

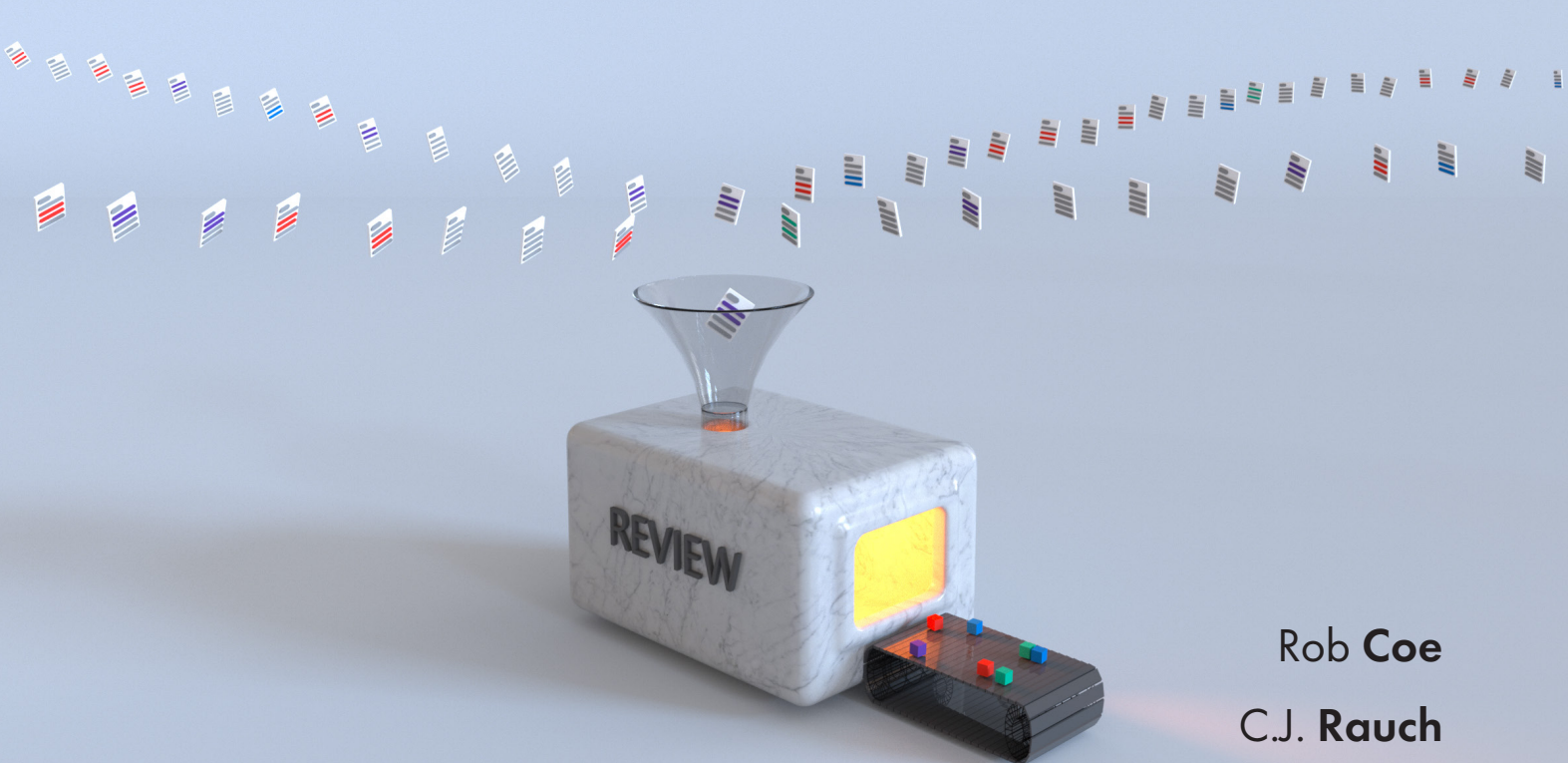


Evidence Based
Education

Great Teaching Toolkit

Evidence Review

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In partnership with



Cambridge Assessment
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greatteaching.com

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As you will discover, the Evidence Review is only the start of a project to transform teacher development. We look forward to acknowledging the collaboration and wisdom of many more teachers, leaders, researchers, designers and policy-makers as we take our next steps together.

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Foreword



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Teaching should be a rewarding profession where teachers are empowered and supported to be the best creative professionals they can be. The overwhelming body of research finds that the most important factor in improving student outcomes is good teaching. Therefore, helping teachers become better is the most important responsibility we have as educational leaders, as it is the best way to help learners fulfil their potential.

Unfortunately, teacher autonomy, creativity and trust have been eroded in recent decades in some educational systems, by a drive toward compliance. While the goal has been noble – to measure and rank institutional and individual performance, increase accountability and reduce variability – the unintended consequence has often been to reduce teacher learning to formulaic practice. In these settings, feedback to teachers has not been as supportive and informative as it should be to give them control and ownership over their professional development and practice.

In contrast, the Great Teaching Toolkit is a breath of fresh air – treating teachers like the professionals they are. It provides both a synthesis of evidence from authoritative studies, and the findings of this evidence, that teachers can relate to their own experience. What makes it so valuable is its clear focus on areas of practice that have the potential to improve student learning and outcomes.

Professional learning happens when we think hard about our practice and take full ownership of it. Cambridge International is pleased to be able to sponsor this review, which clearly defines what is worth teachers thinking hard about. These are principles and practices that we endorse and use in developing our own professional development services to schools, with the aim of helping teachers become confident, responsible, reflective, innovative and engaged

At the time of writing, the educational world is in turmoil caused by the Covid-19 crisis. Teachers have had to learn quickly to adapt, teach online and support learners in new ways. A number of commentators have speculated on the implications for the future of schools and the nature of the teaching profession. In such a climate, the evidence-based insights provided in the Great Teaching Toolkit are even more significant. We believe that the Toolkit's universal and timely principles will be an invaluable resource to teachers and schools around the world.



Executive Summary

What are the best bets for teachers to invest time and effort in if they want their students to learn more?

We have reviewed existing research studies and frameworks that are relevant to the components and routes to improvement of teacher effectiveness. Our aim is to help teachers make better decisions about what they can best do to improve their effectiveness. In summary, we have identified four priorities for teachers who want to help their student learn more:

1. understand the content they are teaching and how it is learnt
2. create a supportive environment for learning
3. manage the classroom to maximise the opportunity to learn
4. present content, activities and interactions that activate their students' thinking

We present a model that comprises these four overarching dimensions, with a total of 17 elements within them. An 'element' is defined as something that may be worth investing time and effort to work on to build a specific competency, skill or knowledge, or to enhance the learning environment. There is no implication that the complexity of teaching can be reduced to a set of techniques, but evidence suggests the best route to expertise is likely to involve a focus on developing competencies, guided by formative feedback in a supportive professional learning environment.

This review is the first stage of an ambitious wider project to create a 'Toolkit' that will:

- personalise the curriculum for teacher learning (according to ages and subjects taught, school context and student characteristics, current profile of expertise, etc.)
- develop systems and instruments to provide formative, actionable feedback that helps teachers to focus their learning, evaluate their impact and track their professional growth
- coordinate networks for peer and expert support to generate, share and apply evidence about the most effective ways to improve

The individual elements of the model for Great Teaching are as follows.

1. Understanding the content

- 1 Having deep and fluent knowledge and flexible understanding of the content you are teaching
- 2 Knowledge of the requirements of curriculum sequencing and dependencies in relation to the content and ideas you are teaching
- 3 Knowledge of relevant curriculum tasks, assessments and activities, their diagnostic and didactic potential; being able to generate varied explanations and multiple representations/analogies/examples for the ideas you are teaching
- 4 Knowledge of common student strategies, misconceptions and sticking points in relation to the content you are teaching

2. Creating a supportive environment

- 1 Promoting interactions and relationships with all students that are based on mutual respect, care, empathy and warmth; avoiding negative emotions in interactions with students; being sensitive to the individual needs, emotions, culture and beliefs of students
- 2 Promoting a positive climate of student-student relationships, characterised by respect, trust, cooperation and care
- 3 Promoting learner motivation through feelings of competence, autonomy and relatedness
- 4 Creating a climate of high expectations, with high challenge and high trust, so learners feel it is okay to have a go; encouraging learners to attribute their success or failure to things they can change

3. Maximising opportunity to learn

- 1 Managing time and resources efficiently in the classroom to maximise productivity and minimise wasted time (e.g., starts, transitions); giving clear instructions so students understand what they should be doing; using (and explicitly teaching) routines to make transitions smooth
- 2 Ensuring that rules, expectations and consequences for behaviour are explicit, clear and consistently applied
- 3 Preventing, anticipating & responding to potentially disruptive incidents; reinforcing positive student behaviours; signalling awareness of what is happening in the classroom and responding appropriately

4. Activating hard thinking

- 1 Structuring: giving students an appropriate sequence of learning tasks; signalling learning objectives, rationale, overview, key ideas and stages of progress; matching tasks to learners' needs and readiness; scaffolding and supporting to make tasks accessible to all, but gradually removed so that all students succeed at the required level
- 2 Explaining: presenting and communicating new ideas clearly, with concise, appropriate, engaging explanations; connecting new ideas to what has previously been learnt (and re-activating/checking that prior knowledge); using examples (and non-examples) appropriately to help learners understand and build connections; modelling/demonstrating new skills or procedures with appropriate scaffolding and challenge; using worked/part-worked examples
- 3 Questioning: using questions and dialogue to promote elaboration and connected, flexible thinking among learners (e.g., 'Why?', 'Compare', etc.); using questions to elicit student thinking; getting responses from all students; using high-quality assessment to evidence learning; interpreting, communicating and responding to assessment evidence appropriately
- 4 Interacting: responding appropriately to feedback from students about their thinking/knowledge/understanding; giving students actionable feedback to guide their learning
- 5 Embedding: giving students tasks that embed and reinforce learning; requiring them to practise until learning is fluent and secure; ensuring that once-learnt material is reviewed/revisited to prevent forgetting
- 6 Activating: helping students to plan, regulate and monitor their own learning; progressing appropriately from structured to more independent learning as students develop knowledge and expertise

The Great Teaching Toolkit

The fundamental goal of everyone that works in education is to improve students' lives. While many personal, family, and cultural factors contribute to students' outcomes, a large body of research indicates that what teachers do, know and believe matters more to the achievement of students than anything else we can influence. The quality of teaching is hugely important to the outcomes of young people, and great teaching can be learnt. Raising the quality of teaching within existing schools is probably the single most effective thing we could do to promote both overall attainment and equity (Wiliam, 2018).

Professional learning:

Teachers' professional learning continues beyond their initial teacher education. While "inset days" or "twilight sessions" may be what first springs to mind, it also can include mentorship, engagement with research, deepening knowledge of the content, or any other activities that aim to improve teachers' effectiveness.

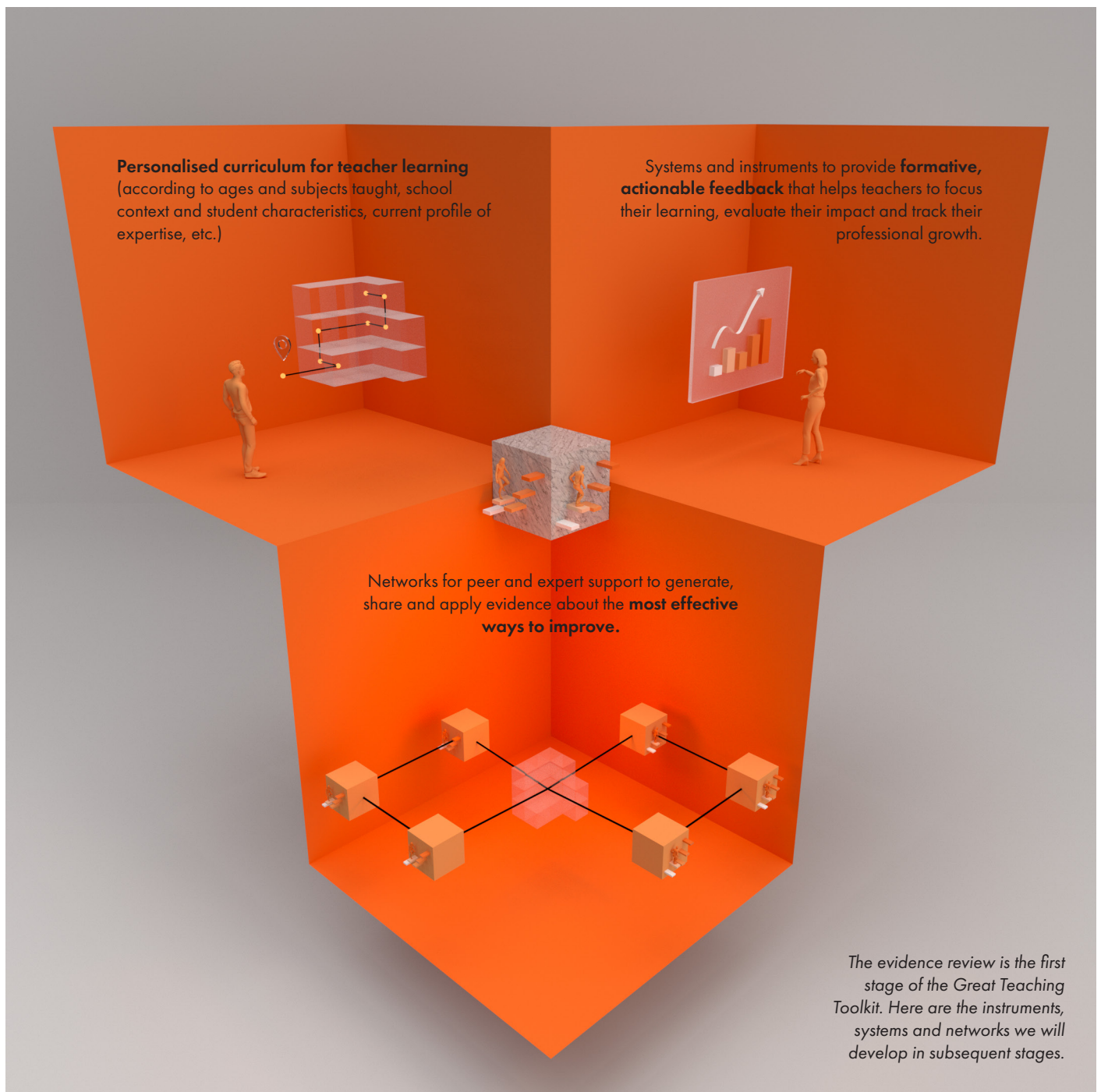
Teachers know a lot about learning and how to make it happen. Unfortunately, it seems common for that knowledge to be disregarded when it comes to their own **professional learning**. Among the conditions we would routinely provide for our students are a clear and sequenced curriculum that sets out the learning aims, diagnostic assessment to ensure prerequisites are secure, models of excellent performance, scaffolding, guidance, opportunities for practice and, crucially, feedback that guides next steps and indicates progress. Many teachers who strive to ensure their students' learning has all these supports would say that their own has none of them.

Fortunately, human beings can get really good at quite complex tasks if they just have good feedback that tells them whether they are succeeding. Unfortunately, the kinds of feedback that teachers can easily get about their classroom practice are often not very helpful. Creating feedback systems that enable continuous improvement is an area of focus we committed to in our 2019 **Manifesto**, which outlines what we believe an evidence-informed education system should look like. Systems with good feedback can become self-improving as participants learn to optimise outcomes – students benefit directly from this. But when feedback is seen as supportive it can also have real benefits for teachers, giving them agency and control over their professional development and satisfaction and engagement in the process (Coe, 1998), and subsequently for school and system leaders.

How will we create a feedback system to better enable effective teaching? The Great Teaching Toolkit is how, and it starts with this report. We can think of it as a model for teacher learning. It gives us a credible summary of the elements of great teaching practice, the kind that impacts most on learning. Following this report, we will develop and release a set of instruments to help teachers anonymously assess their strengths and identify their own development priorities in the areas identified in this report. The same tools will provide diagnostic formative feedback for teachers as they work on specific goals to improve their practice. Although teaching is an extremely complex set of practices and definitely not just a set of techniques or recipes, taking a

specific technique, skill or area of knowledge and practising to a high level of proficiency is a key way to improve overall effectiveness.

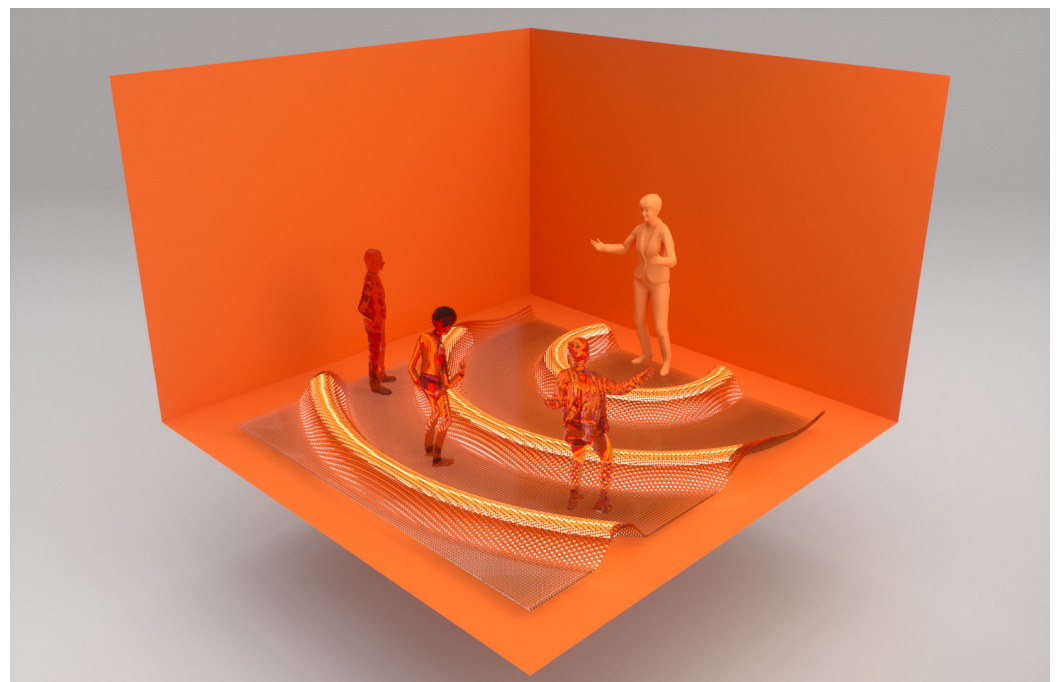
The Great Teaching Toolkit will also aim to identify the kind of professional development that leads to improvement in specific areas of practice. This stage of the project will require a community of thousands of educators working toward a shared aim, supporting each other and creating the evidence we need. The strong, overarching goal here is to help teachers take ownership of their professional learning and to help them enhance their practice for the benefit of students.



Great teaching must be defined by its impact: a great teacher is one whose students learn more. It cannot be defined by compliance to a particular set of practices, however soundly based, nor by the demonstration of specific skills – nor, even, by the possession of particular teacher mindsets or understandings. Teaching is complex.

However, the evidence we present here makes it clear that, on balance, having these things is better than not having them. We also have good evidence that engaging in systematic, focused efforts to develop fluency and expertise in these skills and practices, and to develop teachers’ understanding of the principles and theory underpinning them, are likely to be our best bets for enhancing impact. And none of this happens in isolation: great teachers have a drive to improve their impact and to collaborate with and support their colleagues to improve.

Everyone in every walk of life can be better. Every teacher, no matter how experienced, can improve, if they want to and have the support to. But, as a teacher, even when you decide to take that step, it’s often difficult to know where to start. Your resources are precious, you have no time to waste. How should you prioritise your professional development? What are your best bets in terms of making the most difference to your students? We hope this review, and the rest of the Great Teaching Toolkit, will help to answer those questions.



Great teaching must be defined by its impact

Review of the evidence

We set out to identify, review and then summarise the best available evidence (drawn from both academic reviews and existing frameworks) about what teachers' practices, skills, knowledge and behaviours are important for students' learning. We did this to ascertain what the evidence suggests is important for teachers' learning.

Indicators:

When working with concepts that are difficult to measure directly, it is possible to use an indicator as a way to make conclusions about the topic. A more valid indicator allows more valid conclusions. For example, it is common to look at student exam results as an indicator of attainment. In another example later, teacher behaviours are an indicator for the complex concept of activating thinking.

Correlational studies:

Much of the available research is based around correlational studies; in these the relationships between two variables is measured. While interesting, the conclusions drawn from them are limited. We cannot tell if the two have a causal relationship – does X cause Y, or does Y cause X? Or might there be a third variable, Z? Therefore, while we may find a positive correlation between a teaching practice and student outcomes, we do not know if the practice caused the outcome.

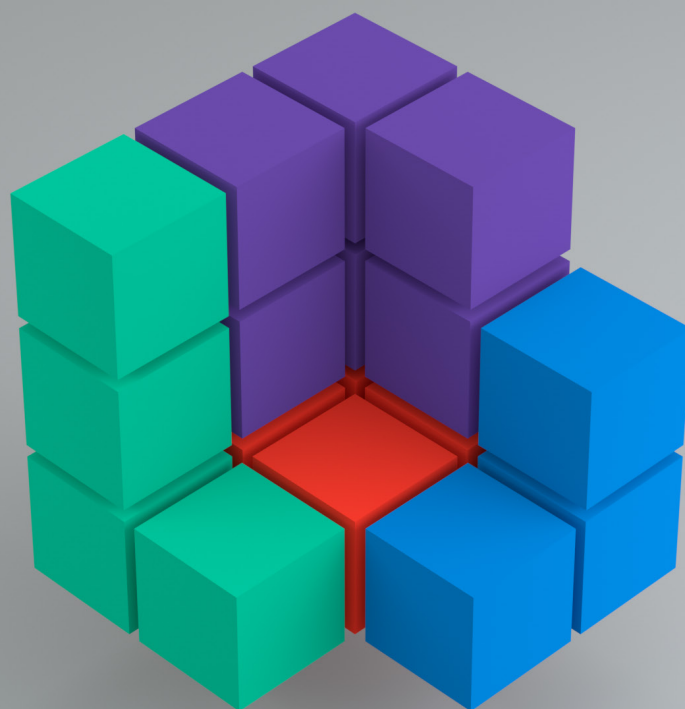
In addition, we set out to review the related evidence on measuring these important features, and to identify useful **indicators** of things found to be associated with student learning (a supportive teacher-student relationship, for instance) that might help us provide better feedback for teachers' professional learning. An important step for the future development of simple, powerful tools is to help teachers truly understand the evidence in a way that would make it actionable: to bring it to life and operationalise it.

What we found was a consensus within the existing research – a signal within the noise – about which elements of teaching appear to be worth learning. Simultaneously, we also found that the evidence base is limited; for example, there is a predominance of **correlational studies** over those making strong causal claims, something we say more about later.

Limitations such as this will make developing certain aspects of the Great Teaching Toolkit very challenging, but we believe that – together – we can overcome these challenges. We believe they necessitate a new collaboration between classroom practitioners, academic researchers, designers and innovators; one which develops and tests a model for Great Teaching and delivers feedback tools that help teachers know where they are, where they're heading, and how to get there.

What follows, then, is the starting point: a simple, digestible summary of what a large and complex body of evidence says about what is worth learning.

A Model for Great Teaching



A Model for Great Teaching

Rationale for presenting a model

Curriculum sequencing:

Mastery of certain content may require understanding of certain prior knowledge. Sequencing identifies these prerequisites within the curriculum so they can be taught and assessed in an appropriate, logical order. For example, a learner's mastery of π depends on their understanding of diameter, radius, and circumference; the sequencing should identify this.

Causal relationship:

A relationship in which it has been shown, usually through a controlled experiment, that one variable (independent) causes the other (dependent)

In an ideal world, we would already have a conceptually clear and empirically well-validated model of classroom teaching that would make it explicit what great teaching looks like and how to get more of it. The model would take account of differences in the ages and other characteristics of the learners. It would factor in the subjects – or even topics – being taught, and relevant features of the context or school. We would also have a curriculum model for teachers' professional learning that set out what teachers need to learn to become better teachers, according to their current profile of strengths and weaknesses and the context in which they work. Such a **curriculum** would be **sequenced** and prioritised: prerequisites and dependencies would be known and clearly set out; the likely 'payback', in terms of increases in student attainment, for each hour spent on particular teacher development activities, would be quantified and optimised.

Unfortunately, we do not currently have either of these things. Instead of a clear, comprehensive and reliable model of great teaching, research gives us partial insights, often contradictory or confusing, much of it based on weak correlations between ill-defined teacher behaviours and rather impoverished measures of student learning that may reflect confounds as much as genuine **causal relationships**. Where we have stronger causal designs – the kind that might allow us to infer that training or development for teachers in particular competences leads to enhanced student learning – the results have often been inconsistent or disappointing. And instead of a well-specified curriculum for teacher learning, we have lots of traditions and loud claims, whose projected confidence or popularity seems to outweigh their evidential warrant, and whose relative merits are hard to evaluate.

One insight we do have is that these two are not the same thing. Being able to describe great teaching is not the same as knowing how to get more of it. Our interest is more in the latter: knowing what great teachers should do to become even greater, or how teachers who are not as great as they could be could become great.

This leads us to what might at first sight seem like a rather narrow and reductionist project, breaking down a complex, nuanced, beautiful thing like 'great teaching' into an atomised list of competences. But this is familiar territory for anyone who has tried to become expert in any complex activity or performance, whether in sport, music, dance, writing, art – or professionals such as pilots, doctors, lawyers or teachers. Giving a precise and useful definition of great performance may be impossible but, despite that, we generally do know something about the steps that lead to expertise. And this usually means breaking the complex activity down into components and exercises, clarifying, then practising them with appropriate guidance until they

are fluent and proficient, and integrating those isolated techniques back into the complex and mysterious whole (Ericsson, 2009).

Our starting point for this 'curriculum' is to identify the elements of great teaching that come out of existing research and then to investigate the process of trying to get better at each of them in isolation. This does not imply that we think classroom teaching can be reduced to a set of isolated techniques; only that our best bet for learning to be a better teacher is to work on specific, underpinning competences, one at a time. We are likely to find that some can be improved more quickly than others; that some matter more than others in their impact on student learning; that there are interactions, dependencies and threshold effects in their relationships; that priorities should be different for different teachers at different stages, in different contexts. As we discover and incorporate these complexities, we hope our model will become more useful.

Our aim is to help teachers make better decisions about what they can best do to improve their effectiveness. We know that, as with other kinds of learning, teachers' professional learning is most effective when the content and activities are targeted to be appropriate to the needs and existing capabilities of the learner (Creemers et al., 2013). It follows that the answer to the question 'What can I best focus on to improve?' is likely to be different for different teachers. We hope that our model can be used to help teachers make more evidence-based, individualised decisions about how to spend a limited amount of time for professional development to get the biggest return in enhanced student learning.

Overview: The Elements of Great Teaching

Our model for great teaching presents a simple narrative:

Great teachers:

1. understand the content they are teaching and how it is learnt
2. create a supportive environment for learning
3. manage the classroom to maximise opportunity to learn
4. present content, activities and interactions that activate their students' thinking

For each of these four broad dimensions, we break it down into a set of elements. An 'element' here is defined as something that may be worth investing time and effort to work on. It may capture a specific skill, technique or area of knowledge that great teachers appear to have: what we have called a 'competency'. But in some cases, the element may be more an environmental than a behavioural indicator. For example, indicators of classroom climate or relationships may not point to a particular teacher behaviour or competency but may still capture an aspect of great teaching. The precise behaviours or actions a teacher should do are not specified, but the objectives and success criteria for their learning are clear. We also recognise that the word 'competency' carries some unfortunate baggage in certain contexts, either being associated with competency-based frameworks in accountability models, or denoting over-generalised skills that are supposedly transferable across domains; neither is part of our intended meaning.

At this stage, there is a degree of arbitrariness to the model. The four dimensions overlap in some areas and their boundaries are debatable. Most of the elements could be further split into smaller strands, which might be conceptually purer and make it easier to practise or learn to improve them; this would also multiply the complexity of the model. We have to start somewhere, but fully expect some of these decisions to be revised as we get more experience of working with the model.

A further challenge is the tension between wanting a generic model, that captures some universal principles of great teaching, and acknowledging that the manifestations of great teaching across ages, contexts and subjects appear very diverse. We think the generic principles are useful and important (and supported by evidence), partly because great teachers need to understand the principles of how and why different techniques are effective and when to deploy them. Nevertheless, it is important to remember that most of these elements will look very different in different classrooms, and their relative importance will also vary.

With these caveats in mind, we offer an overview of each dimension and a more detailed, practice-focused description of its different elements, what exactly each one means and the evidence behind it.

Evidence for a four-dimensional model

There is no universal consensus in the research literature about how many dimensions a research-based model of teaching should contain. We find the arguments set out by Praetorius et al. (2018) compelling, that their three-dimensional model captures a reasonable consensus of evidence from a range of existing studies, though even their own evidence does not seem to support it unequivocally. Certainly, other frameworks present it differently. For example, the Dynamic Model (Creemers and Kyriakides, 2011) has eight classroom dimensions, ISTOF (Muijs et al, 2018) has seven components, ICALT (van de Grift et al. 2017) has six, Rosenshine (2010) has ten principles, and the Early Career Framework has eight standards. However, their content is readily compatible with the aforementioned three-dimensional model; ultimately, it seems to be a somewhat arbitrary choice. Moreover, the three-dimensional model lends itself easily to a simple narrative about what great teachers do: they create a supportive environment for learning, they maximise opportunity to learn and they activate their students' thinking.

However, we have also been convinced by the arguments that a fourth dimension should be included: content knowledge. This is missing from the generic models that focus on observable classroom behaviours, for obvious reasons: it is more about teacher knowledge than teacher behaviour. We recognise that there is a danger here – there is no point in teachers having good content knowledge if their classroom actions do not reflect this. Indeed, in some of the observational frameworks, content knowledge is included in that way. But there is enough evidence that effective teachers need to have particular kinds of knowledge and understanding of the material they are teaching to justify including it here as something that some teachers could profitably work on. Because it is likely to be a prerequisite rather than an extended focus of professional learning, we place this first.

What next?

We hope that our model can help you make more evidence-informed decisions about how to spend a limited amount of time for professional development to get the biggest return in improving student learning.

Having read through the model, you might be thinking how useful it would be to have examples of these elements, to help anchor and orientate practice in different phases and subjects. We agree, and that's where you come in!

Your profession needs you!

You, like thousands of others, will read this review through a lens of your individual context, phase or subject. It would be simply impossible for us to create accessible examples for everybody and to do them all justice.

So, we welcome you to join the Great Teaching community.

We ask that you share your examples of these elements of Great Teaching, to tell us what they look like in your phase and subject. We ask that you discuss them with other education professionals, to begin reflecting on and improving your practice. Through your insight, you will help us shape the next steps of the Great Teaching Toolkit.

Head to www.greatteaching.com to start sharing and get inspired.

Dig deeper into the evidence

You have been presented with a model for great teaching, and a way to get involved with it, but you may be wondering how we got to these conclusions. Where is the evidence behind it?

In the remainder of this report you can go into more depth in each of the four dimensions, learn all about our review methodology and find an overview of all the studies we reviewed.