

Pedagogy for a
Changing World

Teaching Creative Thinking

Developing learners who
generate ideas and can
think critically

Bill Lucas and Ellen Spencer



Series Introduction

Capabilities and pedagogy

Ensuring that all people have a solid foundation of knowledge and skills must therefore be the central aim of the post-2015 education agenda. This is not primarily about providing more people with more years of schooling; in fact, that's only the first step. It is most critically about making sure that individuals acquire a solid foundation of knowledge in key disciplines, that they develop creative, critical thinking and collaborative skills, and that they build character attributes, such as mindfulness, curiosity, courage and resilience.

Andreas Schleicher and Qian Tang, *Universal Basic Skills: What Countries Stand to Gain* (2015, p. 9)

Changing roles for schools

Across the world there is a great shift taking place. Where once it was enough to know and do things, our uncertain world calls for some additional learning. We call them 'capabilities'. Others call them 'dispositions', 'habits of mind', 'attributes' or 'competencies', words we find very helpful. Some refer to them as 'non-cognitive skills', 'soft skills' or 'traits', none of which we like given, respectively, their negative connotations, tendency to belittle what is involved and association with genetic inheritance.

Our choice of capabilities is pragmatic. A country in the northern hemisphere like Scotland is actively using the term, as is Australia at the opposite end of the earth. If we had to choose a phrase to sum up our philosophy it would be 'dispositional teaching' – that is to say, the attempt specifically to cultivate in learners certain dispositions which evidence suggests are going to be valuable to them both at school and in later life.

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We know that the shift is underway for four reasons:

1. One of the 'guardians' of global comparative standards, PISA, is moving this way. In 2012, as well as tests for 15-year-olds in English, maths and science, they introduced an 'innovative assessment domain' called 'creative problem-solving'. This became 'collaborative problem-solving' in 2015 and will become 'global competence' in 2018. 2021's assessment domain is 'creative thinking'.¹
2. Researchers the world over are beginning to agree on the kinds of capabilities which do, and will, serve students well at school and in the real world. We'll explore this increasingly consensual list later on, but for now we want to share just some of the key thinkers to reassure you that you are in good company: Ron Berger, Guy Claxton, Art Costa, Anna Craft, Angela Duckworth, Carol Dweck, K. Anders Ericsson, Chris Fadel, Michael Fullan, Howard Gardner, Leslie Gutman, Andy Hargreaves, John Hattie, James Heckman, Lois Hetland, Bena Kallick, Tim Kautz, Geoff Masters, David Perkins, Lauren Resnick, Ron Ritchhart, Sir Ken Robinson, Andreas Schleicher, Ingrid Schoon, Martin Seligman, Robert Sternberg, Louise Stoll, Matthew Taylor, Paul Tough, Bernie Trilling, Chris Watkins, Dylan Wiliam and David Yeager. We would include our own work in this field too.
3. Organisations and well-evidenced frameworks are beginning to find common cause with the idea of capabilities. The Assessment and Teaching of 21st Century Skills project, Building Learning Power, the Expeditionary Learning Network, the Global Cities Education Network, Habits of Mind, New Pedagogies for Deeper Learning, Partnership for 21st Century Learning and the Skills4Success Framework are just a few examples. We'd include our own Expansive Education Network in this too.

1 Every three years the Programme for International Student Assessment (PISA) undertakes a worldwide study for the Organisation for Economic Co-operation and Development (OECD) in member and non-member nations of 15-year-old school students' performance in mathematics, science, reading and in one other 'innovative domain'. With Jack Buckley, Bill Lucas is co-chair of the Strategic Advisory Group overseeing the development of the creative thinking test in 2021.

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4. Inspirational leaders across the world are very gradually showing us that you can powerfully embed capabilities into the formal, informal and hidden curriculum of schools – if you have a mind to do so. Here are five examples: Col·legi Montserrat in Spain, Hellerup School in Denmark, School 21 and Thomas Tallis School in England, and Rooty Hill High School in Australia. You'll doubtless have your own favourites to add. We admire these schools and their courageous teachers. Throughout the series, we hope that their stories and our grounded practical advice will serve to ensure that hundreds of thousands of schools across the world see the value of systematically cultivating capabilities, *as well as* deep disciplinary knowledge and useful academic or practical skills.

Increasingly, 'character' is the word used to describe the cluster of capabilities which are useful in life, with a further clarification of the term 'performance character' suggesting those attributes which are associated with excellence in situations where performance is called upon – an academic test, examination, sporting match or any extra-curricular activity in which concentrated demonstration of a skill is called for.

All this means that as well as ensuring, as Andreas Schleicher and Qian Tang put it in the quotation which begins this chapter, all young people develop a solid foundation of knowledge and skills while at school, they also need to acquire a set of important capabilities.

The purposes of education

Parents, educators and policy-makers alike have many hopes for the education of children and young people. But with so many ideas about what schooling might achieve, it is hard to reach any kind of consensus. Nevertheless, in late 2015, the UK parliament initiated an inquiry into the 'purpose of education'. On the one hand, it is a telling admission if a government has to ask such a fundamental question. On the other, it could be construed as a sign of strength, as a recognition that times are changing.

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At the Centre for Real-World Learning, we worked with a number of national bodies to see if common agreement could be reached. The list below is what we came up with, and it is indicative of the sorts of things we might all wish for our students' education to achieve (Lucas and Spencer, 2016). The first six are particularly relevant to this series of books, but the remainder also give a sense of our values. We want educational goals which:

1. work for all young people
2. prepare students for a lifetime of learning at the same time as seeing childhood and school as valuable in their own right
3. see capabilities and character as equally important as success in individual subjects
4. make vocational and academic routes equally valued
5. cultivate happier students
6. engage effectively with parents
7. engage well with business
8. use the best possible teaching and learning methods
9. understand how testing is best used to improve outcomes
10. empower and value teachers' creativity and professionalism
11. proactively encourage both rigorous school self-improvement and appropriate external accountability.

Which capabilities matter most?

Let's look in more detail at the third item on our wish list: seeing capabilities and character as equally important as success in individual subjects. In the last decade, we have begun to understand with greater clarity those capabilities which are particularly useful. Here are two lists, the first from an economic perspective (Heckman and Kautz, 2013) and the second through the eyes of educational researchers (Gutman and Schoon, 2013). Both sets of researchers are attempting to describe those capabilities or, in some cases, transferable skills which will improve outcomes for individual learners and wider society.

Heckman and Kautz:

Perseverance
Self-control
Trust
Attentiveness
Self-esteem and self-efficacy
Resilience to adversity
Openness to experience
Empathy
Humility
Tolerance of diverse opinions
Engaging productively in society

Gutman and Schoon:

Self-perception
Motivation
Perseverance
Self-control
Metacognitive strategies
Social competencies
Resilience and coping
Creativity

The striking thing about these lists, to us, is how similar they are. While we may want to interrogate the terms more closely, the general direction is clear. The demand side, from employers, is similar in its emphasis to that of the educational researchers. The Confederation of British Industry launched a campaign setting out the kinds of capabilities it wanted young people to acquire at school. Their list included: grit, resilience, curiosity, enthusiasm and zest, gratitude, confidence and ambition, creativity, humility, respect and good manners, and sensitivity to global concerns (CBI, 2012).

The idea of signature pedagogies

If we are reaching consensus as to the kinds of capabilities increasingly being seen as valuable, what about the kinds of teaching and learning methods that might cultivate them? Is there a similar level of agreement? In truth, there is probably less so, mainly because, regardless of subject matter, there are some deeply engrained pre-perceptions. Teaching authoritatively from the front, for example, is something that those who see themselves as ‘traditionalists’ might advocate, but that most people would agree is only one kind of good teaching. By contrast, those who see themselves as more ‘progressive’ would argue that good teachers should be much less visible and their students engaged in self-organised group activities, another potentially good kind of more facilitative teaching.

We’d like to urge you not to adopt either of these binary positions, but instead to ask yourself some different questions:

- If I wanted to teach a student how to become more creative and better able to solve problems, what methods would I choose?
- If I wanted my students to become more resilient, what methods would I choose?
- If I wanted my students to be full of zest for learning, what methods would I choose?

Before you answer, we need to introduce you to an important concept – the idea of *signature pedagogies*. First suggested by Lee Shulman in the context of preparing learners for different vocational routes, these are ‘the types of teaching that organize the fundamental ways in which future practitioners are educated for their new professions’ (Shulman, 2005, p. 52). Shulman talks of the three dimensions of a signature pedagogy:

1. Its surface structure: ‘concrete, operational acts of teaching and learning, of showing and demonstrating, of questioning and answering, of interacting and withholding, of approaching and withdrawing’ (ibid., pp. 54–55).
2. Its deep structure: ‘a set of assumptions of how best to impart a certain body of knowledge and know-how’ (ibid., p. 55).

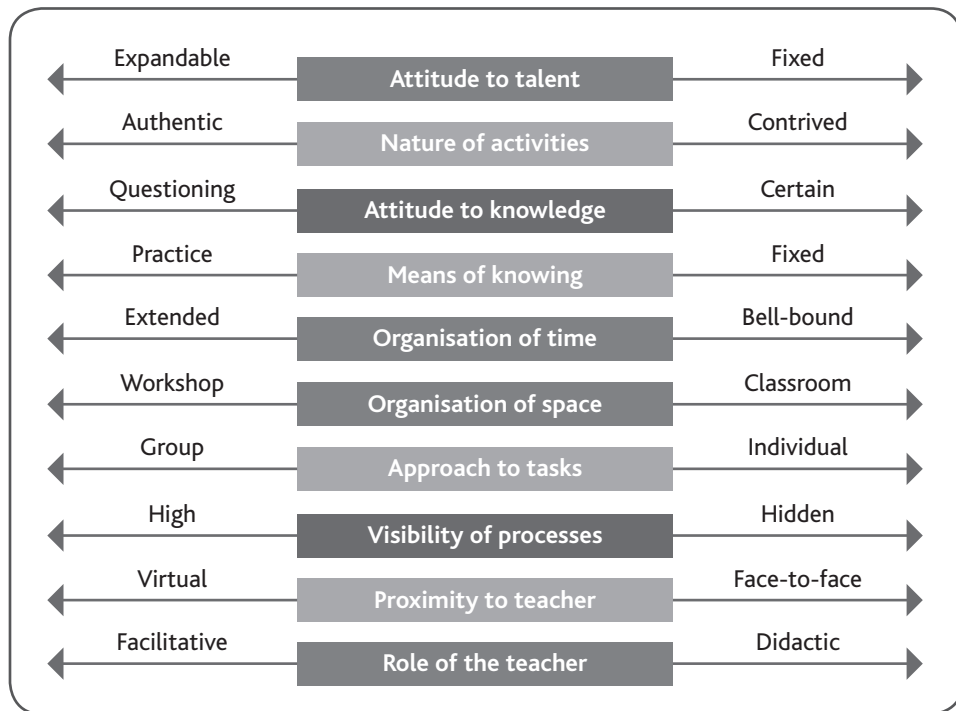
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3. Its implicit structure: ‘a moral dimension that comprises a set of beliefs about professional attitudes, values, and dispositions’ (ibid., p. 55).

It’s not much of a leap to think not about the fundamentals of a particular profession but instead of a particular capability. Suppose it were perseverance: how would you model and demonstrate it? What know-how does someone who is a good perseverer show, and how can you impart the clues of persevering to students? What are the underpinning self-belief and can-do dispositions that reinforce perseverance? Quite soon you are getting under the skin of a target capability. You begin to realise that some methods – having tactics for getting unstuck, asking for help, self-talk to keep going when others have given up – might be what you need to focus on.

Signature pedagogies are the teaching and learning methods which are most likely to lead to the desired capability and, throughout the series, we will be exploring these. In our earlier book, *Expansive Education: Teaching Learners for the Real World* (Lucas et al., 2013a), we introduced a ten-dimensional framework to help teachers think more carefully about the kinds of teaching and learning methods they might select. To do this, we encouraged them to reflect more about the kinds of outcomes they desired. Each line of our dimensions then serves as a prompt to think about learning methods suited to the desired outcome or outcomes and matched to a specific context.

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A TEN-DIMENSIONAL FRAMEWORK OF PEDAGOGICAL CHOICES

Source: Lucas et al. (2013a, p. 136)

In some cases (e.g. our attitude to talent and the visibility of processes), we have powerful research evidence from Carol Dweck (2006) and John Hattie (2009) which means that we are always likely to choose methods which put us at the left of the continuum whatever we are teaching. But in others (e.g. means of knowing, approach to tasks and role of the teacher), decisions are likely to depend on the nature of the task, the timing within a lesson and the desired outcome. Take 'means of knowing' as an example and it becomes clear that in most situations teachers will want learners to be confident in both theory and practice. The question is really one of timing. Do you tell students that there is something called Ohm's law before you encourage them to play around with different ways of assembling electrical circuits, or do you let them discover the properties of voltage and current more experimentally before explaining that they are not the first to have noticed some important relationships between the two? The teacher decides.

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The more a teacher moves from an ‘instruction’ approach to teaching, to what Chris Watkins (2005, p. 13) calls a ‘co-construction’ or more facilitative approach, the more decisions about the use of time, space and tasks look different and the more the role of the teacher changes. ‘Good’ teaching is an effective blend of the methods which are most likely to achieve desired outcomes. Typically these are a blend of capabilities, skills and knowledge.

A four-step process to cultivating capabilities in young people

From work with teachers across the world, and from the kinds of initiatives listed earlier in this introduction, there is a considerable amount known about how best to develop the kinds of capabilities at the core of performance character. Essentially it is a four-step process, as follows.

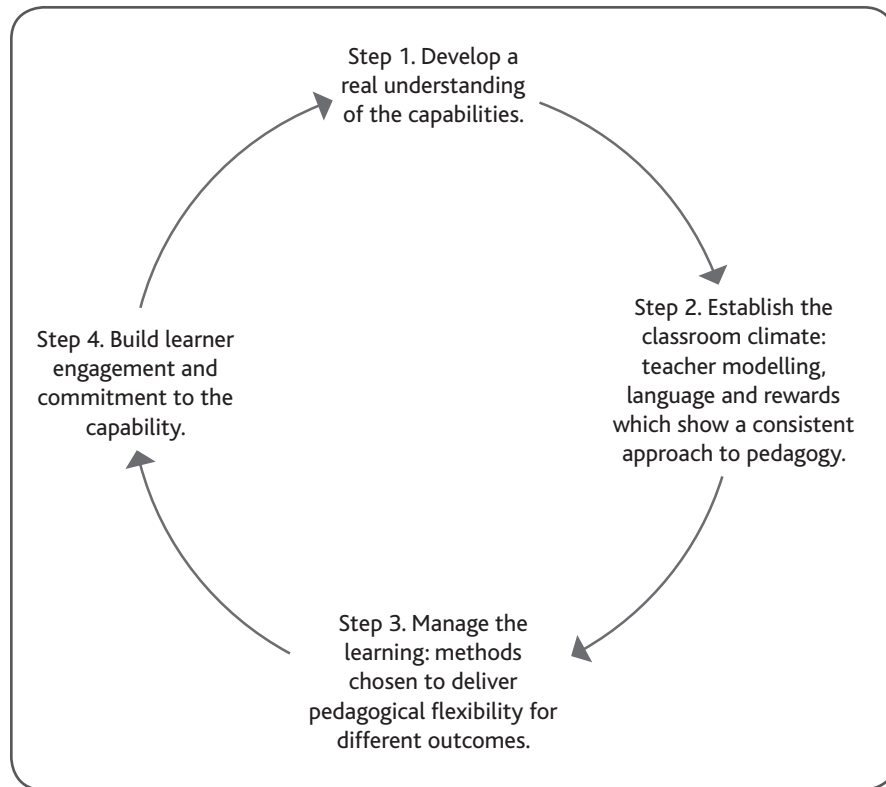
Step 1: Understand the capabilities

As well as being subject-matter and skill experts, teachers have a vital third role: cultivating capabilities. Just as decisions have to be made about whether the timetable has scope to fit in both French and Spanish, so schools will want to decide which capabilities are most critical to them and on which they are going to focus. In some cases these will be value judgements and in others it will require a careful study of the research. Each book in the Pedagogy for a Changing World series takes a core capability and tries to get underneath its skin.

Step 2: Establish the classroom climate

Across the world, much effort is expended in determining curriculum content. Governments rightly have a role in determining the kind of education their nation’s students will receive, ensuring their chosen blend of competitive advantage, prosperity, social cohesion and well-being. As part of the process of qualifying

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A FOUR-STEP PROCESS OF CULTIVATING CAPABILITIES

Source: Centre for Real-World Learning

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to be a teacher, individuals demonstrate knowledge and understanding of one or more disciplinary areas. But at least as important as subject matter knowledge is pedagogical knowledge and skill (Coe et al., 2014). Teachers make thousands of decisions every day about the *process* of helping learners to learn. These kinds of pedagogical decisions are what we are concerned with in steps 2 and 3.

Creating the classroom climate, or culture, is about designing an environment that consistently communicates the right messages to learners, parents, teaching and support staff, both explicitly and implicitly. Each of these stakeholders will witness the extent to which capabilities are valued, or not, whether verbally or through what they see and experience. A classroom whose climate is conducive to the valuing and learning of capabilities will be distinctly to the left of our ten-dimensional model.

The way knowledge is acquired can be done in a way that closes off questioning or that helps learners to understand how we come to know certain facts. In science, for example, are learners taught theories as ‘fact’, or do they understand the limits of scientific theory and what makes a theory scientific? Do they understand the role of perspective or motive? Who wrote history? What was the world-view of our scientists? How do we know that? Why is it important? How can that thought process be used elsewhere?

Displays of work reflect what is valued. Where capabilities are valued, this might be shown in a visual demonstration of the process learners have been through of drafting and improving for excellence. Important as excellence in a final product is, we need to show and teach the process of getting there. A sense of crafting for improving is shown through displays of risk-taking and creativity that have led to failed attempts accompanied by thoughtful evaluations.

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A whole host of capabilities – resourcefulness, curiosity, collaboration and critical thinking, for example – can be strengthened by access to appropriate resources as learners decide they are needed, as well as through the process of having to work out what tools might be required to complete a task.

Effective pedagogy will *always* involve the teacher modelling the capabilities they value. This includes a willingness to take risks, to collaborate with colleagues, to question their own understanding and their own readiness to learn.

Parents have an important role in supporting the messages teachers convey to learners about learning. They can either reinforce the capabilities at home or contradict them. In this respect, the education and involvement of parents is key.

Classroom systems of reward, recognition and sanction will need to align with any desired capabilities. Learners need to receive their teacher's commendation for the critical thinking behind a good essay.

Step 3: Manage the learning

Given that capabilities are not generally taught in a vacuum (although it is possible that a teacher might wish to focus on them aside from the lesson content – for example, in a school assembly), a fundamental management issue is the way that teachers ensure that learners value knowledge and skills at the same time as understanding the importance of developing their capabilities as learners in every lesson they experience.

Whether within the formal curriculum or outside it, it is important to name the capability explicitly: 'Today we're going to learn how to pass accurately, and I'd like all of you to see how many times you can practise this – *get your teammate to make it trickier each time so you are stretched to get better.*' In this example we are learning to throw a ball *and* we are learning about the importance of pushing ourselves.

In lessons, we know that certain approaches to teaching and learning work better than others. These include – when done rigorously – problem-based enquiry-led learning; Philosophy for Children approaches; the use of thinking routines, extended tasks and case studies; role play; and peer teaching, coaching and self-managed projects.

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For learners, there are some core techniques which need to be mastered, just as they will need to become comfortable in their times tables, irregular verbs, or acids and bases. These include:

- giving and receiving feedback
- practising deliberately
- drafting and prototyping
- using design processes
- goal-setting
- mentally rehearsing
- verbalising the processes of learning
- reflecting on processes and progress
- self-testing
- working in groups
- teaching others.

In each of the books in this series, we will explore these techniques as and when they work well in different contexts.

Step 4: Build learner engagement

Schools which really embed capabilities rapidly realise that, for it to be sustainable and authentic, they need to be creative in engaging students and young people, giving them new roles, creating new co-curricular opportunities and partnering with a range of youth and community groups outside of the formal sector.

Within a primary class, this might take the form of asking students to take on the role of being question-noticer – listening carefully to the kind of questions being asked in a lesson and taking a moment at the end of the session to tell the class which one seemed the most effective and why. Secondary schools might

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like to invite a group of students, with support, to prepare a short demonstration lesson to present to their parents to show how their school is teaching all learners to develop as critical thinkers.

While we have described these four steps as if they are a simple linear progression, in practice it tends to be messier than this in the busy real world of schools. For example, using a particular pedagogy may lead to deeper understanding of a capability rather than the other way round.

Learning to change

Deliberately seeking to cultivate capabilities is hard because it involves change on multiple levels and cooperation from those around you. Change in education is particularly hard because of the complexity of school culture, the drive for 'performativity', the churn of sometimes unwelcome government initiatives and the tendency for politicians to oversimplify issues.

Changing habits that have become deeply engrained is harder still and requires sustained effort and support. However, habit formation is a slow, incremental process and habitual behaviour is very resistant to change. As well as using the ideas in this book, exploring the suggested resources and following up by looking at the websites of some of the case studies, we suggest that you connect with other like-minded colleagues.

You could start within your own school and then move outside to create a professional learning community, either locally or as part of a wider group such as the Expansive Education Network.² Professional learning communities within and between schools provide opportunities for teachers to take risks in a supportive environment and contribute significantly to the effective sharing of practice and ideas (Davies et al., 2013, p. 88).

² See www.expansiveeducation.net.

About the series

The Pedagogy for a Changing World series is action oriented and research led. The books are guides for teachers and school leaders who want to introduce and/or embed capabilities in their schools. Each book will offer practical suggestions as to how key capabilities can best be developed in learners, building both theoretical and practical confidence in the kinds of pedagogies which work well. The books are aimed at both primary and secondary levels.

The first three in the series are:

1. *Teaching Creative Thinking: Developing learners who generate ideas and can think critically*
2. *Developing Tenacity: Creating learners who persevere in the face of difficulty*
3. *Zest for Learning: Developing curious learners who relish real-world challenges*

Each book is structured in the following way:

- a clear definition of the capability and why it matters
- an overview of pedagogies for cultivating the capability
- practical examples for getting started
- more extended illustrations and descriptions of approaches
- promising practices – case studies of schools which are adopting these approaches
- challenges – a reminder of some of the pitfalls and how to overcome them
- suggestions as to how learners' progress can be tracked.