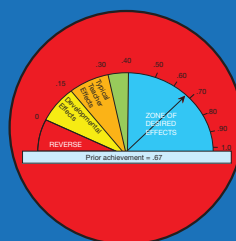
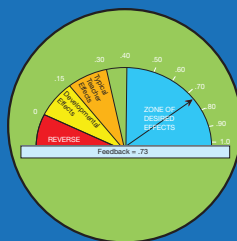
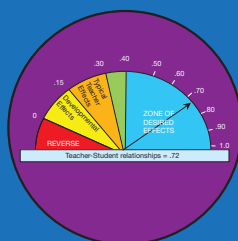


VISIBLE LEARNING FOR TEACHERS

MAXIMIZING IMPACT ON LEARNING

JOHN HATTIE



Visible Learning for Teachers

John Hattie's ground-breaking book *Visible Learning* synthesized the results of more than 15 years research involving millions of students and represented the biggest ever collection of evidence-based research into what actually works in schools to improve learning.

Visible Learning for Teachers takes the next step and brings those ground-breaking concepts to a completely new audience. Written for students, pre-service and in-service teachers, it explains how to apply the principles of *Visible Learning* to any classroom anywhere in the world. The author offers concise and user-friendly summaries of the most successful interventions and offers practical step-by-step guidance to the successful implementation of visible learning and visible teaching in the classroom.

This book:

- links the biggest ever research project on teaching strategies to practical classroom implementation;
- champions both teacher and student perspectives and contains step-by-step guidance including lesson preparation, interpreting learning and feedback during the lesson and post lesson follow up;
- offers checklists, exercises, case studies and best practice scenarios to assist in raising achievement;
- includes whole school checklists and advice for school leaders on facilitating visible learning in their institution;
- now includes additional meta-analyses bringing the total cited within the research to over 900;
- comprehensively covers numerous areas of learning activity including pupil motivation, curriculum, meta-cognitive strategies, behaviour, teaching strategies and classroom management.

Visible Learning for Teachers is a must read for any student or teacher who wants an evidence-based answer to the question: 'how do we maximize achievement in our schools?'

John Hattie is Professor and Director of the Melbourne Education Research Institute at the University of Melbourne, Australia and honorary Professor at the University of Auckland, New Zealand. He is the author of *Visible Learning* and co-author of *Intelligence and Intelligence Testing*, both published by Routledge.

Visible Learning for Teachers

Maximizing impact on learning

John Hattie

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Preface

Elliot is now aged 10. When *Visible Learning* was being completed, Elliot was diagnosed with leukaemia. Since then, he has completed the four-year regime of chemotherapy; now, his own system is being asked to take over. He has started school, is learning to read and write, and is becoming a happy, adventurous pre-teen – having retained his sparkly personality throughout the arduous hospitalization. The scripts that the doctors decided to follow have been successful and the interventions have had major positive consequences. Throughout the treatment, the impact of the interventions was monitored, changed, and led to the critical decisions that now allow Elliot to shine in touch rugby and BMX riding, and to be a peer mediator at his school. He has been a part of a community of doctors, nurses, teachers, friends, and family – so many were involved. The impact of the dosage and treatment was constantly monitored to ensure that it was leading to the criteria of success. Decisions were made in light of the monitoring; teams worked to understand the consequences of treatments; and evidence was the key to adaptive professional decision-making – all aiming to maximize the impact not only on the medical, but also the social and family, aspects. We all truly knew their impact. Again, Elliot is the inspiration for the major message of this book: know thy impact!

For many years of my career, I have worked in schools, met many stunning teachers who have evidence of their impact on student learning, and worked with some of the best in the world in researching teaching expertise. In the past few years, my team has run workshops for over 3,000 teachers and school leaders, and worked in more than 1,000 schools, mainly in New Zealand and Australia. We have learned much from these schools about the implications from *Visible Learning*. The message certainly is not ticking off the top ten in the league table! The most common question is: ‘Where do I start?’ The argument in this book is that the starting place is the way in which you think about your role – it is to know, on a regular basis, the nature and magnitude of your impact on the learning of your students. The next most common question is ‘What does visible learning look like in a school?’ – hence one of the themes in this book of ‘visible learning inside’. There is no program, no single script, no workbook on how to implement visible learning; instead, I have provided a set of benchmarks that can be used to create debates, to seek evidence, and to self-review to determine whether a school is having a marked impact on all of its students. This highlights the importance of educators as evaluators of their impact.

Both questions (‘Where do I start?’; ‘What does visible learning look like?’) beg the next question, ‘What is the nature of the learning that you wish to impact?’, and my hope

is that it is more than passing surface-level tests. It involves impacting on the love of learning, inviting students to stay in learning, and seeing the ways in which students can improve their healthy sense of being, respect for self, and respect for others – as well as enhancing achievement. What achievement is to be valued needs to be a major debate in schools, communities, and societies; right now, such curricular questions seem more determined by the test specifications than by such lively debate.

I could have written a book about school leaders, about society influences, about policies – and all are worthwhile – but my most immediate attention is more related to teachers and students: the daily life of teachers in preparing, starting, conducting, and evaluating lessons, and the daily life of students involved in learning. Note the plural: it is a community of teachers that is needed to work together to ask the questions, evaluate their impact, and decide on the optimal next steps; it is the community of students who work together in the pursuit of progress. Such passion for evaluating impact is the single most critical lever for instructional excellence – accompanied by understanding this impact, and doing something in light of the evidence and understanding.

Throughout *Visible Learning*, I constantly came across the importance of ‘passion’; as a measurement person, it bothered me that it was a difficult notion to measure – particularly when it was often so obvious. But it is a particular form of passion – a passion based on having a positive impact on all of the students in the class. This book starts with a discussion of the attributes of such passionate teachers who have major impacts on students. It then uses the evidence from the synthesis of meta-analyses to elaborate on major messages for teachers as they go about their daily tasks. The book concludes by noting the major mind frames that underline these passionate and inspired educators. A major claim is that it is these mind frames that are the precursors of success in schools, these mind frames that need to be developed in teacher education programs. These mind frames require nurturance and resourcing, and these mind frames are the professional being of those we call ‘effective’ teachers and school leaders.

As I noted in the preface to *Visible Learning*, the message about schools is a positive one. Both *Visible Learning* and this book are based on the story of many real teachers whom I have meet, seen, and some of whom have taught my own sons. Many teachers already think in the ways for which I argue in both this (and the earlier) book; many are always seeking to improve and constantly monitoring their performances to make a difference to what they do; and many inspire the love of learning that is one of the major outcomes of any school. I ended *Visible Learning* where this book now starts, by citing my friend and colleague Paul Brock (2004: 250–1):

I want all future teachers of my Sophie and Millie to abide by three fundamental principles that I believe should underpin teaching and learning in every public school.

First, to nurture and challenge my daughters’ intellectual and imaginative capacities way out to horizons unsullied by self-fulfilling minimalist expectations. Don’t patronize them with lowest-common-denominator blanchmange masquerading as knowledge and learning; nor crush their love for learning through boring pedagogy. Don’t bludgeon them with mindless ‘busy work’ and limit the exploration of the world of evolving knowledge merely to the tyranny of repetitively churned-out recycled worksheets. Ensure that there is legitimate progression of learning from one day, week, month, term and year to the next.

Second, to care for Sophie and Millie with humanity and sensitivity, as developing human beings worthy of being taught with genuine respect, enlightened discipline and imaginative flair.

And third, please strive to maximize their potential for later schooling, post-school education, training and employment and for the quality of life itself so that they can contribute to and enjoy the fruits of living within an Australian society that is fair, just, tolerant, honorable, knowledgeable, prosperous and happy.

When all is said and done, surely this is what every parent and every student should be able to expect of school education: not only as delivered within every public school in NSW, but within every school not only in Australia but throughout the entire world.

Know thy impact.

John Hattie
University of Melbourne, 2011



Acknowledgements

The team in the visible learning lab at the University of Auckland have been a major inspiration for this book. We have all worked in an open space, sharing ideas, problems, and successes. Over the past 12 years, we have developed a major assessment and reporting system for all New Zealand elementary and high schools, have worked in many schools implementing the ideas relating to visible learning, and have conducted many studies relating to the major themes of visible learning. Over 1,000 teachers have worked with us in developing the assessment system; over 100 people have worked in our lab; we have had many visitors (academics and students) spend time with us – and it has made coming to work a pleasurable experience. Gavin Brown, Annette Holt, Earl Irving, Peter Keegan, Andrea Mackay, and Debra Masters have all led this team, and their thoughts, prompts, and feedback are ever-present in these pages. I thank all involved in this place of fun, learning, and valuing.

Many have read and commented on drafts of this book, and they are acknowledged for their suggestions for improvement, although I accept responsibility for the remaining errors. Thanks to Kristin Anderson, Janet Clinton, Steve Dinham, Michael Fullan, Patrick Griffin, John Marsden, Brian McNulty, Roger Moses, Geoff Petty, Doug Reeves, Ainsley Rose, Julie Schumacher, Carol Steele, and Greg Yates for their input, critique, and valuable advice. I am most grateful for the nine reviewers who provided reports to the publishers: Ann Callander; Rick DuFour; Michael Fullan; Christopher Jones; Geoff Petty; Andrew Martin; Elaine Smitheman; Sebastian Suggate; and Huw Thomas. I am especially indebted to Debra Masters and Janet Rivers for their attention to the details, to Earl Irving for permission to use his student evaluation survey, and to Steve Martin from Howick College for allowing me to use the SOLO lesson plan in Chapter 4. The team at Routledge, headed by Bruce Roberts, have made completing this book a pleasure, and the Australia MacMillan team headed by Lee Collie and Col Gilliespie have made it enjoyable to travel around talking about the messages. I also thank the team at my new academic home, the Melbourne Graduate School of Education at the University of Melbourne, for their welcoming of me to my next set of challenges.

But, most of all, I thank: my family – Janet, Joel, Kyle, Kieran, Billy (deceased), Bobby, and Jamie – who are my inspirations for living; my sisters and brothers; and all those passionate teachers who have invited me into their classrooms over the past 12 years.

Visible learning inside

When we buy a computer, there is often a label proclaiming that it has ‘Intel inside’. While most of us might not know exactly what this means, the label acts as a seal of approval indicating that what we are buying is good quality and will work. Indeed, it does indicate this: ‘Intel inside’ refers to the processor, or brain, in the computer – and it is the key to the success of the software and other hardware that makes up the ‘workings’ of the computer. In many ways, our schools have emphasized the ‘software’ (the programs in schools) and the ‘hardware’ (buildings, resources), rather than the ‘Intel inside’ (the core attributes that make schools successful). The ‘software’ and ‘hardware’ have been the major marketing tools of schooling used by politicians and principals, and they are also the topics that we most love to debate. Raise the question of class size, grouping in class, salaries and finance, the nature of learning environments and buildings, the curriculum, assessment, and the ensuing debate will be endless and enjoyable. These are *not*, however, the core attributes of successful schooling.

This book is about those core attributes – about the ‘Intel inside’. It discusses not the software or hardware of schooling, but instead asks what are the attributes of schooling that truly make the difference to student learning – the ‘processing’ attributes that make learning visible, such that we might say that the school has ‘visible learning inside’?

The ‘visible’ aspect refers first to making student learning visible to teachers, ensuring clear identification of the attributes that make a visible difference to student learning, and *all* in the school visibly knowing the impact that they have on the learning in the school (of the student, teacher, and school leaders). The ‘visible’ aspect also refers to making teaching visible to the student, such that they learn to become their own teachers, which is the core attribute of lifelong learning or self-regulation, and of the love of learning that we so want students to value. The ‘learning’ aspect refers to how we go about knowing and understanding, and then doing something about student learning. A common theme throughout this book is the need to retain learning at the forefront and to consider teaching primarily in terms of its impact on student learning.

The arguments in this book are based on the evidence in *Visible Learning* (Hattie, 2009), although this book is not merely a summary. *Visible Learning* was based on more than 800 meta-analyses of 50,000 research articles, about 150,000 effect sizes, and about 240 million students (Chapter 2 gives an outline of this evidence). A further 100+ meta-analyses completed since *Visible Learning* was published have been added in Appendix A of this book – but they have not changed the major messages.

This book also builds on perhaps the most significant discovery from the evidence in *Visible Learning*: namely, that almost any intervention can stake a claim to making a difference to student learning. Figure 1.1 shows the overall distribution of all of the effect sizes from each of the 800+ meta-analyses examined in *Visible Learning*. The y -axis represents the number of effects in each category, while the x -axis gives the magnitude of effect sizes. Any effect above zero means that achievement has been raised by the intervention. The average effect size is 0.40, and the graph shows a near normal distribution curve – that is, there are just as many influences on achievement above the average as there are below the average.

The most important conclusion that can be drawn from Figure 1.1 is that ‘everything works’: if the criterion of success is ‘enhancing achievement’, then 95 per cent+ of all effect sizes in education are positive. When teachers claim that they are having a positive effect on achievement, or when it is claimed that a policy improves achievement, it is a trivial claim, because virtually everything works: the bar for deciding ‘what works’ in teaching and learning is so often, inappropriately, set at zero.

With the bar set at zero, it is no wonder every teacher can claim that he or she is making a difference; no wonder we can find many answers as to how to enhance achievement; no wonder there is some evidence that every student improves, and no wonder there are no ‘below-average’ teachers. Setting the bar at zero means that we do not need any changes in our system! We need only more of what we already have – more money, more resources, more teachers per students, more . . . But this approach, I would suggest, is the wrong answer.

Setting the bar at an effect size of $d = 0.0$ is so low as to be dangerous.¹ We need to be more discriminating. For any particular intervention to be considered worthwhile, it needs to show an improvement in student learning of at least an average gain – that is, an

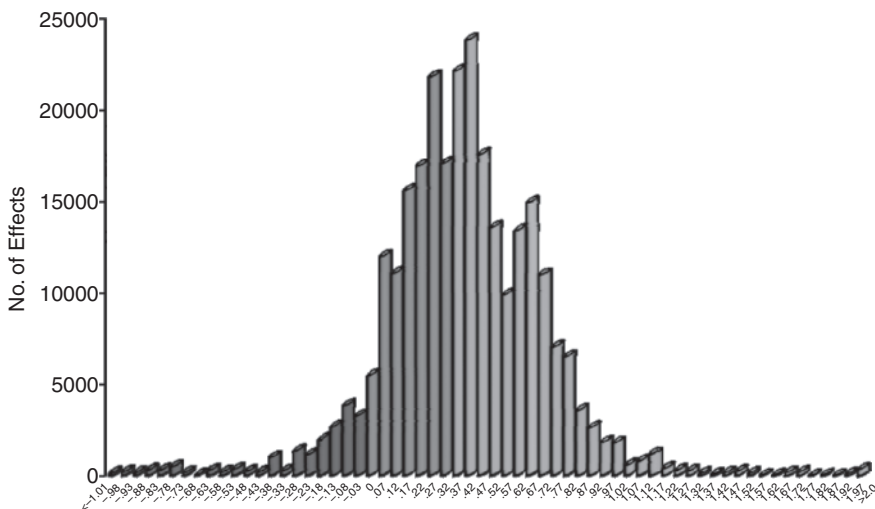


FIGURE 1.1 Distribution of effect sizes across all meta-analyses

¹ d is shorthand for ‘effect size’.

effect size of at least 0.40. The $d = 0.40$ is what I referred to in *Visible Learning* as the *hinge-point* (or h-point) for identifying what is and what is not effective.

EFFECT SIZE

An effect size is a useful method for comparing results on different measures (such as standardized, teacher-made tests, student work), or over time, or between groups, on a scale that allows multiple comparisons independent of the original test scoring (for example, marked out of 10, or 100), across content, and over time. This independent scale is one of the major attractions for using effect sizes, because it allows relative comparisons about various influences on student achievement. There are many sources for more information on effect sizes, including: Glass, McGaw, and Smith (1981); Hattie, Rogers and Swaminathan (2011), Hedges and Olkin (1985); Lipsey and Wilson (2001); and Schagen and Hodgen (2009).

Half of the influences on achievement are above this hinge-point. This is a real-world, actual finding and not an aspirational claim. That means that about half of what we do to *all* students has an effect of greater than 0.4. About half of our students are in classes that get this effect of 0.40 or greater, while half are in classes that get less than the 0.4 effect. *Visible Learning* told the story of the factors that lead to effects greater than this hinge-point of 0.40; this book aims to translate that story into information that teachers, students, and schools can put into practice. It translates the story into a practice of teaching and learning.

Outcomes of schooling

This book is concerned with achievement; we require much more, however, from our schools than mere achievement. Overly concentrating on achievement can miss much about what students know, can do, and care about. Many love the learning aspect and can devote hours to non-school-related achievement outcomes (in both socially desirable and undesirable activities), and love the thrill of the chase in the learning (the critique, the false turns, the discovery of outcomes). For example, one of the more profound findings that has driven me as a father is the claim of Levin, Belfield, Muennig, and Rouse (2006) that the best predictor of health, wealth, and happiness in later life is *not* school achievement, but the number of years in schooling. Retaining students in learning is a highly desirable outcome of schooling, and because many students make decisions about staying in schooling between the ages of 11 and 15, this means that the school and learning experience at these ages must be productive, challenging, and engaging to ensure the best chance possible that students will stay in school.

Levin et al. (2006) calculated that dropouts from high school have an average income of US\$23,000 annually, while a high-school graduate earns 48 per cent more than this, a person with some college education earns 78 per cent more, and a college graduate earns 346 per cent more. High-school graduates live six to nine years longer than dropouts, have better health, are 10–20 per cent less likely to be involved in criminal activities, and are

20–40 per cent less likely to be on welfare. These ‘costs’ far exceed the costs of demonstratively successful educational interventions. Graduating from high school increases tax revenue, reduces taxes paid into public health, and decreases criminal justice and public assistance costs, plus there is clear justice in providing opportunities to students such that they can enjoy the benefits of greater income, health, and happiness.

That the purposes of education and schooling include more than achievement have been long debated – from Plato and his predecessors, through Rousseau to modern thinkers. Among the most important purposes is the development of critical evaluation skills, such that we develop citizens with challenging minds and dispositions, who become active, competent, and thoughtfully critical in our complex world. This includes: critical evaluation of the political issues that affect the person’s community, country, and world; the ability to examine, reflect, and argue, with reference to history and tradition, while respecting self and others; having concern for one’s own and others’ life and well-being; and the ability to imagine and think about what is ‘good’ for self and others (see Nussbaum, 2010). Schooling should have major impacts not only on the enhancement of knowing and understanding, but also on the enhancement of character: intellectual character, moral character, civic character, and performance character (Shields, 2011).

Such critical evaluation is what is asked of teachers and school leaders. This development of critical evaluation skills requires educators to develop their students’ capacity to see the world from the viewpoint of others, to understand human weaknesses and injustices, and to work towards developing cooperation and working with others. It requires educators to develop in their students a genuine concern for self and others, to teach the importance of evidence to counter stereotypes and closed thinking, to promote accountability of the person as responsible agent, and to vigorously promote critical thinking and the importance of dissenting voices. All of this depends on subject matter knowledge, because enquiry and critical evaluation is not divorced from knowing something. This notion of *critical evaluation* is a core notion throughout this book – and particularly in that teachers and school leaders need to be critical evaluators of the effect that they are having on their students.

Outline of the chapters

The fundamental thesis of this book is that there is a ‘practice’ of teaching. The word *practice*, and not *science*, is deliberately chosen because there is no fixed recipe for ensuring that teaching has the maximum possible effect on student learning, and no set of principles that apply to all learning for all students. But there are practices that we know are effective and many practices that we know are not. Theories have purposes as tools for synthesizing notions, but too often teachers believe that theories dictate action, even when the evidence of impact does not support their particular theories (and then maintaining their theories becomes almost a religion). This rush by teachers to infer is a major obstacle to many students enhancing their learning. Instead, evidence of impact or not may mean that teachers need to modify or dramatically change their theories of action. Practice invokes notions of a way of thinking and doing, and particularly of learning constantly from the deliberate practice in teaching.

This book is structured about the big ideas from *Visible Learning*, but presented in a sequence of decisions that teachers are asked to make on a regular basis – preparing, starting, conducting, and ending a lesson or series of lessons. While this sequence is not intended

to imply that there is a simple linear set of decisions, it is a ‘coat hanger’ to present the ways of thinking – the mind frames – which are the most critical messages.

The first part of the practice of teaching is the major mind frames required by the school leaders or teachers. The source of these ideas is outlined in Chapter 2, explored in more detail in Chapter 3, and returned to in the final chapter, Chapter 9. The second part of the practice of teaching is the various phases of the lesson interaction between teacher and students, each of which is discussed in a separate chapter:

- preparing the lessons (Chapter 4);
- starting the lessons (Chapter 5);
- the flow of the lessons – learning (Chapter 6);
- the flow of the lessons – feedback (Chapter 7); and
- the end of the lesson (Chapter 8).

Figure 1.2 sums up the high-level principles argued throughout this book. I do note that there may seem to be ‘too much’ at times, but then our enterprise of teaching and learning is never straightforward. The big ideas in Figure 1.2 are expanded in each chapter and can

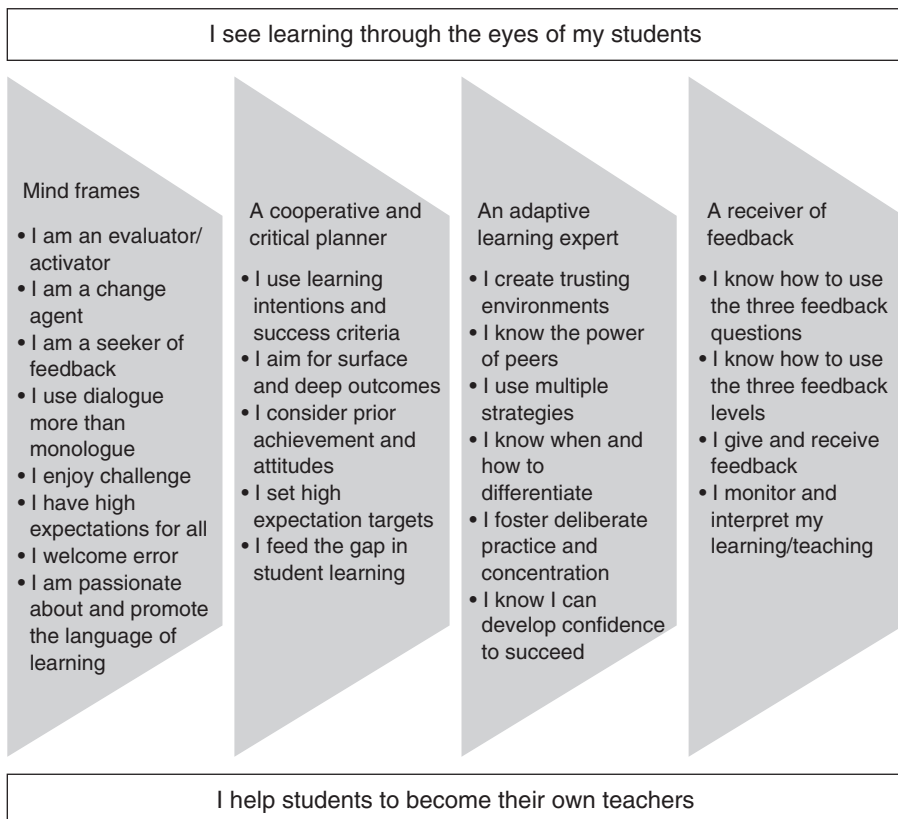


FIGURE 1.2 Know thy impact

serve as an advance organizer, and the aim of the chapters is to convince you of the merits of this program logic.

Each chapter develops a set of checklists for schools to evaluate whether they have 'visible learning inside'. These checklists are not meant as tick lists of 'yes' or 'no', but as guidelines for asking and answering questions about the way in which a school knows about the effect it is having on the students in that school. Atul Gawande (2009) has detailed the power of such checklists, most often used in the airline industry and in his case translated into the medical domain. He shows how checklists help to achieve the balance between specialized ability and group collaboration. He does comment that while most surgeons resist checklists (finding them too confining and unprofessional), more than 90 per cent would require them if a member of their family were to be under the surgeon's knife. The set of checks aims to ensure that critical matters are not overlooked, to give direction to debates in staff rooms, and to provide an outline for assessing whether there are good evaluation processes in the school. Michael Scriven (2005) also has been a long-time advocate of checklists. He has distinguished between the many types, from the laundry list, the sequential list, flow charts and, most usefully, the merit checklist. It is the merit checklist that is suggested for each chapter here. These consist of a series of criteria that can each be considered; those reviewing the evidence for each criterion can then make an overall decision about merit and worth (see <http://www.wmich.edu/evalctr/checklists> for further examples of checklists). The merit checklists in each chapter are more DO–CONFIRM not READ–DO, because this allows for much flexibility in providing evidence and acting to ensure that a school is working towards making learning visible.

PART

1

The source of ideas and the role of teachers

The source of the ideas

In 2009, *Visible Learning* was published. This was the culmination of many decades of work – finding, reading, and analysing meta-analyses. I recently spoke in Seattle to a group of educators about this work. It was like a return to the beginning: my search began there in 1984, when I was on sabbatical at the University of Washington. In many cases, as part of researching the meta-analyses, I went back to the original articles, wrote separate articles on themes, and spoke to many groups about the meaning of these analyses. Always, the question was: ‘So, what does all of this *mean*?’ Addressing this question is the reason the book had a long gestation. The aim of *Visible Learning* was to tell a story, and in most cases the reviews and reactions indicate that the story has been heard – although, as expected, not always agreed with.

The *Times Educational Supplement* was first to review it. Mansell (2008) argued that *Visible Learning* was ‘perhaps education’s equivalent to the search for the Holy Grail – or the answer to life, the universe and everything’. Mansell recognized that the ‘education Grail’ was most likely to be found in the improvement in the level of interaction between pupils and their teachers. (Please note that we have yet to find the ‘real’ Holy Grail – despite the efforts of Dan Brown, *Lord of the Rings*, and *Spamalot!*)

It was not the aim of *Visible Learning* to suggest that the state of teaching is woeful; indeed, the theme was the opposite. The majority of effects above the average were attributable to success in teaching, and there is no greater pleasure than to visit schools and classrooms in which the ideas in *Visible Learning* are transparently visible. As I wrote in the conclusion to *Visible Learning*:

I have seen teachers who are stunning, who live the principles outlined in this book, and demonstrably make a difference. They play the game according to the principles outlined here. They question themselves, they worry about which students are not making appropriate progress, they seek evidence of successes and gaps, and they seek help when they need it in their teaching. The future is one of hope as many of these teachers exist in our schools. They are often head-down in the school, not always picked by parents as the better teachers, but the students know and welcome being in their classes. The message in this book is one of hope for an excellent future for teachers and teaching, and based on not just my explanation for 146,000+ effect sizes but on the comfort that there are already many excellent teachers in our profession.

(Hattie, 2009: 261)

So what was the story and what was the evidence base? This chapter introduces the main implications from *Visible Learning* and, most importantly, introduces the course of ideas for this book. The next chapter, Chapter 3, will provide more about the evidence on which this story is based – although it is not intended to be a substitute for detailed discussion of the evidence presented in *Visible Learning*.

The evidence base

The basic units of analysis are the 900+ meta-analyses. A meta-analysis involves identifying a specific outcome (such as achievement) and identifying an influence on that outcome (for example, homework), and then systematically searching the various databases: mainstream journals and books (such as ERIC, PsycINFO); dissertations (for example, ProQuest); grey literature (material such as conference papers, submissions, technical reports, and working papers not easily found through normal channels). It involved contacting authors for copies of their work, checking references in the articles found, and reading widely to find other sources. For each study, effect sizes are calculated for appropriate comparisons. In general, there are two major types of effect size: comparisons between groups (for example, comparing those who *did* get homework with those who *did not* get homework), or comparisons over time (for example, baseline results compared with results four months later).

Take, for example, Cooper, Robinson, and Patall's (2006) meta-analysis on homework. They were interested in the effect of homework on student achievement based on research over the past twenty years. They searched various databases, contacted the deans of 77 departments of education (inviting them also to ask their faculties), sent requests to 21 researchers who have published on homework, and letters to more than 100 school districts and directors of evaluation. They then examined each title, abstract, and document to identify any further research. They found 59 studies, and concluded that the effect size between homework and achievement was $d = 0.40$; effects of homework were higher for high-school students ($d = 0.50$) than for elementary-school students ($d = -0.08$). They suggested that secondary students were less likely to be distracted while doing homework and more likely to have been taught effective study habits, and could have better self-regulation and monitoring of their work and time investment. Like all good research, their study suggested the most important questions that now needed to be addressed and reduced other questions to being of lesser importance.

As I have noted, more than 800 of these meta-analyses formed the basis of *Visible Learning*. For each meta-analysis, I created a database of the average effect size plus some related information (for example, standard error of the mean). A major part of the analyses was looking for a moderator: for example, did the effects of homework on achievement differ across ages, subjects, types of homework, quality of the meta-analyses, and so on?

Consider my synthesis of five meta-analyses on homework (Cooper, 1989, 1994; Cooper et al., 2006; DeBaz, 1994; Paschal, Weinstein, & Walberg, 1984). Over these five meta-analyses, there were 161 studies involving more than 100,000 students that investigated the effects of homework on students' achievement. The average of all of these effect sizes was $d = 0.29$, which can be used as the best typical effect size of the influence of homework on achievement. Thus, compared to classes without homework, the use of homework was associated with advancing students' achievement by approximately one year, or improving

the rate of learning by 15 per cent. About 65 per cent of the effects were positive (that is, improved achievement), and 35 per cent of the effects were zero or negative. The average achievement level of students in classes that prescribed homework exceeded 62 per cent of the achievement levels of the students not prescribed homework. However, an effect size of $d = 0.29$ would not, according to Cohen (1977), be perceptible to the naked eye, and would be approximately equivalent to the difference in height between someone measuring 5'11" (180 cm) and someone 6'0" (182 cm).

The 800+ meta-analyses analysed for *Visible Learning* encompassed 52,637 studies – about 240 million students – and provided 146,142 effect sizes about the influence of some program, policy, or innovation on academic achievement in school (early childhood, elementary, high, and tertiary). Appendices A and B (taken from *Visible Learning*) sum up this evidence. The appendices include 115 additional meta-analyses discovered since 2008 (an extra 7,518 studies, 5 million students, and 13,428 effect sizes). There are a few additional major categories (going from 138 to 147), and some minor changes in the rank order of influences, but the major messages have not changed.

Since *Visible Learning* was published, I have continued to add to this database, locating a further 100 meta-analyses – added in Appendix A. The overall ranking of the influences, however, has negligibly changed between this and the previous version ($r > 0.99$ for both rankings and effect sizes). The underlying messages have certainly not changed. The estimated total sample size is about 240 million+ students (the 88 million below is only from the 345 meta-analyses that included sample size).

The overall average effect from all meta-analyses was $d = 0.40$. So what does this mean? I did not want to simplistically relate adjectives to the size of the effects. Yes, there is a general feeling that $d < 0.20$ is small, 0.3–0.6 is medium, and > 0.6 is large – but often specific interpretations make these adjectives misleading. For example, a small effect size that requires few resources may be more critical than a larger one that requires high levels of resourcing. The effect of reducing class size from 25–30 students to 15–20 students is 0.22 and the effect of teaching specific programs to assist students in test-taking is about 0.27. Both are smallish effects, but one is far cheaper to implement than the other. The relatively better return on cost from the latter is obvious – thus, the relative effect of two smallish effects can have different implications.

Almost everyone can impact on learning if the benchmark is set at $d > 0.0$ – as is so often the case. Most interventions with a modicum of implementation can gain an effect

TABLE 2.1 Average effect for each of the major contributors to learning

ACROSS DIMENSIONS	NO. OF META-ANALYSES	NO. OF STUDIES	NO. OF PEOPLE	NO. OF EFFECTS	ES	SE
Student	152	11,909	9,397,859	40,197	0.39	0.044
Home	40	2,347	12,066,705	6,031	0.31	0.053
School	115	4,688	4,613,129	15,536	0.23	0.072
Teacher	41	2,452	2,407,527	6,014	0.47	0.054
Curricula	153	10,129	7,555,134	32,367	0.45	0.075
Teaching	412	28,642	52,611,720	59,909	0.43	0.070
Average	913	60,167	88,652,074	160,054	0.40	0.061

of 0.20, and on average we can have an influence of 0.40. There are many students who benefit from being in classes in which they regularly gain > 0.40 from a program implemented by a high-impact teacher. The central question should be the debate about allocating resources to sustain and support those who have this $d > 0.40$ influence, and to ask seriously what to change where there is evidence of lower effects. While bus routes, utility bills, and lengthy administrative meetings may be needed to make schools run, the true debate is about the nature, quality, and effects of the influences that we have on students – and in this book it is argued that we should attain at minimum gains of at least or above the average for all students. This is accomplished already in so many classrooms, and great schools can be known for the choice of their debates – about ‘knowing thy impact’.

Perhaps the most important thing to remember when using these adjectives to describe effect sizes is that *Visible Learning* has summed up what has happened – the imperative here is the past tense. For example, consider the homework example. The general message from the overall $d = 0.29$ is that the effects of homework are small, and even smaller (near to zero) in elementary schools. On the one hand, this is not a big issue, as the cost of adding homework to the school costs is negligible. On the other hand, the finding should be an invitation to *change* how we do homework in elementary schools, because *homework as it has traditionally been done* (and thus reported in the 161 studies) has not been very effective in elementary schools. What a wonderful opportunity for schools to try something different . . .

Indeed, many New Zealand schools did exactly this: they did not abandon homework (because too many parents judge the quality of a school by the mere presence of homework and get upset if there is none), but they tried different approaches. One school worked with students and parents to create a website of various ‘home challenges’ and evaluated the effects of this new policy on student motivation, achievement, and parent involvement with their children’s learning. When teachers and schools evaluate the effect of what they do on student learning (and this was the major message in *Visible Learning*), we have ‘visible learning inside’. The term refers not to the specific presence or otherwise of an initiative, *but to the evaluation of its effect*. Such an evaluation must, of necessity, take into account local conditions, local moderators, and local interpretations. And *that* is the main message in this current book: become evaluators of your effect. I want you to aim for a $d > 0.40$ effect, which, on average, is most definitely attainable.

The barometer and the hinge-point

One of the tensions in writing *Visible Learning* was to present the evidence without overwhelming the reader with data. I wanted a visual image to summarize the oodles of data. My partner devised the illustration shown in Figure 2.1 as a ‘barometer of influences’.

The arrow in Figure 2.1 points to the average effect of the various meta-analyses on the particular topic (in Figure 2.1, it is $d = 0.29$ for the five homework meta-analyses). The variability (or standard error) of the average effect sizes from each meta-analysis is not always easy to determine. Across all 800+ meta-analyses, the typical standard error of the mean is about $d = 0.07$. To provide a broad sense of variance, any influence for which the average ‘spread of effects’ was less than $d = 0.04$ was considered low, between $d = 0.041$ and $d = 0.079$ was deemed medium, and greater than $d = 0.08$ was deemed large. While these are crude estimates, rather than focus on them, it is more important *to read the discussion about each influence to ascertain whether important sources of variance can be identified*

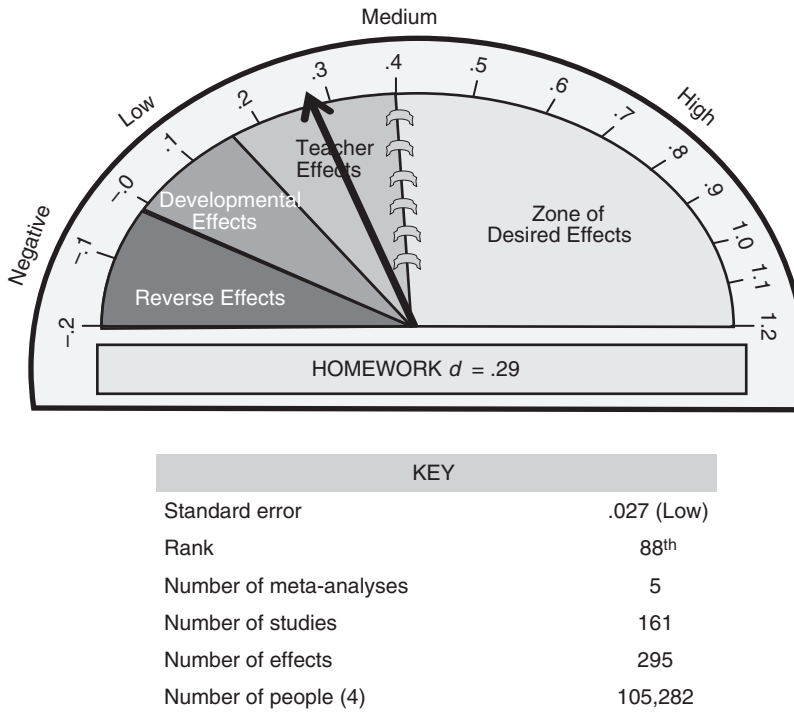


FIGURE 2.1 The barometer for the influence of homework

to explain differential effects within that influence. The information under the barometer provides more detail on how confident we can be about the summary information: the number of meta-analyses on each category (five in Figure 2.1, based on 161 studies, and 295 effect sizes). There were 105,282 students in the four meta-analyses that provided information about sample size (one did not provide sample size information). The average effect is $d = 0.29$, with a standard error of 0.027 (considered 'low' relative to all meta-analyses). The effects of homework ranked 88th out of all 138 influences.

Like all summaries of literature, caution should be the byword when interpreting overall effects. The nuances and details of each influence are important, and these are discussed in more detail in *Visible Learning*. The overall hinge-point of 0.40 is suggested as a starting point for discussion – clearly, there are many hinge-points (for example, one for each influence), but the variability, the moderators, the quality of the studies (and meta-analyses), and the costs of implementation need to be considered.

There is also, as noted in Chapter 1, the finding that most changed my way of thinking: when you look at the distribution of all 50,000-plus effect sizes, *almost everything works*. All that is needed to enhance achievement is a pulse. This indicates that it is not enough merely to provide evidence that you have a positive effect on achievement; we need also to identify a level of evidence that might be considered the minimum level for claiming a worthwhile positive effect. When I looked at the distribution of effects (see Figure 1.1), it seemed to follow an approximate normal distribution, so I used the average effect of 0.4 as the 'hinge-point' for identifying actions that could be considered to be 'working'

in terms of making a visible difference to student learning. Because it is the ‘average’ point, it becomes an achievable, ‘real-world’ hinge-point, not an idealistic or aspirational target.

The 0.40 hinge-point is also important because it is close to the average effect that we can expect from a year’s schooling. I searched longitudinal databases, interrogated the US National Education Longitudinal Study (NELS), Trends in International Mathematics and Science Study (TIMSS), the Program for International Student Assessment (PISA), the Australian National Assessment Program in Literacy and Numeracy (NAPLAN), the National Assessment of Educational Progress (NAEP), and Progress in International Reading Literacy Study (PIRLS), and my own longitudinal data based on nearly 1 million New Zealand students. The average yearly gain was 0.4, although it was slightly higher for lower-grade students and lower for upper-grade students. So $d = 0.4$ is what we can expect as growth per year on average, and it is also the case that 0.4 is what we can expect from all possible interventions. Hill, Bloom, Black, and Lipsey (2008) analysed the norms for 13 major standardized achievement tests (in USA), and found an average growth in maths and reading of about 0.40 – and, like in the NZ sample, the effects for each year were greater in the younger and lower in the older grades. So while $d = 0.40$ is a worthwhile average, we may need to expect more from the younger grades ($d > 0.60$) than for the older grades ($d > 0.30$). I choose this average (0.4) as the benchmark for assessing the influence that teachers have on achievement. In my work in schools since the publication of *Visible Learning*, we have used this hinge-point as the basis for discussions. (Please note that I did *not* say that we use this hinge-point for *making* decisions, but rather that we use it to *start discussions* about the effect of teachers on students.)

The story

The simple principle underlying most of the syntheses discussed in this book is ‘visible teaching and learning’. Visible teaching and learning occurs when learning is the explicit and transparent goal, when it is appropriately challenging, and when the teacher and the student both (in their various ways) seek to ascertain whether and to what degree the challenging goal is attained. Visible teaching and learning occurs when there is deliberate practice aimed at attaining mastery of the goal, when there is feedback given and sought, and when there are active, passionate, and engaging people (teacher, students, peers) participating in the act of learning. It is teachers seeing learning through the eyes of students, and students seeing teaching as the key to their ongoing learning. The remarkable feature of the evidence is that the greatest effects on student learning occur when teachers become learners of their own teaching, and when students become their own teachers. When students become their own teachers, they exhibit the self-regulatory attributes that seem most desirable for learners (self-monitoring, self-evaluation, self-assessment, self-teaching). Thus, it is visible teaching and learning by teachers and students that makes the difference.

A key premise is that the teacher’s view of his or her role is critical. It is the specific mind frames that teachers have about their role – and most critically a mind frame within which they ask themselves about the effect that they are having on student learning. Fundamentally, the most powerful way of thinking about a teacher’s role is for teachers to see themselves as *evaluators* of their effects on students. Teachers need to use evidence-based methods to inform, change, and sustain these evaluation beliefs about their effect. These beliefs relate to claims about what each student can do as a consequence of the teacher’s



FIGURE 2.2 What teachers see

actions, and how every resource (especially peers) can be used to play a part in moving students from what they can do now to where the teacher considers they should be – and to do so in the most efficient, as well as effective, manner. It matters what teachers do – but what matters *most* is having an appropriate mind frame relating to the impact of what they do. An appropriate mind frame combined with appropriate actions work together to achieve a positive learning effect.

What I am *not* saying is that ‘teachers matter’: this cliché is the most unsupported claim from the evidence in *Visible Learning*. It is a cliché that masks the fact that the greatest source of variance in our system relates to teachers (both between teachers, and even in that a single teacher can vary in his or her impact across students, across days, and across lessons). What *does* matter is teachers having a mind frame in which they see it as their role to evaluate their effect on learning.

As I argued in *Visible Learning* (Hattie, 2009: 22–4), when teachers see learning occurring or not occurring, they intervene in calculated and meaningful ways to alter the direction of learning to attain various shared, specific, and challenging goals. In particular, they provide students with multiple opportunities and alternatives for developing learning strategies based on the surface and deep levels of learning some content or domain matter, leading to students building conceptual understanding of this learning, which the students and teachers then use in future learning. Learners can be so different, making it difficult for a teacher to achieve such teaching acts: students can be in different learning places at various times, using a multiplicity of unique learning strategies, meeting different and appropriately challenging goals. Learning is a very personal journey for the teacher and

the student, although there are remarkable commonalities in this journey for many teachers and students. It requires much skill for teachers to demonstrate to all of their students that they can see the students' 'perspective, communicate it back to them so that they have valuable feedback to self-assess, feel safe, and learn to understand others and the content with the same interest and concern' (Cornelius-White, 2007: 23).

The act of teaching requires deliberate interventions to ensure that there is cognitive change in the student; thus the key ingredients are being aware of the learning intentions, knowing when a student is successful in attaining those intentions, having sufficient understanding of the student's prior understanding as he or she comes to the task, and knowing enough about the content to provide meaningful and challenging experiences so that there is some sort of progressive development. It involves a teacher who knows a range of learning strategies with which to supply the student when they seem not to understand, who can provide direction and redirection in terms of the content being understood and thus maximize the power of feedback, and who has the skill to 'get out the way' when learning is progressing towards the success criteria.

Of course, it helps if these learning intentions and success criteria are shared with, committed to, and understood by the learner – because in the right caring and idea-rich environment, the learner can then experiment (be right and wrong) with the content and the thinking about the content, and make connections across ideas. A safe environment for the learner (and for the teacher) is an environment in which error is welcomed and fostered – because we learn so much from errors and from the feedback that then accrues from going in the wrong direction or not going sufficiently fluently in the right direction. In the same way, teachers themselves need to be in a safe environment to learn about the success or otherwise of their teaching from others.

To create such an environment, to command a range of learning strategies, and to be cognitively aware of the pedagogical means that enable the student to learn requires dedicated, passionate people. Such teachers need to be aware of which of their teaching strategies are working or not, need to be prepared to understand and adapt to the learner(s) and their situations, contexts, and prior learning, and need to share the experience of learning in this manner in an open, forthright, and enjoyable way with their students and their colleagues.

As I noted in *Visible Learning*, we rarely talk about passion in education, as if doing so makes the work of teachers seem less serious, more emotional than cognitive, somewhat biased or of lesser import. When we do consider passion, we typically constrain such expressions of joy and involvement to secluded settings not in the public space of being a teacher (Neumann, 2006). The key components of passion for the teacher and for the learner appear to be the sheer thrill of being a learner or teacher, the absorption that accompanies the process of teaching and learning, the sensations of being involved in the activity of teaching and learning, and the willingness to be involved in deliberate practice to attain understanding. Passion reflects the thrill, as well as the frustrations, of learning; it can be infectious, it can be taught, it can be modelled, and it can be learnt. It is among the most prized outcomes of schooling and, while rarely covered in any of the studies reviewed in this book, it infuses many of the influences that make the difference to the outcomes. It requires more than content knowledge, acts of skilled teaching, or engaged students to make the difference (although these help). It requires a love of the content, an ethical, caring stance deriving from the desire to instil in others a liking, or even love, of

the discipline being taught, and a demonstration that the teacher is not only teaching, but also learning (typically about the students' processes and outcomes of learning). In the current economic climate of many countries, property values have plummeted, leading to fewer resources available for the education budget. As Doug Reeves pointed out to me, passion may be the only natural renewable resource that we have.

Learning is not always pleasurable and easy; it requires over-learning at certain points, spiralling up and down the knowledge continuum, building a working relationship with others in grappling with challenging tasks. Students appreciate that learning is not always pleasurable and easy, and indeed can engage with and enjoy the challenges that learning entails. This is the power of deliberate practice and concentration. It also requires a commitment to seeking further challenges – and herein lies a major link between challenge and feedback, two of the essential ingredients of learning. The greater the challenge, the higher the probability that one seeks and needs feedback, but the more important it is that there is a teacher to provide feedback and to ensure that the learner is on the right path to successfully meet the challenges.

The key to many of the influences above the $d = 0.40$ hinge-point is that they are deliberate interventions aimed at enhancing teaching and learning. It is critical that teachers learn about the success or otherwise of their interventions: those teachers who are students of their own impact are the teachers who are the most influential in raising students' achievement. Seeking positive effects on student learning (say, $d > 0.40$) should be a constant theme and challenge for teachers and school leaders. Because this does not happen by serendipity or accident, the excellent teacher must be vigilant to what is working and what is *not* working in the classroom – that is, teachers must be vigilant as to the consequences for learning based on their classroom climate, their teaching, and their students' co-teaching and co-learning. They must also assess the merits of any gains in terms of the 'worthwhileness' of the learning aims.

It is critical that the teaching and the learning are visible. There is no deep secret called 'teaching and learning': teaching and learning are visible in the classrooms of successful teachers and students; teaching and learning are visible in the passion displayed by the teacher and learner when successful learning and teaching occurs; and teaching and learning requires much skill and knowledge by both teacher and student (initially by the teacher and later more by the student). The teacher must know when learning is occurring or not, know when to experiment and when learn from the experience, learn to monitor, seek and give feedback, and learn when to provide alternative learning strategies when other strategies are not working. What is most important is that teaching is visible to the student, and that the learning is visible to the teacher. The more the student becomes the teacher and the more the teacher becomes the learner, then the more successful are the outcomes (see Hattie, 2009: 25–6).

This explanation of visible teaching relates to teachers as activators, as deliberate change agents, and as directors of learning (Hattie & Clinton, 2011). This does not mean that they are didactic, spend 80 per cent or more of the day talking, and aim to get through the curriculum or lesson come what may. The model of visible teaching and learning combines, rather than contrasts, teacher-centred teaching and student-centred learning and knowing.

As well as surface and deep learning, we also want efficiency or fluency as a valued outcome. We know what 'fluency' is when we talk of being fluent in a language; the same

concept can apply to any learning. ‘Over-learning’ can be a factor in helping us to achieve fluency. Over-learning is what happens when we reach a stage of knowing what to do without thinking about it; its critical feature is that it reduces the load on our thinking and cognition, allowing us to attend to new ideas. To reach a state of over-learning requires much deliberate practice – that is, extensive engagement in relevant practice activities for improving performance (as when swimmers swim lap after lap aiming to over-learn the key aspects of their strokes, turns, and breathing). It is not deliberate practice for the sake of repetitive training, but deliberate practice focused on improving particular aspects of performance, to better understand how to monitor, self-regulate, and evaluate one’s performance, and to reduce errors.

Conclusions

The major argument presented in this book is that when teaching and learning are visible, there is a greater likelihood of students reaching higher levels of achievement. To make teaching and learning visible requires an accomplished ‘teacher as evaluator and activator’, who knows a range of learning strategies to build the students’ surface knowledge, deep knowledge and understanding, and conceptual understanding. The teacher needs to provide direction and redirection in terms of the content being understood, and thus make the most of the power of feedback. The teacher also needs to have the skill to get out of the way when learning is taking place and the student is making progress towards meeting the criteria against which successful learning will be judged. Visible teaching and learning also requires a commitment to seeking further challenges (for the teacher and for the student) – and herein lies a major link between challenge and feedback, two of the essential ingredients of learning. The greater the challenge, the higher the probability that one seeks and needs feedback, and the more important it is that there is a teacher to ensure that the learner is on the right path to successfully meet the challenge.

It is some teachers with certain mind frames that make the difference. That teachers are the greatest source of variance is often disputed, but how many more studies do we need to show their impact? There are production studies that relate specific attributes of teachers (such as education, experience); there are variance studies that evaluate teacher effects across different classrooms; there are association studies that relate teaching practices to student achievement. All of these methods control differing effects of students (for example, prior achievement, socio-economic status). These various value-added studies typically show high levels of variability due to teacher effects (hence the claim that it is ‘not all teachers that make the difference’), but the variance is the largest source over which we have any control (Alton-Lee, 2003).

The conclusions in *Visible Learning* were cast as six signposts towards excellence in education, as follows.

1. Teachers are among the most powerful influences in learning.
2. Teachers need to be directive, influential, caring, and actively and passionately engaged in the process of teaching and learning.
3. Teachers need to be aware of what each and every student in their class is thinking and what they know, be able to construct meaning and meaningful experiences in light