High quality teachers, high quality learning – a framework for improvement

What is needed to establish a spirit of enquiry which makes a real improvement difference in schools? **David Hopkins** and **Wayne Craig** look at the conditions required which have profound implications for leadership and for professional development.

This is the final article in a series of three that have appeared in successive issues of PDT. Their focus has been on the improvement of student achievement through the development of professional practice within a systemic context. In the first of these papers there was an analysis of the strategies for improvement at the school and local level, known as the 'powerful learning' framework, that was developed in the

Northern Metropolitan Region (NMR) of Victoria, Australia. The second article, described 'theories of action', the subsequent 'Curiosity Booklet' and the 'instructional rounds' strategy from which the Curiosity handbook was derived. Finally, in this third article, the leadership strategies adopted to ensure that implementation occurs at a level sufficient to impact on student learning and achievement are presented. An analysis is then made of the necessary school level conditions required to enable this. The article concludes with a model of system reform and the theories of action that support it.

■ ■ ▪ Confronting the "Killer" Theory of Action

As part of the ongoing enquiry into classroom, school and system improvement described in this article, we have identified 'Ten Theories of Action' that when taken together not only enhance the learning outcomes of students but also their learning capability – in a word their 'curiosity'. As we have seen, these ten theories of action fall into two groups: those that pertain to the whole school level - that enable teachers to do their work; and those that relate to the teacher level - that enable them to create more effective and enquiring learning environments for their students.

As our enquiry developed, it soon became clear the second of the school level theories of action was not only the most powerful, but also the most difficult to implement. In a slightly expanded form it is –

When teacher directed instruction is infused by a 'spirit of enquiry', then the level of student engagement and achievement increases. This is the foundation stone for not only high quality teaching, but also the development of curiosity.

Although most of the schools we were working with had identified a set of theories of action related to teacher behaviours to focus on and had introduced professional learning opportunities for teachers to develop them, this did not mean that the 'spirit of enquiry' also became realised. We began worrying about why this was so difficult to achieve and in trying to resolve the conundrum identified five interlinking and sequential conditions that seem to be in place when schools

realise this *desiderata*. Although most schools were implementing some of the theories of action (Condition 2) through professional learning approaches (Condition 3), in many cases this only resulted in superficial and variable impact. It was only when there was narrative (Condition 1) and consistency (Condition 4), that the change in culture (Condition 5), that embraced the spirit of enquiry, was reliably achieved.

When working at scale we found it necessary to develop frameworks that not only assist schools through this process, but that also allows them to more precisely monitor the impact of implementation. In this brief description of the five conditions, there is also reference to the monitoring frameworks that schools can use to confront and overcome the killer theory of action!

Each of the five conditions contribute strategically to the emerging story or narrative of the school's own journey of school improvement. The narrative is critical. It serves as the means of uniting the work of the system, the school and the classroom. Stories are treated differently and better by the brain than any other memories. Stories also act as the currency of our thoughts, storing value and enabling exchange. In the school improvement context, stories enable us to purposefully share the core elements of our work and serve to unite – around a common rallying point, better outcomes for students - the district or region, the school and the classroom. Finally, stories act as the brain's flight simulators and allow us to effectively rehearse our work before we do it. In the school context, telling the school improvement stories acts almost exactly as a "dress rehearsal" for doing the work. In a classroom, telling the story of the lesson or a sequence of instruction not only gives students a chance to mentally practice what they will do, it also provides a clear path for the teacher to follow.

1. The story of the curiosity journey is introduced
A clear reform narrative for student learning is developed and consistently applied over time, with an urgency that translates the vision of curiosity into clear principles for action. This narrative is the task of leadership to develop. It is based on detailed and strategic planning, but is couched in a language that is understandable

by staff, students and the community and that links moral purpose to action in practical and concrete ways. Above all it highlights the connection between curiosity, enquiry, problem solving and collaboration as the necessary ingredients of a teaching and learning culture that results not just in high standards but also student empowerment.

Monitoring framework – The schools position on the 'performance cycle' from "awful to adequate", "adequate to good" and "good to great" is used as a basis for developing the narrative (See Box 1).

Box 1: Performance Cycle Grid

School Journey ➡ Improvement ⬇ Dimension	Awful to Adequate	Adequate to Good	Good to Great
Environment	Orderly	Learning	Self directed
Teaching Practice	Consistency	Share best practice	Models of learning, tools for teaching
Curriculum	Literacy and numeracy basics	Literacy and numeracy across curriculum	Cross curricular enquiry projects
Assessment	Ownership for progress of students	Assessment of learning	Students set own targets and monitor progress
Data	Establish systems for data use	Monitor student progress through data	Formative and student use of data
Leadership	Developing leadership capacity	Distributed leadership	System leadership

2. Key pedagogic strategies are selected

High leverage theories of action related to student learning are selected and implemented strategically and operationally. High leverage relates to the ability of the theory of action to not only have virtually immediate impact on the teaching and learning practices of the school, but also to lay the foundation for future action. So

*p*D**T**

for example, many schools at the start of their journey will select, 'learning intentions' as these will, when even only partially implemented, impact on student expectations and engagement and lay the basis for differentiated task setting and peer assessment, that have increased power to enhance student achievement and learning. Over time this will also influence the ways in which the narrative of the curriculum within the school evolves, from simply covering content, to a series of sequential and integrated problem solving activities.

Monitoring framework – The three-year planning framework, which is essentially a Gantt chart detailing what activity will be taken and when, provides a means of not only building the narrative, but also ensuring that priorities are selected that will not only produce short-term gains, but also lay the foundation for the next phase of the work. The framework prioritises the teaching strategies to be developed and deployed, the length of the proposed cycles of enquiry associated with each strategy and the timing of success checks for each strategy.

3. Professional learning is placed at the heart of the process

In schools where staff development implies going on a course, and classroom observation is both hierarchical and evaluative, putting professional learning at the heart of the process marks a distinctive and necessary break with tradition. However, it is only forms of professional learning that emphasise non-judgmental peer observation, support through triads, disciplined by clear definitions and protocols that will develop professional practices that have a predictable impact of student learning and achievement. Going even further, replacing normative approaches to performance management with teacher portfolios of examples of such work is characteristic not only of high achieving schools, but is also the hallmark on 'inside out' working.

Monitoring framework – The Joyce and Showers (1995) coaching model is used to ensure that the appropriate phases and sequencing of professional learning activities are in place. For example, if a school was implementing *Theory of Action 1, Harnessing*

Learning Intentions, Pace, the first phase would be based on the theory and explain and justify the new approach. The second, demonstration phase shows or models how the work is done in practice. The third phase is the practice phase where teachers practice in non-threatening situations. From here, the next phase sees teachers receiving feedback. The final and critical phase is where teachers in triads (groups of three) or other groupings coach each other. Unless the coaching phase is reached the professional development process (and the teaching strategy) will have no impact on student learning. Teachers will have developed their knowledge about the strategy but will not have the requisite skills to implement it.

4. Consistency across the whole school is seen as paramount

Leadership works self consciously to ensure that over time the vision of curiosity and spirit of enquiry is pervasive, more precise carefully monitored and supported by robust and highly reliable school structures. The 'loose coupling' so characteristic of 'underperforming' and 'coasting' schools is incrementally tightened. Although this is essential in reducing 'within school variation' a word of caution needs to be entered here. Although 'top down' approaches are useful in schools that are dysfunctional and badly underperforming, autocratic or charismatic forms of leadership need to be used judiciously with schools on the 'inside out' journey. Putting into place structures to ensure consistency need to be done in a way that lead to forms of lateral and professional accountability and not prejudice the emerging and often fragile episodes of professional learning.

Monitoring framework – The Hall and Hord (1987) 'Levels of Use' framework is used to indentify and progress the levels of implementation required to impact directly on student learning.

The steps in the model are as follows:

■ **Level 0, Non-Use:** No interest shown in the innovation and no action taken;

- **Level 1, Orientation:** Begins to gather information about the innovation
- **Level 2, Preparation:** Begins to plan ways to implement the innovation
- **Level 3, Mechanical:** Concerned about mechanics of implementation
- **Level 4a, Routine:** Comfortable with innovation and implements it as taught
- **Level 4b, Refinement:** Begins to explore ways for continuous improvement
- **Level 5, Integration:** Integrates innovation with other initiatives; does not view it as an add-on; collaborates with others
- **Level 6, Renewal:** Explores new and different ways to implement innovation

5. Cultures are changed and developed

A culture of disciplined action and a professional ethos that values curiosity and enquiry is embedded and deepened over time as a consequence of the impact of the work structures implied by the previous four conditions. As Andy Hargreaves (1994) once wrote:

… it is not possible to establish productive school cultures without prior changes being effected in school structures that increase the opportunities for meaningful working relationships and collegial support between teachers. The importance of the structural option of restructuring, therefore, may be less in terms of its direct impact on curriculum, assessment, ability grouping and the like, than in terms of how it creates improved opportunities for teachers to work together on a continuing basis.

Monitoring framework – An adapted and electronic version of David Hargreaves (1999) and his colleagues 'Culture Game' is used to monitor the development and cohesiveness of the school's culture over time (Box 2).

Box 2: Culture Game used to monitor school culture
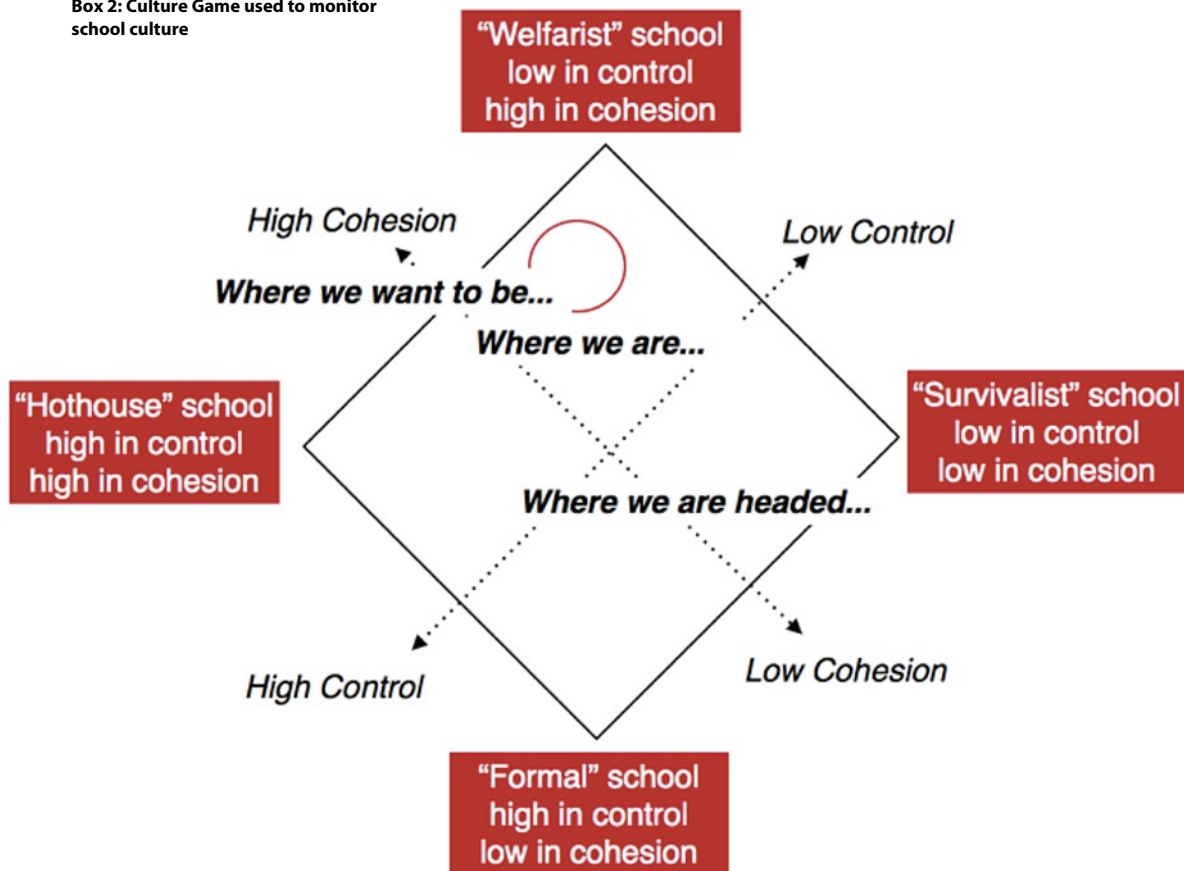
High quality teachers, high quality learning ■■■■

So it is the interaction of the first four conditions that results in the fifth – a culture of teaching and learning in the school that prizes the 'spirit of enquiry' that results in high standards and deeper levels of learning. It should be increasingly clear that the mechanistic and instrumental approaches to school improvement associated with charismatic leadership and management are totally unable to deliver the high standards, the adaptive learning and the sustainability that are the hallmarks of outstanding schools and systems. Rather, skillful leadership:

■ develops and nurtures the narrative,
■ embraces and sequences the theory of actions,
■ creates the professional learning opportunities and allows the tightening of the loose coupling that ensures consistency.

It is the interaction of these conditions that together produce the cultural change that sustains the enquiry and keeps on giving.

■■■ The Dynamics of School Improvement

In the previous sections of this paper we have described the approach to school and system improvement that we have developed in Northern Melbourne. We have also described it in such a way as to be helpful to those who are struggling with similar challenges of implementing school and system reform in their own jurisdictions. Most of the analysis so far has been at the strategic or Regional / District levels. We feel that it may be helpful if we also looked more closely at the dynamics of change at the school level.

In our attempt to get a purchase on the dynamics of school reform we recently identified a small selection of schools in Melbourne, both primary and secondary, that recruited their students from areas of very high social disadvantage yet produced academic results in the top decile of the State distribution. What follows is a condensed attempt to make sense of their school improvement journeys over a five or six year time horizon.

Before presenting the data we need to clarify two issues that are implicit in the preceding discussion.

■ The first is that all school improvement strategies are phase dependent, in so far as they need to be differentiated to match the performance level of the individual school. This is the point being made in Condition 1 above. There is now a well-documented literature on the phases of both school and system reform (Hopkins 2013, chapter nine). What is interesting in the data collected from these schools is that although the schools do progress through a series of phases they do so in an iterative almost intuitive way. We delineate these phases in the comparison below and also demonstrate that although performing well there is still some distance to go.

■ The second point is that whatever strategy the school is working on it has to be embedded to a reasonably deep level of practice before the change in teacher behaviour impacts on the learning of students. In terms of the metrics used in Condition 4 above, the level of use has to meet at least the 4a criterion. Unless this condition is met teacher practice has no hope of impacting on student performance. One of our observations as practitioners of system reform is that only too rarely is the level of implementation deep enough. This explains to us the all to frequent paradox of change and no change in so called school improvement.

We have presented the data from the primary and secondary schools alongside each other to highlight both the similarities and differences. In general we found that although both phases of schooling followed a similar pattern, both precision and pace was easier to achieve in the Primary rather than the Secondary schools (See Box 3).

Box 3: Phase Characteristics - similarities and differences

Characteristics of Primary Schools in Northern Melbourne that have broken the association between poverty and student achievement	Characteristics of Secondary Schools in Northern Melbourne that have broken the association between poverty and student achievement
All being implemented at a high and consistent level of use – level 4a and above	**Most being implemented at a high and consistent level of use – level 4a and above**
Phase 1 – The beginnings	**Phase 1 – The beginnings**
1. Vision and high expectations in concrete and practical terms 2. Safe orderly environment, behavior, dress, displays, activities and sport 3. Involvement with Regional AIZ initiative, especially literacy and behaviour programmes and school improvement strategies	1. No alternative – change was the only option 2. Re-branding strategy – uniform, name, mission, environment and outreach to parents and involvement in school. In one case this involved a significant change in staffing that has had great benefit and should be applied more generally. 3. Continued involvement of students in building a more productive learning culture in the school, including opportunities out of school 4. Vision and high expectations in concrete and practical terms by Principal 5. Safe orderly environment, behavior, attendance, classroom management, displays, activities and sport
Phase 2 – The building blocks	**Phase 2 – The building blocks**
4. Collaborative curriculum planning and progression 5. Pervasive use of learning protocols and rubrics 6. Professional development that focuses on the development of teacher's skills and behaviors through coaching 7. Prevalent use of data at student level based on expected progress	6. Involvement with Regional AIZ initiative, especially literacy and behaviour programmes and school improvement strategies 7. Explicit effort to build leadership capacity with a pedagogic focus 8. Small number of high priority school improvement activities related to moral purpose and teaching and learning 9. Professional development that focuses on the development of teacher's skills and behaviors through coaching

*p*D**T**

High quality teachers, high quality learning ▣▣▣▣▢

Phase 3 – Going deeper	Phase 3 – Going deeper
8. Targeted and increasingly precise curriculum and learning interventions	10. Strategic removal, recruitment, induction and mentoring of staff
9. Differentiation and grouping and regular re-grouping based on performance	11. Increased emphasis on curriculum planning and involvement of Domain leaders
10. Reporting of student progress and individual student planning	12. Whole school planning for student achievement - short and medium term
11. Whole school planning for student achievement - short and medium term	13. Beginning to use data at student level to monitor student progress and inform individual student planning
12. Strategic recruitment, induction and mentoring of staff	14. Organisational re-design particularly in terms of meetings, use of space, budgets and performance management
13. High degree of internal accountability and consistency	15. Internal accountability and consistency becoming more widespread
14. Organisational re-design particularly in terms of meetings, use of space, budgets and performance management	
15. Outreach to parents and involvement in school	
Phase 4 – The scope for further improvement – all to do with Curiosity	**Phase 4 – The scope for further improvement – all to do with Curiosity**
1. Teaching protocols	1. Teaching protocols
2. Structure of tasks – more enquiry than didactic	2. Pervasive use of learning protocols and rubrics
3. Assessment of learning – success criteria and peer assessment	3. Structure of tasks – more enquiry than didactic
4. Structured group work	4. Assessment of learning – success criteria and peer assessment
5. Higher order questioning	5. Structured group work
6. Feedback	6. Higher order questioning
7. Models of teaching particularly the Inductive model	7. Feedback
	8. Models of teaching particularly the Inductive model
	9. Targeted and increasingly precise curriculum and learning interventions
	10. Differentiation and grouping and regular re-grouping based on progress and performance data

■■■ Coda - Theories of Action for School and System Reform

One of the consequences of our work in Melbourne and the State of Victoria is an increasing awareness of the myth that 'one size fits all' in school and system reform. Three points need to be reiterated. The first is that this analysis applies equally to individual schools or groups of schools, as it does to national or local governments and systems. The second point is that unfortunately, most of the time single strategies or policy initiatives tend to be worked on discretely, rather than as a set of complementary and mutually supportive policies as proposed here. Third and critically, the set of strategies that have been selected need to be precisely aligned to the growth-state or performance phase of the school or system. What is needed is a heuristic framework to help systems and schools to reflect on how best to balance these various strategies in a comprehensive approach to educational improvement. We have been using a simple framework that identifies three key elements of a coherent approach to school change.

This concept was initially developed by Michael Barber (2005) based on Thomas Friedman's (1999) analogy of a nation's economy being compared to a computer system. There is the hardware—the infrastructure, funding and physical resources as well as human and intellectual capital. There is also the software—the interaction between the school and the student, the process of teaching and learning infused by the leadership of the school. In between the two, there is the operating system, or the strategy for change the school or system chooses (or not) to employ to develop itself as a whole.

Many schools, as well as ministries of education worldwide, assume that there is a direct link between the hardware and the software—as long as the resources are in place then student learning will be satisfactory. This is rarely the case and the reason is simple. We need an improvement strategy, or in McKinsey's (Mourshead, Chijioke and Barber 2010) terms, a 'stage-dependent intervention cluster' to link inputs to outputs, as without it, student and school outcomes will remain unpredictable. With it, schools will be more likely to translate their resources more directly into better learning environments and therefore, enhanced learning outcomes for their children (Hopkins 2013).

The same argument goes for local and national governments and systems. The existence of such a framework allows for a more intelligent debate over the policies adopted by different countries in terms of all three elements—the hardware, the software and the operating system and their integrated impact on standards of learning and achievement. This also applies to Fullan's (2011) recent articulation of the 'wrong drivers' for system reform. Of course, these drivers may be wrong for one of two reasons, or both. They may be wrong because they are wrong, or wrong because they

*pD*T

are inappropriate to the stage the school or system is at. As Fullan (2011, p. 5) comments:

In the rush to move forward, leaders, especially from countries that have not been progressing, tend to choose the wrong drivers. Such ineffective drivers fundamentally miss the target. There are four main 'wrong driver' culprits ...
1. *Accountability: using test results, and teacher appraisal, to reward or punish teachers and schools, versus capacity building;*
2. *Individual teacher and leadership quality: promoting individual, vs. group solutions;*
3. *Technology: investing in and assuming that the wonders of the digital world will carry the day vs. instruction;*
4. *Fragmented strategies vs. integrated or systemic strategies.*

Fullan's wrong drivers of course remind us of some of the myths of school and system reform that we have recently identified in *Exploding the Myths of School Reform* (Hopkins 2013). Discussion of the myths stems from a deep frustration that despite what we collectively know about school and system reform, the potential contained in this knowledge is not systematically realised. This is because as Fullan says 'the wrong drivers are chosen' and often occurs because of ineptness, misunderstanding or cultural and bureaucratic hegemony. So as Machiavelli (quoted in Hopkins 2013: xvii) presciently commented—'It seems to me better to follow the real truth of things than an imaginary view of them.' This is what we have attempted to do here, and the overarching narrative goes something like this:

1. We know much about school and system reform
2. Unfortunately, this knowledge is often misused and an illusion or myth is generated that leads in unproductive directions and consequently has little impact on the learning and achievement of students.
3. In order to fulfil our moral purpose we must correct the myths and present 'the real truth of things'.
4. We need then to couch them as theories of action within an overall strategy for school and system reform.

The work described in this article has given us the opportunity to develop the following set of theories of action:

1. When schools and systems are driven by moral purpose then all students are more likely to fulfil their potential
2. When the focus of policy is on the quality of teaching rather than structural change, then student achievement will increase
3. When schools and teachers are of high quality, poverty is no longer a determinant of educational success
4. When the focus is on powerful learning, then students will both attain more and develop their cognitive and social skills
5. When teachers acquire a richer repertoire of pedagogic practice then students' learning will deepen.
6. When data is used to monitor, feedback and enhance student performance, then students' progress will more quickly accelerate
7. When teachers and schools go deeper in their search for improvement (rather than adopting fads) then the student learning experience also deepens and outcomes improve
8. When leadership is instructionally focused and widely distributed, then both teachers and students are able to fully capitalise on their capacity to learn and achieve
9. When teachers and leaders employ more precise strategies for teaching, learning and improvement, the whole system benefits
10. When the system as a whole takes student learning seriously then moral purpose is achieved

This is a far more positive way of viewing the myths. It provides an action framework for moving from what we know, by addressing the barriers that prevent us realising that potential, to theories of action that give more precision to the achievement of our moral purpose. The overarching or meta-theory of action is something like this:

When all the distinct but interrelated parts of what

we know about school and system improvement are aligned and working together, then all students, schools (as well as the system as a whole) will realise their individual and collective potential.

The purpose of this case study of school and system improvement in Melbourne, Victoria is to illustrate how we have attempted to realise this theory of action in practice.

David Hopkins is Professor Emeritus at the Institute of Education, University of London and Director of Education of the Bright Tribe Trust; Wayne Craig is Chief Advisor on schools to the Department of Education and Early Childhood Development, State of Victoria. David and Wayne began working together on school reform in Melbourne in 2007 when David was Professorial Fellow at the University of Melbourne and Wayne, Regional Director of Melbourne's Northern Metropolitan Region. This series of papers provide a narrative of their collaboration

References: Barber, M 2005, 'A 21st century self-evaluation framework. Annex 3 in Journeys of discovery: the search for success by design', Keynote speech in the National Center on Education and the Economy Annual Conference, Florida. ■ Friedman, T 1999, The lexus and the olive tree: understanding globalization, Anchor Books, New York. ■ Fullan, M 2011, 'Choosing the wrong drivers for whole system reform', CSE Seminar Series paper no. 204, May, Centre for Strategic Education, East Melbourne. ■ Hall, GE & Hord, SM 1987, Change in schools: facilitating the process, State University of New York Press, Albany. ■ Hargreaves, A 1994, Changing teachers, changing times, OISE Press, Toronto. Hargreaves, D 1999 'Helping practitioners explore their school's culture' in J Prosser (ed.), School Culture, Paul Chapman Publishing, London. ■ Hopkins, D, 2013, Exploding the Myths of School Reform, ACER Press, Camberwell and Open University Press, McGraw Hill Education, Berkshire. ■ Joyce, BR & Showers, B 1995, Student achievement through staff development, 2nd edn, Longman, White Plains, New York. ■ Mourshead, M, Chijioke, C & Barber, M 2010, How the world's most improved school systems keep getting better, McKinsey and Company, London.

Composite References for the three articles: Anderson, LW & Krathwohl, DR (eds) 2001, A taxonomy for learning, teaching and assessing: a revision of Bloom's Taxonomy of educational objectives, complete edition, Longman, New York. ■ Assessment Reform Group 2002, Assessment for learning: 10 principles. Research-based principles to guide classroom practice, AGR, London. ■ Barber, M 2005, 'A 21st century self-evaluation framework. Annex 3 in Journeys of discovery: the search for success by design', Keynote speech in the National Center on Education and the Economy Annual Conference, Florida. ■ Barber, M. (2009). From system effectiveness to system improvement, in Hargreaves A. & Fullan M. (Eds.), Change Wars. Bloomington, IN: Solution Tree. ■ Caerphilly County Borough Council, 2012, Caerphilly skills strategy: theories of action for leading learning, CCBC, Caerphilly, Wales. ■ City, EA, Elmore, RF, Fiarman, SE & Teitel, L 2009, Instructional rounds in education: a network approach to improving teaching and learning, Harvard Education Press, Cambridge, Massachusetts. ■ Department of Education and Early Childhood Development 2011, Powerful learning: taking educational reform to scale, paper no. 20, prepared by D Hopkins, March, Education Policy and Research Division, Office for Policy, Research and Innovation, DEECD, Melbourne. ■ Doyle, W 1987, 'Academic work' Review of Educational Research, vol. 53, no. 2, pp. 159-99. ■ Friedman, T 1999, The lexus and the olive tree: understanding globalization, Anchor Books, New York. ■ Fullan, M 2011, 'Choosing the wrong drivers for whole system reform', CSE Seminar Series paper no. 204, May, Centre for Strategic Education, East Melbourne. ■ Good, T & Brophy, J 2008, Looking in classrooms, 10th edn, Allyn and Bacon, Boston, Massachusetts. ■ Hall, GE & Hord, SM 1987, Change in schools: facilitating the process, State University of New York Press, Albany. ■ Hardiman, M 2012, The Brain-Targeted Teaching Model for 21st Century Schools, Corwin, California and Sage, London. ■ Hargreaves, A 1994, Changing teachers, changing times, OISE Press, Toronto. ■ Hargreaves, D 1999 'Helping practitioners explore their school's culture' in J Prosser (ed.), School Culture, Paul Chapman Publishing, London. ■ Hattie, J 2009, Visible learning: a synthesis of over 800 meta-analyses relating to achievement, Routledge, Oxon. ■ Hopkins, D 2007, Every school a great school, Open University Press, McGraw Hill Education, Berkshire. ■ Hopkins, D, Munro, J & Craig, W 2011, Powerful learning: a strategy for systemic educational improvement, ACER Press, Camberwell. ■ Hopkins, D, 2013, Exploding the Myths of School Reform, ACER Press, Camberwell and Open University Press, McGraw Hill Education, Berkshire. ■ Jensen E 2005, Teaching with the Brain in Mind (2nd Edition), ASCD, Alexandria, VA. ■ Johnson, RT & Johnson, DW 1994, 'An overview of co-operative learning', in J Thousand, A Villa and A Nevin (eds), Creativity and collaborative learning, Brookes Press, Baltimore. ■ Joyce, BR & Showers, B 1995, Student achievement through staff development, 2nd edn, Longman, White Plains, New York. ■ Joyce, BR, Calhoun, EF & Hopkins, D 2009, Models of learning: tools for teaching, 3rd edn, Open University Press, Buckingham. ■ McKinsey (2007) How the World's Best Performing School Systems Come Out on Top. London: McKinsey. ■ Medina J 2008, Brain Rules, Scribe Publications, Brunswick, Victoria. ■ Mourshead, M, Chijioke, C & Barber, M 2010, How the world's most improved school systems keep getting better, McKinsey and Company, London. ■ Northern Metropolitan Region 2009, Powerful learning: Northern Metropolitan Region school improvement strategy, Department of Education and Early Childhood Development, East Melbourne. ■ Northern Metropolitan Region 2011, Curiosity and powerful learning: Northern Metropolitan Region school improvement strategy, Department of Education and Early Childhood Development, East Melbourne. ■ Organisation for Economic Co-operation and Development 2005, Formative assessment: improving learning in secondary classrooms, OECD, Paris. ■ Wilingham D 2009, Why Don't Students Like School: A Cognitive Scientist Answers Questions About How The Mind Works and What It Mans For the Classroom, Jossey-Bass, San Francisco.

*p*D**T**