom's classification of cognitive levels, as outlined above, from time to time to check the progression of your thinking.

#### **END OF UNIT: ACTION**

To consolidate your learning from this unit it might be an idea to write a reflective summary in your learning journal (See unit, '**Reflective learning: keeping a reflective learning journal**'). A lot of strategies to improve your creative and critical thinking skills were presented in this unit. Choose three strategies which you think would make a difference for you *now* and make a conscious decision to apply these in your learning from today. Record your progress. You could then choose and apply three more, and so on.