

Critical thinking ... what is the question?

A workshop for lecturers, learning developers and other professionals in higher education

Notes for presenters and participants

Introductions

Ensure participants have an opportunity to introduce themselves to each other, saying their job titles as well as their names, and perhaps one or two key reasons for wanting to attend this session.

PowerPoint slideshow

- 1) Slide one: the session is called “critical thinking what is the question?” Defining critical thinking (hereafter CT) is notoriously complex and a great deal has been written on the subject. It is widely acknowledged that CT is an essential aspect of university education – in fact some maintain that it is **the** defining characteristic of higher education (see Ronald Barnett’s 1997 book, *Higher Education: A Critical Business*, for example). CT is also widely felt to be necessary for informed citizenship and for employment (see for example the 2003 Scottish report “Higher Education: Higher Ambitions”; and Brown, Hesketh and Williams’ paper, also from 2003: ‘Employability in a knowledge-driven economy’.)
- 2) Slide two: the session aim is to provide you with an opportunity to explore critical thinking – both from a general and theoretical point of view and, more importantly, in practical ways to explore how it relates to your own work with students.
- 3) Slide three: the outcomes intended are that you will develop your awareness of critical thinking in general, and as it relates to your own subject and your teaching; and that you will have an opportunity to try out and evaluate a particular model. This is a framework that you will be able to take away for use in your own practice. It was developed by John Hilsdon and the Learning Development team at Plymouth University for promoting critical thinking via systematic questioning. The model is also available online and has a good track record in helping students to develop their critical thinking and developing arguments.
- 4) Slide four: so to get started, take a few minutes on your own to make some notes of what comes to mind in response to these questions:
 - a) what is CT in general?
 - b) what is CT in your discipline?

Critical Thinking ... what is the question?

Your answers don't need to be fully formed – and you will not be asked to share them with anyone else unless you want to!

(Allow approximately five minutes for this writing activity, including set-up time)

Would anyone like to say what they have come up with?

(Allow a maximum of ten minutes for this sharing activity – emphasise that there will be opportunities for further discussion later)

- 5) Slide five: here are some dictionary definitions. First, the word 'critical' - and here we can see that it comes from the Ancient Greek 'kritikos', meaning the ability to judge or discern - and also, via the verb 'krino', to judge and also to separate. So straight away we can see that there is a sense of **categorising** implied here – of separating things out. Of course, the everyday usage of 'critical' to mean a **negative** judgement, is often responsible for misleading inexperienced students into imagining that *critical* thinking must mean to criticise by finding fault and pulling something apart!
- 6) Slide six: the word 'thinking' is used in a number of ways, some of which are described here. It's interesting to see that the notion of separating or categorising comes up again here. In the sense that both words refer to making decisions or judgements, the implication is that critical thinking must be highly reflective – in other words it is **thinking about thinking** – and in fact as we'll see later, this is the view of critical thinking taken by Richard Paul, one of the leading proponents of CT. As a subject in its own right, CT is taught in some schools at A level and examined by boards such as OCR (Oxford Cambridge and RSA Examinations), and as a discipline it draws upon **psychology** in relation to the activities of reasoning and habits of thought; and **philosophy** in relation to logic and epistemology, or the nature of knowledge; and **critical theory** insofar as it relates to a critical stance towards disciplinary knowledge and world-views.
- 7) Slide seven: as we'll see, in history and in the educational literature, critical thinking has been conceptualised in a number of ways. As we look at the range of ways to define critical thinking, check back at the notes you made a few minutes ago to see where your thoughts fit in with these – or where you may have something different.

(It's worth noting at this point that all the books and websites referred to in these slides are listed in the participants' handout called 'Critical Thinking Resources'.)

Writers such as Edward de Bono, who coined the term 'lateral thinking' (1996) focus on skills and mental processes for problem-solving. De Bono is a keen advocate of the teaching of 'thinking' as a subject in its own right.

Some writers, such as Warburton (2007) or Kaye (2009) emphasise an approach of deriving from formal logic in mathematics and philosophy, and developed via 'informal' logic (i.e. using natural language rather than mathematical expressions), looking at how we judge the validity and soundness of arguments based on premises and leading to conclusions. The most familiar of these are called syllogisms – we'll look at some examples of these shortly.

In his well-known book on this subject, John McPeck (1990) makes a powerful case against teaching thinking in decontextualised ways. He argues that CT can only be developed in relation to a subject discipline – a view that runs counter to the argument of those who call for CT to be taught as a set of core, transferable skills. We'll return to this analysis when we look at the question-focussed model later in this workshop.

Richard Paul and Linda Elder (of the Foundation for Critical Thinking in the USA) ([click on the hyperlink](#)) see critical thinking as the commitment and disposition to subject all kinds of thinking to rigorous critique, based on criteria that include dividing thought into its elements (**information, concepts, interpretations and assumptions**) and what they call the “universal intellectual standards” including **clarity, accuracy, precision, relevance, depth, breadth, logic, significance and fairness**.

There are also many writers who have drawn in varying degrees upon all of these approaches to devise their materials and text books aimed at university staff and students. Stella Cottrell ([click on the hyperlink](#)) in her popular book on critical thinking stresses the development of the following skills: **observation, reasoning, decision-making; analysis; judgment and persuasion** (2005; 4); along with “**categorising, selection, differentiation, comparing and contrasting**”. Nel Noddings in her book *Philosophy of Education* (2012) acknowledges the importance of logic, of particular skills, the clear use of language, and the relevance of context – whilst adding a moral dimension – for her, critical thinking should always implies a critique of current arrangements, in the interests of making improvements in whatever field is under question. The same could also be said for the writer and activist bell hooks whose 2010 book, 'Teaching Critical Thinking: practical wisdom', is also referred to here.

(This is good point at which to pause for discussion – see handout and suggestions on slide eight. Depending on the context and numbers, participants can be offered the opportunity to discuss in small groups of three to five, or in the whole group. It is suggested that up to fifteen minutes be allocated for small group discussion and a further ten for feedback or consolidation /presentation of key points. These topics and points raised can be revisited later in the session.)

8) Slide eight: (see *handout*) Suggested questions for discussion:

- **In your view can thinking be taught independently of a particular subject?**
- **Is critical thinking mostly to do with cognitive skills? Does affect (emotion or psychological state) have a role in thinking?**
- **What is the role of language – social or regional dialect, or subject-specific language – in the development of critical thinking?**

9) Slide nine: this quote, from the British philosopher and mathematician, Bertrand Russell reminds us that whatever skills or mental processes we seek to develop in our students, there is a prior condition required for critical thinking that is not related to knowledge, methods or skills but to motivation, and therefore to the desire for action or engagement in the world. Ron Barnett also speaks of this – referring to the ‘will to learn’ (2007). Richard Paul whom we mentioned in the previous slide is also interested in promoting a particular kind of *disposition* to be critical or to ask questions and to engage in critical work. Later in this workshop, we’ll look at the cultivation of such an attitude or disposition through the use of a question-focussed model - an approach designed to help students feel able to ask questions, and attempt to answer them systematically.

10) Slide ten: we will now look briefly at the philosophical background to CT. The Socratic method – based around questioning – is possibly the best known approach to CT. It is said that Socrates thought questioning - as opposed to lecturing or merely attempting to transmit knowledge - was the most valid form of teaching. Socrates intended his probing questions to be used to evaluate truth-claims. There can be various purposes for such questioning, designed to get students to undertake key learning activities such as

- Eliciting detail to clarify a description, e.g. *“Tell me more about ...”*; *“What kind of ... was it?”*
- To reveal underlying assumptions, or test conclusions, e.g. *“Is that always the case?”*; *“Might there be another reason for that happening ...?”*
- To identify evidence, e.g. *“Why might these data have arisen?”*; *“What changed as a result of ...?”*
- To examine the implications of a particular action, e.g. *“What might happen as a result of ...?”*

If you’d like to know more about the Socratic method, two of the best known critical thinking specialists - Richard Paul and Linda Elder - have written a book on this which is listed in your resources handout (Paul and Elder 2006)

- 11) Slide eleven: for the sake of simplification we can say that argument in philosophy can be based on deductive reasoning (originating in formal logic); inductive reasoning (based on prediction from empirical experience) or arguments from authority. We'll look briefly at each of these. Clearly this is a very cursory treatment of what is a massive field, and some of you are likely to be familiar with this already; if so, bear with us as we undertake this introductory consideration of the origins of critical thinking.
- 12) Slide twelve: formal logic is concerned with assessing whether expressions and arguments are valid and sound. E.g. if $X = 2Y$ then $Y = 0.5X$. We can build arguments based on premises. If the premises logically lead to the conclusion then the argument is valid. It may or may not be true! When an argument is valid and the premises are true, it is said to be 'sound' and the conclusion will be true.
- 13) Slide thirteen: this shows a famous case of a valid and sound argument – in this case, a categorical syllogism. Both premises are true and the argument is internally consistent - i.e. it is 'valid'. Even if we subsequently discovered that Socrates was actually a woman, this would not affect the consistency or validity of the argument – nor the truth of the conclusion - but it would mean that the argument was no longer sound.
- 14) Slide fourteen: underlines this point.
- 15) Slide fifteen Here we see a technically valid (consistent) argument but one which is unsound.
- 16) Slide sixteen: and now an argument which, although we'd probably all agree has a true conclusion, is actually invalid. Can anyone say why this is the case? (*It's a logical fallacy - clearly a premise that all women are stupid does not tell us anything about the intelligence of men!*) There are numerous books that deal with the various characteristics of categorical syllogisms and the errors or fallacies that can be generated by faulty reasoning (e.g. where the premises don't account for all members of a category) – a good text for this purpose is 'Critical Thinking' by Sharon Kaye (2009).
- 17) Slide seventeen: although, of course, science makes much use of deductive reasoning – especially in the mathematical work involved in the analysis of data – it is inductive logic and reasoning that are more common in empirical scientific work. Slide seventeen offers an everyday, simple example of using inductive logic as prediction.
- 18) Slide eighteen encourages us to think about the characteristics of induction – and the distinctive point is that unlike in a sound deductive

argument, in inductive reasoning the premises may be true but that does not guarantee the truth of the conclusion.

- 19) Slide nineteen: arguments from authority. Of course, a lot of what students do at university is to make use of work already published by others. Part of the skill of developing an argument is to base it upon work already considered strong, valid and sound. For example, this may mean reporting findings from more than one published source in comparable circumstances or experiments, to indicate the statistical significance, or strength or weakness of a particular conclusion. The system of peer review for academic publications could be seen as an institutionalised way to provide opportunities for developing valid arguments from authority.

For discussion: what do you think are the likely pitfalls of students arguing from authority? Does this link to the need to encourage students to learn how to refer to and cite published work appropriately, and does this relate to arguments about plagiarism?

(Allow ten to fifteen minutes for this discussion, depending how much time has been taken so far. This activity will lead into the session break which should take place at about the half-way point in the workshop – i.e. after approx 1.5 hours.

BREAK - approx 15 minutes

- 20) Slide twenty: in March 2013 a range of academics in science-related subjects were asked for their views on critical thinking. We're going to hear what some of them said. You may want to make notes of anything you agree or disagree with in this – or note any points for further discussion.

(Play sound recordings. The transcript can be used as a handout)

- 21) Slide twenty-one: the key points made are summarised here. These also accord with academics' views collected by the Plymouth University Learning Development team some years previously when they were developing their model for critical thinking. We're going to have a look at that next. As we've heard, what academics want from critically thinking students is not just about sound reasoning – although that clearly comes into it. The key implication of what academics say is that critical thinking also includes being able to communicate thinking using language. They want students to ask questions; to analyse data; to review other viewpoints; to justify a position; and come to conclusions. In order to do all of these things it is clear that using language and communicating is as important as sound reasoning or logic – in fact many would argue that these two things – clear thinking and clear communication – are in fact inseparable processes, or sets of processes.

22) Slide twenty two: the Plymouth model we're about to introduce draws partly upon work done in mapping the linguistic and functional structure of argument. The best-known example of this is the work of Stephen Toulmin, a philosopher of science interested in how arguments are structured and their linguistic features. In 'the uses of argument' (1958) he developed a model to show how arguments rely on structured and predictable ways to justify conclusions by introducing evidence that can be tested. There are six components in his model:

1: the **claim**, or conclusion – which we arrive at by starting from some data, evidence or

2: **grounds**. This movement from the grounds to the conclusion requires

3: the **warrant** – in other words statement(s) that present the chain of reasoning or authorisation. This requires

4: **backing** up – or further, corroborating evidence. Next, in order to strengthen our argument, we need to show we have considered other possibilities – hence one or more

5: **qualifiers** may be introduced to account for any necessary or potential

6: **rebuttals** to our claim – i.e. exceptions or counter-arguments.

23) Slide twenty-three: let's look at an example of an argument mapped onto Toulmin's model. Imagine coming into a room to find litter from the bin strewn all over the floor. Imagine further that you have a dog (in this case the dog's name is Fletcher), one of whose toys is a tennis ball. Imagine also that you find his ball in the bin! You can see how we move from these data to the claim that Fletcher is the culprit by using a chain of reasoning – the warrant and supporting evidence. There may, of course, be further supporting evidence if the rubbish includes food-wrappers and shows signs of having been chewed, or if the dog behaves in a guilt-ridden fashion by hiding under the table! We can qualify our reasoning and hedge our conclusion by considering alternative explanations – which in this case are rebutted on the grounds of their unlikelihood.

24) Slide twenty-four: (*also available as a handout*) you may wish to try using this blank Toulmin-map slide with your own students. The Plymouth team experimented with this with mixed results; students tended to find it confusing or helpful in roughly equal numbers. For some it seemed too mechanistic and they reported feeling restricted by the boxes. Others reported being distracted by trying to decide what to put in each box – the extent to which a distinction between 'warrant' and 'backing' is needed, for example, is unclear. What is useful about this model; however, is its role in illustrating the important functions played by language in the development of reasoning, argument and critical thinking. For example, it shows natural language performing vital functions such as addition, qualification, exclusion, comparison or contrast.

25) Slide twenty-five: Mitchell and Riddle (2000) developed what they intended to be a model for use by students that is less rigid than Toulmin's. It uses the everyday language terms 'since'; 'then'; and 'because'. The triangular structure is a visually clear representation and the Plymouth learning developers found that many students liked its initial simplicity. A key advantage of this model is that it can be used by students both to analyse and assess arguments they come across in texts AND to generate their own. The Plymouth team still found some problems with this model; however, in particular as students frequently confused the 'since' and 'because' elements of the structure ...

26) Slide twenty-six: *(also available as a handout)* ... so they adapted Mitchell and Riddle's model as we can see in this slide by removing the terms 'since', 'then' and 'because' and replacing them with descriptors and prompt phrases linked to the key **functions** being performed by language at each point of the triangle. In this case the functions are to make a claim, to justify and then support it.

Another important feature of the Plymouth development here is the contextualisation of the Mitchell and Riddle model within academic assignment-writing; and especially as it relates to paragraph structure: hence the title used here ('argument and paragraph structure')

By focusing on how the functions (claim, justify and support) relate to work students need to do in their use of language – e.g. to explain the claim, to present evidence or underpinning theory in support of it - the model becomes a more practical tool for developing **both thinking and writing**.

Furthermore, the Plymouth version offers an indication of how the writing will develop both within the current paragraph and beyond it – hence the arrow heading left towards **implications** and the idea of the next paragraph or section.

27) Slide twenty-seven: *(Give this text out as a handout before showing the next slide (28). Suggest that participants work in groups of between three and five for this exercise.)*

We can see how the adapted Mitchell and Riddle model might be used with this example. Here is a paraphrased extract from an article in the Nursing Times. Imagine you are a student writing an assignment in which you are evaluating the use of the drug desmopressin for the treatment of older patients with the condition known as nocturia. Take a few minutes to read the text and imagine this is your key source. Decide first on your claim and then try to map justification, support and implications. Which bits of the text might be useful for each stage?

(After five minutes stop the groups and show the next slide)

- 28) Slide twenty-eight: how similar or dissimilar are your ways of using the model? Does this tell us anything about the usefulness of the model? (*Allow five to ten minutes for feedback and discussion*)

The Plymouth team continue to use this model in conjunction with the question-focussed approach we'll examine now.

- 29) Slide twenty-nine: the systems theorist Gregory Bateson liked to tell stories and commented on the vital role of narrative in our understandings of the world. Hilsdon's critical thinking model was inspired by remembering the power of Kipling's story "The Elephant's Child" – and in particular this reference to what questions can do as 'servants' to anyone who is seeking to learn. As we study, it becomes clear that attempting systematically to answer these questions is what helps us construct our understandings - our stories. And the more rigorously we ask and attempt to answer, the more 'critical' we become.
- 30) Slide thirty a: (*blank oval*) The model is also informed by the work of the linguists Halliday (1978), and Fairclough (1995), taking socio-functional and critical views of the role of discourse in knowledge creation and social action. In short this reveals how language achieves effective communication as discourse by fulfilling functions in its use. At the broadest level, those functions are to describe, to analyse and to evaluate or make judgements, and upon these further action may be based. In scientific and academic contexts those texts are lab reports, research papers, essays, theses etc.

Slide thirty b: (*click through*) As we click through the model a pattern emerges. Asking and answering questions imply or achieve certain functions. It can be seen that the answers to certain questions are more likely than others to yield particular kinds of answers. Answering the question 'what', for example often yields definitional information; answering a 'why' question may result in explanation drawing upon theory; answering 'how' may lead to explanations of processes; answering a 'so what' question leads to judgement, say, in terms of implications.

In using the model with students it has been noted that they are often able to see how they might use it almost immediately. For many it has the classic 'light-bulb' effect.

By attempting systematic asking and answering of these questions students can see how they might begin a research plan or an outline for an essay. It acts as simple yet potent heuristic device since it is very familiar. The structure of a children's story has a beginning a middle and an end, and beginnings tend to be descriptive; middles explanatory and analytical; endings tend to be evaluative, prescriptive or advisory – just as science reports describe methods, analyse results and draw conclusions. For this reason, the approach has been called 'functional-

narrative' (Hilsdon and Bitzer, 2007). Bateson's comment, "*that reminds me of a story*" refers to an anecdote he told – the comment is supposed to be what a computer says in answer to a human who asks the computer if computers themselves will ever think like humans. The computer in this case clearly was already thinking like a human because humans think in stories!

- 31) Slide thirty-one: proposing these three core or 'meta' functions (description, analysis and evaluation) as corresponding to the fundamental kinds of scientific, intellectual or academic work is central to the question-focussed model for promoting critical thinking. It needs to be stressed; however, that the model claims only to provide a guiding framework. It is neither prescriptive nor predictive. It is a simplification and an approximation – but one that nonetheless has been shown to be very effective. In the form we have seen it is two-dimensional and circular. In reality, of course, doing description, analysis and evaluation are not a once-and-for-all activities and can never be said to be completely achieved or accomplished – they must each be returned to at increasing levels of complexity and criticality as we progress in our understandings. In this sense the model is in the Popperian tradition of critical rationalism (2002). Similarly, it is important to recognise that, as a simplification, the model might seem to imply that there are strict boundaries between description, analysis and evaluation, whereas in fact, of course, the three functions overlap – and the more so the greater the depth of our studies. Description can never be 'just' description – all description implies some kind of explanatory, analytical or evaluative work; and analysis too is not 'pure' or separate from either description or evaluation. In other words, the model is, like thinking itself, a tool, and is indicative of rather than indexical to reality.
- 32) Slide thirty-two: as students gain confidence in the basic model they can make use of it in more complex ways – becoming more specific and sophisticated in their interpretation of the functions that their own language, the language of others and of academic texts. The subcategories identified here were generated by academic staff at Plymouth University in the development of a learning resource – the WrAssE project which also makes use of the question-focussed critical thinking model. The URL for WrAssE is included in the list of online resources you may wish to explore.
- 33) Slide thirty-three: over to you. (For the last fifteen minutes of the workshop, it is suggested that participants work in small groups of three to five to discuss the question-focussed model and its possible application in their own areas of work.
- 34) Slide thirty-four: thought and language. You'll have noticed that in this workshop on critical thinking we've travelled from Socratic questioning, via logic, back to questioning again, and ended with the Plymouth model, which is very much a language-focussed approach. It is

certainly true that philosophers, especially since Wittgenstein have stressed the role of language in shaping knowledge. As we can see, in this slide, Martinich and Searle, both of whom are philosophers of language, see language as the expression of thought. Clarity of language use therefore becomes of paramount importance in seeking to develop skills and abilities for critical thinking. The question-focussed model seeks to help students to develop such clarity by introducing them to how language functions to describe, analyse and evaluate in the context of their studies, rather than in an abstract way. The learning development team at Plymouth University would very much welcome feedback from academics on their use of the question-focussed model – the email address for comment is learn@plymouth.ac.uk

35) list of some useful online Resources for CT

36) Paul and Elder *Links to/from slide 7 (click on the hyperlink to return)*

37) Cottrell *Links to/from slide 7 (click on the hyperlink to return)*