

What is critical thinking and how can it be cultivated?

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The Australian Curriculum Assessment and Reporting Authority (ACARA) has identified a number of general capabilities as a key dimension of the Australian Curriculum. They encompass the knowledge, skills, behaviours and dispositions that, together with curriculum content in each learning area and the cross-curriculum priorities, will assist students to live and work successfully in the twenty-first century. They play a significant role in realising the goals set out in the *Melbourne Declaration on Educational Goals for Young Australians,* that all young people in Australia should be supported to become successful learners, confident and creative individuals, and active and informed citizens. The Australian Curriculum includes seven general capabilities. These are:

         Literacy

         Numeracy

         Information and communication technology capability

         Critical and creative thinking

         Personal and social capability

         Ethical understanding

         Intercultural understanding

These general capabilities can be understood as the “new basics” – a foundation for success in learning and in life.

In this paper I will examine one of these capabilities – critical thinking. I will seek to answer the following questions.  What is critical thinking?  Why is it important? How might it be cultivated (learned or taught)?  How can critical thinking be assessed? How might curriculum be designed to encourage the cultivation of critical thinking? How does critical thinking relate to the other general capabilities?

I will argue that, as a basic capability, critical thinking should receive at least as much policy emphasis in school systems as literacy and numeracy. I will describe how a better policy balance can be achieved by giving greater emphasis to the cultivation of critical thinking.

# What is critical thinking?

In a recent paper on critical thinking Doug McCurry (2013) usefully distinguishes between a global view of critical thinking in which it is seen as “all and any kind of good and rational thinking” or ‘the judgement view of critical thinking’ that sees critical thinking as involving multiple and conflicting considerations and uncertainty: weighing of evidence and the assessment of argument. (McCurry 2013 page 4)

An example of the global view is ACARA’s account of critical thinking as “at the core of most intellectual activity that involves students in learning to recognise or develop an argument, use evidence in support of that argument, draw reasoned conclusions, and use information to solve problems.” (ACARA 2013 page 66)

An example of the judgement view is Matthew Lipman’s account of critical thinking as “thinking that (1) facilitates judgement because it (2) relies on criteria (3) is self-correcting and (4) is sensitive to context” (Lipman 2003 page 211-212) Lipman explains that critical thinking employs criteria and can be assessed by appeal to criteria (Lipman 2003 page 213) It is thinking that is aware of its own assumptions and implications and conscious of the reasons and evidence that support this or that conclusion; is prepared to recognise factors that make for bias, prejudice and self-deception; involves thinking about its procedures at the same time as it involves thinking about its subject matter. (Lipman 2003 page 26)

For the purposes of this paper, I will adopt the ‘judgement view’ about critical thinking. The global view is inclusive of the judgement view, so my comments in relation to the judgement view will apply to the global view.

A significant feature of critical thinking is that it is unauthoritarian. Martha Nussbaum writes “Socratic critical inquiry… is utterly unauthoritarian. The status of the speaker does not count; only the nature of the argument.” For Nussbaum critical thinking involves the ability to think and argue for oneself, rather than defer uncritically to tradition or authority. (Nussbaum 2010 page 50)

# What is the rationale for critical thinking?

Lipman argues that one rationale for schools cultivating critical thinking in its students is that the schooling of future citizens in democracy entails getting them to be reasonable and this can be done by fostering children’s reasoning and judgement” (Lipman 2003 page 1)

Lipman elaborates on this rationale as follows:

Insofar as the question of knowledge and belief is concerned, I would say that the role of critical thinking is defensive: to protect us from being coerced or brainwashed into believing what others want us to believe without our having an opportunity to inquire for ourselves. There are great and powerful forces ranged against the individual in every society – the political, the military, and the economic are the most obvious examples – and their aim is often to get us to acquiesce without reflection in the views they want us to have. The armour of scepticism that critical thinking can provide is not an impervious one as far as any given individual is concerned, but in a populace so armoured it could be decisive. (Lipman 2003 page 47)

To put it a little more positively Martha Nussbaum argues that critical thinking is crucial to the promotion of a humane, people sensitive democracy dedicated to promoting opportunities for “life liberty and the pursuit of happiness” to each and every person. (Nussbaum 2010 page 25)

Amartya Sen develops this kind of argument further. According to Sen, democracy is best seen as ‘government by discussion’ – not just in terms of the demands for public balloting. (Sen 2009 page 324)

Underlying his idea of justice (and democracy) is an *open impartiality* invoking a wide variety of views and outlooks based on diverse experiences from far and near, including the points of view of individuals not impacted by the institutions. Sen suggests that if the discussion of the demands of justice is confined to a particular locality, there is a danger of ignoring or neglecting many challenging counter-arguments that might not have come up in local political debates but which are worth considering in an impartial perspective. Arguments that may at first seem ‘outlandish’ may help to enrich our thinking, particularly if we try to engage with the reasoning behind these points of view. (Sen 2009 page 407)

The concepts of “public reasoning” and “critical thinking” are closely related. Public reasoning requires critical thinking, and is a form of collective critical thinking.

Improved public debate is crucial to improving democracy understood as government by discussion. Harvard political philosopher, Michael Sandel, speaking in an American context, suggests that there is considerable room for improvement in public debate on moral issues. He characterises political argument in the USA as consisting “mainly of shouting matches on cable television, partisan vitriol on talk radio, and ideological food fights on the floor of Congress” (Sandel 2012 page 13)

Sandel sees American politics as overheated because “it is mostly vacant, empty of moral and spiritual content. It fails to engage with the big questions that people care about.” (Sandel 2012 page 13)

Similar comments could be made about the quality of public debate in many other democracies. A rationale for cultivating critical thinking is to enhance the quality of public debate, particularly on moral or ethical issues.

A second rationale for schooling cultivating critical thinking is that by fostering critical thinking that schools could “best prepare children for the world they would face when they grow up.” (Lipman 2003 pages 1-2)

Lipman develops this argument taking a historical perspective. He notes that “Outstanding among the intellectual virtues treasured in the ancient world were knowledge and wisdom. Knowledge was needed for cases in which the required decision could be made by rational means... But wisdom was necessary for cases that were rationally undecidable and where what had to be relied on instead were Solomonic judgements.”(Lipman 2003 pages 205-206) The modern notion of critical thinking equates to the ancient world’s notion of wisdom. What we today call critical thinking is a recent version of long standing concerns about “the adequacy of our thinking…to the increasingly difficult task at hand.” (Lipman 2003 page 208)

The ability to think well, for example, to examine, to reflect, to argue and to debate are important in addressing economic challenges relating to work in a knowledge economy. Robert Reich notes that in the American economy two categories of work are growing. (These trends are even more magnified in Australia.) The first he calls *symbolic analytic* work that has to do with identifying and solving new problems, and with analysing, manipulating and communicating through abstract symbols – numbers, shapes, words, ideas. (Reich 2005 page 128) The capacities to think well, examine, reflect, argue and debate clearly facilitate this category of work.

The second growing category of work involves personal services, such as nursing, child care, aged care, teaching and other caring services. (Reich 2005 page 129). Increasingly, success in personal service work (and to some extent symbolic analytic work) requires a strong *ethical* understanding of concepts such as duty of care, privacy, autonomy, consent, confidentiality, rights, fairness, wellbeing, occupational health and safety. Developing ethical understanding of the kind required for success as a youth worker, a nurse, an aged care worker, a disability support worker, a child care worker, a teacher – would be strongly facilitated by critical thinking.

A third rationale for schools cultivating critical thinking relates to entitlement. Lipman argues that it is widely agreed that children have a right to physical education, and literacy. He suggests that children also have a right to the development of their thinking capabilities – reasonableness, judiciousness, imaginativeness and appreciativeness, so that they can bring their potentials into closer connection with the requirements of modern communal life. (Limpan 2003 page 204)

# How is critical thinking best cultivated?

The OECD recommends that in teaching both direct and student-oriented instruction methods should be used. Direct instruction is built around problems with clear, correct answers that can be learned quickly. Student-centred instruction is associated with the teacher facilitating students’ own inquiry by allowing them time to find solutions to problems on their own. The OECD observes that while there is no consensus in the literature on which approach is better, an over-reliance on either approach is not recommended. (OECD 2012 page 138)

The cultivation of critical thinking in particular, requires a balanced combination of a range of different pedagogies. Of particular importance in cultivating critical thinking is the use of an inquiry-based pedagogy called Socratic pedagogy.

Lipman developed and refined a dialogue-based inquiry approach to teaching critical thinking called *Philosophy for Children* – a paradigm example of Socratic pedagogy. The approach is based on a ‘community of inquiry’ in which students listen to one another with respect, build on one another’s ideas, challenge one another to supply reasons for otherwise unsupported opinions, assist each other in drawing inferences from what has been said, and seek to identify one another’s assumptions. (Lipman 2003 page 20).

Such an approach is used in teaching mathematics in countries like Japan and China. Teachers pose a single well-chosen problem to students, which students reason through together. Students individually and as a group develop and present a variety of possible solutions for class discussion and further evaluation until everyone understands the concept from multiple perspectives. At the end of this process, the students may derive a formula or set of principles to characterise what they have learned. (Darling-Hammond 2011 page 13)

Socratic Pedagogy is an excellent tool for cultivating critical thinking. Socratic Pedagogy engages students in philosophical thinking, in giving reasons for their views, accommodating counter-examples to their definitions and identifying principles underlying their points of view.

Lipman argues that teaching of content is not useless. He adds that there is nothing wrong with attempting to remodel lesson plans so as to make them more likely to encourage critical reflection and to strengthen judgement within and among the disciplines. But, he suggests, these efforts will only be successful if students are permitted to examine directly and for themselves the standards, criteria, concepts and values that are needed to evaluate whatever it is they are talking and thinking about. Student must be given the tools of inquiry.

Having said this, Socratic Pedagogy could be supported by the explicit teaching of logic, perhaps as part of Mathematics. Through worked examples, students could learn to identify, in a variety of texts, conclusions of arguments and the premises supporting those conclusions. Students could learn different ways of evaluating arguments, again through worked examples, and to distinguish between the validity of an argument (an argument is valid where its conclusion is entailed by its premises) and the soundness of an argument (an argument is sound if it is valid and its premises are true.) Students could learn to identify patterns of valid arguments.

Good lectures can *model* critical thinking by having a clear and logical structure.

A lecture can also *demonstrate* critical thinking by clearly and explicitly identifying a position, reasons for and against the position and principles pertinent to the argument.

Lipman notes that “It is not that the lecture is an inferior or obsolete mode of pedagogy. It can be brilliant; it can be a work of art; it can often penetrate deeper into its subject matter from its single point of view than can a discussion from its multiple points of view. But to the extent that it is fascinating and charismatic, it turns listeners into passive admirers rather than active inquirers. Too often it inhibits rather than encourages creativity and the same is even true of critical thinking. It appropriates the means of intellectual production instead of turning them over to the students so as to enable them to become productive themselves.” (Lipman 2003 page 57)

Lipman rightly notes that values, such as peace, cannot be effectively taught. They must be practiced, embodied and lived. (Lipman 2003 page 114) Similarly, judgement and reasonableness cannot be effectively taught. They must be practiced, embodied and lived.

McCurry (2013) identifies a number of routines for learning critical thinking. For example, a ProCon table identifies a proposition in the top row of a table and then outlines different arguments for or against that proposition in the rows below.

|  |  |  |  |
| --- | --- | --- | --- |
| The proposition to be analysed | | | |
| 1 | Pro |  | Con |
| 2 | Pro argument 1 | 🡺 | Rebuttal of pro argument 1 |
| 3 | Rebuttal of con argument 1 | 🡸 | Con Argument 1 |
| 4 | Pro argument 2 | 🡺 | Rebuttal of pro argument 2 |
| 5 | Rebuttal of con argument 2 | 🡸 | Con Argument 2 |

The ProCon table reflects the fact that critical thinking involves exploring at least two sides of an issue, and it assumes that every pro and con argument is subject to counter argument.

A ProCon table could be elaborated to include:

* The identification of a question to which the proposition is a possible answer
* The identification of replies to rebuttals
* The identification of principles appealed to in arguments for or against a proposition.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Question | | | | | |
| Possible Answer  *Prompt Question: What are some possible answers to question?* | | | | | |
|  | Pro Argument 1 | 🡺 | Objection | 🡺 | Reply |
|  | *Prompt Question: What reasons can we give to support this answer?* |  | *Prompt Question: What would someone say if they disagreed?* |  | *Prompt Question: Could something be said in response to this?* |
|  | Con Argument 1 | 🡺 | Objection | 🡺 | Reply |
|  | *Prompt Question:*  *What reasons can we give against this answer?* |  | *Prompt Question: What would someone say if they disagreed?* |  | *Prompt Question: Could something be said in response to this?* |
|  | Pro Argument 2 | 🡺 | Objection | 🡺 | Reply |
|  | Con Argument 2 | 🡺 | Objection | 🡺 | Reply |

(Based on Kovach 2013 pages 2-3)

# How might critical thinking best be assessed?

The OECD states that to improve learning in school classrooms policies need to ensure that schools promote the use of a balanced combination of student-centred and direct *instruction with aligned curricular and assessment practices* (OECD 2012 page 136)

Which assessment practices align with the pedagogical practices for cultivating critical thinking?

According to Michael Fullan “Quality instruction requires getting a small number of practices right. These practices involve knowing clearly and specifically what each student can and cannot do, followed by tailored intervention that engages students in that particular learning in question, and then doing the assessment-instruction-correction process on a continuous basis.” (Fullan 2010 page 6)

In direct instruction the teacher provides “feedback” to a learner engaged in an activity. The assessment-instruction-correction process is a kind of feedback loop. Worked examples and process worksheets serve a similar role. They provide an instructive “standard” to enable self-assessment and correction in the process of carrying out a task.

Assessment is an integral part of the direct instruction approach favoured by Fullan.

Are there any assessment practices that align with Socratic Pedagogies?

The Structure of the Observed Learning Outcome (SOLO) taxonomy, (Biggs 1995, Biggs and Collis 1982) provides a systematic way of describing how a learner’s performance grows in complexity when mastering varied tasks. The SOLO taxonomy postulates five levels of increasing complexity in growth or development of concepts or skills:

Prestructural The task is engaged, but the learner is distracted or misled by an *irrelevant* aspect belonging to a previous stage or mode

Unistructural The learner focuses on the *relevant* domain and *picks up one aspect* to work with

Multistructural The learner *picks up more and more* relevant and correct features, but does not integrate them

Relational The learner now *integrates* the parts with each other, so that the whole has a coherent structure and meaning

Extended abstract The learner now *generalises* the structures to take in new and more abstract features, representing a new and higher mode of operation (Biggs and Collis 1991 page 65)

Implicit in the SOLO model is a set of criteria for evaluating the quality of a response to (or outcome of) a task utilising general capabilities. The quality (or richness or complexity) of a response to a complex task varies with the *relevance* of the considerations brought to bear on the task, the range or *plurality* of those considerations, and the extent to which these considerations are *integrated* into a whole, and *generalised* to or related to, broader contexts.

The following reasoning progression based on a framework proposed by Songer (2009) captures critical thinking using the SOLO taxonomy. The levels are as follows.

|  |  |
| --- | --- |
| **SOLO Level** | **Critical thinking progression** |
| *Pre-structural* | Student makes a claim. |
| *Uni-Structural* | Student makes a claim and gives a reason for that claim. |
| *Multi-Structural* | Student makes a claim and provides a range of (unrelated) reasons supporting that claim. |
| *Relational* | Student makes a claim, develops a valid argument for the claim, identifies objections and counter-arguments to the claim and replies to those objections and counter-arguments |
| *Extended Abstract* | Student makes a claim, develops a valid argument for the claim, identifies objections and counter-arguments to the claim and replies to those objections and counter-arguments, articulates and tests general principles supporting the claim. |

A teacher using the SOLO framework for assessing an argument proposed by a student might seek evidence of:

* Reasons advanced in support of a claim – are they relevant to that claim?
* The range of reasons advanced in support of a claim – are a range of relevant issues considered?
* The integration of relevant considerations into a valid argument – does the student develop a valid argument for the claim, identify objections and counter-arguments to the claim and reply to those arguments?
* The application and testing of principles – does the student identify a general principle in support of a claim, and test that principle?

The SOLO model can be used with particularly good effect in connection a student-centred pedagogy – such as Socratic Pedagogy.

# How might curriculum best support critical thinking?

Curriculum specifications in syllabus documents can influence the types of pedagogies adopted by teachers. For example, giving too much emphasis to propositional knowledge (knowing that...) in a syllabus over skills or capabilities (knowing how...), or specifying too much content (propositional knowledge) in syllabus documents can result in pressuring teachers to rely on didactic pedagogies to deliver that content. We have seen that critical thinking is best cultivated through using a combination of didactic and inquiry-based pedagogies. While in many English speaking nations there is a well-established division of labour between curriculum developers and teachers that curriculum authorities make decisions about what is in the curriculum and teachers make decisions about how to teach it, *curriculum developers need to be mindful of the influence on pedagogy that curriculum might have*. Care needs to be taken with the amount of content specified in syllabus documents. There are political pressures to include too much content in syllabus documents, since it is considered that to say that particular content should not be included in the curriculum is to suggest that it is not important.

Is it feasible to reduce the content specified in curriculum without compromising quality of education?

Joanne Capper suggests that curriculum should focus on central ideas, and aim for deep understanding of central ideas rather than wide coverage of topics... Attention should be focussed on concepts rather than facts. Students should learn key concepts, concepts should be interrelated, and relations should be established between old and new knowledge. (McCurry 2013 page 10) Costa advocates the selection of relevant, generative and wondrous content to serve as the vehicle for learning. (McCurry 2013 page 12)

One way of reducing content and at the same time to support the cultivation of critical thinking is to give greater emphasis to what Lipman calls *essentially contestable concepts*—concepts that lie at the heart of any discipline when it is presented as a living thing rather than simply as a body of established knowledge. This suggests that one way of animating the disciplines with the spirit of inquiry is by attention to the philosophically problematic within them. Lipman argues that if thinking in the classroom is considered desirable, the curriculum cannot present itself as clear and settled, for this paralyses thought. The curriculum should bring out aspects of the subject matter that are unsettled and problematic in order to capture the laggard attention of the student and to stimulate them to form a community of inquiry. (Lipman 2003 page 20)

Attending to the philosophically problematic within a discipline is one way of reducing the content in curriculum – making it less crowded, and at the same time generating or cultivating thinking capabilities.

# What is the relationship between critical thinking and other capabilities?

Critical thinking underpins literacy and numeracy. At their higher levels, literacy and numeracy require critical thinking. (McCurry 2013 page 3) An important component of literacy is to write papers with well-structured arguments, and analyse the arguments presented in other texts. (Nussbaum 2010 page 55). Understanding mathematical concepts requires the ability to reason.

Critical and creative thinking complement each other. Lipman suggests that when we consider an instance of creativity traditional criteria may fail to come to grips with that which is original, unique and distinctive. Criteria more typical of creative than critical include: Originality – thinking for which there are no clear precedents: Imagination – envisaging a possible world, or the details of such a world, or the journey one may take to reach such a world; Experimentation – creative thinking is hypothesis guided rather than rule-guided and involves a constant experimentation; Surprise – creative thinking generates astonishment and wonder. (Lipman 2003 page 245)

An emphasis on critical thinking can integrate cognitive development with personal and social development. (McCurry 2013 page 3) Caring and critical thinking complement each other. Lipman argues that our emotions shape and direct our thought, provide them with a framework, a sense of proportion, with a perspective, or better still, with a number of different perspectives. To care is to focus on that which we respect, to appreciate its worth, to value its value. As Amartya Sen observes reason and emotion play complementary roles in human reflection. (Sen 2009 page 39) There is no irreducible conflict between reason and emotion (Sen 2009 page xvii) If we are strongly moved by some particular emotion, there is good reason to ask what that tells us. Reason does not exclude taking note of the value of instinctive reactions, nor ignore the informative role that our mental reactions often play. And all this is quite consistent with not giving our unscrutinised instincts an unconditional final say. (Sen 2009 page 51)

Critical thinking, as I have defined it in this paper, is necessary to ethical understanding. Ethical thinking and understanding can be seen as critical thinking applied to Socrates’ question “How should we live?”

Recall that according to Sen, underlying his idea of justice (and democracy) is an *open impartiality* invoking a wide variety of views and outlooks based on diverse experiences from far and near, including the points of view of individuals not impacted by the institutions. Sen suggests that if public discussion is confined to a particular locality, there is a danger of ignoring or neglecting many challenging counter-arguments that might not have come up in local political debates but which are worth considering in an impartial perspective. (Sen 2009 page 407) If so, intercultural understanding informs critical thinking.

# Conclusion

In this paper I have argued that the cultivation of critical thinking, understood as “thinking that facilitates judgement” should receive stronger emphasis in schooling, given its benefits to the students as future citizens and workers, and to the health of democracy and the knowledge society. Cultivation of critical thinking requires greater emphasis on Socratic Pedagogies, such as Philosophy for Children, though it can be supported by didactic approaches. Such pedagogies can be supported by the adoption of assessment for learning approaches such as the SOLO taxonomy as a framework for assessment. The Australian Curriculum can support the more widespread adoption of Socratic Pedagogies by reducing content in the curriculum in turn by emphasising essentially contestable concepts within and between the disciplines. Given the inter-relationships between critical thinking and other general capabilities, the greater emphasis on critical thinking would be strategic in promoting the cultivation of all of the general capabilities, and so realising the goals of the Melbourne Declaration that all young people in Australia should be supported to become successful learners, confident and creative individuals, and active and informed citizens.

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