



Critical and Creative Thinking: ideas from the key skills classroom

Contents

Introduction	3
Questioning to promote critical and creative thinking	4
Classroom tactics for effective questioning	7
Classroom activities to stimulate critical and creative thinking	10
References and web links	15
Reflection sheets	16

This booklet contains some tips and ideas for teaching some of the skills needed for critical and creative thinking. The booklet in itself is not intended to be a comprehensive course in the elements and learning outcomes of this skill. Please consult the Key Skills Framework for many other aspects of Critical and Creative Thinking.

Critical and creative thinking

Introduction

As we develop our ability to think, we improve our capacity to learn. Regardless of our age, perceived ability or background, we can all become more skilled thinkers. How do we teach students to not just think, but think skilfully, critically and creatively? Many critical and creative thinking programmes advocate the explicit teaching of thinking skills. The development of skills such as critical and creative thinking is most effective when embedded in the subjects students encounter on a daily basis.

This booklet presents a range of classroom strategies to stimulate more critical and creative thinking within classroom teaching and learning. As with the other key skills, you will find lots of ways of linking this skill to the other skills. So check out the other booklets in this series for learning activities and other resources related to this skill at <http://www.action.ncca.ie>.

The key elements of this skill are:

Critical and creative thinking
<ul style="list-style-type: none">▪ Examining patterns and relationships, classifying and ordering information▪ Analysing and making good arguments, challenging assumptions▪ Hypothesising and making predictions, examining evidence and reaching conclusions▪ Identifying and analysing problems and decisions, exploring options and alternatives, solving problems and evaluating outcomes▪ Thinking imaginatively, actively seeking out new points of view, problems and/or solutions, being innovative and taking risks

Questioning to promote critical and creative thinking

What's in a question, you ask? Everything. It is a way of evoking stimulating response or stultifying inquiry. It is, in essence, the very core of teaching.

John Dewey, 1933

There are many ways critical and creative thinking can be developed in the classroom. One way that we can help students become better thinkers is by asking them better questions. This section of the booklet explores how different kinds of questions can lead to different levels of thinking.

Effective questioning

If we want our young people to become independent and critical thinkers and leave school equipped for all that life will present to them, we really need to encourage them to develop higher-order thinking skills. One way to do this is to ask them HOT questions which require them to think about the answer. HOT stands for Higher-Order Thinking, HOTS for Higher-Order Thinking Skills. By using HOT questions students get to generate the 'heat' (i.e. the real learning), while teachers simply generate the 'light' (with a good HOT question or two!).

Closed, lower-order thinking (LOT) questions are useful when you need to check for understanding during explanations or recap sessions. A downside of using LOT questions and the ping-pong approach is that students have no time to put an answer together. Many students know that someone else (and they usually know who) will answer and they just move into a spectator role. Questioning is fundamental to good teaching and learning. When effective questioning is a significant feature of lessons, students are more likely to:

- develop a fuller understanding of an idea because they have tried to explain it themselves
- be clear about the key issues
- easily recall existing knowledge
- be able to link the ideas in the class with their existing knowledge
- tackle problems at a deep level and be able to extend their thinking
- engage easily with a task because they are clear about what is expected
- develop independence in the way they learn and think.

Practical tips for using thinking questions

- Be clear about why you are asking the question, tell the class what to expect.
- Plan sequences of questions that will make increasingly challenging cognitive demands on the learners.
- Give the learner time to answer and provide prompts if necessary.
- Provide a safe environment by allowing learners discuss answers with each other first and build on this to have discussion on answers with the whole class.
- Ask conscripts rather than volunteers to answer questions (no-hands).
- When planning for a class, a good habit to get into is to think of one or two HOT questions to ask students in that class or for homework..... and only ask those two questions!

Some common pitfalls and possible solutions

Not being clear about why you are asking the question: You will need to reflect on the kind of class you are planning. Is it one where you are mainly focusing on facts, rules and sequences of actions? If that is the case, you will be more likely to ask closed LOT questions which relate to knowledge. Or is it a class where you are focusing mainly on comprehension, concepts and abstractions? In that case you will be more likely to use open HOT questions which relate to analysis, synthesis and evaluation. See question stems below.

Asking too many closed questions that need only a short answer: It helps if you plan open questions in advance. Another strategy is to establish an optimum length of response by saying something like *I don't want an answer of less than 15 words*.

Asking too many questions at once: Asking about a complex issue can often lead to complex questions. Since these questions are oral rather than written, students may find it difficult to understand what is required and they become confused. When you are dealing with a complex subject, you need to tease out the issues for yourself first and focus each question on one idea only. It also helps to use direct, concrete language and as few words as possible. Allow students the time to absorb the information to help them develop their communication skills by allowing different forms of answers—oral, written, drawing, and mind map and so on.

Asking difficult questions without building up to them: This happens when there isn't a planned sequence of questions of increasing difficulty. Sequencing questions is necessary to help students to move to the higher levels of thinking. It is possible to ask lots of questions but not get to the centre of the issue. You can avoid this problem by planning probing questions in advance. They can often be built in as follow-up questions to extend an answer.

Asking a question then answering it yourself: What's the point? This pitfall is often linked to another problem: not giving student's time to think before they answer. Build in 'wait time' to give students a chance to respond. You could say *think about your answer for 3 seconds, then I will ask*. You could also provide prompts to help. Think-pair-share activities can help solve this problem.

Asking bogus 'guess what's in my head' questions: Sometimes teachers ask an open question but expect a closed response. If you have a very clear idea of the response you want, it is probably better to tell students by explaining it to them rather than trying to get there through this kind of questioning. Remember, if you ask open questions you must expect to get a range of answers.

Dealing ineffectively with wrong answers or misconceptions: Teachers sometimes worry that they risk damaging students' self-esteem by correcting them. There are ways of handling this positively, such as providing prompts and scaffolds to help students correct their mistakes. It is important that you correct errors sensitively or, better still; get other students to correct them.

Not treating students' answers seriously: Sometimes teachers simply ignore answers that are a bit off-beam. They can also fail to see the implications of these answers and miss opportunities to build on them. You could ask students why they have given that answer or if there is anything they would like to add. You could also ask other students to extend the answer.

Classroom tactics for effective questioning

Creating a climate where students can learn from mistakes

This is very important if students are going to build the confidence to speculate and take risks. It is important that students' contributions are listened to and taken seriously by both the teacher and the class. You should model this by ensuring that you make appropriate responses to contributions and are not critical. It is also important that you do not allow the class to ridicule wrong answers. You could also model making mistakes yourself to show that being wrong is acceptable. It is important to create a climate where the learner feels safe to make mistakes and to learn from them. A good habit to encourage this is to allow the learner to discuss answers with their neighbour or in groups—the think-pair-share approach.

Giving 'wait time'

We have all had that eureka moment when we have figured something out for ourselves....but as teachers do we deny some learners that moment by asking for an immediate answer or by rephrasing the question too quickly (anything but silence!) or by giving the answer before the students have a chance to give an attempt at an answer? Giving sufficient time for students to formulate an attempt at an answer is very important. How about giving your students an extra ten seconds to come up with an answer themselves...this can be the difference between students learning or not.

The 'no hands rule'

We all have been at talks where the facilitator asks a question and we squirm in our seats until an eager person puts up their hand and we can relax. The same is true of our students. They tend to stop thinking when a few in the class put up their hands. If we use the 'no hands' rule, we encourage all students to think about the answer to the question as the teacher can choose anyone to answer.

Helping students to generate their own questions

Being able to raise questions to explore a problem or to find an answer is central to critical and creative thinking. You can help students develop their ability to raise questions by using some of these approaches.

Generate questions together: Start with a problem and discuss with students what questions they would like to find answers to.

You could then gather a number of questions on the board, grouping types appropriately and discussing where you would look to find answers. Students can then work in groups to find answers to their chosen question.

Play 20 questions: Allocate students to small groups (e.g. three to a group) and provide each group with different information on something they are studying. Then ask them to form big groups, each comprising three of the small groups. Two of the small groups have to ask questions of the other to get their information. The group that 'wins' is the one that asks the fewest questions. The groups swap round so they all get a turn at being questioned.

Explore a new topic: Briefly, tell students what the new topic is about and ask them to identify what they already know. Make a note of these points and then ask students, perhaps working in groups at first, to generate a number of questions about the topic they would like to explore further. You could use some question stems from the grids provided.

Use questions that require students to use their imaginations: Such as what would happen if ...? Is there another way of doing this? Imagine...Suppose...

What are some possible consequences...?

What if you were...imagine yourself as...?

Use questions that probe assumptions

What are you assuming?

What could we assume instead?

You seem to be assuming _____. Do I understand you correctly?

All of your reasoning depends on the idea that _____. Why have you based your reasoning on _____ instead of _____?

Why would someone make that assumption?

Use questions that probe reasons and evidence

What would be an example?

How do you know?

Why do you think that is true?

Do you have any evidence for that?

What are your reasons for saying that?

What other information do you need?

Could you explain your reasons to us?

Are these reasons adequate?

Why do you say that?

What led you to that belief?

What would change your mind?

But, is that good evidence for that belief?

Is there a reason to doubt that evidence?

What would you say to someone who said that _____?

Can someone else give evidence to support that view?

By what reasoning did you come to that conclusion?

Questions about viewpoints or perspectives

You seem to be approaching this issue from _____ perspective.

Why have you chosen this rather than that perspective?

How would other groups/types of people respond? Why? What would influence them?

Can/did anyone see this another way?

What would someone who disagrees say?

What is an alternative?

How are Ken's and Joanne's ideas alike? How are they different?

Questions about implications and consequences

What are you implying by that?

When you say _____, are you implying _____?

But, if that happened, what else would happen as a result? Why?

What effect would that have?

Would that necessarily happen or only possibly/probably happen?

If we say that _____ is ethical, how about _____?

Classroom activities to stimulate critical and creative thinking

Brainstorming

Brainstorming is a technique which involves generating a list of ideas in a creative, unstructured manner. The goal of brainstorming is to generate as many ideas as possible in a short period of time. The key tool in brainstorming is “piggybacking,” or using one idea to stimulate other ideas. During the brainstorming process, ALL ideas are recorded, and no idea is disregarded or criticised. After a long list of ideas is generated, these can be prioritised as most/least important, most/least helpful, most/least unusual/creative, plus/minus, etc. They can also be ranked 1-5 in order of importance or in the order in which they might be useful in planning an essay.

Carousel brainstorming is another useful technique.

1. The class is arranged into small groups. Each group has a different colour marker.
2. The teacher poses a question on a flip chart.
3. The flipchart question is passed from group to group. (To speed up the process you may have a number of pages going around)
4. Each group must add two original suggestions.
5. The flipchart page(s) are displayed for all to see.
6. You can see which group has suggested each idea (by colour) and ask them more about their idea.

Think-pair-share

This activity encourages higher-order thinking that involves students thinking individually, then pairing with a partner, then sharing ideas with the wider group. The sequence generally begins with the teacher posing an open-ended question, to which there may be a range of responses. Think time or wait time is followed by discussion with a partner. The pair then share their best ideas with the whole class. The structure was first developed by Professor Frank Lyman at the University of Maryland in 1981, and subsequently adopted as a co-operative learning strategy.

Free-writing

When free-writing, a person will focus on one particular topic and write non-stop about it for a short period of time. The idea is to write down whatever comes to mind about their topic, without stopping to proofread or revise the writing. This can help generate a variety of thoughts about a topic in a short period of time, which can later be restructured or organised following some pattern of arrangement.

Mind or subject-mapping

Mind or subject-mapping involves putting brainstormed ideas in the form of a visual map or picture that shows the relationships among these ideas. One starts with a central idea or topic, and then draws branches off the main topic which represent different parts or aspects of the main topic. This creates a visual image or 'map' of the topic which the writer can use to develop it further. For example, a topic may have four different branches (sub-topics), and each of those four branches may have two branches of its own (sub-topics of the sub-topic). This includes both divergent and convergent thinking.

The power of persuasion

Another strategy to get the thinking going is to get the class to generate four possible answers to a HOT question and to ask the learners to vote on their preferred answer. Count the votes for each answer. Ask the students to sit with their preferred answer groups. Now the job of each group is to persuade others from different answer groups to come over to their group. Give them some time to formulate their campaign strategy. Depending on the age of the class, the following questions may be useful to prompt debate:

1. Who is going to speak? What argument will they use?
2. Are they going to have a campaign slogan?
3. Which other group will they target?
4. Will they focus on the strengths of their own argument, or on the weakness of the opposition?

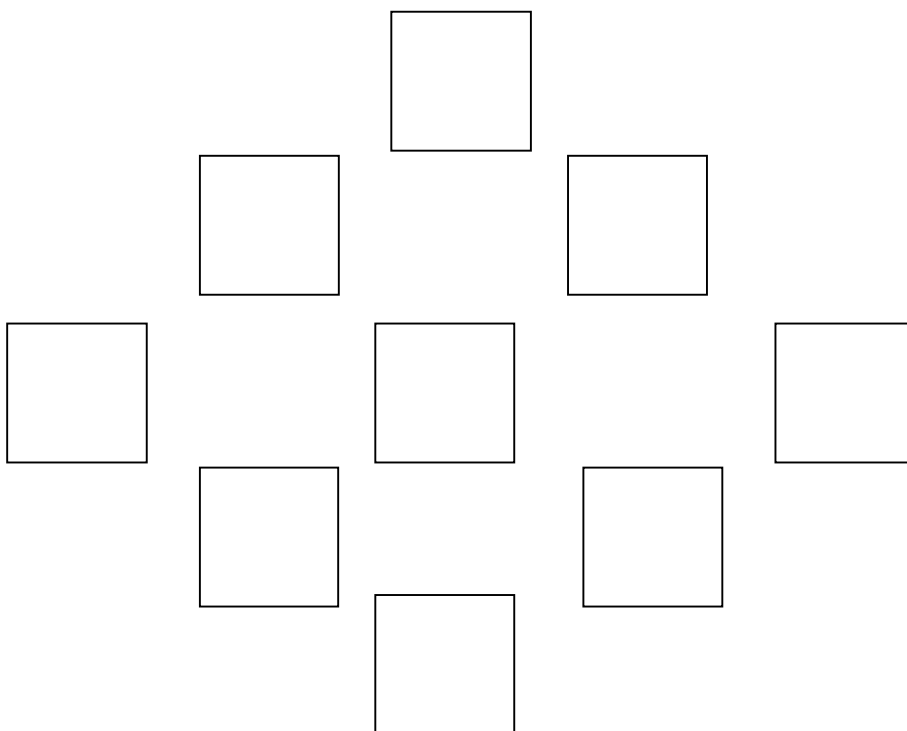
During the 'campaign' the teacher acts as chairperson, although this role may also be assigned, especially as the class becomes familiar with the strategy. In the course of the lesson, learners may change sides, or revert to original positions. Leave enough time at the end of the lesson to think about the campaign and the tactics used. A good follow-up homework task for further learning is for students to

generate a paragraph or a statement beginning with *I was persuaded because....* or, *Answer A won because.....*

Diamond Ranking

Diamond ranking is a thinking tool that gets students to prioritise and make judgments. Then it helps them to analyse and evaluate the criteria that they have used for making their judgments. Take an issue and ask your students to come up with a range of judgments. For example, the reasons why tourists might choose to visit Ireland or the qualities that are important for doing a particular job. It's important that there is no single right answer but a range of possible responses.

Show the diamond template and explain that the boxes are arranged to allow them to rank the most important on the top and the least important on the bottom



Form groups of two or three and give each group nine cards. Ask them to agree how they will diamond rank the different answers.

In debriefing, it is easier if you focus on the groups' top and bottom choices, asking students questions such as

5. How did you decide what was most important/least important?

6. Why do groups disagree on these?
7. How did the Diamond Ranking help you to prioritize?
8. When might the ability to prioritize come in useful in everyday life?

(Adapted from *Teaching Thinking Pocketbook*, Anne de A'Echevarria and Ian Patience, 2008)

Academic controversy

This method is used for a topic where there are two points of view, e.g. do prisons work? Should the cloning of human life be allowed? Was Ireland 'neutral' during World War 2?

1. Students are allocated one of the points of view. They research and prepare their arguments to support that viewpoint.
2. Students are arranged in pairs with opposing points of view, or put in groups of four containing two students with each point of view. Each side presents their position in as persuasive a manner as possible.
3. Students engage in discussion and argue their position.
4. Students swap positions and present each others' position as accurately, completely and persuasively as they can. It's best to tell students this is coming up so that they will listen carefully to the opposing view!

In the HOT seat

You may be familiar with the strategy of putting a learner in a HOT seat....taking the role of a character from fiction or from history, or of a person from another part of the world or facing a particular challenge. The class must think of questions to ask the character relating to the events in the story and the occupant of the HOT seat answers the questions from the character's perspective. For younger learners, it is best if the teacher models being the person in the HOT seat until the class become familiar with the concept.

There are a few variations on this which can really test HOT skills. Preparing questions in advance, organising radio interviews or panel discussions with the 'guests' in the HOT seat or seats, putting the whole class in the HOT seat and asking them to write their *Facebook* profile in character, generating text messages (on paper

– without phones!) from and to characters in HOT seat scenarios...all of these work to get the learners thinking.

Bookmark

Copy the next page and cut it out to make a bookmark. Bring it to class to help you in varying your questioning approaches. (Adapted from Bloom's Taxonomy.)

Knowledge

Who, what, why, where, when, which?
Describe or define
Can you find?
Recall, select, list
How did ... happen?
What were the main?
Label, select

Comprehension

Describe in your own words
Summarise what you have learned
Classify, categorise the facts to show
What is the main idea of?
Interpret in your own words
Compare and contrast
Can you explain what is happening?

Application

What examples can you find to?
What facts show that?
How would you organise ... to show?
What would happen if?
How could you use what we have learned?

Analysis

Why do you think?
What conclusions can you draw from?
What would you infer from?
What is the relationship between?
Classify or categorise the evidence
Can you make a distinction between?
Examine closely and explain how did?

Synthesis

How would you improve/solve?
Can you propose an alternative?
How could you adapt/modify?
How could you test?
What would happen if?
Can you predict?
What solutions would you suggest?

Evaluating understanding

What do you think about?
What would you prioritise?
What do you think is the most important?
Why do you think ... is not/is important?
What would you recommend?
How could you solve/improve?
How could you determine?

References and websites

A range of additional ideas on teaching key skills can be found on the NCCA website at <http://www.action.ncca.ie/en/key-skills>. There you will find videos, slide presentations, sample learning activities, and much more on all five key skills.

Articles in Info@ncca are available to download at www.ncca.ie. In particular, Issue 4 *Popping the Question* and Issue 10 *What is Hot?*

Pedagogy and Practice Series: Teaching and Learning in Secondary Schools Unit 7 Questioning. Available to download from <http://www.standards.dfes.gov.uk>

Splitter L., (2008) *On the theme of 'Teaching for Higher Order Skills,'* accessed at <http://chss.montclair.edu/inquiry/summ95/splitter.html>.

Teachers' Pocketbooks (a series of booklets to help teachers make teaching and learning more dynamic, challenging and effective.) www.teacherspocketbooks.co.uk

Geoff Petty website <http://www.geoffpetty.com/activelearning.html>

Reflection sheets

Teacher Reflection sheet

Select one approach, try it out and then answer the questions below.

Class:

Topic:

Date:

Teaching approach tried:

1. Give a brief description of the task you set for the students
2. What was the impact on the students?/How did they respond?
3. What key skills were evident?
4. How might you improve this approach or do it differently again?

Student's reflection sheet

Class

Topic

Date

Give a brief description of how you participated in class today

The main thing I learned is...

I liked/didn't like this way of learning because.....

