the evaluation questions about knowing their impact, but it requires a lot of change to sustain and embed this mind frame. As many have said: 'It was easier not to know.'

These mind frames, or ways of thinking, are identified based on the claims made in the preceding chapters. The claim is that teachers and school leaders who develop these ways of thinking are more likely to have major impacts on student learning.

Mind frame 1: Teachers/leaders believe that their fundamental task is to evaluate the effect of their teaching on students' learning and achievement

Among the most powerful of all interventions is feedback or formative evaluation – providing information to the teacher as to where he or she is going, how he or she is going there, and where he or she needs to go next. The key factor is for teachers to have mind frames in which they seek such feedback about their influences on students and thus change, enhance, or continue their teaching methods. Such a mind frame – that is, seeking evidence relating to the three feedback questions ('Where am I going?'; 'How am I going there?'; 'Where to next?') – is among the most powerful influences on student achievement that we know.

Knowing what is optimal does not always mean deciding on a teaching method, resources, sequence, and so on, and then implementing these to the best of our abilities. It does not mean a prescription of the 'seven best strategies to use', 'what works', and so on. Instead, what is optimal means altering the instruction 'on the fly' during the class, with the many students at differing stages of knowing and understanding on the basis of feedback to the teacher about the value and magnitude of their teaching decisions. Hence the importance of seeking feedback about our effects both in a formative and summative manner.

The interactions between what we do as educators and what students are doing as learners is the key: it is the interaction – and being tuned into the nature and impact of these interactions – that is critical. This means evaluating what we are doing and what the student is doing, and seeing learning through the eyes of students, as well as evaluating the effect of our actions on what the student does and the effect of what the student does on what we then need to do – and, together, this is the essence of excellent teaching.

The operative notion is that of 'evaluating'. Teachers need to enhance their evaluation skills about the effects that they are having on students. Only then are teachers best equipped to know what to do next to enhance students' improvement. Over a series of lessons, if the typical impact is not high (that is, at least $d = >0.40$), then change in the teaching methods is likely to be necessary. Offering 'more' is probably the worst solution; what is needed is more likely to be 'different' methods. This is a 'win–stay, lose–shift' strategy.

The key questions underlining Mind frame 1 are as follows.

- 'How do I know that this is working?'
- 'How can I compare "this" with "that"?'
- 'What is the merit and worth of this influence on learning?'
- 'What is the magnitude of the effect?'
- 'What evidence would convince me that I was wrong in using these methods and resources?'
- 'Where is the evidence that shows that this is superior to other programs?'
- 'Where have I seen this practice installed where it has produced effective results (which would convince me and my colleagues on the basis of the magnitude of the effects)?'
- 'Do I share a common conception of progress with other teachers?'

Mind frame 2: Teachers/leaders believe that success and failure in student learning is about what they, as teachers or leaders, did or did not do . . . We are change agents!

This proposition is *not* making the claim that students are not involved in the learning equation, or that all success or failure is indeed the responsibility of the teacher; rather, it is claiming that the greatest impact relates the teacher's mindset. Some of the positive beliefs that need to be fostered include the following.

- 'All students can be challenged.'
- 'It's all about strategies, never styles.'
- 'It is important to develop high expectations for all students relative to their starting point.'
- 'It is important to encourage help-seeking behaviours.'
- 'It is important to teach multiple learning strategies to all students.'
- 'It is important to develop assessment-capable students.'
- 'Developing peer interactions is powerful for improving learning.'
- 'Critique, error, and feedback are powerful opportunities for improving learning.'
- 'Developing student self-regulation and developing "students as teachers" are powerful mechanisms for improving learning.'
- 'Don't blame the kids.'
- 'Handicaps of social class and home resources are surmountable.'
- 'There is no place for deficit thinking – that is, there is no labelling of students, nor are there low expectations of students.'

Teachers need to see themselves as change agents – not as facilitators, developers, or constructivists. Their role is to change students from what they are to what we want them to be, what we want them to know and understand – and this, of course, highlights the moral purposes of education. It is about teachers believing that achievement is changeable or enhanceable and is never immutable or fixed, that the role of a teacher is as an enabler not as a barrier, that learning is about challenge and not about breaking down material into easier chunks, and it is about teachers seeing the value of both themselves and students understanding learning intentions and success criteria.

There has been a longstanding debate between those who argue that teachers need to be facilitative and less intrusive, and those who support teachers as activators in the classroom (Taber, 2010). The answer is clear, but it seems that, every few years, we rediscover this notion (see Mayer, 2004, 2009). Alrieri, Brooks, Aldrich, and Tenenbaum (2011) conducted a meta-analysis on this question. They showed the value of directed over undirected discovery learning. From 580 effects based on 108 studies, the average effect was 0.38 in favour of the former over the latter. They then compared more specific, but explicit, methods of teaching: requiring students to generate rules, strategies, etc. ($d = 0.30$); elicited explanation requiring learners to explain their learning or target material ($d = 0.36$); scaffolding or regular feedback ($d = 0.50$). They concluded that:

> unassisted discovery generally does not benefit learning . . . . teaching practices should employ scaffolded tasks that have support in place as learners attempt to reach some objective, and/or activities that require learners to explain their own ideas. The benefits of feedback, worked examples, scaffolding, and elicited explanation can be understood to be part of a more general need for learners to be redirected . . . . unguided discovery activities were too ambiguous to allow learners to transcend the mere activity and to teach the level of constructivism intended.
>
> (Alrieri et al., 2011: 12)

The message in this book certainly supports the direct approach. Too often, the distinction is not made starkly enough, but I mince no words: teachers are change agents; they need to be activators; and they are responsible for enhancing student learning. There are many others also responsible (the student, parents, and so on), but the teacher is employed to be a change agent. As I noted in *Visible Learning*, this places a high obligation on the moral aspects of teaching – especially what is taught and knowing the effects of the teacher on what is taught. It also places an obligation on all then to esteem this expertise – in the staffroom, in the home, in the community, and in the profession.

Mind frame 3: Teachers/leaders want to talk more about the learning than the teaching

I have almost reached the point at which I lose interest in discussion about teaching – not because it is not important, but because it is often prevents important discussions about learning. So many professional development sessions are about best practice, new methods of teaching, interrogation of assessment far too late to make a difference today or tomorrow – and we seem to like these safe and non-threatening topics. Where is the debate about how we learn, evidence of students' learning in their multiple ways, how to learn differently? Can you name three competing theories of learning? To have these collegial debates about learning and about our impact on this learning requires school leaders that are supportive of teachers being learners and evaluators. Teachers need to be adaptive learning experts, to know multiple ways of teaching and learning, to be able to coach and model different ways of learning, and to be the best error detectors in the business.

Mind frame 4: Teachers/leaders see assessment as feedback about their impact

Of all of the influences on student learning, feedback is among the top-ranked – and this is also the case for teacher learning. Teachers need feedback about their effects on each student; hence the notions of assessment as teacher feedback, teachers as evaluators, and teacher colleagues and students as peers in the feedback equation. Teachers, like students, need to debate and agree about where they are going, how they are going, and where they are going next.

Of course, the assessment is about the student, but the power of interpretation and the consequences of assessment are more in the hands of teachers. We need to move from the prepositional divide of assessment as 'assessment of' and 'assessment for' to assessment as feedback for teachers. The critical questions are as follows.

- 'Who did you teach well and who not so well?'
- 'What did you teach well and what not so well?'
- 'Where are the gaps, where are the strengths, what was achieved, and what has still to be achieved?'
- 'How do we develop a common conception of progress with the students and with all of the teachers in our school?'

Mind frame 5: Teachers/leaders engage in dialogue not monologue

While there is a need for teachers to impart information, while the lecture format is indeed efficient, and while teachers do and should know more than students, there is a major need for teachers also to *listen* to the students' learning. This listening can come from listening to their questions, their ideas, their struggles, their strategies of learning, their successes, their interaction with peers, their outputs, and their views about the teaching. The current dominance of monologue may cause less damage for the brighter students, who can engage in learning with their typically greater access to learning strategies and self-talk about the learning. Monologue is less satisfactory for the struggling, the disengaged, and the confused, and is powerful for the brighter students.

There is a need for more research about the optimal proportions of dialogue and monologue – particularly when one is preferred more than the other – and which is best for surface and deep learning. There is also a great need to find out more about the effects of the nature of the dialogue. One form of dialogue can enhance the language of a subject such that students begin to talk the language of the subject, or the language of the 'correct procedures' to use when studying the subject, or the language of more lucid explanations or justification when interacting with the subject. Clarke (2010) videoed mathematics classes in many countries and noted marked differences in the language used in the classrooms. He concluded that:

> it is clearly the case that some mathematics teachers value the development of a spoken mathematical vocabulary and some do not. If the goal of classroom mathematical activity was fluency and accuracy in the use of written mathematics, then the teacher may give little priority to students developing any fluency in spoken mathematics. On the other hand, if the teacher subscribes to the view that student understanding resides in the capacity to justify and explain the use of mathematical procedures, in addition to technical proficiency in carrying out these procedures in solving mathematical problems, then the nurturing of student proficiency in the spoken language of mathematics will be prioritized, both for its own sake as valued skill and also because of the key role that language plays in the process whereby knowledge is constructed.
>
> (Clarke, 2010: 35)

A recent newspaper heading about my presentation on this topic read 'Researcher claims teachers should shut up' (although I liked the letter to the editor the next day headed 'Teacher claims researcher should shut up'). While the heading may have captured the spirit, the major message is more about the balance of talking and listening. What is not suggested is that teachers 'shut up' and then students engage in busy work, complet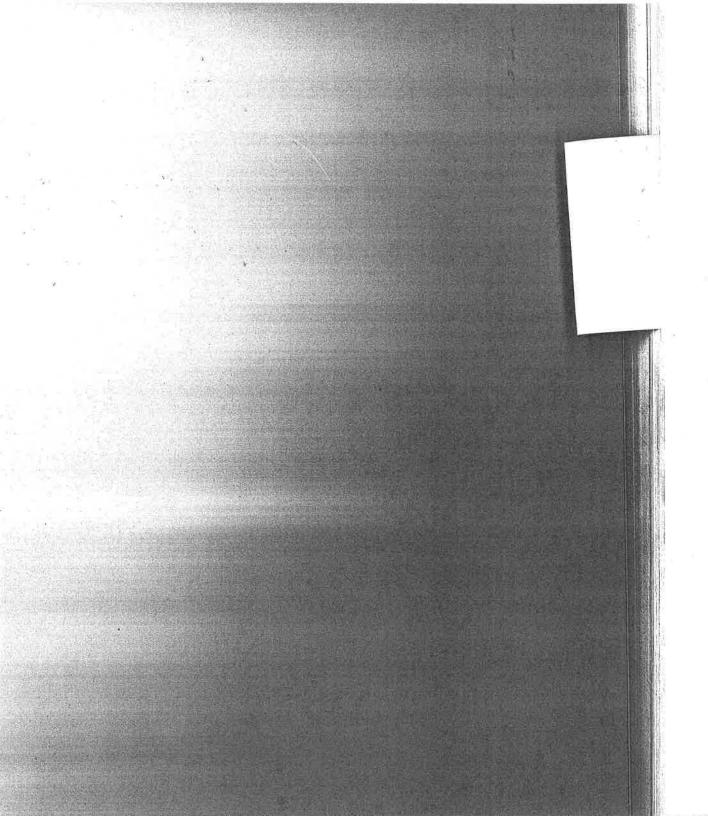e endless trials of similar tasks, fill in worksheets, or talk among themselves. There is not a lot of evidence that reducing teacher talk and increasing student talk necessarily leads to greater achievement gains (Murphy, Wilkinson, Soter, Hennessey, & Alexander, 2009). It may be that a particular type of talk is needed to promote surface and deeper comprehension; it may that a particular type of listening is needed to better understand how and whether students are learning; and it may be that a particular type of reaction to this listening (for example, using rapid formative feedback) is the essence of the power of 'shutting up'. As Carl Rogers, the famed psychotherapist, demonstrated, active listening means that we demonstrate to the other that we not only have listened, but also that we have aimed to understand and show that we have listened. Providing formative feedback helping the student to know what to do next is among the most powerful ways in which to demonstrate to that student that we have listened.

Mind frame 6: Teachers/leaders enjoy the challenge and never retreat to 'doing their best'

Every day in most class's life is a challenge – and we need to embrace this challenge and make it the challenge that we want it to be. The art of teaching is that what is challenging to one student may not be to another; hence the constant attention to the individual differences and seeking the commonality so that peers can work together with the teacher to make the difference. The teachers' role is not to decide on the challenge and then 'break it down' into manageable bits so that it is easier for students; instead, his or her role is to decide on how to engage students in the challenge of the learning. This is why learning intentions and success criteria have been emphasized so strongly, because when students understand these, they can see the purposes of the challenges that are so critical to success in learning.

Mind frame 7: Teachers/leaders believe that it is their role to develop positive relationships in classrooms/staffrooms

So often, we are concerned about the classroom climate, but forget the purpose of warm, trustworthy, empathetic climates. The primary purpose is to allow students to feel okay about making mistakes and not knowing, and to establish a climate in which we welcome error as opportunities. Learning thrives on error: a fundamental role for teachers is to seek out misconceptions, misunderstandings, and lack of knowledge. While teachers may have warm interpersonal interactions, this is not the point. The point is: do the students believe that the climate of the class is fair, empathetic, and trustworthy? Can students readily indicate that they do not know, do not understand – without getting snide comments, looks, and sneers from peers? The power of peers is pervasive, and much about creating the right classroom climate is about creating a safe harbour for welcoming error and

thence learning; in the same way, it is critical for school leaders to create a safe staffroom climate, so that all teachers can talk about teaching and their impact on student learning.

Mind frame 8: Teachers/leaders inform all about the language of learning

In many aspects of daily interactions, we take on many roles that are formally undertaken by professionals. We are travel agents, bank tellers, store assistants, bloggers of news, and so on. Such co-production is becoming more common, but it has hardy dented schools. We still see parents as those who receive biannual reports, supervise homework (or not), provide accommodation, and feed and look after students in the other eight hours of their waking lives.

While all parents want to find ways in which to help to co-educate their children, not all parents know how to do this. A major barrier for these latter parents is that they are often not familiar with the language of learning and schools. For many of them, school was not always the most pleasant experience. In our multi-year evaluation of five of the schools in the lowest socio-economic area in New Zealand, we found many positive consequences when teaching parents the language of schooling (Clinton, Hattie, & Dixon, 2007). The Flaxmere Project involved a series of innovations related to improving home–school relations, and included giving a sample of families computers and employing former teachers as 'home–school liaison persons' to help the families to learn how to use the computers. The evaluation demonstrated that it was these former teachers who were informing the parents about the language of schooling that made big differences – that is, the parents learned the language about the nature of learning in today's classrooms, learned how to help their children to attend and engage in learning, and learned how to speak with teachers and school personnel. Parents who co-understand the importance of deliberate practice, concentration, the difference between surface and deep knowing, and the nature of the learning intentions and success criteria are more able to have dialogue with their children. Teaching parents the language of learning led to enhanced engagement by students in their schooling experiences, improvements in reading achievement, greater skills and jobs for the parents, and higher expectations, higher satisfaction, and higher endorsement of the local schools and the Flaxmere community (the effect sizes ranged from $d = 0.30$ to $d = 0.60$ and occasionally were much higher across many outcomes).

When this co-learning occurs, then more evidence about the impact on learning can be understood and potentially acted upon by all. The involvement in homework, in esteeming and promoting schools based on evidence of impact on progress of their children, and in providing support and opportunities to engage in worthwhile challenges in the home can all assist in progressing students to become critical evaluators and learned citizens.