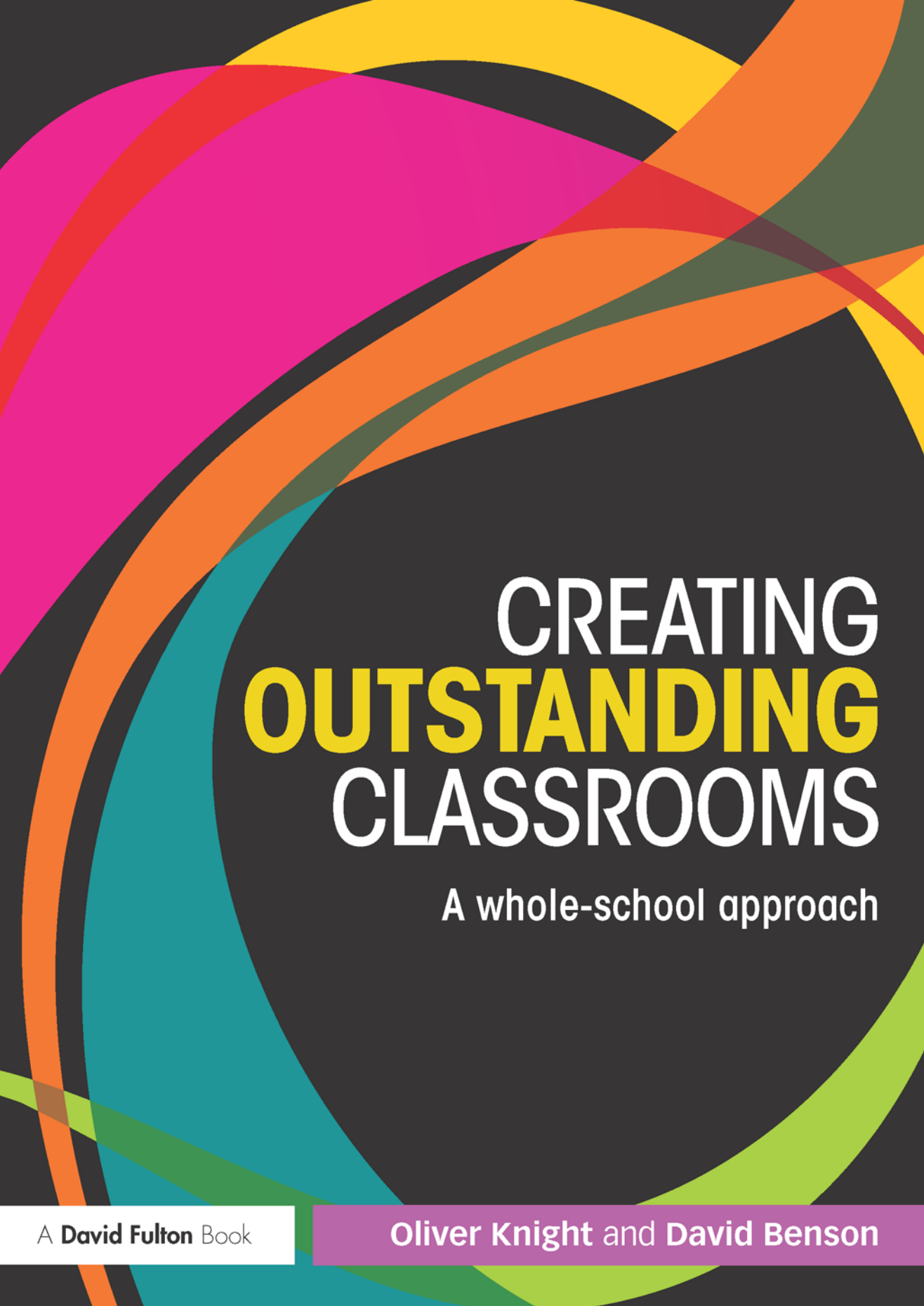
CREATING
OUTSTANDING
CLASSROOMS
A whole-school approach
A David Fulton Book
Oliver Knight and David Benson

Praise for *Creating Outstanding Classrooms*

It does not take long to realise that *Creating Outstanding Classrooms* is based on a long and rich history of running schools, on two authors who know how to turn theory into practice, to learn from research and from others, and to focus on the important. With so many demands made of schools it is refreshing to see learning, knowing one's impact, and a sense of fun in creating outstanding classrooms. The many ideas and activities can be readily adopted but there is an underlying strength in their arguments while at the same time they confront some of the most difficult problems.
John Hattie, Director, Melbourne Education Research Institute, University of Melbourne

Drawing upon wide experience of teaching, senior leadership and curriculum development, Oliver Knight and David Benson have attempted the most comprehensive and practically grounded account yet of a disciplinary curriculum in action. With a winning and unusual integration of pedagogic, curricular and professional development concerns, they build their case that deep professional reflection on subject structure and subject knowledge leads to vibrant learning and shared, valid measures of the quality of that learning. Benson and Knight are trenchant in their critique of generic "thinking skills" approaches, arguing that different disciplines foster different ways of thinking and different forms of knowledge and that these distinctions enable rather than constrain, liberating both staff and students. They place these at the centre of whole-school professional development and professional debate, showing ways forward for the whole-school management of subject-driven learning that is knowledge-rich, demanding and lively.
Christine Counsell, Senior Lecturer, University of Cambridge Faculty of Education

Oli and David have proven they know how to run outstanding schools; this powerful manual captures how. It should be essential reading for every school leader and governor in the country. It is a practical and powerful end-to-end blueprint of how to run an outstanding secondary school.
Tom Shinner, Lead Proponent and Vice Chair of Governors, Greenwich Free School

Creating Outstanding Classrooms appears to be the 'missing link' in that it brings the best of practice in each discipline together and underpins them with good research and well thought out case studies... We will be purchasing copies for all our staff and using it to radically alter our approach to delivering the curriculum by adopting the concept of 'fertile questions' across all school subjects.
Sir Iain Hall, CEO, Great Schools for All Children

We know that effective schools are schools in which there are effective classrooms and this book provides a valuable set of resources to improve the quality of teaching in classrooms, with a clear focus on teaching for understanding...it is stimulating, thought-provoking, and eminently usable.
Professor Chris Husbands, Director, Institute of Education

Creating Outstanding Classrooms is a book that you need to read at least once. At times provocative and challenging it is always a practical handbook for those of us who are compelled to make our schools better.
Mark Keary, Principal, Bethnal Green Academy (Most Improved School in London 2011)

One of the greatest challenges facing school leaders is in-school variation. You just seem to solve a problem in one area when another one 'pops up' somewhere else. This book is a great resource for school leaders and teachers providing case studies and tools to crack inconsistency. It is a handbook that can be used every day to create outstanding practice.
John Baumber, CEO and Director of Education, The Learning Schools Trust

The quality of teaching and the vibrancy of learning is at the heart of school improvement. Sadly in all the discourse around structural change, curriculum and accountability such critical discussions are often lost. Fortunately, in their excellent new book, *Creating Outstanding Classrooms: A Whole-School Approach*, Oli Knight and David Benson have given us an insightful and strategic approach to enhancing teaching and learning.
David Hopkins, Professor Emeritus, Institute of Education, London and Director of Education, Bright Tribe Trust

This is a fascinating and important book, underpinned by deep, systematic thinking about the curriculum and pedagogy, and yet written with a light and wholly readable style that makes it practical, compelling and uplifting. All teachers will find ideas here to challenge as well as to reaffirm aspects of what they teach and how they teach it. Recommended.
Geoff Barton, Headteacher, King Edward VI School, Suffolk

Creating Outstanding Classrooms

This timely new book outlines a whole-school approach to embedding a sustainable model of teaching and learning that puts the learner at the heart of the system. It provides an entire framework for ensuring all students achieve above their expectations; incorporating school vision, teacher professional development, assessment models, school culture, leadership and management, and core classroom practices.

It takes what the current research suggests does – and does not – work and builds it into a practical approach that has been tried, tested and proven to work. Each section incorporates the research, a model of how this can be embedded across a school and then a training section that allows senior leaders in schools to teach the skill-set to others to ensure it can be embedded and reviewed.

Covering all aspects of teaching and learning including curriculum design, teacher practices, assessment and leadership, the book features:

- a clear planning framework that is easy to implement;
- subject based case studies to exemplify good practice;
- diagrams to clarify and consolidate information;
- training activities throughout each chapter, also available to download at www.routledge.com/9780415831178.

Designed to be used as a training tool for both new and established teachers, this book is essential reading for senior leaders that want to equip their teachers with the skills and knowledge to create a school of outstanding classrooms.

Oliver Knight is Director of Teaching and Learning for Bright Tribe Trust and was formerly Vice Principal with responsibility for Teaching and Learning at Ark Academy in Brent and a member of the Future Leaders programme.

David Benson is Principal of Kensington Aldridge Academy in North Kensington, and former Vice Principal at Ark Academy in Brent, with responsibility for Teaching and Learning, Assessment and Curriculum.

This page intentionally left blank

Creating Outstanding Classrooms

A whole-school approach

Oliver Knight and David Benson

Routledge
Taylor & Francis Group
LONDON AND NEW YORK

First published 2014
by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

and by Routledge
711 Third Avenue, New York, NY 10017

Routledge is an imprint of the Taylor & Francis Group, an informa business

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

Library of Congress Cataloging in Publication Data
Knight, Oliver (Educator)
Creating outstanding classrooms : a whole-school approach / Oliver Knight, David Benson.
ISBN 978-0-415-83116-1 (hardback) -- ISBN 978-0-415-83117-8 (paperback) -- ISBN 978-1-315-88993-1 (ebook)
1. School improvement programs. 2. Student-centered learning. 3. Effective teaching. I. Benson, David (School principal) II. Title.
LB2822.8.K63 2013
371.2'07--dc23
2013009588

ISBN: 978-0-415-83116-1 (hbk)
ISBN: 978-0-415-83117-8 (pbk)
ISBN: 978-1-315-88993-1 (ebk)

Typeset in Celeste and Optima
by Saxon Graphics Ltd, Derby

Contents

List of training activities

List of additional resources

You can find the eResource for this book at www.routledge.com/9780415831178. Where you see this logo, you can download case studies and templates.

Acknowledgements

This book is very much written standing on the shoulders of giants. We are truly indebted to many people and organizations who have given us their time, ideas and experience.

The biggest thank you should go to Delia Smith and all of the inspirational teachers at Ark Academy in Wembley. This book is the product of opening Ark Academy and recruiting and training a dedicated set of teachers who all consistently taught according to the central pedagogical aims outlined in this book. Under Delia's guidance we were able to build on and develop the ideas and approaches we had encountered and designed throughout our careers. It is her leadership and unrelenting commitment to tackling underachievement that has led to this book, and the unwavering support of the teachers at Ark Academy that meant that 'outstanding' was our raison d'être.

We also doff our cap to the expertise and generosity of Fidelma Boyd, Deputy Head at St. Angela's Ursuline School in Newham. Under her mentorship Oli was able to experiment and try out many of the ideas and strategies we have refined for this book. Her commitment to our progression and her availability and constant support meant that we were never afraid to implement our ideas – both at St. Angela's and Ark Academy. Continuing along the St. Angela's thread we would also like to extend our thanks to Mark Johnson, Headteacher, for giving us permission to use the data we have in the leadership chapter.

Special mention must go to John Kirkman, English teacher extraordinaire and Aishling Ryan, Maths genius, for allowing us to use their work in this book. Also Tracey Keane, the brilliant Director of Science at Ark. Their support and willingness to adopt our approach and refine it for their disciplines, as well as creating outstanding progress, has ensured that we have evidence from across the curriculum that our approach works and is future-proof.

On a personal note, Oli would also like to thank Christine Counsell at Cambridge University and Nicolas Kinloch, formerly of Netherhall School. If it was not for Christine's patience and development of his 'extended' PGCE Oli

would never have become a teacher and, without her advice, it is unlikely he would have got to where he is today. Nicolas has also played a particularly special role in Oli's career, supporting his PGCE as he tried to combine life as a full-time athlete with life as a trainee teacher. Needless to say Oli spent a lot of time in the Netherhall staff room eating and catching up on sleep in between training sessions but Nicolas kept the faith and helped him to scrape through.

Finally, a big thank you must go to the Institute of Education, in particular Adam Lefstein, Cathy Wallace and John Clegg. We are grateful to Adam for refining the thinking around inquiry or Fertile Questions and for many email exchanges about planning and trying to conceptualize learning. These had a very formative influence in helping make our approach concrete. Cathy and John allowed us to borrow their excellent thinking and work on language acquisition and progression. Without their work our approach to planning for language would not be as refined and robust as it is.

Grateful thanks must also go to Tracey Keane for her expert subject knowledge in Science and her ability to convert complex conceptual frameworks into accessible planning for students.

Thank you also to anyone else who has entered into conversation with us and showed belief in us. We are nothing more than the sum total of other people's support. A final point is that wherever we have borrowed from, adapted or modified the work of someone else, we have tried our best to fully reference it and acknowledge how it has helped us to build our argument and model. If we have failed to do this fully, then we apologize in advance and hope to be able to rectify this in future reprints.

About the authors

Oli Knight

Oli is director of teaching and learning for Bright Tribe; a new kind of multi-academy trust that puts the learner at the centre. Oli was previously Vice Principal with responsibility for teaching and learning at Ark Academy in London, part of one of the UK's leading academy chains, ARK Schools Group. He joined the academy a year before it opened and, with the Principal and senior team, led the school to its 'outstanding' Ofsted inspection in November 2010. The approach to teaching and learning that Oli implemented at Ark has subsequently been adopted as a best practice model in other ARK network schools and beyond. Ark Academy, although still a young school, is increasingly seen as a centre of excellence for teaching and teacher training.

David Benson

David is Principal of Kensington Aldridge Academy in North Kensington, and former Vice Principal at Ark Academy in Brent, with responsibility for Teaching and Learning, assessment and curriculum. He was also the ARK Network Lead for Assessment, supporting other schools in the ARK group in their use of assessment data. David and Oli worked together at Ark Academy from January 2010 where, with the Principal, they helped lead the set-up of an outstanding school. At Ark, David developed a whole-school approach to assessment that puts teachers and subject leaders in control of the assessment process and avoids data becoming a 'management exercise'. The approach is now being adopted in many other ARK schools.

This page intentionally left blank

Learning in the 21st century

A whole-school approach

> To instruct someone...is not a matter of getting him to commit results to mind. Rather, it is to teach him to participate in the process that makes possible the establishment of knowledge. We teach a subject not to produce little living libraries on that subject, but rather to get a student to think mathematically for himself, to consider matters as an historian does, to take part in the process of knowledge-getting. Knowing is a process not a product.[1]

This book has arisen from over 20 years of combined teaching experience, from being NQTs struggling to get to grips with the profession, through to being Senior Leaders in Outstanding schools. It is informed from experience in working in a variety of contexts and from having different 'education careers' of our own.

Our leadership journeys

Oli took a traditional PGCE path into teaching and had a diverse range of experiences: from being a Head of Department in one of the highest performing grammar schools in the country, to holding the same position at a school in Special Measures in Tower Hamlets. As an AST[2] at a Good school that was coasting, and a Senior Leader at an Outstanding school in Newham, Oli has witnessed first-hand different education contexts and varied approaches to school design and classroom consistency.

David joined teaching through the *Teach First* programme in 2004. He has worked in three different inner London comprehensives during his career – one judged by Ofsted[3] as Satisfactory, one as Good and one as Outstanding. He, like Oli, has seen both good and bad examples of school leadership. He has

worked in transition schools where the priority has been to establish some degree of consistency and move practice from satisfactory to good, and in a brand new school where the challenge has been to fully exploit the unique opportunities of a start-up and raise the bar as high as possible.

We met in 2009 when we were appointed as the founding Vice Principals of Ark Academy, a new, all-through 3 to 18 academy in Brent, with Oli leading on teaching and learning and David on assessment and curriculum. This book draws heavily on our experience of setting up a new school, and describes how we used the opportunity of starting from scratch to think through the very best approaches and then embed a genuinely 'whole-school' model of teaching and learning.

Our model recognizes the sovereignty of the classroom in school life, and the simple fact that all areas of school culture flow from classroom teaching. Six great lessons a day, consistently across the school, and everything else will fall into place. Any decision about school management – whether it be about budget, uniform, or even corridors and playgrounds – needs to be considered in terms of how it affects the experiences of students as learners in the classroom.

Structure liberates

We have learnt from many inspirational teachers and school leaders during our careers. We have debated with those outside of schools: academics and professionals involved in teacher training and education policy. We feel indebted to everyone who has given us their time and their thoughts. Some of them we agree with, some we disagree with; but we recognize that all were working with the same goal in mind: to create outstanding schools, and an outstanding education system. This handbook is carved in that vein.

Through all of our experiences and all of the classrooms we have been in, both as teachers and observers, one thing was always apparent – it is teachers that make the biggest difference. This difference, however, is either helped or hindered by the culture and system in which the teachers operate. Many schools have pockets of expert teaching which fail to spread to other classrooms, because the management structures are not in place to effectively disseminate the good practice. At best the ideas are misappropriated or distorted and lose impact. At worst they are just ignored.

It is clear that there are many excellent teachers in the UK at present. It is also clear that there are few schools where we can say that the teaching is consistently excellent. Of the 20 per cent of schools rated Outstanding by Ofsted in 2010-11, only 6 per cent had outstanding teaching and learning. Reducing in-

school variance in the standards of teaching, and supporting all teachers to get to the highest levels, is what this book hopes to achieve. If students in the same school are either inspired or disengaged by a subject, simply because of which teacher they are given, then many will continue to fall through the net. Furthermore we would argue that at best Ofsted only captures around 25 per cent of what an outstanding or expert teacher does and so the need for a more consistent approach is vital to enable more teachers to develop expertise.

The poverty of the generic 'thinking-skills' approach

Outstanding (or expert) teaching is not just about pedagogy – the strategies and techniques that the teacher uses. It is about what is being taught – the curriculum the school and department has chosen to follow. Over the past seven years, we have witnessed with regret the moves away from academic subjects towards genericism and competence-based frameworks in schools. This has proceeded hand in hand with the mistaken view that teaching academic subjects is merely about providing information, rather than about developing forms of disciplinary *thinking*. It is fashionable now to ask, 'if we have Google why do we need subjects? Pupils just need the *skills* to find the information'. Put another way, in the words of Counsell:

> The view that disciplines can neither engage nor serve most pupils often betrays two misapprehensions: first, an assumption that a subject equates to information, as opposed to knowledge; second, a lack of awareness that a school subject such as history has long involved the active and engaging exploration of the structure and form of that knowledge, using concepts and attendant processes.[4]

The thinking-skills argument ignores the distinctive purposes of academic disciplines. Disciplines are not sets of 'skills' so much as distinctive ways of building knowledge, weighing evidence and finding truth. In schools, subject specialists use their own disciplines to teach students how to think in particular, powerful ways. In our experience of working with teachers who are passionate about their subjects, the particular disciplinary context of a subject is central to that particular way of thinking, of researching, of judging evidence and of building knowledge about the world. Academic subjects in schools therefore provide disciplined forms of criticality; disciplined ways of reading, writing and speaking; and a disciplined understanding of how different types of knowledge are constructed. In our experience the best subject teachers are those that combine a flair for delivery and lesson design with a deep understanding of the foundational rules and principles of their subjects.

Sometimes the argument for genericism is linked to a changing economic climate. Its proponents make the case that we need to teach skills because the future is unknown, and flexibility not knowledge will be at a premium. The weakness of the skills approach is these 'learning skills' or 'thinking skills' cannot be taught in isolation. You cannot teach someone to solve a problem unless that problem is grounded in some context; unless it is a *mathematical* or *historical* or *scientific* problem. Or rather you can, but because the learning is not linked to an underlying concept in one of these subjects, it becomes superficial, and therefore cannot be transferred to new, unseen problems – which is exactly what the genericist skills approach is trying to achieve.

Those advocating genericism frequently argue that the curriculum should be designed through cross-curricular themes and projects that allow learners to see how all subject areas are connected. This might be a good intention, but the problem is that this is not normally achieved. As Howard Gardner points out so well, most of this type of activity is misleadingly labelled at best:

> Children may well benefit from carrying out evocative classroom projects or from pursuing a unit on generative topics like "patterns" or "water" or the "cradle of civilisation." But these endeavours do not involve disciplines in any legitimate sense of that term. In making a diorama or a dance, in thinking of water or cities in a variety of ways, students are drawing on common sense, common experiences, or common terminology and examples. If no single discipline is being applied, then clearly interdisciplinary thinking cannot be at work.[5]

We are all for cross-curricularity, but how about connecting subjects at a deeper conceptual level than that of surface content? If the skills most at premium in the twenty-first century are 'complex communication' and 'expert thinking' then generic curriculum approaches are no longer remotely suitable. What is needful, rather, is an ability to think about how the different disciplinary approaches are *distinctive*. Only then, might teachers, and students, be in a position to explore how they interrelate.[6]

Two routes through the curriculum

Let us look very briefly at what two different approaches might be to an enquiry incorporating the disciplines of History, Art and Geography. One framed within a competency curriculum, the other with a focus on teaching for conceptual understanding.

In the kind of cross-curricular approach that makes appeal to generic skills, and treats subject matter merely as information on which to practise generic skills, the typical pattern that we have observed is for teachers to come up with a generic theme (such as 'balance' or 'mountains') that claims to enshrine a cross-curricular project but is only connected at a surface level rather than a conceptual one. Sometimes teachers simply take a content area, such as 'the Romans' or 'India', and then weave students' work purely around the content but without any sense of disciplinary goal. Generic skills or competences are invariably invoked as the unifiers – e.g. finding or presenting information; research; team-work; reasoning; creativity – but, without any sense of purpose, the subject matter is reduced to 'information' rather than a disciplinary quest for a particular type of truth claim and a particular type of meaning. For example, a 'generic skills' approach to a cross-curricular project on the Romans might see pupils learning some surface detail and general information in the name of History, doing some map work and gathering/summarizing information on interrelationships and location in Geography and looking at Roman art or mosaics in Art, perhaps with students making their own mosaics. These elements might be linked by some general competencies, such as speaking and listening skills, research skills or reasoning skills, or creativity. Creativity might be expressed in all aspects of the work or in some final project. But how are pupils learning to think historically, geographically and aesthetically here? And how are these disciplines really being both taught well and linked together to become bigger than the sum of their parts?

Below is an alternative, and more powerful, version that leads to both deep and conceptual understandings.

Let us look at Year 7 and the Roman Empire. Firstly we need to decide on the disciplinary or conceptual focus – in this instance we could look at the concept of change; a focus on how far life changed and for what groups. We need to then connect the different subjects through the deeper understanding they can give to the concept students are developing an understanding of and also help students to see that the concept takes on different meanings as it crosses disciplinary thresholds. To do this we need to frame the learning as a 'Fertile Question': a problem to be solved. A way of achieving this could be to look at Leptis Magna in Libya as an expression of Roman thought and power – the way the Romans used art and the built environment as an expression of imperial greatness and higher culture as a way of controlling their empire.

The question might be something like '*Did the Roman Empire improve people's lives?*' In History we would look at the psychology of the art as an expression of power and an attempt at realizing hegemony, the changes that took place as the Romans entered (modern-day) Libya and the impact this had

on different groups, interrogating the source material we find to say how people at the time might have experienced the change and reconstructing these experiences based on what the evidence does and does not tell us – a key difference from using 'research skills to access information'. In Art we would study how the Romans used art to express their wealth and power, their use of depth and perspective to create meaning and as a way of displaying their cultural superiority and attempting to transpose their cultural practices onto another people through their art; in Geography we would look at change – *how did different people experience the empire (directly or indirectly) and how did they communicate this experience? What has the nature, rate and extent of change been like? How might it be different in the future (prediction)?*

This would then culminate in a performance of understanding that would require students to use their deepening knowledge of the concept of change to either criticize or create something new that answers the Fertile Question.

It is clear to see that whilst both these examples nominally look at the same 'content area' one remains inert and simply provides surface information with little deep learning whilst the other seeks to induct students into an 'apprenticeship in thinking' through looking at the same event through different disciplinary lenses.

What does business want from education?

The Confederation of British Industry also recently rejoined the debate around UK education and where it has gone wrong. In their recent report 'First steps: A new approach for our schools' they have reclarified what businesses want from the education system; moving from a narrow focus on skills to a broader view of the whole person inculcated with a disciplinary perspective.

> In the past, the CBI has tended to discuss many of these areas in terms of 'employability skills.' This terminology was misleading, giving the impression that they {skills/behaviours} could be taught separately in the curriculum. That is not the case – the curriculum is the space in which we deliver core knowledge and enabling subjects.[7]

The inherent weakness of the genericist approach is further deepened by the fact that thinking skills are seen as tools to solve problems, without any reference to context. Apparently, you simply encounter a problem, choose the right skill, deploy it and the problem is solved and you move on. The thinking-skills approach is flawed, in that it sees the brain as a toolbox, and every problem as falling into a preconceived set of 'boxes' that map onto the tools

provided. It has led to a cottage industry of suppliers publishing materials which will have little impact on students' understanding of proper academic subjects, and on their success in these subjects at GCSE and A-Level (particularly as these exams are strengthened over the coming years). We feel strongly that this misunderstanding has often polluted approaches to enabling students to engage with reading. Now all they do is access tiny de-contextualized snippets and teachers then wonder why students do not want to read.

Disciplines misunderstood

This book is written as a handbook to enable schools to get to grips with the idea of disciplinary thinking, outlining why it is so vital to students' success and therefore to the UK not being left behind by its international competitors. We detail how this approach can be embedded in every classroom and every space. If senior managers in schools do not have a firm grasp of how academic subjects develop thinking, and empower students to succeed far better than a thinking-skills approach, then 'how can they manage a curriculum in the first place?'[8]

Part of the blame for the predominance of thinking-skills in UK education at the moment must be apportioned to those on the other side of the debate, the 'saviours' of traditional teaching. By expounding the virtues of traditional subjects with their canons of knowledge (information) to be imparted and committed to memory, they have drawn an unhelpful dichotomy. In reality both camps are wrong, and a different approach is needed.

Students need to be active learners, who discuss, question and operate on the knowledge they are given in class; who connect it with other knowledge they have and use it to form new ideas. Those of us who advocate attention to the integrity of subjects as disciplines are not, contrary to the way we are often presented, arguing that students should be passive vessels, whose heads we fill up with facts and information that they can then recite back to us. A discipline-based approach is questioning, critical and active. It has to be, because to engage with a discipline is to engage with how knowledge is constructed in the first place.

An international perspective

There are many vocal opponents to this cause, and we do not expect to convince everyone, but this is a call to arms for all teachers and school Senior Leaders who know that disciplinary thinking and academic perspectives are vital if we are to create an education system in this country that can compete with the best in the world. We often hear about the impressive results of the Singapore education system, or why Chinese Maths students consistently outstrip their

UK and US counterparts. The differences are sometimes explained by the different ways these students' languages operate, or cultural factors to do with work-ethic and the values families place on education. Our answer is a simpler one: in all these education systems there is an emphasis placed on disciplinary thinking and the role of concepts in shaping and developing meaning. For example, in China Maths teachers have a very clear grasp of the fundamental concepts that underpin the subject of Maths, and their curriculum is built around these concepts. They are then in turn able to teach these conceptual understandings in a way that enables students to apply their learning to a range of unseen problems – proof that they have a deep understanding. We believe that a similar emphasis on subject concepts, and a move away from generic thinking skills, would benefit students here in the UK.

Disciplinary thinking and education policy

The proposed changes to the UK examination system, due to take effect in 2015, will make the above approach even more necessary. Harder GCSEs and A-Levels that test understanding of the key elements in each subject, and a move away from the excessive predictability of recent years, mean that results could dip. The students who are most at risk of missing out on a passable grade – those currently at the D/C borderline – often tend to be students from inner-city comprehensives with a higher proportion of students on Free School Meals.

Reform of the examination system is welcome – we must bring it in line with the rigour and challenge of our international competitors. But schools now need to make concurrent changes to the curriculum in order to best prepare students for the demands of these new exams. The only way to ensure all students have an equal chance of achieving good grades and getting into a good university is by teaching them to think in a disciplined way. And as we move through the twenty-first century the importance of a university education becomes ever greater:

> In 2008, a man with higher education could expect to earn 58% more than his counterpart with no more than an upper secondary education, on average across OECD countries. By 2010, this premium increased to 67%.[9]

In addition to increased earning potential, the unemployment figures from across OECD countries makes interesting reading.

> The OECD has found that throughout the economic downturn, education level has been a predictor of job security. Between 2008 and 2010, unemployment in OECD countries rose from 8.8% to 12.5% for people with

> no upper secondary education, and from 4.9% to 7.8% for people with an upper secondary education. For those with tertiary education, unemployment increased from 3.3% to only 4.7%. Even in a time of economic crisis, OECD countries still need highly skilled employees.[10]

These statistics show the urgency of the situation. We need more inner-city schools that can deliver the very best outcomes for students, and deliver them against a backdrop of harder exams and increasing floor targets. The genericist approaches of the past will not deliver the change we need. Subjects matter, and disciplinary thinking is key to developing a more powerful education system which in turn will deliver more highly skilled employees. This handbook is built around that central premise. Academic subjects and their ways of thinking, talking, writing and knowing are not bodies of information to be found on a website; they are constructed and contested forms of knowledge that have come about through man's desire to understand the world around him. Our view, from our experience, is that if more teachers and school leaders can understand this, and adopt this approach with their students, then perhaps in 20 years' time countries around the world will be discussing how to emulate our education system, and not the other way around.

To sum up, it is estimated that we could add £8trn to the GDP of the UK over the lifetime of a child born today if we reached Finnish levels of achievement (outcomes) in education.[11] Our view is that disciplinary thinking is crucial to developing a more powerful education system and that genericist skills-based approaches are misinformed at best.

New technologies and the future of education

You will notice that nowhere in this manual do we talk about new technologies and the use of ICT in learning. The reason for this is twofold. First, the rate of change and development is so rapid in the technological world that to talk about a particular piece of software or programme would probably render the approach outdated within a year. Second, the evidence as it currently stands does little to support the use of technology as a lever on learning. We would argue that the reason for this is because technology is often used as a bolt-on, replicating and repeating teacher input of surface content with little progression in understanding (where understanding means thinking and acting flexibly, not reciting). There is huge value to the use of new technology and it is as follows.

Researchers are now fairly happy to acknowledge that there are three kinds of understanding: surface, deep and conceptual (Bereiter 2002). Hattie defines these as follows:

> The surface knowledge needed to understand the concepts; the deeper understandings of how ideas relate to each other and extend to other understandings; and the conceptual thinking that allows surface and deep knowledge to turn into conjectures and concepts upon which to build new surface and deep understandings. (Hattie 2008)

A more powerful way therefore of utilizing the benefits of new technologies is in using them to provide students with the surface knowledge they need. The role of the teacher is to help convert this surface understanding into deeper understanding and conceptual thinking. New technology, for all its merits, cannot fulfil this role but when used properly it plays a very significant part in helping to develop conceptual thinking in students. If most teaching currently focuses on surface understanding then building in technology to play that role frees up the teacher to focus on developing deeper and more sophisticated types of thinking.

To enable this to truly happen with little in-school variance, every teacher in the school must first understand how to plan for this progression in thinking and once that is embedded technology can be unleashed to secure even greater progress. This book is written to allow this process to happen.

Now that we have looked at the role of disciplines in delivering educational excellence at a national and international level, we will go on to look at how that fits with the unique challenges of the twenty-first century and the particular school systems and framework that we have developed to meet these challenges.

The challenge facing education

The core values of outstanding schools

This handbook outlines a whole-school approach to embedding a sustainable model of teaching and learning that puts the learner at the heart of the system. It provides an entire framework for ensuring all students achieve above national expectations. We cover school vision; teacher training and professional development; assessment models; culture and ethos; leadership and management; curriculum design; constructing schemes of work; and lesson planning and delivery. It is based on our combined experience in over seven different schools.

The single most important aspect of your school culture is establishing that *we are all learners* – students and staff alike.

Our experience has shown us that a key student misconception to challenge is that intelligence is fixed. Working with our staff teams, we have learnt that students need to see themselves as developing individuals, whose mistakes represent opportunities to review and better understand the work, not evidence that they are unable to do it. All students should be treated as intelligent and individual, capable of accessing complicated ideas and thinking in a disciplined manner. To secure this, we have prioritized some crucial planning principles:

i. Lessons are not isolated events: all subjects are taught through enquiries that embody the structural features of the discipline.[12]

ii. All enquiries embed a 'Learner Profile' of the students.

Taken together, the disciplinary focus foregrounded in planning and the use of Learner Profiles, we have managed to avoid students thinking of themselves as 'high ability' or 'low ability', and, most crucially, allowing the latter to be forced down a non-academic, non-disciplinary pathway at a young age.

For staff, they must believe that teacher training and development is an ongoing process; that we never 'arrive' as teachers, but can always refine and improve our teaching, and better tailor our lessons to improve students' understanding and performance. Teaching is a craft, and a lifetime is not long enough to master it. In our experience, the best teachers reflect, evaluate, observe and are observed, seek and respond to feedback, engage with research, experiment, take risks and try new ideas. As soon as we stop seeing ourselves as learners we will be unable to model the learning behaviours we expect from our students, and unable to honestly develop the teachers we lead.

The challenge of twenty-first century education[13] – outcomes misunderstood

> A generation ago, teachers could expect that what they taught would last their students a lifetime. Today, because of rapid economic and social change, schools have to prepare students for jobs that have not yet been created, technologies that have not yet been invented and problems that we don't yet know will arise.
>
> *(*Andreas Schleicher, OECD Education Directorate. The case for 21st century learning)[14]

In this important study, the OECD considered the kind of education schools should provide in the twenty-first century. They proposed that students should be introduced to:

- **new ways of thinking**: including creativity, critical thinking, problem solving and decision-making;
- **new ways of working**: including new forms of collaboration and communication;
- **using new tools for working**: including the capacity to harness the potential of new technologies.

'Success will go to those individuals and countries that are swift to adapt, slow to resist and open to change. The task of educators and policymakers is to help countries rise to this challenge.' (Schleicher op. cit.)

It is in reaction to studies like this that generic frameworks of vaguely linked competencies were created. The problem is that teaching 'critical' or 'higher-order thinking skills' cannot be divorced from teaching academic subjects. Maths, Science, History, Geography – these are not dry information-gathering exercises that will not develop the creativity, critical thinking and problem solving the twenty-first century economy demands. They are fields of research and debate that have their own language, rules and modes of discourse, which, through studying, enable students to understand the world around them, and then develop that understanding in others.

To a certain extent it is true in that schools have, in the past, taught subjects in a dry way; viewing them as bodies of information to be consumed and committed to memory. If this was the only alternative then it might be sensible to discard Geography or English and teach a series of thematic projects instead. There is nothing engaging, motivating or real-world relevant about learning all the capital cities of the world off by heart – but this is not what we mean by teaching subjects. Instead we propose a disciplinary approach based on conceptual understandings; an approach which lifts academic subjects off the mundane plains of information-gathering and up into the ambitious heights of critical thinking and analysis – with all the complexities of thought that universities and employers want. This handbook maps out an approach to being future-proof as a school, and securing the best outcomes for all students.

Fit for purpose?

The current education system is not fit for the present, let alone the future. A 2012 study into what universities want from secondary education concluded:

> Issues about…skills essential for undergraduate learning arose in interviews with universities. These included both specific academic skills, such as

researching, finding sources, essay-writing and referencing, and the wider skills of problem solving, analysis and critical thinking.[15]

The kind of intellectual flexibility described here – the ability to make connections, think critically, be objective and original, work independently – can only be arrived at by studying discrete academic subjects from an early age, with a sustained focus on conceptual understanding. What universities want are students who have a deep academic understanding that allows them to self-direct their studies. To achieve this, students need to be taught to think in a disciplined manner. They must encounter and wrestle with powerful knowledge, and move from the everyday to the academic.

A paradigm shift[16]

Views on the role of schools and the purposes of education have shifted enormously over the past 20–30 years, as shown in Figure 0.1. The focus now is much more on processes and metacognition.

A new role for assessment[17]

Whatever our view is of the purposes of schools and education and the transformative and enlightening impact it can have, the test of any approach to teaching and learning has to be the measurable outcomes of students in national examinations. This is the currency the world uses and it is the currency we have to provide for all our students. In our experience, however creative or innovative a model sounds, if it cannot deliver the results it is of little use to students and teachers. It would be a mistake to think that the enquiry approach we outline here does not have a hard assessment edge to it. It does – it is just that we consider the best assessment results are not achieved by narrowly drilling students for the test. This approach will work to a point – it might get you more C grades or Level 4s – but it will not help you if the test changes, or if your ambition is for students to achieve the very top grades they will need for the best universities.

Assessment is covered in depth later in the handbook, but it is worth noting some key principles around assessment in schools here:[18]

i. Assessment has a backwash effect on curriculum and teacher practice. It can undermine or support your philosophy of teaching, depending on how

it is managed. This must be recognized so that teachers and schools focus on what we value.

Nineteenth/twentieth century assumptions	Twenty-first century assumptions
Intelligence is perceived as unitary, fixed and innate.	Intelligence is understood as multi-faceted, plastic and (to a certain extent) learnable.
Learning is the acquisition of subject content. Students are consumers of knowledge.	Students are producers, not just consumers of knowledge. The learning focus is on application of knowledge.
Curriculum focuses on content coverage and behavioural objectives.	Curriculum focuses on processes of learning to learn, metacognition and skill development.
The focus is on information and knowledge.	Information *literacy*, learning to handle information is the focus.
Education is limited to the school and for fixed periods.	Education is lifelong and unconstrained in time and place.
Teaching and learning roles are sharply defined and segregated. School is a place with clear rigid boundaries. School is like a factory.	The roles are blurred and overlapping. School is a network and part of a broader web.
Schools and teachers are autonomous.	Schools and teachers are embedded in complex interconnected relationships.
The focus is local, national and international.	The focus is local, national and *global*.
Schools prepare students for lifelong employment in one future occupation.	Students' identities and destinies are fluid and changing.

Figure 0.1 Hargreaves' synthesis of twenty-first century assumptions about education

ii. Curricula, with corresponding assessments, must be broad and balanced. Students must be assessed on the processes as well as the products of learning, and be able to demonstrate understanding and performance holistically in authentic contexts, as well as in examinations and tests. Fertile Questions help here.

iii. Good schools need to listen to the messages coming from universities about assessments, and avoid dumbing down tests or introducing excessive predictability. Work backwards from the assessment demands of the subject at undergraduate level; this way your students' long-term interests will be served, but they will still be suitably prepared for GCSE and A-Level.

iv. The central role of the teacher as a creative professional must be recognized and encouraged. In our schools, our teachers have eschewed shrink-wrapped, commercially produced tests. Such externally produced assessment packages, imposed on staff, will not lead to expert assessment. If subject leaders are writing their own schemes of work (which they must be if they are to have any ownership) then they can – and should – write their own assessments. Otherwise they will be in the peculiar situation where the end of term assessment does not link to the taught curriculum.

v. The feedback from summative assessments – including large exams – must be used as a planning tool and all teachers must be responsive to this. If (groups of) students perform badly in assessments this information must inform both what you teach those students next and how you teach that Fertile Question(s) differently next time to avoid the same issues.

The whole-school model

The paradigm shift articulated in Hargreaves' table above is of central importance to the approach outlined in this handbook. The approach and school model we have implemented is designed around these twenty-first century assumptions and what research suggests provides greatest traction for learning.

Where to go with school autonomy?

Current UK education policy is giving schools more freedom and autonomy. To make the most of these freedoms schools need to have not only a clear vision and sense of purpose but also a clear model for how to implement that vision.

The model outlined in this book fuses disciplinary approaches to subject teaching with what the science of learning currently does – and does not – tell us about how learning happens and meaning is made. It solves the challenges and complexities of the twenty-first century by focusing on developing deeper conceptual understandings and using assessment as a performance of understanding rather than a recital of pre-rehearsed skills. The model does not reject traditional subject divisions but neither is it a blinkered approach to teaching subjects and lessons as isolated events, divorced of connections and contradictions and focused on information absorption. It creates a *coherent curriculum* – coherent by being connected at the conceptual level rather than the surface content or thematic level – that revolves around application rather than acquisition of knowledge.

And it is a timely solution. The education system in the UK has changed dramatically under recent governments, partly in response to this paradigm shift. Although this book is not political it recognizes the likely direction of education policy over the next ten years and the emergence of the new GCSE examinations. The expansion of the academies programme; the introduction of free schools; the review of the National Curriculum – all these policies seek to devolve power and control to individual schools. And not just control over management and budgets; control over those areas of school leadership we concern ourselves with here: curriculum, teaching and learning, assessment.

Increased autonomy for schools in these areas is a positive thing. It is only by thinking through these defining questions – what subjects do I want to offer, what do these involve, how should I teach them, how will I assess students' understanding – that schools can achieve the highest standards. Teachers need to feel ownership of their classrooms, and that does not come from being told what to teach, and how to teach it. In school management you can 'prescribe adequacy', but you have to 'unleash greatness'.[19]

What are schools for?

Michael Young of the Institute of Education put it like this in a speech to Headteachers in 2012:

> I want to make an argument for a view of school leadership and a new way of thinking about leadership. It places the curriculum – the principles on which we decide what a school should teach – as shaping all the other responsibilities that face a Head teacher. It arises partly from my understanding of the new policy context that schools face...the new freedoms that the government claims to offer schools. ...It is a school's

> curriculum priorities that convey to staff and students and to parents, (and ultimately, government) what a school's purposes are – what it can (and cannot) do. Schools are not social work agencies nor can they solve the problems of youth unemployment. So what can schools do that no other institutions in our society can do?

Schools can teach, and develop understanding of academic subjects to as wide a group as possible. This is the democratic promise of state education. We know that university is the biggest driver of social mobility, and in the twenty-first century this is more true than ever before. All students deserve a secondary school that will prepare them for entrance to university. All students *can think* in a disciplined manner, and developing 'powerful knowledge' in students is a social justice issue that is often overlooked.

Perhaps a terrifying report but a very relevant one is this:

> Four [independent] schools and one sixth-form college sent more pupils to Oxbridge between them over three years to 2011 than 2,000 [comprehensive] schools across the UK, according to a new study that analyses university admissions from individual schools. Westminster, Eton, St Paul's, St Paul's girls school and Hills Road sixth-form college, produced 946 Oxbridge entrants from 2007-09, the study by the Sutton Trust finds. In the same period, there were 2,000 schools and colleges which sent two or fewer pupils to Oxbridge, producing 927 in total. The difference in these schools' success rates is driven mainly by gaps in achievement at A-level. The Sutton Trust study underlines a familiar divide between the private and state sectors – finding that independent school pupils are twice as likely as comprehensive pupils to get into the 30 most selective universities and seven times as likely to get into Oxbridge. Even at the 30 highest achieving comprehensive schools, entry into competitive universities lags behind private and grammar schools. Just under 60% of pupils from the best state schools went to the most selective universities compared with just under 90% of pupils at the best private schools and 74% from the top grammars. Of a comprehensive and a private school in Cornwall, with near identical results, the former sent 17% to selective universities and the latter 66%. There are striking differences even between schools of the same type. At two comprehensives with similar results, almost 70% of 18-year-olds applied to go to university at one, but only 33% at the other.[20]

The disciplinary perspective

There are of course many factors that influence the proportion of student leavers a school sends to university each year. A school's careers programme, its historical experience, the local industry, the socio-economic background of the students – all of these things matter. But the ambition and challenge in the curriculum at Key Stage 3, 4 and 5, and the school's philosophy on teaching and its conception of the kind of learners it wants to develop its students into are the biggest factors.

We started out with the belief that all learners should encounter and wrestle with ways of constructing knowledge and ways of thinking that are above their everyday experiences, and see that academic concepts are different from everyday concepts and ways of explaining the world. For us this was the best way of preparing them to think like undergraduates before they even get close to deciding whether to apply to university. If instead students are taught only a skills and competencies approach, and denied the chance to view the world through more academic lenses, then it is likely their access to elite universities will be limited (or indeed their access to elite professions) and the two-tier society we currently inhabit will continue.

Exposure to subject disciplines connected at the conceptual level will teach students to:

- think critically
- solve problems and be analytical
- make connections
- communicate clearly and with passion
- argue and debate with clarity
- be creative
- be information literate
- be objective and original
- work independently.

These are exactly the characteristics that universities feel secondary schools often fail to develop in their students.

For this ambitious goal to be achieved all aspects of the school – teacher training, lesson observation, assessment, performance management, behaviour and ethos – need to pull in the same direction. There needs to be a strong, agreed version of what and how we teach, and this must be consistently applied across the school.

The whole-school approach to teaching and learning

Let us begin to move from theory to practice, and discuss how this approach could be implemented across a school. From our experience of teaching and of senior leadership, we have developed six guiding principles:

- **Learning is disciplined:** Different academic subjects stretch and develop different ways of thinking and talking. A scientist's questioning is not the same as a theologian's. Evidence in History is not the same as evidence in Mathematics. Each of the subjects that we teach has grown out of man's desire to understand the world around us and each subject has certain rules and ways of thinking that students need to understand if they are to engage fully with the world.
- **Teaching is exploratory:** All subjects are taught through substantial enquiries, or Fertile Questions. A Fertile Question is a planning device for knitting together a sequence of lessons around a problem posed, so that all of the learning activities – teacher exposition, reading, independent research, role-play, seminars – all move towards the resolution of a meaningful *historical/scientific/mathematical* problem by means of substantial, real and motivating activity at the end.
- **Learning is joined-up:** By being linked by a single, profound question, an enquiry-based approach engages pupils and helps them to see the links between concepts and knowledge. It also goes beyond traditional models, because the enquiry must enshrine a journey that helps pupils to *think* historically, *think* scientifically, *think* geographically, *think* mathematically and so prepare pupils, gradually, to see the differences and tensions, as well as interesting convergences, between these.
- **Teaching is public:** Through a constant programme of peer observation, review and feedback, joint planning and micro-teaching, teachers can enjoy building collective knowledge about their craft. In the schools that we have served, teachers plan together, teach together and review together, maintaining a constant reflective and collaborative dialogue.
- **Learning is meaningful:** People understand something when they can *think and act flexibly with what they know about it* – not just rehearse information and execute routine familiar skills. Students need to present knowledge, to operate on and with knowledge, and to criticize and create new knowledge if they are to really know.

- **Teaching is responsive:** Ongoing self-evaluation is a feature of any successful organization. Teachers should be constantly engaged in evaluating the impact of their strategies and changing or recasting them if they are not working. As learners progress through an enquiry, the teacher takes on different roles, moving from instructor, to facilitator, to mentor, to chair of a review.

Educating is more than teaching people to think – it is also teaching people things that are worth knowing. Good teaching involves constructing explanations, criticizing, drawing out inferences, finding applications, and there 'should never be a need for a teacher to think of ways to inject more thinking into the curriculum. That would be like trying to inject more aerobic exercise into the lives of Sherpa porters'. If the students are not doing enough thinking, something is seriously wrong with the instruction.[21]

How learning happens in our classrooms[22]

These principles form the framework for everything that follows. They are based on both the research into how learning happens as well as on two decades of teaching, observing and training in schools. These six principles form the bedrock of the approach and adherence to them is central to long-term success.

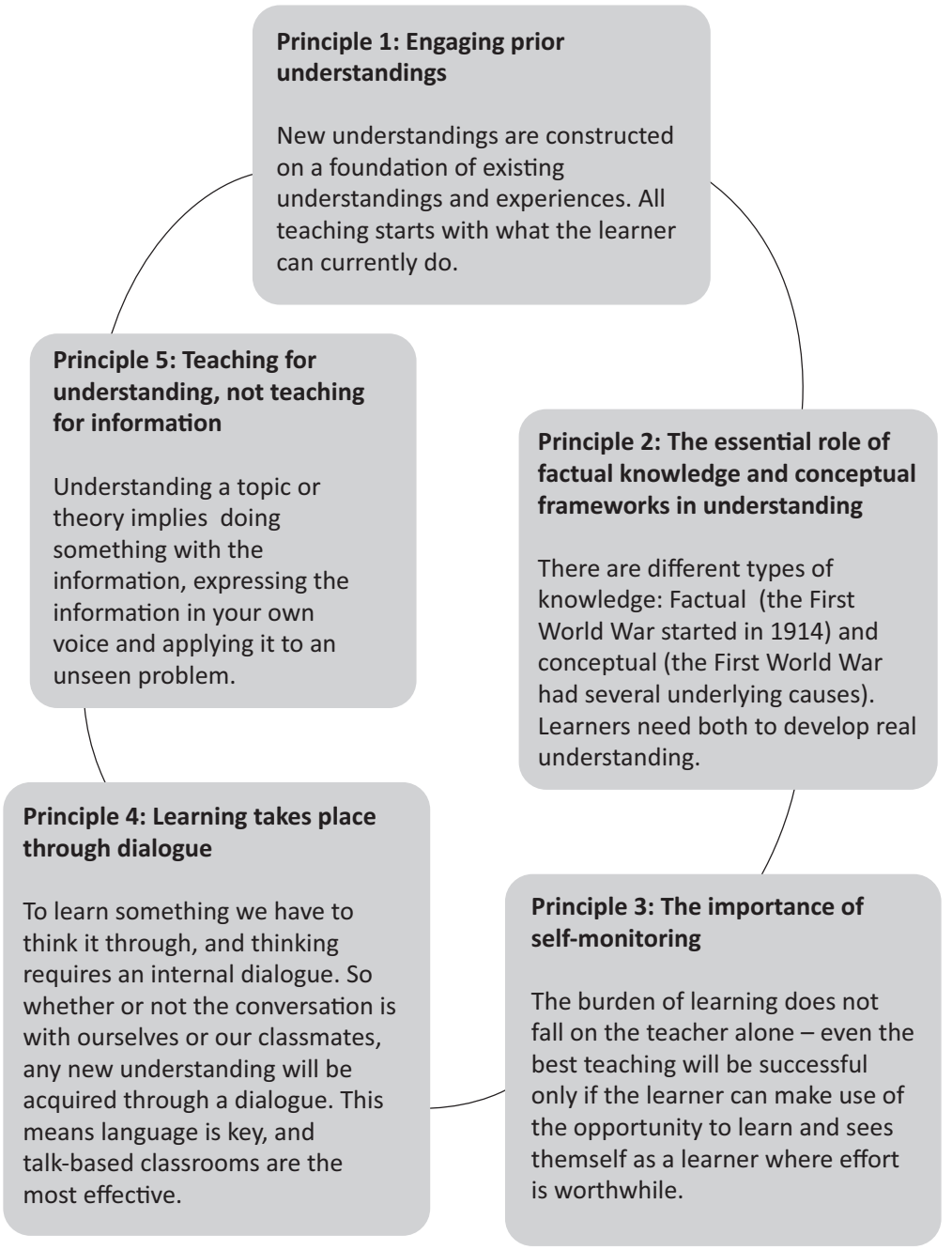

Figure 0.2 How learning happens in our classrooms

How to use this book

'Teachers, teachers, teachers'

Teachers make the biggest difference in any school, as anyone who has ever worked in education knows. In many cases it is not what school you go to, but what classrooms you go to in that school, that dictates what your future life choices are. Teaching is the core business of any school, and as such the recruitment and development of teachers is the first priority of any Headteacher. We mean development in the broadest sense – not just five INSET days a year. Teaching using Fertile Questions, or focusing on disciplinary understanding, these are developmental tools.

Influences on student outcomes

The pie chart (see Figure 0.3) is based on Professor John Hattie's meta-analysis of over 800 international research studies into what does and does not have an impact on students' learning and outcomes. The chart clearly shows that after the students themselves, the biggest impact comes from teachers.

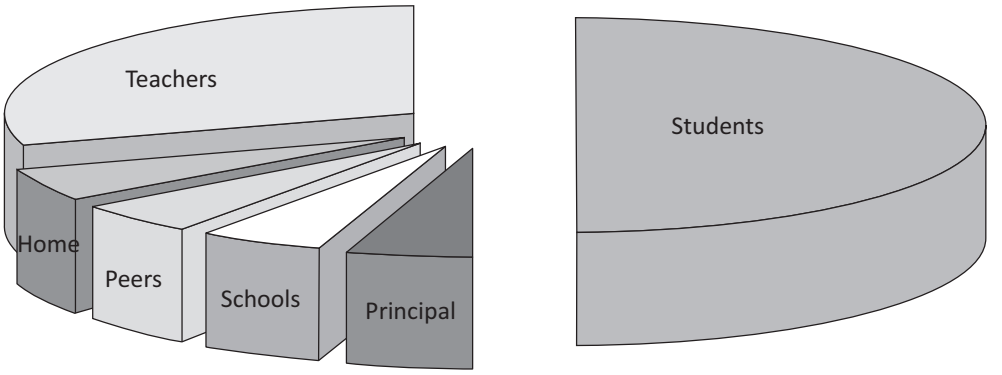

Figure 0.3 Influences on student learning and outcomes[23]

Eradicating in-school variance

> An effective school is [essentially] a school full of effective classrooms. It matters much less which school a child attends than which classrooms they are in at that school. In England there is a four-fold difference between the most effective and least effective classrooms. (Dylan Wiliam, Talk at the SSAT in May 2009)

So, limiting in-school variance, and ensuring consistently high standards of classroom teaching, is what this book aims to achieve. Six great lessons every day for every student will ripple out into all other areas of school life: attainment, progress, behaviour, culture and ethos, attendance and more. But to get that kind of consistency you need a model: a framework for teachers to follow and refer back to. This is not a prescriptive approach – we do not expect teachers' lessons to be formulaic or repetitive. Instead the ideas in the model provide a stimulus for teachers to plan their lessons. The structures in the book are liberating, not limiting.

Because, in our model, the classroom is sovereign, all areas of school management – training, lesson observation, performance management, curriculum design, assessment – need to cohere and support a school's aim of strong classroom teaching. It is our experience that if this approach is to become embedded then all other elements of school life should be aligned with it. If the behaviour policy does not reinforce the Learner Profile that the Senior Team is trying to develop in lessons, or if the performance management policy does not reinforce expectations on lesson planning, then the model will not take hold. Our advice is that everything the Senior Team initiates should be fully built in and integrated with the core provision, not bolted on as an afterthought. Ultimately, we will not raise attainment in Year 11 with intervention programmes. An 'intervention' implies that something has already gone wrong. To be fully transformative, we need to think beyond intervention. We have found that we can only raise attainment and sustain that rise with consistently strong teaching, across five years. And strong teaching does not come from a handful of training sessions or one snazzy questioning strategy. It comes from a carefully thought-through model of teaching and learning that is researched, written down, reinforced and trained at every opportunity.

A manual not a thesis

With that in mind we have designed this book to be a handbook and training manual to be drawn upon by every teacher, in daily practice. It is not something to read over the summer holidays and then to pick one or two nice activities

from to try out in September. Nor is it something for the Senior Team to read and 'do' to the rest of the staff. It is a training manual to implement, evaluate and refine a whole-school approach to teaching and learning that will create an aspirational culture within school, and prepare students to play a meaningful role in society. It is intended to be read and reread, annotated, with key pages photocopied and stuck on your wall. Use it when you are writing a scheme of work, planning a lesson, designing a training session. Do not leave it on the shelf unused. It is a manual, not a thesis.

Each section outlines an aspect of the whole-school approach, what the research says about it and then how to embed it in every classroom. At the end of each section there is a training section or activity. These have been written to allow teachers to be trained on the ideas and practices contained within that section. They can either be used as they are or tweaked to fit with where the school is on its journey. The most effective method of creating a school of outstanding classrooms is to use each section as a series of training sessions. Then, as outlined in the leadership section, plan for a cyclical timetable of future training to revisit, revise and amend the initial training to ensure new teachers are inducted and existing staff continue to be developed. Throughout this book there are also in-depth case studies that help to demonstrate the thinking involved in putting the principles into practice. These case studies need to be shared and talked about, deconstructed, challenged and picked apart. They outline the approach that teachers have taken to engage with the five principles and make them come alive in their classrooms. Hold true to our five principles and the model will prove transformative.

Core practices that comprise the whole-school approach

The core practices of our model are broken into four strands. These strands encompass all areas of school life and provide a framework for creating a consistent approach across all areas. The book now goes on to describe each area in detail and looks at how to embed it in every classroom. Figure 0.4 is a model of how our approach operates.

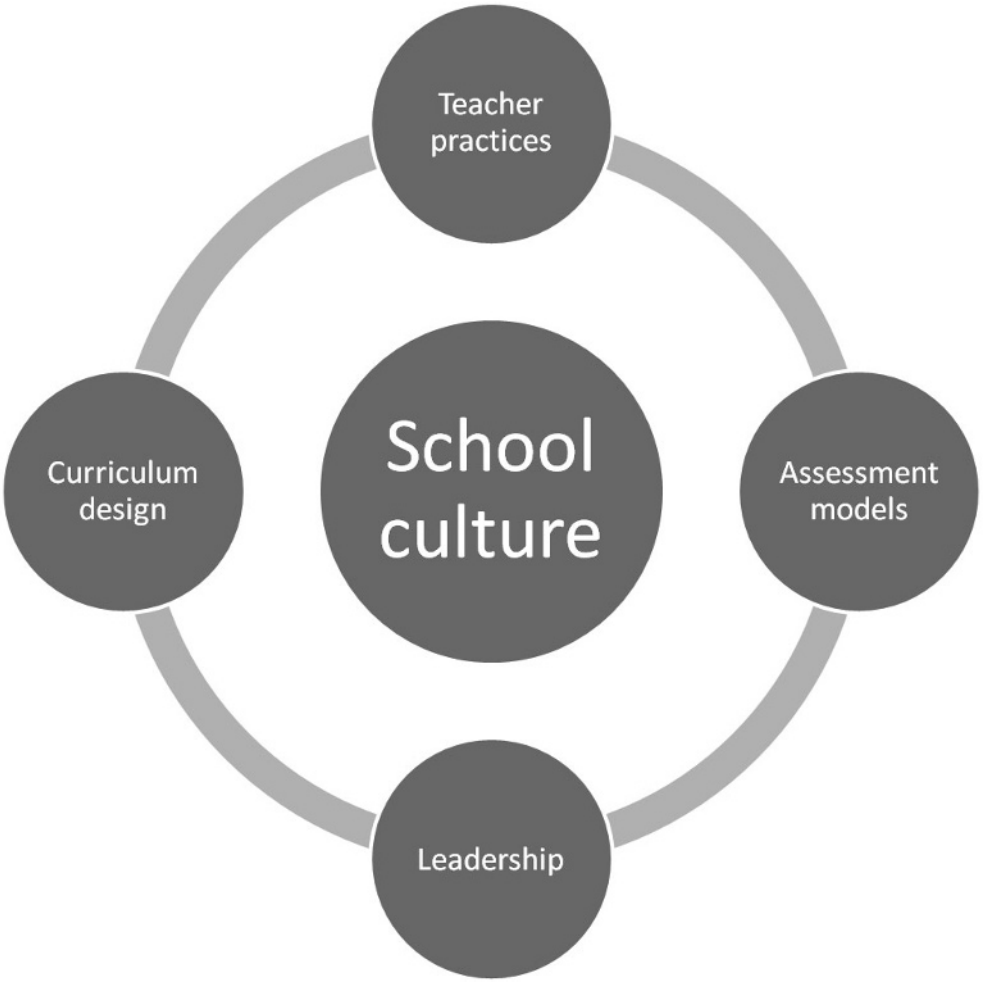

Figure 0.4 How the whole-school model operates

How could you seek to implement the approach outlined in this book?

This table shows the different levels of implementation and how you could move through them.

Functioning	Embedding	Innovating
• understands the five principles; • can design a sequence of learning experiences that revolve around a Fertile Question; • each Fertile Question planned around a core concept; • the curriculum design allows for progression in thinking to be seen as a ladder with conceptual thinking escalated over time and earlier concepts revisited and expanded; • following the letter of the approach: i. students receive feedback – mainly about task completion – and set strategies – mainly around procedures to complete the task; ii. precise planning by the teacher through a Fertile Question; iii. feedback focused on performance and the successful completion of the task in hand; iv. an intention to teach or assess the next pre-determined thing in a linear progression through the curriculum plan/map; v. opportunities for language development built in to the Fertile Question but not planned for over a 3-5 year plan;	• uses the five principles to shape the planning; • the curriculum model is mapped out from undergraduate level to Year 7 through a spiralling set of Fertile Questions; • Fertile Questions over time revisit and strengthen core conceptual understandings over a 3-5 year plan; • the curriculum design sees the curriculum as a spider's web, with students constantly revisiting prior thinking as a way of strengthening their understanding; • following the spirit of the approach – growing out from a fixed path through the curriculum to: i. flexible planning which incorporates alternative resolutions to a Fertile Question and multiple ways of explaining the resolution; ii. primarily open tasks with questioning by teachers and learners directed at 'helping' rather than testing; iii. a focus on miscues – aspects of learners' work which yield insights into their current understanding – and on prompting metacognition;	• innovates with the five principles; • uses core conceptual understandings as the starting point for planning and designing Fertile Questions; • transcending the approach – the curriculum shifts from a fixed map to a kaleidoscope with different journeys to the same destination by: i. complex planning which constantly amends itself to learner achievement; ii. formative assessment focused on a holistic view of criteria, the learners' understandings of them and how they fit into wider notions of knowledge and competence; iii. involvement of the learners as initiators of assessments as well as recipients and students as devising their own Fertile Questions; iv. an analysis of the interaction of learners and the curriculum from the point of view of both learners and the curriculum; v. a view of assessment as a collaboration between and amongst teachers and students; vi. language being seen as an integral part of learning;

vi. staff trained on all aspects of the approach and lessons observed to ensure uptake.	iv. exploratory, provisional or provocative feedback aimed at prompting further engagement from the learner and challenging assumptions; v. discussion prompting reflection on the task and its context with a view to constructing understanding of future situations in which new knowledge might be applied; vi. language development planned over the duration of the curriculum map; vii. cyclical staff training with time planned for co-teaching and peer observation as part of normal duties; viii. students involvement in target-setting and review.	vii. staff designing their own training programmes and creating bespoke observation timetables; viii. staff regularly working in small groups and following the process of 'micro-teaching'; ix. students regularly predicting their performance and being involved in setting goals and the short or medium-term targets that they believe will help them reach these goals.