

Praise for *Teaching Creative Thinking*

This book can teach us all how to think more effectively.

Arthur L. Costa, Professor Emeritus, California State University,
Co-Director, International Institute for Habits of Mind

This commendable new book charts a course for developing employees who are both inquisitive and collaborative in the classroom and beyond.

John Cridland, Chairman, Transport for the North, former Director General, CBI

A hugely welcome book, full of practical examples of pedagogy to cultivate knowledge, skills and capabilities, all the while recognising the power of professional learning communities within and between schools.

Dame Alison Peacock, Chief Executive, Chartered College of Teaching

The work Bill Lucas and his team are doing in examining the place of capabilities in the curriculum – and, perhaps more importantly, how to assess capabilities – is of critical importance.

Dr David Howes, CEO, Victorian Curriculum and Assessment Authority

An intelligent, strongly evidenced and globally connected approach to developing creative thinkers in schools today.

Matthew Taylor, Chief Executive, RSA

There is a risk in today's data-driven educational environment that knowledge and skill are emphasised at the expense of creative thinking. *Teaching Creative Thinking* shows us that this need not be the case; creativity can be embedded in all schools.

Walter Boyle, Head Master, Holyport College

This book resonates strongly with the profession because it puts forward a powerful argument for scaffolding curriculum content through capabilities.

Christine Cawsey, Principal, Rooty Hill High School, Sydney

If you still need convincing why your school or school system should prioritise critical thinking, look no further than *Teaching Creative Thinking*.

Louise Stoll, Professor of Professional Learning, UCL Institute of Education

This powerful book gives a clear explanation of how and why creativity breathes life into the curriculum. Step away from the spreadsheets and read it!

Carolyn Roberts, Head Teacher, Thomas Tallis School

A must-read for educators and other professionals who are passionate about encouraging children and young people's critical and creative thinking.

Dr Leslie Gutman, Senior Lecturer and Programme Director,
UCL Centre for Behaviour Change

Bill Lucas and Ellen Spencer's *Teaching Creative Thinking* is a must-read for anyone teaching in Scotland.

George Roberts, Head Teacher, Danestone Primary School
and Heathryburn Primary School

Here is a book that creates the thrust for better learning in schools. It should be read by parents, teachers, learners, employers and policy-makers.

Mick Waters, Professor of Education, Wolverhampton University

At last, an approach to developing creativity in schools which eschews the false dualism of knowledge and skills in favour of a holistic approach to cultivating young people's capabilities.

Alex Crossman, Head Teacher, The Charter School East Dulwich

Lucas and Spencer provide the right mix of pedagogical and school practices, and real-life examples. Their framework will inspire a variety of readers, including teachers, school leaders and policy-makers.

Stéphan Vincent-Lancrin, Senior Analyst, OECD

This is a practical handbook, a resource to support far-reaching and high-impact developments, whose purpose is to raise standards and prepare young people for further learning and for life as high-functioning contributors to the workforce and to wider society.

Bill Watkin, Chief Executive, Sixth Form Colleges Association

Hats off to Bill Lucas and Ellen Spencer for *Teaching Creative Thinking* – a compelling case for capability-based education.

Keith Budge, Headmaster, Bedales Schools

Creativity in the classroom will not happen by accident, and this book gives valuable insights into how schools can promote it.

James Townsend, Director, The Church of England Foundation for Educational Leadership

Wholehearted thanks to Bill Lucas and Ellen Spencer for this hugely important book on the future of teaching.

Rhys Morgan, Director of Education, Royal Academy of Engineering

Today's employers tell us they need character, resilience, problem-solving and creativity in potential employees. Let's just get on with cultivating and valuing creative thinking as this book seeks to do.

Kirstie Donnelly, Managing Director, City & Guilds

Teaching Creative Thinking is a timely book, both expert and readable, which makes an authoritative case for the relevance of creative thinking to schools today.

Jonnie Noakes, Director,
Tony Little Centre for Innovation and Research in Learning, Eton College

Being able to think creatively opens the door to opportunity and this book brings a welcome global breadth to this vital topic.

Tony Little, Chief Academic Officer, GEMS Education

Teaching Creative Thinking

Developing learners who generate
ideas and can think critically

Bill Lucas and Ellen Spencer



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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.

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 children 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'd 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.
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:

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 pupils' 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.

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 in. 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, sports 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.

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 children's education to achieve (Lucas and Spencer, 2016). The first half a dozen

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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 children.
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 so for 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 pupils 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 pupil 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 pupils 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

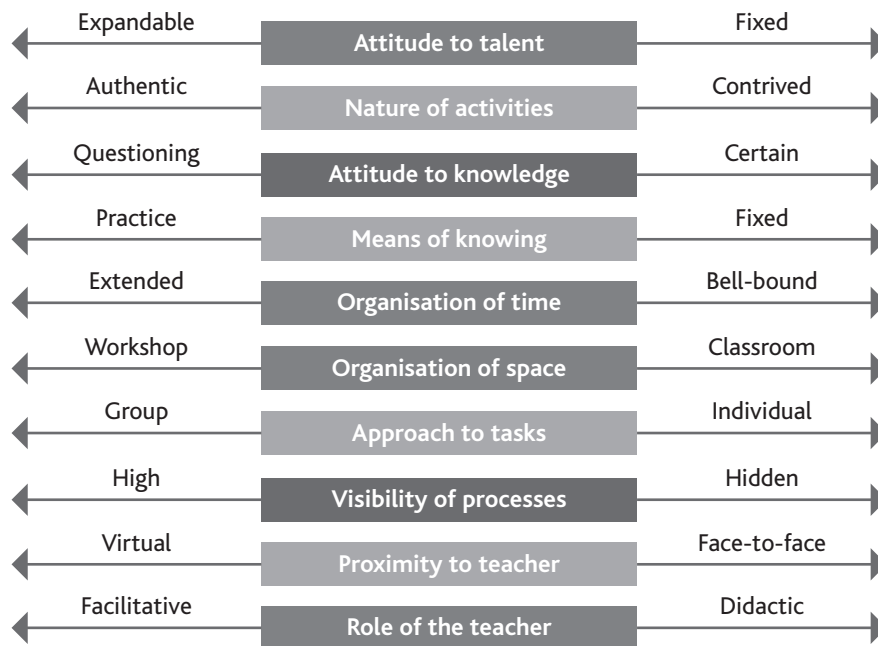
for their new professions' (Shulman, 2005, p. 52). Shulman talks of the three dimensions of a signature pedagogy:

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).
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 pupils? 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 children 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.

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:

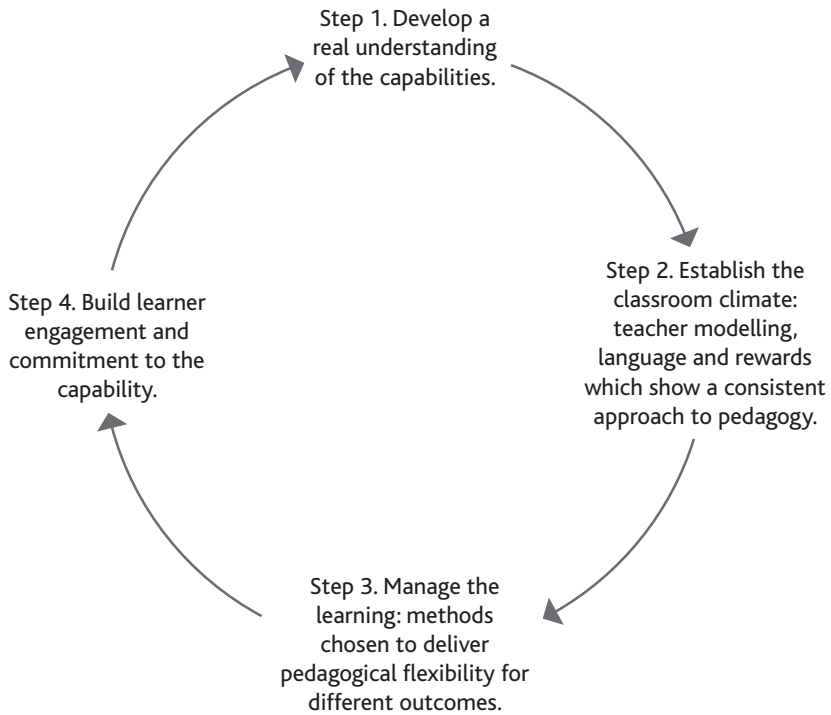
Step 1: Understand the capabilities

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 children will receive, ensuring their chosen blend of competitive advantage,

Teaching Creative Thinking



A four-step process of cultivating capabilities.

Source: Centre for Real-World Learning

Young people need more than subject knowledge in order to thrive – they need capabilities. The Pedagogy for a Changing World series details which capabilities really matter and how schools can develop them.

A key capability is creative thinking, which is to be the focus of a new 2021 PISA test, based on the authors' research at the University of Winchester's Centre for Real-World Learning.

Teaching Creative Thinking is a powerful call to action and a practical handbook for all teachers seeking to embed creativity into the school experiences of their students.

The thinking classroom is most likely to develop the thinking student – Bill Lucas and Ellen Spencer show how this is possible, now! Developing creative thinking requires deliberate planning and expertise. This book, richly embedded in the science of learning, shows the how.

John Hattie, Professor of Education, University of Melbourne

This innovative book applies the idea of growth mindset to the cultivation of a vital contemporary capability – creative thinking – drawing on both evidence and promising practices.

Carol Dweck, Professor of Psychology, Stanford University

A text for our time – taking us beyond current parochial notions of schooling, and demonstrating powerfully, with evidence, the centrality of creative thinking to the achievement of all students.

Geoff Barton, General Secretary, UK Association of School and College Leaders

Lucas and Spencer do a masterful job of encompassing the entire field of creativity. They also nail policy and practice as most countries are questioning how to situate creativity in the world of learning. You will find the answers and much more in *Teaching Creative Thinking*.

Michael Fullan, Professor Emeritus, Ontario Institute for Studies in Education

This book is an important contribution to the conceptualisation, cultivation and assessment of a core capability – creative thinking.

Geoff Masters, CEO, Australian Centre for Educational Research

The thinking here is shaping international curriculum and assessment, while offering practical tips and guidance to teachers. It's a powerful contribution to policy and practice. If you're interested in the future of education you'll find inspiration on every page.

Michael Stevenson, Senior Adviser, PISA Directorate for Education and Skills

Professor Bill Lucas is Director of the Centre for Real-World Learning. With Guy Claxton he created the Expansive Education Network: an organisation of schools that share a common view of the goals of education. These goals are outlined in their seminal book, *Educating Ruby*. The model of creativity on which *Teaching Creative Thinking* is based is the subject of a 14-country study by the OECD and is shaping the development of the 2021 PISA test of creative thinking.

Dr Ellen Spencer is a senior researcher at the Centre for Real-World Learning. She has a PhD from the University of Warwick, where her doctoral research focused on the impact of policy on school improvement. With Bill Lucas and Guy Claxton, Ellen is co-author of *Expansive Education: Teaching learners for the real world*.



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