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CHAPTER 1

Creative Thinking

What it is and why it matters

> 'There is no use trying,' said Alice. 'One *can't* believe impossible things.'
>
> 'I daresay you haven't had much practice,' said the Queen. 'When I was your age, I always did it for half-an-hour a day. Why, sometimes I've believed as many as six impossible things before breakfast.'
>
> Lewis Carroll, *Through the Looking Glass, and What Alice Found There* (1872, p. 100)

In this chapter we offer a definition of creative thinking. We demonstrate that this capability has a long history, is highly relevant today and needs to be at the heart of the formal and informal experiences of school. As Lewis Carroll implies through the mouthpiece of the Queen in *Through the Looking Glass*, it can, like using imagination, be practised.

A short history of creative thinking

Creative thinking is what you do when you are being creative and creativity is the outcome of this. Creative activity is purposeful and generates something which is to some degree original and of value. Creative thinking is almost always a social activity and almost always takes place in response to an issue or problem facing an individual or group.

The study of creativity is some seventy years old. Most researchers trace its beginnings to the work of J. P. Guilford in the middle of the last century. Guilford (1950) suggested that there are two kinds of thinking: convergent (coming up

with one good idea) and divergent (generating multiple solutions). In an English lesson, for example, a convergent response to the title 'The End of the World' might be to focus on a post-nuclear disaster, while a divergent approach might take any number of scenarios – terrorism, global warming, invasion by Martians and so forth – as its starting points. Building on this line of thought, E. Paul Torrance (1970) developed four sub-categories: fluency, flexibility, originality and elaboration. Each of these might be applied in our example as an indication of the degree of creative thinking being employed.

More recently, Robert Sternberg (1996) has argued that creativity is three dimensional. It requires synthesising (the ability to see problems in new ways and escape from conventional thinking), analysing (being able to recognise which ideas are worth pursing and which are not) and contextualising (having the skills in different settings to persuade others of the value of any specific idea).

Of course, creative thinking is both a solo and collective activity and most often has a social component. Creativity can be viewed as domain-specific (e.g. being creative in science) or domain-free (being creative in any situation). Anna Craft reminds us that while only a few may aspire to be an exceptional genius, all of us can show a more ordinary form of creative thinking – what she termed 'little c creativity' (2001b). This book is full of suggestions to help teachers and their students grow their 'little c creativity'.

Donald Treffinger (Treffinger et al., 2002) found 120 definitions of creativity and helpfully grouped them into four broad categories: generating ideas; digging deeper into ideas; openness and courage to explore ideas; and listening to one's inner voice. We'll touch on each of these four ideas in this book. Sir Ken Robinson's celebrated TED talk, 'Do Schools Kill Creativity?' (2006), has helped to bring global interest to this topic and challenged us all to think about the way that schools are too often organised *not* to develop creative thinkers.

Two aspects of creative thinking have received increasing attention over the last decade: *problem-solving and critical thinking*.

When the respected international testing body PISA decided to explore collaborative problem-solving in 2015, this aspect of creative thinking received a significant boost (OECD, 2013). PISA argued that there was growing interest

across the world in enquiry-based and problem-led learning, that employers valued the capability to solve problems and that such capabilities were so important that we should try to assess them. Various countries across the world (Singapore and Australia are just two examples) have begun to reflect this kind of thinking in their national curricula. Along with English, maths and science, creative problem-solving is increasingly being held up as a core part of what schools should be teaching.

The table below shows how PISA broke down collaborative problem-solving into its component elements. Along the top are the three main elements of collaborative problem-solving and down the left-hand side is how these might be developed over time.

MATRIX OF COLLABORATIVE PROBLEM-SOLVING SKILLS

	Establishing and maintaining shared understanding	**Taking appropriate action to solve the problem**	**Establishing and maintaining team organisation**
Exploring and understanding	Discovering perspectives and abilities of team members	Discovering the type of collaborative interaction to solve the problem, along with goals	Understanding roles to solve the problem
Representing and formulating	Building a shared representation and negotiating the meaning of the problem (common ground)	Identifying and describing tasks to be completed	Describing roles and team organisation (communication protocol/rules of engagement)

	Establishing and maintaining shared understanding	**Taking appropriate action to solve the problem**	**Establishing and maintaining team organisation**
Planning and executing	Communicating with team members about the actions to be/being performed	Enacting plans	Following rules of engagement (e.g. prompting other team members to perform their tasks)
Monitoring and reflecting	Monitoring and repairing the shared understanding	Monitoring results of actions and evaluating success in solving the problem	Monitoring, providing feedback and adapting the team organisation and roles

Source: OECD (2013, p. 11)

Collaborative problem-solving, as its name suggests, recognises that this activity has both a social component and a set of cognitive and non-cognitive skills useful for solving problems.

Critical thinking has been gaining in importance too. Its roots go back to Socrates and his approach to probing questioning. In Europe, the works of Francis Bacon (*Of the Proficience and Advancement of Learning, Divine and Human*, 1605) and René Descartes (*Rules for the Direction of the Mind*, 1701) laid out the foundations for an approach to thinking that is systematic and disciplined – the foundations of what we would today think of as scientific enquiry.

CHAPTER 2

Cultivating Creative Thinkers

Signature pedagogies

> Creativity isn't a switch that's flicked on or off; it's a way of seeing, engaging and responding to the world around you.
>
> Rod Judkins, *The Art of Creative Thinking* (2015, pp. 6–7)

Let's go back to one of our questions in the introduction. If you wanted to teach someone how to become more creative and better able to solve problems, what methods would you choose? How, in short, could you help them to become creative thinkers?

In this chapter we will explore the pedagogies and teaching and learning methods that are most likely to cultivate young people who are creative thinkers.

Teaching for capability

Let's remind ourselves of the four-step process for cultivating any capability which we outlined in the introduction:

Step 1: Develop real understanding of the capability.

Step 2: Establish the classroom climate. Use of space/layout, teacher modelling, language and rewards which show a consistent approach to pedagogy.

Step 3: Manage the learning. Methods chosen to deliver pedagogical flexibility for different outcomes.

Step 4: Build learner engagement and commitment to the capability.

In this chapter we are going to be focusing on steps 2 and 3, and beginning to see some of the ways in which step 4 can be achieved.

Stop and think for a moment about a particular class or group of students that you know well. Now have another look at our five-dimensional model on page 22 and think specifically about some of the more concrete aspects of creative thinking – like questioning, sticking with difficulty or giving and receiving feedback, for example.

Reflect on how you currently teach these (if you do). If you don't currently focus on them specifically, consider how you might introduce and teach a lesson or series of lessons in which, as well as whatever subject you are focusing on, you explicitly try to embed one of these skills too. We use the climate-related ideas of space, modelling, language and rewards, and a range of method-focused ideas to think some of this through.

Let's suppose you are teaching science. How do you create a laboratory environment in which students ask really good questions and are deeply inquisitive? Or maybe it's an English lesson and you are pondering how to help a student write more fluently and more extensively in English, or to stick with the process of writing which they currently find challenging. Perhaps you want maths students to share their workings on a difficult problem in pairs and give useful feedback to each other as to how they went about it.

For each of these three examples it is possible to use steps 2 and 3 as a mental prompt. What kind of classroom climate would be conducive? For instance, if you are trying to encourage students to work collaboratively on an agreed challenge, you may want the classroom laid out so that it is more like a workshop where they can get tools or materials as they need them – rather than a more traditional classroom where such things are in a cupboard to which you hold the key.

How might you, as the teacher, model creative thinking? By breaking it down into its five habits you could address persistent, for example, as you demonstrate your willingness to grapple. As you try to make that new app work in class, what kind

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of language will be most helpful? We know that it is beneficial to learners if they can think of their progress as provisional and emergent, rather than inevitable or fixed. To this end, saying that you can't do something is unhelpful. Suggesting instead that you cannot *yet* work out how to do it is much more useful.

Let's take another habit: inquisitive. How might you show yourself to be an inquisitive learner when a student asks you a question to which you don't know the answer? Can you model to students how you think about what you *do* know in order to reason what the answer might be?

How will you reward success in achieving an aspect of creative thinking? Within a classroom it is perfectly possible to create your own internal currency for success in creative thinking. This could be as simple as explicitly noticing achievements ('Well done for sticking with that tricky sum, Jim') or as complex as a reward system for all aspects of creative thinking – as used by one of our case study schools, Thomas Tallis (see Chapter 5).

Which teaching methods will you choose? Let's suppose you are trying to encourage better questioning. What methods would work best? Do you start a lesson by introducing a mystery item and inviting speculation about it? Do you begin with questions on a new topic which students have pre-prepared as part of their homework? Do you have a part of one of the classroom's walls already designated as a 'question wall' where interesting and tricky questions are regularly posted? Any one of these ideas would be a useful way of approaching the subject of questioning.

Many educators have pondered ways of promoting better questioning and enquiry. We particularly like the set of questions used by the International Baccalaureate Organization in their *IB Learner Profile Booklet*:

- Is it possible to create more experiences and opportunities in the classroom that allow students to be genuine inquirers?
- How could we give students more time to develop their ability to work effectively as a team?
- Could we create more opportunities to discuss the ethical issues that arise in the subjects we teach?