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What is critical thinking and how to improve it

In recent years ‘critical thinking’ has become something of a ‘buzz word’ in educational circles. For many reasons, educators have become very interested in teaching ‘thinking skills’ of various kinds in contrast with teaching information and content. Of course, you can do both, but in the past the emphasis in most people’s teaching has been on teaching content – history, physics, geography or whatever – and, though many teachers would claim to teach their students ‘how to think’, most would say that they do this *indirectly* or *implicitly* in the course of teaching the content which belongs to their special subject. Increasingly, educators have come to doubt the effectiveness of teaching ‘thinking skills’ in this way, because most students simply do not pick up the thinking skills in question. The result is that many teachers have become interested in teaching these skills *directly*. This is what this text aims to do. It teaches a range of *transferable* thinking skills, but it does so *explicitly* and *directly*. The skills in question are critical thinking skills (sometimes called critico-creative thinking skills – for reasons explained below), and they will be taught in a way that expressly aims to facilitate their transfer to other subjects and other contexts. If you learn, for example, how to structure an argument, judge the credibility of a source or make a decision, by the methods we shall explain in a few contexts, it will not be difficult to see how to do these things in many other contexts too; this is the sense in which the skills we teach in this text are ‘transferable’.

It can be dangerous for an educational idea to become fashionable, because it gets pulled in many directions and can lose its focus, so we begin by explaining the idea of ‘critical thinking’ as it has developed over the last 100 years.

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Question 1.1

Please write down what *you* (the reader) think the phrase ‘critical thinking’ means. You will have heard different uses of the phrase in various contexts, so pull together what makes sense to you from those uses. Even if you have very little idea, do the best you can. At this stage there are no right or wrong answers. Your answer is for you alone – so that you can compare it with what we are about to tell you.

1.1 Some classic definitions from the critical thinking tradition

1.1.1 John Dewey and ‘reflective thinking’

In fact, people have been thinking about ‘critical thinking’ and have been researching how to teach it for about a hundred years. In a way, Socrates began this approach to learning over 2,000 years ago, but John Dewey, the American philosopher, psychologist and educator, is widely regarded as the ‘father’ of the modern critical thinking tradition. He called it ‘reflective thinking’ and defined it as:

Active, persistent, and careful consideration of a belief or supposed form of knowledge in the light of the grounds which support it and the further conclusions to which it tends. (Dewey, 1909, p. 9)

Let us spend a moment unpacking this definition. By defining critical thinking as an ‘active’ process, Dewey is contrasting it with the kind of thinking in which you just receive ideas and information from someone else – what you might reasonably call a ‘passive’ process. For Dewey, and for everyone who has worked in this tradition subsequently, critical thinking is *essentially* an ‘active’ process – one in which you think things through for yourself, raise questions yourself, find relevant information yourself, etc. rather than learning in a largely passive way from someone else.

In defining critical thinking as ‘persistent’ and ‘careful’ Dewey is contrasting it with the kind of unreflective thinking we all engage in sometimes, for example when we ‘jump’ to a conclusion or make a ‘snap’ decision without thinking about it. Sometimes, of course, we have to do this because we need to decide quickly or the issue is not important enough to warrant careful thought, but often we do it when we ought to stop and think – when we ought to ‘persist’ a bit.

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However, the most important thing about Dewey’s definition is in what he says about the ‘grounds which support’ a belief and the ‘further conclusions to which it tends’. To express this in more familiar language, he is saying that what matters are the **reasons** we have for believing something and the **implications** of our beliefs. It is no exaggeration to say that critical thinking attaches huge importance to reasoning, to giving reasons and to evaluating reasoning as well as possible. There is more to it than that, but skilful reasoning is a key element.

Question 1.2

Look at passage 57 in the Questions appendix and, applying Dewey’s definition, say whether any critical thinking is being exhibited; try to give reasons for your answer.

1.1.2 Edward Glaser, building on Dewey’s ideas

We will return to the central role of reasons and reasoning shortly, but let us look briefly at another definition which belongs to the critical thinking tradition. This one is due to Edward Glaser, co-author of what has become the world’s most widely used test of critical thinking, the *Watson–Glaser Critical Thinking Appraisal*. Glaser defined critical thinking as:

(1) an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one’s experience; (2) knowledge of the methods of logical enquiry and reasoning; and (3) some skill in applying those methods. Critical thinking calls for a persistent effort to examine any belief or supposed form of knowledge in the light of the evidence that supports it and the further conclusions to which it tends. (Glaser, 1941, p. 5)

It is immediately obvious that this definition owes a lot to Dewey’s original definition. Glaser refers to ‘evidence’ in place of ‘grounds’ but otherwise the second sentence is much the same. The first sentence speaks about an ‘attitude’ or disposition to be thoughtful about problems and recognises that you can apply what he calls ‘the methods of logical enquiry and reasoning’ with more or less ‘skill’. The tradition has picked up on both these elements, recognising that critical thinking is partly a matter of having certain thinking skills (we will say which shortly), but is not just a matter of having these skills, it is also

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a matter of being disposed to use them (someone might be very skilled at, say, turning somersaults, but might not be disposed to do so). We will return to these points shortly, but let us now look at a third definition from this tradition.

1.1.3 Robert Ennis – a widely used definition

One of the most famous contributors to the development of the critical thinking tradition is Robert Ennis; his definition, which has gained wide currency in the field, is:

Critical thinking is reasonable, reflective thinking that is focused on deciding what to believe or do. (Cf. Norris and Ennis, 1989)

Notice the emphasis on being ‘reasonable’ and ‘reflective’, which picks up on earlier definitions, but notice also that Ennis speaks of ‘deciding what to . . . do’, which was not explicitly mentioned earlier; so decision making is part of critical thinking in Ennis’s conception. Unlike Dewey’s definition, this definition needs no further explanation because the words are familiar to us. We shall see later that there may be questions about how good a definition it is, but it is reasonably clear what Ennis means.

Question 1.3

Did you have all those elements in *your* definition of critical thinking? If so, that is excellent! If you didn’t, revise your definition of critical thinking to take account of the tradition as I have just explained it and write down your new definition of critical thinking – as you understand it – preferably using your own words.

1.1.4 Richard Paul and ‘thinking about your thinking’

In this section and in section 1.4 below we review two final definitions of critical thinking which have been developed by scholars working in this field and which are important for different reasons. The first is due to Richard Paul who gave a definition of critical thinking which looks rather different from the other definitions given above. It is:

Critical thinking is that mode of thinking – about any subject, content or problem – in which the thinker improves the quality of his or her thinking by skilfully taking charge of the structures

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inherent in thinking and imposing intellectual standards upon them. (Paul, Fisher and Nosich, 1993, p. 4)

This definition is interesting because it draws attention to a feature of critical thinking on which teachers and researchers in the field seem to be largely agreed, that the only realistic way to develop one's critical thinking ability is through 'thinking about one's thinking' (often called 'metacognition'), and consciously aiming to improve it by reference to some model of good thinking in that domain. Let us explain this idea with an analogy.

An analogy from basket ball

I lived in California with my family for a year in 1992–3 and my eleven year old daughter wanted to learn how to play basket ball. The basket ball coach at the local high school was just starting a team for eleven year old girls, so my daughter went along. At the first session he divided the girls into two teams, explained that the idea of the game was to pass the ball to your team members until someone from your team could get into a good position to shoot at the basket and that the winner was the one who scored most baskets, then he set them to play against each other. Of course, there are many more rules, but he didn't burden the girls with these to begin with; these could come later. Naturally, this initial game was fairly chaotic, with all the girls chasing the ball at once and few baskets being scored, but it was great fun!

After a while, the coach stopped them and said, 'Well done! But if you are going to be really good basket ball players, you must be able to shoot well, so now we will practise shooting.' He then showed them some of the funny (and ineffective) ways they had been shooting, before showing them how to shoot more skilfully; he drew attention to how he held the ball, where he looked, how he stood and so on. In short he was providing them with a model for shooting well. Having shown them a good model he then set them to practising doing it in the same way, asking them to be self-conscious about how they held the ball, where they looked, how they stood, etc., and saying they should try to do it as much like him as possible. After they had practised shooting for a little while, he said, 'Good. Let's play basket ball again, but this time when you get a chance to shoot, try to do it in the way that we have just practised.' Again the girls played basket ball, but this time they tried to shoot more skilfully. Some could do so and some found it difficult, but, after all, this was only the beginning.

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After a while the coach stopped them and said, ‘Well done, we’ll practise that more another time, but there is something else you need to learn. If you are going to be good basket ball players you need to pass the ball well, so now let’s practise that.’ Again he showed them some of the funny ways of passing poorly before demonstrating how to pass it fast and straight, with or without a bounce. Again, having shown them a good model, he set them practising this in pairs. After a while, he stopped them and said, ‘Great. Now we’ll play basket ball again, but this time, when you get a chance to pass, try to do it in the way you have just practised – and if you get a chance to shoot, don’t forget what we just practised there too.’ Again the girls played, but this time they often passed better (not always of course, because they were just beginning) and they sometimes shot at the basket better than they had at first.

After a while the coach stopped them and said, ‘Well done, but now there is something else you need to learn to be good players. Instead of all racing round the court together you need to be good at marking (or “guarding”) your opponents. So we’ll practise this.’ Again, he showed them what had been happening because players from opposing teams were able to keep clear of each other and then he showed them how to prevent someone from passing a ball to another member of their team. Then he set them in threes to practise this.

Question 1.4

What do you think the coach said after they had practised this for a while?

I hope the analogy is reasonably clear by now. Learning to improve your thinking is very similar. Just as we can all run around the basket ball court playing an informal game of basket ball, so we can think about all sorts of issues. But thinking about issues involves all sorts of skills – and most of us could improve these. Just as the basket ball coach identified some fundamental skills for basket ball, so those who have worked in the ‘teaching thinking’ tradition have identified some fundamental skills for good thinking. Just as the basket ball coach showed ineffective ways of, for example, shooting, then gave a good model, which students then practised before trying to use that skill in real situations, so those working in the teaching thinking tradition have identified ineffective ways of, say, making decisions and have then identified good ways of doing this which can be practised and then used in appropriate situations – whenever needed. That is the way we shall proceed in this book. Like the basket ball coach we shall identify some

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fundamental skills which are essential to good critical thinking; we shall then show some characteristic weaknesses we are all inclined to display when doing these kinds of thinking; after that we shall show a good model of thinking in that way (say, decision making); then you will practise this kind of thinking; and finally you will be faced with whole tasks (analogous to a whole basket ball game) in which you will need to deploy the relevant skills at the appropriate points. The result should be that we can produce better thought out, more reasonable, beliefs and actions than most of us do in the absence of such practice.

Question 1.5

Discuss this analogy with fellow students (or with friends or family if you are reading this book on a self-study basis) then answer the following questions:

- 1.5.1 Explain in your own words what are the three stages of learning outlined.
- 1.5.2 Does the analogy seem to you to provide a good model for teaching a new skill?

1.2 Skills which underlie critical thinking: some basic competencies

I imagine that one question you will ask is, ‘What are the “thinking skills” which underlie critical thinking and which are analogous to the skills which underlie basket ball?’. Almost everyone who has worked in the critical thinking tradition has produced a list of thinking skills which they see as basic to critical thinking. For example, Edward Glaser listed the abilities:

- (a) to recognise problems, (b) to find workable means for meeting those problems, (c) to gather and marshal pertinent information, (d) to recognise unstated assumptions and values, (e) to comprehend and use language with accuracy, clarity and discrimination, (f) to interpret data, (g) to appraise evidence and evaluate statements, (h) to recognise the existence of logical relationships between propositions, (i) to draw warranted conclusions and generalisations, (j) to put to test the generalisations and conclusions at which one arrives, (k) to reconstruct one’s patterns of beliefs on the basis of wider experience; and (l) to render accurate judgements about specific things and qualities in everyday life. (Glaser, 1941, p. 6)

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Glaser was much influenced by Dewey, who saw scientific thinking as a model of ‘reflective thinking’, and this list is probably best understood as relating especially to scientific and similar thinking. It does, however, contain many elements which belong to modern lists. For modern lists see the Appendix in Norris and Ennis (1989) and see Fisher and Scriven (1997, chapter 3).

In this book we shall deal with **some** of the fundamental critical thinking skills, in particular how to:

- identify the elements in a reasoned case, especially reasons and conclusions;
- identify and evaluate assumptions;
- clarify and interpret expressions and ideas;
- judge the acceptability, especially the credibility, of claims;
- evaluate arguments of different kinds;
- analyse, evaluate and produce explanations;
- analyse, evaluate and make decisions;
- draw inferences;
- produce arguments.

Of course, there are other thinking skills you might wish to develop but these are a good place to start.

1.3 Some instructive examples

Let us ask some further questions to see whether you have a reasonable grasp of what has been said so far.

Question 1.6

Do the following activities involve critical thinking as you understand it?

- 1.6.1 You are reading a novel for pleasure.
- 1.6.2 You are solving a routine mathematical problem in a standard, well-learned systematic way, which requires you to reason your way through to a conclusion. Think of an example and discuss your answer with reference to that.
- 1.6.3 A professional basket ball player is playing in an important match.
- 1.6.4 You have just completed your GCSE exams and you are now trying to decide which A-level subjects to do.
- 1.6.5 You attempted to install some new software on your computer but it is not working properly, so now you are trying to follow the instructions for ‘trouble shooting’.

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Question 1.7

Imagine someone, let us call him Andy, standing beside a used car trying to decide whether to buy it. Andy does not have much money and he does not know much about cars, but he has just left college and has just been offered a new job which requires him to have a reliable car. A salesperson has told Andy all the advantages of the car in question and has offered a 'bargain' price.

- (Case 1): Let us suppose that Andy has come to like and trust the salesperson in the course of talking about the car (though they have never met before and Andy knows nothing of the company for which she works) and he likes the 'look' of the car so he decides to buy it.
- (Case 2): Let us suppose instead that Andy comes to like the salesperson, but treats what she says with caution, gets an expert mechanic to check the vehicle over, checks prices of comparable vehicles in a used car price guide and gets a knowledgeable friend to advise on negotiating a price.

The question now has three parts:

- 1.7.1 Look at Dewey's definition above and decide whether Andy displays 'reflective thinking' according to that definition in either case. Is he 'active', 'persistent', 'careful', etc.
- 1.7.2 Referring to Glaser's list of skills, does Andy:
 - recognise what the problem is?
 - find workable means for dealing with the problem?
 - gather and marshal pertinent information?
 - recognise unstated assumptions and values (etc.)?
- 1.7.3 Would you say that Andy had acted reasonably in either case?

Question 1.8

In this case two friends, Bertha and Cheryl, are watching an American TV news report on the 1991 Gulf War. The reporter, who is American, is commenting on the pin-point accuracy of modern US weapons and says that the film shows heat-seeking missiles going down the chimneys of buildings to blow them up and ground-based US Patriot missiles intercepting and blowing up incoming Iraqi Scud missiles. Bertha and Cheryl watch and listen with fascination (as many of us did during the Gulf War); Bertha remarks on how amazing it is that weapons can be so accurate and expresses her relief that America has them. Cheryl, who is majoring in media studies, is not quite so sure; she points out that the sequence

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showing the heat-seeking missile going down the chimney was supplied by the US air force, since it was taken by the plane which fired it, and that we are not told how many such missiles miss their target completely. She also points out that the sequence showing Patriot missiles exploding Scud's in mid-air was hard for anyone but a military expert to interpret: 'Is the flash a Patriot hitting a Scud, or a Patriot exploding too soon, and how many Scud's are missed altogether? Only the military really know – and perhaps even they don't at the time. But either way, the reporter is clearly relying on the interpretation of the flashes given by military people, and they have a propaganda job to do.' Bertha, who is studying computing and usually says she is 'not really interested in politics', is irritated by Cheryl's scepticism and does not really want to hear about it. However, Cheryl says she has studied similar 'news' reports from other wars, which is why she has her doubts. Bertha says Cheryl's teachers are all liberals and communists. Cheryl says this is rubbish, that some of her teachers are very 'Establishment' figures, sometimes acting as Government advisers, and that her course is one of the most respected in the US.

Again the question has three parts:

- 1.8.1 Look at Dewey's definition and decide to what extent Bertha and Cheryl display 'reflective thinking'. Again, are they 'active', 'persistent', etc.
- 1.8.2 Referring to our list of skills, do Bertha and Cheryl:
 - identify and evaluate assumptions?
 - judge the acceptability, especially the credibility of claims?
 - analyse, evaluate and produce explanations?
 - draw inferences?
 - produce arguments?
- 1.8.3 Would you say that Bertha or Cheryl was displaying critical thinking skills? Give your reasons.

1.4 **A final definition of critical thinking**

One last definition is worth reviewing. Michael Scriven has recently argued that critical thinking is 'an academic competency akin to reading and writing' and is of similarly fundamental importance. He defines it thus:

Critical thinking is skilled and active interpretation and evaluation of observations and communications, information and argumentation. (Fisher and Scriven, 1997, p. 21)

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It is worth unpacking Scriven’s definition a little. He defines critical thinking as a ‘skilled’ activity for reasons similar to those mentioned above. He points out that thinking does not count as critical merely because it is *intended* to be, any more than thinking counts as *scientific* simply because it aims to be. To be critical, thinking has to meet certain standards – of clarity, relevance, reasonableness, etc. – and one may be *more* or *less* skilled at this. He defines critical thinking as an ‘active’ process, partly because it involves *questioning* and partly because of the role played by *metacognition* – thinking about your own thinking. He includes ‘interpretation’ (of texts, speech, film, graphics, actions and even body language) because ‘like explanation, interpretation typically involves constructing and selecting the best of several alternatives [and it] is a crucial preliminary to drawing conclusions about complex claims’. He includes ‘evaluation’ because ‘this is the process of determining the merit, quality, worth, or value of something’ and much critical thinking is concerned with evaluating the truth, probability or reliability of claims.

It is unusual to include explicit reference to ‘observations’ in a definition of critical thinking, but, as our Gulf War example showed, what one sees or hears, for example, often requires interpretation and evaluation and this may well require the use of critical thinking skills. Scriven takes the term ‘information’ to refer to factual claims, and the term ‘communications’ to go beyond information to include questions, commands, other linguistic utterances, signals, etc. Finally ‘argumentation’ consists of language presenting reasons for conclusions. Perhaps the most striking feature of this definition is the way it recognises that ‘observations’ can be matters for critical thinking.

This is the last extension of the notion of critical thinking we shall draw to your attention. We have run through this survey of definitions to give you a sense of the development of thinking in this area, to show that it is a changing idea but one which has a core which remains constant, and to show you what a rich idea it is. It should be instructive to contrast what you have read in the previous few pages with the initial definition you gave yourself. In the chapters which follow, we shall give you extensive practice in developing some of the basic skills which belong to the core of critical thinking, but we hope that you will see this work in the rich context we have just described.

1.5 Dispositions and values of the critical thinker

It is clear that someone can have a skill which they choose not to use or not to use much: the example we gave earlier was of someone who

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can turn somersaults but who chooses not to. In the case of critical thinking, it is clear that someone could have the relevant skills but might not bother or choose to use them in appropriate situations; for example, they might show they had the skill by raising the right credibility questions in an examination, but they might not apply this skill in their other work or in everyday situations. Indeed, many people who have worked in the critical thinking tradition have thought there was something intrinsically wrong with such an attitude to good thinking. If we look back at Glaser’s definition, we see that he actually includes an ‘attitude of being disposed’ to consider problems thoughtfully as part of his very definition of critical thinking.

Glaser and others have argued that it makes no sense to have these skills, or to develop them and at the same time to fail to act on them whenever it is appropriate. They argue that if, for example, you are skilled at judging the credibility of evidence, you will see that this produces more reasonable beliefs than if you are rather more gullible – and that you cannot fail to see that this is better – that you will be led astray less often and that this is to your advantage. Thus, they argue, you cannot fail to see that this skill is worth using whenever significant questions of credibility arise; it is valuable and it will pay you to adopt the habit of using it, to be disposed to use it. It is hard to understand someone who develops these thinking skills and then does not bother to use them quite generally. They are undoubtedly valuable skills and, if you can get yourself into the habit of using them, they can greatly increase your understanding in many contexts. The moral is, do not just use them in the critical thinking class, but apply them in your other studies too and in everyday life. You may be surprised to discover how useful they are. To conclude these remarks on a personal note, I have been teaching critical thinking in a university context for some years and, as we proceed through the course, many of my students come to me and say how useful they find these skills in their other courses, then they nearly always add, ‘These skills are so useful, I cannot understand why we were not taught them at school.’

There is no doubt that these are valuable skills and that they will help you in many ways if you get into the habit of using them whenever it is appropriate, so do not just acquire the skills, but value them – and use them; in short become a critical *thinker*.

Question 1.9

Which thinking skills, if any, should be applied in the following situations?

1.9.1 Getting information from the Internet?

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- 1.9.2 Finding a telephone number in the telephone directory?
 - 1.9.3 Deciding whether to accept a job offer?
 - 1.9.4 Following a recipe for making a cake?
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1.6 ‘Critico-creative thinking’

As we said earlier, critical thinking is sometimes referred to as ‘critico-creative’ thinking. There are two related reasons for this. The first is that the term ‘critical thinking’ is sometimes thought to sound rather ‘negative’, as though one’s only interest is in adversely criticising other people’s arguments and ideas. This would be a serious mistake since (and this is the second reason) to be good at evaluating arguments and ideas one often has to be very imaginative and creative about other possibilities, alternative considerations, different options and so on. To be a good judge of issues it is not enough to see faults in what other people say, you need to base your judgement on the best arguments you can devise (in the time available) and this often requires that you think of relevant considerations other than those presented, look at issues from different points of view, imagine alternative scenarios and perhaps find other relevant information – in short, you will need to be quite creative.

For both these reasons some writers have wanted to speak of ‘critico-creative’ thinking to emphasise the positive, imaginative aspects of critical thinking. Unfortunately the result is a rather unwieldy expression – which has not caught on – so we shall use the term ‘critical thinking’ which is now so widely used, whilst understanding it in this positive, imaginative sense. Thus we shall use it in the same sense that one speaks, for example, of a theatre ‘critic’ – as someone whose comments and judgements may be either positive or negative. In short, critical thinking is a kind of evaluative thinking – which involves both criticism and creative thinking – and which is particularly concerned with the quality of reasoning or argument which is presented in support of a belief or a course of action.

1.7 Summary of this introduction

The critical thinking tradition is a long one and is still developing. However, it is not too difficult to summarise the ideas contained in the tradition which we have just explained.

It is clear that critical thinking is contrasted with *unreflective* thinking – the kind of thinking which occurs when someone jumps to a

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conclusion, or accepts some evidence, claim or decision at face value, without really thinking about it. It is a *skilful* activity, which may be done more or less well, and good critical thinking will meet various intellectual standards, like those of clarity, relevance, adequacy, coherence and so on. Critical thinking clearly requires the interpretation and evaluation of observations, communications and other sources of information. It also requires skill in thinking about assumptions, in asking pertinent questions, in drawing out implications – that is to say, in reasoning and arguing issues through. Furthermore, the critical thinker believes that there are many situations in which the best way to decide what to believe or do is to employ this kind of reasoned and reflective thinking and thus tends to use these methods whenever they are appropriate.

Does this attitude imply that there is just one correct way to think about any given problem? No. But it does imply that most of us could do it better than we do (that is, more skilfully/ reasonably/ rationally), if we asked the right questions.

This tradition is all about improving our own thinking by considering how we think in various contexts now, seeing a better model and trying to move our own practice towards that better model. It does not imply that there is just one correct way of thinking – which we should try to emulate – but that there are better ways of thinking than we often exhibit and that our poor thinking can be at least partially remedied by suitable practice. What follows in this book are the explanations and exercises which aim to do precisely this.

Further reading

Ennis (1996, chapter 1, and skim chapter 14); Passmore (1967).