CHAPTER

4 Preparing the lesson

Planning can be done in many ways, but the most powerful is when teachers work together to develop plans, develop common understandings of what is worth teaching, collaborate on understanding their beliefs of challenge and progress, and work together to evaluate the impact of their planning on student outcomes.

There are four critical parts in planning that we need to consider up front: the *levels of performance* of the students at the start (prior achievement), the *desired levels* at the end of a series of lessons (or term, or year) (targeted learning), and the *rate of progress* from the start to the end of the series of lessons (progression). The fourth component is *teacher collaboration and critique in planning*.

VISIBLE LEARNING – CHECKLIST FOR PLANNING

6. The school has, and teachers use, defensible methods for:
   a. monitoring, recording, and making available, on a 'just in time' basis, interpretations about prior, present, and targeted student achievement;
   b. monitoring the progress of students regularly throughout and across years, and this information is used in planning and evaluating lessons;
   c. creating targets relating to the effects that teachers are expected to have on all students' learning.

Prior achievement

David Ausubel claimed:

> . . . if I had to reduce all of educational psychology to just one principle, I would say this: 'The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly.'
>
> (Ausubel, 1968: vi)

It is the case that prior achievement is a powerful predictor of the outcomes of lessons (d = 0.67).

What a student brings to the classroom each year is very much related to his or her achievement in previous years: brighter students tend to achieve more and not-so-bright students achieve less. Our job as teachers is to mess this up, by planning ways in which to accelerate the growth of those who start behind, so that they can most efficiently attain the curriculum and learning objectives of the lessons alongside the brightest students. This means knowing their trajectories of learning, the current learning strategies used, and how willing and ready the student is to invest in learning. So, before the lesson is planned, the teacher must know what a student already knows and can do. This allows the teacher to tailor the lesson, so that the student can bridge the gap between his or her current knowledge and understanding, and the target knowledge and understanding. Thus it is also critical to have a clear understanding of the student's current position and the target position.

Any lesson planning must therefore begin with a deep understanding of what each student already knows and can do, and how the instruction is aimed at increasing the progress and levels of achievement for each of the students. The primary concern is to add value to all students, wherever they start from, and to get *all* students to attain the targeted outcomes.

One of the important understandings that teachers need to have about each student is his or her ways of thinking. By this, it is not intended to delve into learning styles (visual, kinaesthetic, etc.), for the effectiveness of which there is zero supporting evidence, but to understand a student's strategies for thinking, so that he or she can be helped to advance his or her thinking. One of the more well-known theories of learning – Piaget's – is still among the most powerful that we know. While there have been many advances on how we think since Piaget produced his influential research, it is worth going back to his work to make at least one key point: before teachers can help students to 'construct' knowledge and understanding, they need to know the different ways in which students think.

Piaget (1970) argued that children develop their thinking through a succession of stages.

1. The first is the 'sensorimotor' stage, which occurs between birth and the age of 2. Children rely on seeing, touching, and sucking objects, and they are learning the relationship between their bodies and the environment. They learn object permanence – that is, that an object exists independent of them, even when it cannot be seen.
2. The second is the 'preoperational' stage (2–7 years), during which the child believes that everyone thinks as he or she does, and has difficulty viewing life from any other perspective than his or her own. During this stage, children learn to form concepts and use symbols, and thence acquire language skills. Thinking is concrete and irreversible; hence it is difficult for them to think in abstract terms or reverse events in their minds.
3. It is in the next, the 'concrete operational' stage (7–12 years) that logical thinking emerges, reversibility begins to occur, and children can begin to explore concepts.
4. At the formal operational stage (from the age of 12 to adulthood), children can think in abstract or hypothetical terms, are able to form hypotheses, and can reason through analogy and metaphors.

Of course, there have been many critiques, modifications, and enhancements of this work. The greatest criticism relates to the notion of fixed stages tied to ages: it is argued that

students can be in multiple stages (which Piaget also argued), that the stages are not necessarily tied to these ages (Piaget suggested that these were guides), and that there is no strict sequence. Case (1987, 1999) showed that the achievement of staged milestones in cognitive development did not proceed at a uniform pace across all content domains of knowledge. He showed that enhancing a child's information-processing and working memory capacities could lead to better overall understanding.

The key issue is that children may think differently from adults/teachers, which means that attention needs to be given to *how* and not only to *what* the child is learning. Based on Piaget's notions, Shayer (2003) developed a program of 'cognitive acceleration' based on three main drivers: the mind develops in response to challenge or disequilibrium, so any intervention must provide some *cognitive conflict*; the mind grows as we learn to become conscious of, and so take control of, its own processes; and cognitive development is a social process promoted by high-quality dialogue among peers supported by teachers. The program attained effect sizes of 0.60+.

Shayer (2003) suggests two basic principles for teachers. First, teachers need to think of their role as one of creating interventions that will increase the proportion of children attaining a higher thinking level, such that the students can use and practise these thinking skills during the course of a typical lesson – that is, teachers must attend first to *how* the students are thinking.

> If you cannot assess the range of mental levels of the children in your class, and simultaneously what is the level of cognitive demand of each of the lesson activity, how can you plan and then execute – in response to the minute by minute responses of the pupils – tactics which result in all engaging fruitfully?
>
> (Shayer, 2003: 481)

Second, learning is collaborative and requires dialogue, and this requires teachers to be attentive to all aspects of peer-to-peer construction and mediation (particularly in whole-class discussion, by encouraging and creating spaces for all views, comments, and critique). This allows teachers to be more aware of both the processing levels of different aspects of the activity and how each student's response indicates the level at which they are processing – that is, teachers need to listen as well as to talk.

One disturbing trend is that the average age at which students move into Piaget's formal operational stage in the UK seems to be increasing (Shayer, 2003). Shayer suggests that the reason may be the amount of attention paid to tests that measure the accumulation of knowledge. (If this is an outcome that is valued by the authorities, then teachers and students learn to work out successful ways in which to deliver on what the authorities ask from schools, to the detriment of higher levels of thinking!) Further, the levels of processing of the average 11-year-old and 12-year-old about to enter high school spans about 12 development years (on average, from the ages of 6 to 18) and fewer than 50 per cent of (school) year 11 and 12 students are formal operational thinkers.

The message is that we must know what students already know, know how they think, and then aim to then progress all students towards the success criteria of the lesson.

The self-attributes that students bring to the lesson

> **VISIBLE LEARNING – CHECKLIST FOR PLANNING**
>
> 7. Teachers understand the attitudes and dispositions that students bring to the lesson, and aim to enhance these so that they are a positive part of learning.

As well as bringing their prior achievement, students bring many other dispositions to the classroom. These include motivation to learn, strategies to learn, and confidence to learn. In my earlier years in academia, I spent many years studying the notion of self-concept and its measurement (Hattie, 1992): how do students see themselves; what do they see as most important; and how does this relate to their learning and outcomes? There were two major directions in this research literature: research about the structure of self-concept (what are the various ways in which we see ourselves and how do they work together to form an overall self-concept?); and research about the processes of self-concept (how do we process information about ourselves?). I proposed a model to bring these two directions together – called the 'rope model' of self-concept (Hattie, 2008).

The metaphor of the rope aimed to emphasize that there is no single strand underlying our self-concept, but that there were many overlapping concepts of self, and the strength in the rope 'lies not in one fibre running throughout its length, but in the overlapping of many fibres' (Wittgenstein, 1958: section 67). These many fibres relate to the processes of self-concept – such as self-efficacy, anxiety, performance or mastery goal orientations – that we use to select and interpret the information that we receive, and which we use to present ourselves to others. Teachers need to know how students process self-information so that the teacher can develop and enhance the students' confidence in tackling challenging tasks, resilience in the face of error and failure, openness and willingness to share when interacting with peers, and pride in investing energy in actions that will lead to successful outcomes.

A major claim of the rope model is that students are 'choosers' and aim to impose some sense of order, coherence, and predictability in their world; we make choices about how to interpret events, about alternative courses of action, and about the value of making these decisions or not (which is why some naughty kids seek evidence to confirm their view of themselves as naughty kids). These choices aim to *protect*, *present*, *preserve*, and *promote* our sense of self such that we can 'back ourselves' – that is, maintain a sense of self-esteem. A major purpose of schooling is to enable students to 'back themselves' as learners of what we consider worth knowing.

We have spent many years working with adolescents in prisons; they, too, back themselves and use similar self-strategies to acquire a depth of knowledge and understanding – about socially undesirable tasks and outcomes (Carroll, Houghton, Durkin, & Hattie 2009). We have argued that they, too, esteem challenge, commitment, and passion, and build many well-developed strategies of learning to attain success in those areas in which they 'back themselves' as learners. Teachers and schools need to make schools inviting places in which to learn the knowledge that we value, but teachers and schools should never presume that all students will come to school wanting to share these values. Those in schools need to extend an invitation to students to engage in learning that is considered

valuable – and this requires appropriate challenge and helping students to see the value of investing in the deliberate practice of learning school-based subjects (Purkey, 1992).

Some of the self-processes to which teachers need to pay attention, and that they must modify where necessary, include self-efficacy, self-handicapping, self-motivation, self-goals, self-dependence, self-discounting and distortion, self-perfectionism, and social comparison.

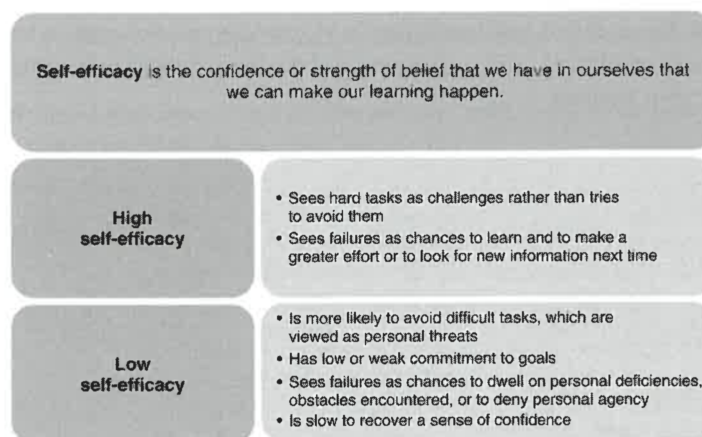

FIGURE 4.1 Self-efficacy

Self-efficacy This is the confidence or strength of belief that we have in ourselves that we can make our learning happen. Those with high self-efficacy are more likely to see hard tasks as challenges rather than try to avoid them, and when they have failures, they see them as a chance to learn and to make a greater effort or to look for new information next time. Those with low self-efficacy are more likely to avoid difficult tasks, which they view as personal threats; they are likely to have low or weak commitment to goals, and are more likely, in 'failure' situations, to dwell on personal deficiencies, obstacles encountered, or to deny personal agency, and they are slow to recover their confidence.

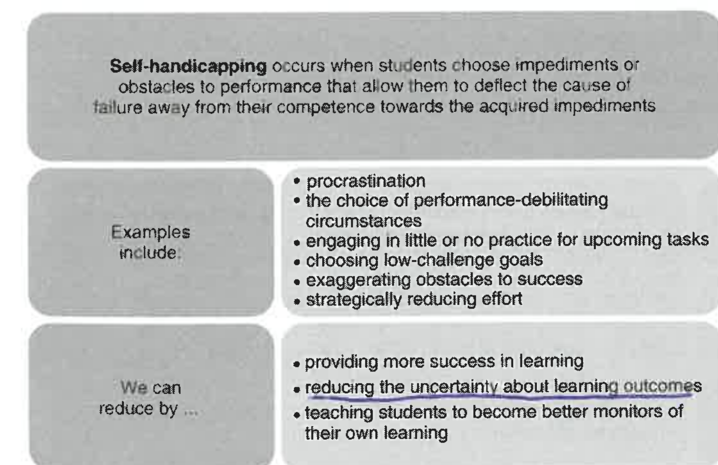

FIGURE 4.2 Self-handicapping

Self-handicapping This occurs when students choose impediments or obstacles to performance that enable them to deflect the cause of failure away from their competence towards the acquired impediments. Examples include procrastination, the choice of performance-debilitating circumstances (for example, 'the dog ate my homework'), engaging in little or no practice for upcoming tasks, having low-challenge goals, exaggerating obstacles to success, and strategically reducing effort. In the event of failure, the person has an immediate excuse. We can reduce self-handicapping by providing more success in learning, reducing the uncertainty about learning outcomes, and teaching students to become better monitors of their own learning.

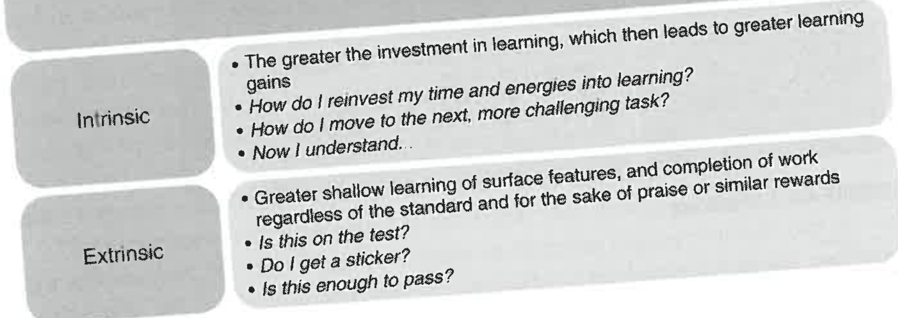

FIGURE 4.3 Self-motivation

Self-motivation This can be towards intrinsic or extrinsic attributions: is the learning itself the source of satisfaction, or are perceived rewards the sources of satisfaction? 'How do I reinvest in learning more?', 'How do I move to the next, more challenging task?', and 'Now I understand . . .' are examples of the former. 'Is this on the test?', 'Do I get a sticker?', and 'Is this enough to pass?' are examples of the latter. A combination of both is probably needed, but the more the balance moves towards intrinsic motivation, the greater the investment in learning, which then leads to greater learning gains. Too much external motivation can lead to shallow learning of the surface features, completion of work regardless of the standard, and completing work for the sake of praise or similar rewards.

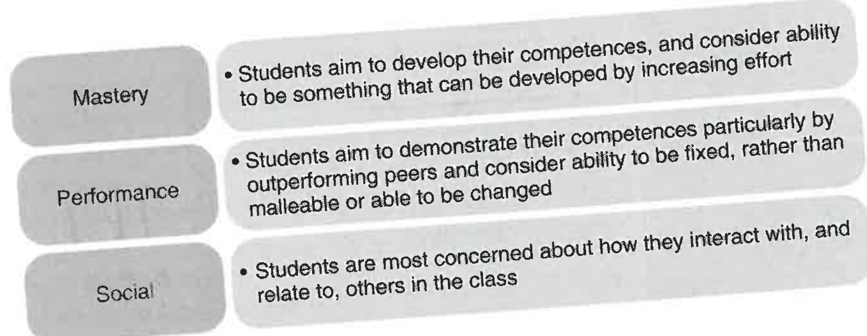

FIGURE 4.4 Self-goals

Self-goals There is a rich literature on the goals that students can have. There are three major types of goal, as follows.

- *Mastery goals* arise when students aim to develop their competence and they consider ability to be something that can be developed by increasing effort.
- *Performance goals* arise when students aim to demonstrate their competence particularly by outperforming peers, and they consider ability to be fixed, and not malleable or able to be changed.
- *Social goals* arise when students are most concerned about how they interact with, and relate to, others in the class.

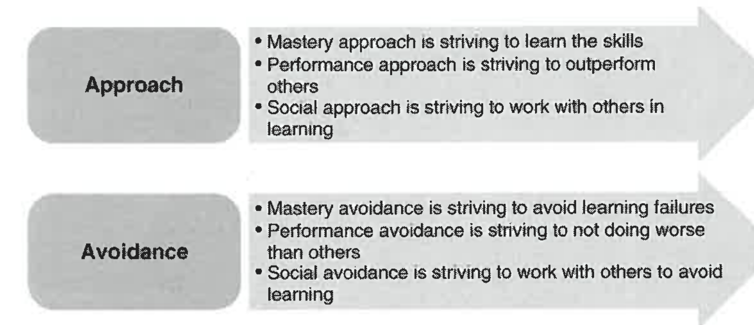

FIGURE 4.5 Approach and avoidance

These goals can be either 'approach' goals (when the student is striving to learn or master the lesson intention), or 'avoidance' (when the student is striving not to do worse than before or than others). The relation to achievement is higher for approach goals than it is for avoidance.

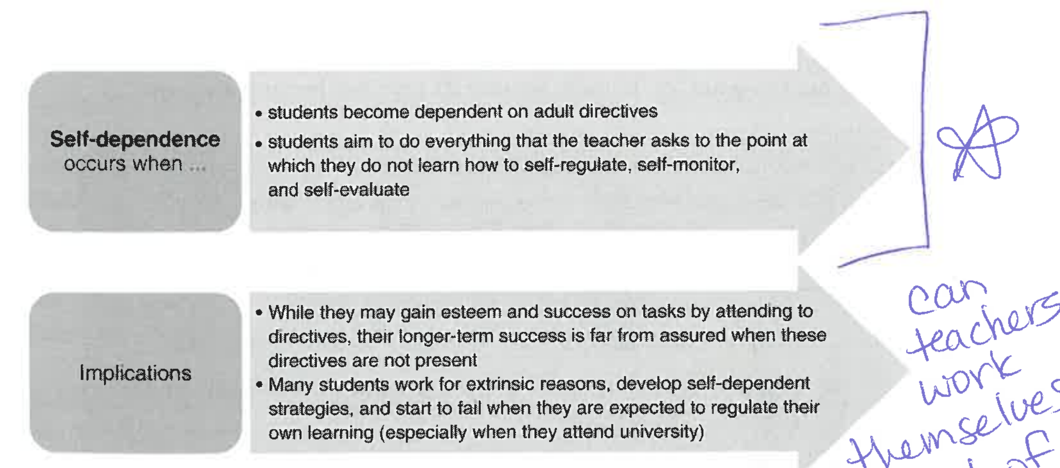

FIGURE 4.6 Self-dependence

Self-dependence This can occur when students become dependent on adult directives. In many gifted classes, especially, students can aim to do everything that the teacher asks of them to the point that they do not learn how to self-regulate, self-monitor, and self-evaluate. While they may gain esteem and success in tasks by attending to these directives, their longer-term success is far from assured when these directives are not present. I have met so many bright students who work for extrinsic reasons, develop self-dependent strategies, and start to fail when they are expected to regulate their own learning (especially when they attend university).

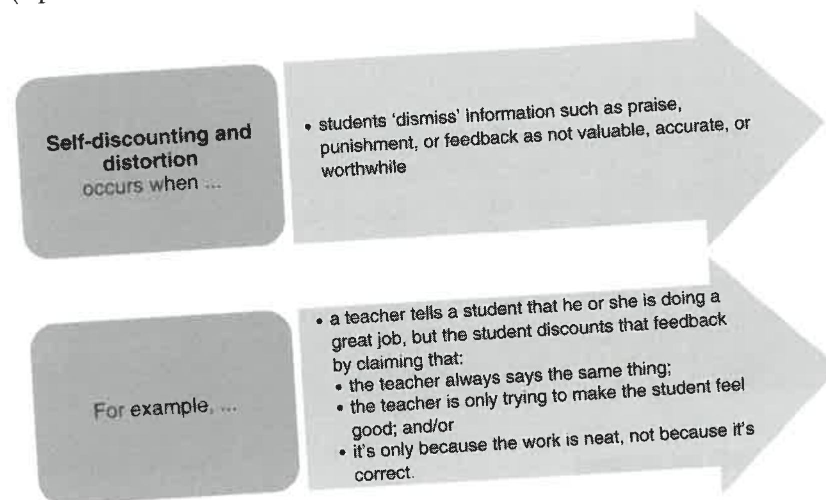

FIGURE 4.7 Self-discounting and distortion

Self-discounting and distortion This can be invoked by students 'dismissing' information such as praise, punishment, or feedback as neither valuable, accurate, nor worthwhile. For example, when a teacher tells a student that he or she is doing a great job, the student's reaction may be to discount this by claiming 'She always says that,' 'She's only trying to make me feel good,' or 'It's only because it's neat, not because it's correct'.

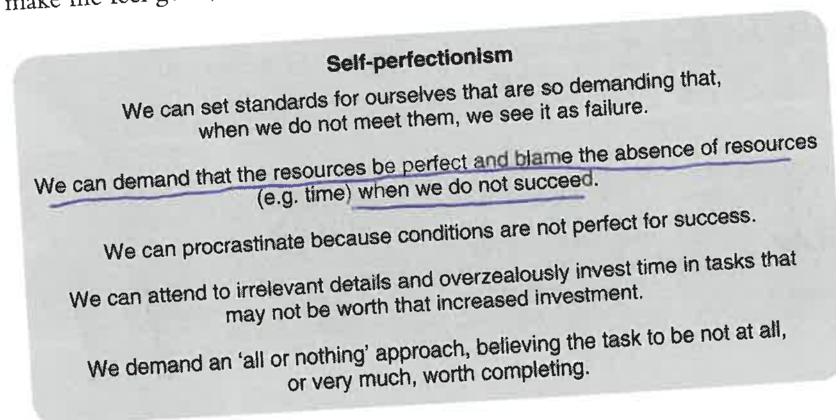

FIGURE 4.8 Self-perfectionism

Self-perfectionism This comes in many forms: we can set such demanding standards for ourselves that, when they are not met, we see it as failure; we can demand that resources be perfect and blame their absence (for example, a lack of time) when we do not succeed; we can procrastinate because conditions are not perfect for success; we can attend to irrelevant details and overzealously invest time in tasks that may not be worth the increased investment; or we may have an 'all or nothing' approach, believing that the task is not at all or very much worth completing. While there can be a sense of pleasure derived from taking painstaking effort, there are more likely to be negative consequences.

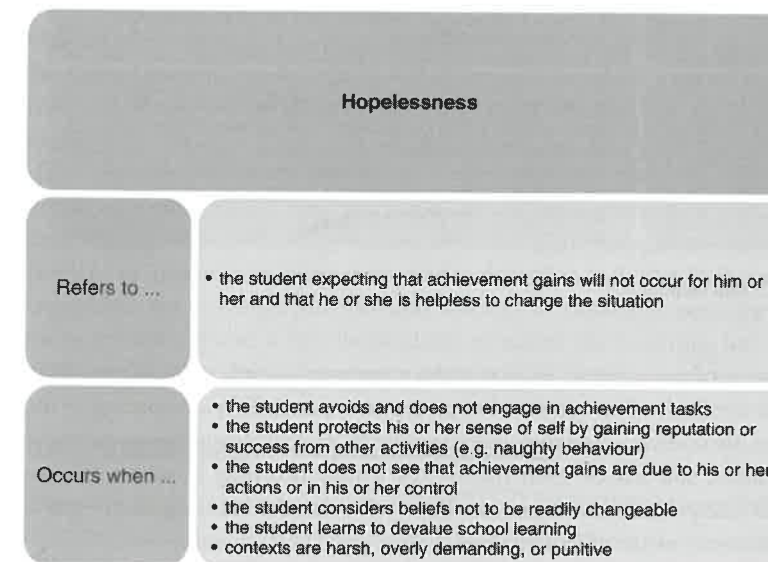

FIGURE 4.9 Hopelessness

Hopelessness This refers to the student expecting that achievement gains will not occur for him or her and that he or she is helpless to change the situation. In such a situation, the student avoids and does not engage with achievement tasks, protects their sense of self by gaining reputation or success from other activities (such as naughty behaviour), and does not see that achievement gains are due to his or her actions or in his or her control. Such hopelessness is likely to come from prior academic failures, holding beliefs that achievement is not readily changeable, but is more likely to be fixed, low levels of self-efficacy, not valuing school learning, not having appropriate learning strategies for the task, and from being in a context that is harsh, overly demanding, or punitive (Au, Watkins, Hattie, & Alexander 2009).

Social comparison This is ever-present in classrooms. Students often monitor others' behaviour for cues and attributions to explain or enhance their own conceptions of self. For example, very successful mathematics students might have a high maths self-concept in an average maths class, but after being sent to a gifted maths class, their self-concept could plummet as they compare themselves with this new cohort. Marsh et al. (2008) has termed this the 'big fish, little pond' effect. It is essential to teach such students that they can have

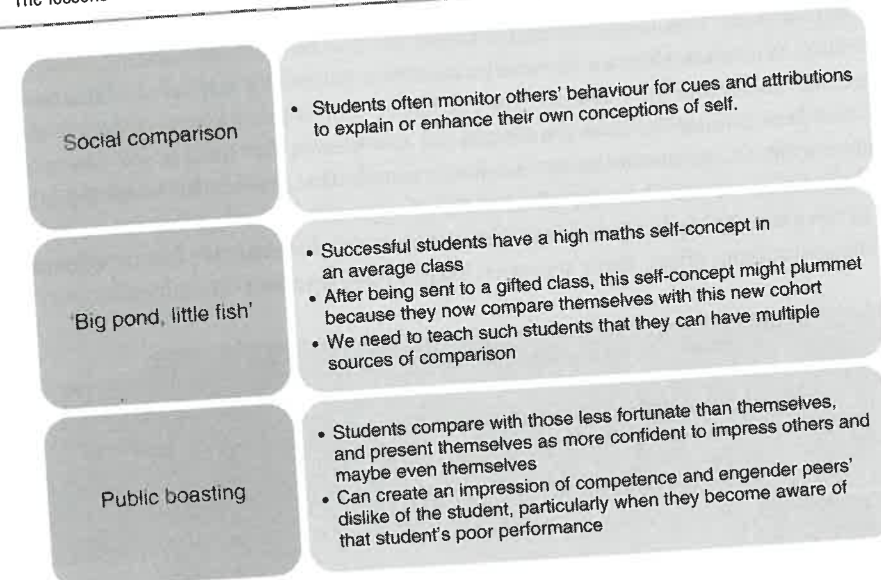

FIGURE 4.10 Social comparison

multiple sources of comparison, so as to reduce any negative effect (Neiderer, 2011). Low self-esteem individuals often use social comparison – particularly comparing to those less fortunate than themselves – and they often attempt to present themselves as more confident to impress others and maybe even themselves. Public boasting, however, can create an impression of competence and engender dislike of the student among peers – particularly when they become aware of that student's actual poor performance.

When students invoke learning rather than performance strategies, accept rather than discount feedback, set benchmarks for difficult rather than easy goals, compare their achievement to subject criteria rather than with that of other students, develop high rather than low efficacy to learning, and effect self-regulation and personal control rather than learned hopelessness in the academic situation, then they are much more likely to realize achievement gains and invest in learning. These dispositions can be taught; they can be learned.

The more transparent the teacher makes the learning goals, the more likely the student is to engage in the work needed to meet the goal. Also, the more the student is aware of the criteria of success, the more the student can see and appreciate the specific actions that are needed to attain these criteria. Of course, he or she could choose to not engage, to be actively unengaged, or simply to wait and see. If the teacher does not clearly set out the learning intentions, then often the only goal for a student is to compare himself or herself to other students – and how easy it is to choose someone who is not quite as good as you, meaning that success is almost guaranteed! Schunk (1996) showed that when goals are made transparent at the start of the lesson, students have higher confidence that they can attain them. Their confidence grows as they make progress in skill acquisitions, and their confidence thus helps to sustain motivation and skilful performance. Rapid formative assessments (see Chapter 7) used throughout lessons also helps students to 'see' their progress, and thus monitor their investment and confidence in learning.

Targeted learning

VISIBLE LEARNING – CHECKLIST FOR PLANNING

8. Teachers within the school jointly plan series of lessons, with learning intentions and success criteria related to worthwhile curricular specifications.

There are two parts in targeted learning: the first is being clear about what is to be learned from the lesson(s) (the learning intention); the second is having a way of knowing that the desired learning has been achieved (the success criteria). Targeted learning involves the teacher knowing where he or she is going with the lesson and ensuring that the students know where they are going. *These pathways must be transparent for the student.* Such teacher clarity is essential, and by this I mean clarity by the teachers as seen by the students. Teachers need to know how to keep all in the class on track for the learning goal and then evaluate their success in moving all to the goal. Transparent learning intentions can also lead to greater trust between student and teacher, such that both parties become more engaged in the challenge provided and invested in moving towards the target. It does not mean knowing if and when the students complete the activities, but knowing whether they gain the concepts and understandings relative to the intentions of the lesson(s).

Learning intentions

The goals (that is, the learning intentions) of any lesson need to be a combination of surface, deep, or conceptual, with the exact combination depending on the decision of the teacher, which in turn is based on how the lesson fits into the curriculum. Goals may be short-term (for a lesson or part of a lesson), or longer-term (over a series of lessons), and thus may be tracked in terms of importance and effectiveness relative to the complexity of desired learning and duration of the lesson or lessons. Good learning intentions are those that make clear to the students the type or level of performance that they need to attain, so that they understand where and when to invest energies, strategies, and thinking, and where they are positioned along the trajectory towards successful learning. In this way, they know when they have achieved the intended learning. Effective teachers plan effectively by deciding on appropriately challenging goals and then structuring situations so that students can reach these goals. If teachers can encourage students to commit to achieving these challenging goals and if they provide feedback to the students on how to be successful in learning as they work to achieve the goals, then the goals are more likely to be attained.

Learning intentions describe what it is that we want students to learn and their clarity is at the heart of formative assessment. Unless teachers are clear about what they want students to learn (and what the outcome of this learning looks like), they are hardly likely to develop good assessment of that learning.

Clarke, Timperley, and Hattie (2003) noted some important features of learning intentions and planning, as follows.

- Share the learning intentions with students, so that they understand them and what success looks like. This is more than students chanting the learning intentions at the start

of the lesson, but a deeper understanding of what is desired, what success will look like, and how the tasks relate to the intention.

- Not all students in the class will be working at the same rate or starting from the same place, so it is important to adapt the plan relating to the intentions to make it inclusive of all students.
- The cascade from curriculum aim, through achievement objective, to learning intention is sometimes complex because the curriculum documents do not all follow the same format and learning does not happen in neat, linear sequences.
- Learning intentions and activities can be grouped, because one activity can contribute to more than one learning intention, or one learning intention may need several activities for the students to understand it fully.
- Learning intentions are what we intend students to learn. They may also learn other things not planned for (which can be positive or negative), and teachers need to be aware of unintended consequences.
- Finish each unit or lesson by referring to the learning intention and help students to understand how much closer they are to the success criteria.

A key issue is that students often need to be explicitly taught the learning intentions and the success criteria. Sandra Hastie (2011) asked about the nature of goals that students set for themselves in the middle school years. She found that, at best, students set performance goals such as: 'I aim to complete the work faster, better, or make the work longer.' She then carried out a series of studies to teach the students to set mastery goals ('I aim to understand the concepts'), but these were not as successful as teaching the teachers how to help students to set mastery goals. The teachers were provided with strategies to show students how to set and write personal best goals, the value of SMART goals (that is, those that are specific, measurable, ambitious, results-oriented, and timely), how students can break goals down into micro-goals, what challenge meant in a goal, what success looked like relative to the goals, and how students could fill in a self-review questionnaire diary. The diary invited students, assisted by their teachers, to write down three goals for themselves based on the unit that they were about to study. They were then provided examples of what success in relation to the goal looked like and rated themselves after each lesson.

Pre-lesson questions included the following.

- 'What are today's goals?'
- 'How much do I already know about today's goal?' ('Nothing' to 'a great deal')
- 'I think today's goal will be . . .' ('Very hard' to 'very easy')
- 'How much effort will I put into today's goal?' ('Nothing' to 'a great deal')

Post-lesson questions included the following.

- 'What was today's goal?'
- 'Did I achieve this goal?' ('Not at all' to 'fully')
- 'How much effort did I put in?' ('Not much' to 'a great deal')

The students were then provided with some reasons to tick explaining why they thought that they achieved the goal, such as:

- 'I wanted to learn about today's lesson';
- 'I wanted to achieve today's goal';
- 'I paid attention';
- 'I checked my answers';
- 'I worked out why I got it wrong';
- 'I looked at examples in my text book', etc.

Similarly, they responded to reasons for not achieving the day's goal, such as:

- 'I was distracted';
- 'I gave up';
- 'It was too hard';
- 'It was too easy';
- 'I didn't understand what I was supposed to be doing';
- 'I rushed my work because I wanted to finish quickly';
- 'The teacher was too busy with others', etc.

Across the 339 students, the effect size for the students' maths scores between the goal and control groups over an eight-week period was 0.22 – a reasonable return for a small investment. As importantly, there were much larger gains for attention and motivation, an enhanced commitment to reach goals, and specific information for teachers as to why students did or did not reach the goals. When teachers show students how to set mastery goals and show them what success on these goals looks like, there is an increased attention and motivation to succeed, and there is greater success. These are taught skills, with important consequences.

Another worthwhile way of setting goals is through personal bests. Andrew Martin (2006) has shown the usefulness of this method, and how personal bests can improve enjoyment of learning, participation in class, and persistence on the task. He distinguished two dimensions of personal bests (PBs): specificity and challenge. Personal bests can reduce the ambiguity about what is to be achieved, and the level of challenge prescribed by a PB must be at least higher than that of a previous best level of performance. Most importantly, PBs relate to the attainment of a *personalized* standard and this is what distinguishes them from many other goals. They are competitive (relative to previous bests) and self-improving (success leads to enhanced performance).

Martin noted that PBs help to sustain motivation, and help in identifying awareness, accessibility, adjustments, and that use of various strategies to attain them. As importantly, striving for PBs may be worthwhile for successful learning, even if the goals are performance or mastery goals.

> [Personal best]-oriented interventions might seek to develop students' skills in setting personalized academic goals that are specific and optimally more challenging than what they have previous achieved and also help students develop strategies to achieve these goals.
> (Martin, 2006: 269)

Goals are important for teachers. Butler (2007) found that teachers have different orientations with respect to their thinking about their goals of teaching. First, she asked

TABLE 4.1 Four major factors involved in teachers' orientation to their teaching goals

FOUR MAJOR FACTORS	EXAMPLE	TEACHER MOTIVATIONS OR STRIVINGS
Mastery approach	'I learned something new about myself; students' questions made me think'	To demonstrate superior teaching ability
Ability approach	'My class scored higher than other classes; my lesson plan was the best'	To learn and acquire professional understanding and skills
Work avoidance approach	'My students didn't ask hard questions; my class did not do worse on exam; my class is not furthest behind'	To avoid the demonstration of inferior ability
Ability avoidance approach	'I didn't need to prepare lessons; I got by without working hard; I didn't have any work to mark'	To get through the day with little effort

teachers to comment on what they considered a 'successful day'; she found four major factors that then led to four different forms of motivation, as summarized in Table 4.1.

A key correlate of these motivations was student help-seeking: only the mastery approach was associated with seeing student help-seeking as useful for promoting learning. These teachers communicated to students that asking questions is a good way in which to learn, they provided opportunities for these questions, they invited students to acknowledge and work through their errors, they promoted the message that help-seeking is not a sign of inadequate ability but a desire to learn, and they were more likely to respond to this help-seeking. These teachers felt successful when they were learning something new, when something in their class made them think, when they overcame difficulties, and when they saw that they were teaching better than they had done in the past. They were more likely to agree that they taught in ways that supported students' mastery goal orientations, and which provided students with challenging and stimulating tasks that promote critical and independent thinking (Retelsdorf, Butler, Streblow, & Schiefele, 2010).

The last two motivations (work avoidance and ability avoidance), in particular, were associated with avoidance of – and even undermining – help-seeking. The students in these teachers' classes reported that they were more involved in cheating, would be less likely to turn to these teachers for help, were more likely to be presented with easy tasks that were graded highly, and considered that students who asked questions or sought help were considered to be less intelligent by these teachers.

We need more teachers with mastery approaches.

Success criteria

Success criteria relate to knowledge of end points – that is, how do we know when we arrive? A learning intention of '*To learn to use effective adjectives*', for example, does not give the students the success criteria or how they will be judged. Imagine if I were simply to ask to get in your car and drive; at some unspecified time, I will let you know when you

have successfully arrived (if you arrive at all). For too many students, this is what learning feels like. At best, they know that when they get there, they will be asked for more (to 'drive' more), and it should be no wonder that many students get turned off school learning. In the case of the '*effective adjectives*', three success criteria might be: '*What you're looking for is that you have used at least five effective adjectives*', or '*What you're looking for is that you have used an adjective just before a noun on at least four occasions that will help to paint a detailed picture, so that the reader can understand the feel of the jungle and the light of the jungle*'. Students can be actively involved in devising success criteria with the teacher.

We must not make the mistake of making success criteria relate merely to completing the activity or a lesson having been engaging and enjoyable; instead, the major role is to get the students engaged in and enjoying the challenge of learning. It is challenge that keeps us investing in pursuing goals and committed to achieving goals.

Five components of learning intentions and success criteria

VISIBLE LEARNING – CHECKLIST FOR PLANNING

9. There is evidence that these planned lessons:
   a. invoke appropriate challenges that engage the students' commitment to invest in learning;
   b. capitalize on and build students' confidence to attain the learning intentions;
   c. are based on appropriately high expectations of outcomes for students;
   d. lead to students having goals to master and wishing to reinvest in their learning; and
   e. have learning intentions and success criteria that are explicitly known by the student.

There are five essential components of the learning equation as it relates to learning intentions and success criteria: challenge; commitment; confidence; high expectations; and conceptual understanding.

1. Challenge

Challenge is a relative term – relative to a student's current performance and understanding, and relative to the success criteria deriving from the learning intention. The challenge should not be so difficult that the goal is seen as unattainable, given the student's level of prior achievement, self-efficacy, or confidence; rather, teachers and students must be able to see a pathway to attaining the challenging goal – a pathway that can include strategies for understanding the goal or intention, implementation plans to attain it, and (preferably) a commitment to attaining the goal.

One of the fascinating notions is how challenge is related to what we know: in most schools tasks, we need to already know about 90 per cent of what we are aiming to master in order to enjoy and make the most of the challenge (Burns, 2002). In reading, this target is somewhat higher: we need to know more like 95–99 per cent of the words on a page before we enjoy the challenge of reading a particular text (Gickling, 1984). Anything less than 50 per cent virtually assures that students are likely to be not engaged and their success will be limited.

Teachers more often see challenge in the activity itself – that is, that the task is challenging – whereas students see challenge in the difficulty of completing the task –

that is, 'my head hurts' (Inoue, 2007). Tasks may be inherently challenging, but unless the student invests and engages in the task, it may not be challenging for them. While challenge is one of the core ingredients of effective learning, the art is in making the challenge appropriate to the student. This is why relating a task to prior learning is so important.

There is also a reciprocal relation between the challenge of the goals and the power of feedback. If the goals are more challenging, then feedback is more powerful. If the goals are easy, then feedback has a lesser effect. If you already know something, then providing feedback is of low value.

The problem with the notion of challenge is that it is individual: what is well beyond the grasp of one student may be easy for the next. Carol Tomlinson (2005: 163–4) summed this up very well:

> Ensuring challenge is calibrated to the particular needs of a learner at a particular time is one of the most essential roles of the teacher and appears non-negotiable for student growth. Our best understanding suggests that a student only learns when work is moderately challenging that student, and where there is assistance to help the student master at what initially seems out of reach.

When we experience challenge, we often encounter dissonance, disequilibrium, and doubt. Most of us need safety nets if we are going to take the risk of the challenge, and this is particularly so when it is some of our underlying conceptual understandings that may be at risk.

Many teachers find encouraging dissonance, disequilibrium, and doubt to be demoralizing for the students. It certainly is not the intention to make the students struggle, become disheartened, and begin to disengage. This positive creation of tension underlines the importance of teachers in encouraging and welcoming error, and then helping the students to see the value of this error to move forward; this is the essence of great teaching. Shifting the focus from the self to the task, to the nature of the error, and to the strategies to use the error are the skills of teaching. Succeeding at something that you thought was difficult is the surest way in which to enhance self-efficacy and self-concept as a learner.

2. Commitment

Creating lessons in which students are committed to learning is less critical than ensuring that the task is challenging – that is, commitment comes second. 'Commitment' refers to a student's (or teacher's) attachment or determination to reach a goal: the greater the commitment, the better the performance.

Commitment is more powerful when it relates to investing in challenging tasks. We need to be careful that, in making activities interesting, relevant, authentic, and engaging, this does not lead to busy work rather than learning and challenge. Engagement is higher in classrooms in which students perceive instruction as challenging and in which there are peers who are also similarly challenged (Shernoff and Czsikzenhmilayi, 2009). This is not to underestimate the agency of commitment in the learning equation: overall, the effects of adding commitment to challenge are among the powerful ingredients in planning and learning.

As students move through elementary school, a major source of this commitment to school learning comes from peers – through pressure, modelling, and competition (Carroll

et al., 2009). The teacher's aim, therefore, is to help students to gain a reputation among their peers as good learners.

3. Confidence

The ability to be confident that one can attain the learning goals is critical. Such confidence can come from the student (from having had past success in learning), from the teacher (in providing the quality of teaching and feedback along the way to ensure success), from the tasks (in ensuring appropriate scaffolding along the ladder of success), and from peers (in terms of feedback, sharing, and lack of distraction). Together, the mantra is 'I think I can . . . I think I can . . . I *know* I can . . .' followed by 'I thought I could . . . I thought I could . . . I *knew* I could . . .'. Such confidence can lead to resilience – particularly in the face of failure. Resilience is the ability to react to adversity, challenge, tension, or failure in an adaptive and productive manner. The proficiency to adapt to these situations is somewhat akin to when we are inoculated with the disease-causing pathogen such that we will build resistance and thus overcome the disease.

4. Student expectations

The influence that was highest of all in *Visible Learning* was self-reported grades. Overall, students have reasonably accurate understandings of their levels of achievement. Across the six meta-analyses (about 80,000 students), the effect was $d = 1.44$, or a correlation of about 0.80 between students' estimates and their subsequent performance in school tasks.

> On the one hand, this shows a remarkably high level of predictability about achievement in the classroom (and should question the necessity of so many tests when students appear to already have much of the information the tests supposedly provide), but on the other hand, these expectations of success (which are sometimes set lower than students could attain) may become a barrier for some students as they may only perform to whatever expectations they already have of their ability.
>
> (Hattie, 2009: 44)

There are at least two groups that are not as good at predicting their performance and who do not always predict in the right direction: minority students and lower-achieving students. These students are less accurate in their self-estimates or self-understanding of achievement. They tend to underestimate their achievement and, over time, they come to believe their lower estimates and lose the confidence to take on more challenging tasks. There have been many studies trying to improve the calibration and to entice students to have higher confidence or efficacy to take on challenging tasks. Changing these students' predictions of their performance has proved to be very difficult, often because this lower confidence and learned helplessness has developed and been reinforced over a long time. As they move into adolescence, these students often consider another alternative: opting out of the place called 'school'.

Student reflection of their performance alone makes no difference. Emphasizing accurate calibration is more effective than rewarding improved performance. The message is that teachers need to provide opportunities for students to be involved in predicting their performance; clearly, making the learning intentions and success criteria transparent, having high, but appropriate, expectations, and providing feedback at the appropriate levels (see

Chapter 7) is critical to building confidence in successfully taking on challenging tasks. Educating students to have high, challenging, appropriate expectations is among the most powerful influence in enhancing student achievement.

5. Conceptual understanding

The nature of success raises questions about the nature of the outcomes. There are at least three levels of understanding: surface, deep, and conceptual (Hattie, 2009: 26–9). The most powerful model for understanding these three levels and integrating them into learning intentions and success criteria is the SOLO (structure of observed learning outcomes) model developed by Biggs and Collis (1982).

In this model, there are four levels, termed 'uni-structural', 'multi-structural', 'relational', and 'extended abstract' – which simply mean 'an idea', 'many ideas', 'relating ideas', and 'extending ideas', respectively. The first two levels are about surface learning and the last two are about deeper processing (see Figure 4.11 for an example). Together, surface and deep understanding lead to the student developing conceptual understanding.

We have used the SOLO model in the development of our assessment system (see Hattie & Brown, 2004; Hattie & Purdie, 1998), and we found that most tests (both teacher-made and standardized state-wide tests) are dominated by surface items. Indeed, most teacher questions in class are surface (and often closed, as well). At minimum, the aim is to balance the surface and deep (in our asTTle assessment engine, we found that at least 30 per cent of items in a test should be surface and 30 per cent deep to create optimal tests). We also use the surface and deep distinction in scoring open-ended items, such as essays, performances, experiments (cf. Glasswell, Parr, & Aikman, 2001; Coogan, Hoben, & Parr, 2003), in classifying study skills programs (Hattie, Biggs, & Purdie, 1996), in identifying expert teachers (Smith et al., 2008), and in evaluating gifted programs (Maguire, 1988).

Steve Martin is a science teacher at Howick College (in Auckland, New Zealand), and he uses learning intentions, success criteria, and complexity (via the SOLO taxonomy) in his preparation of all units of work. Consider, for example, a series of lessons on light and sound. Martin starts with pre-tests – sometimes through class discussion; sometimes with a written test; sometimes by interviewing three students (of differing abilities). He then works through the learning intentions sheets illustrated in Table 4.2 with the students. He now has an excellent system such that he can monitor the progress of students from the point of learning at which they came into the lesson through the various learning intentions, knowing (as do the students) what success looks like – at differing levels of complexity. He also accompanies each learning intentions sheet with resources, key words, and so on.

Surface • Uni-structural • Multi-structural	• Who painted *Guernica*? • Outline at least two compositional principles that Picasso used in *Guernica*.
Deep • Relational • Extended abstract	• Relate the theme of *Guernica* to a current event. • What do you consider Picasso was saying through his painting *Guernica*?

FIGURE 4.11 An example of four questions related to the SOLO taxonomy

TABLE 4.2 An example of learning intentions and success criteria categorized by SOLO complexity category

LEARNING INTENTIONS		SUCCESS CRITERIA	
SOLO 1: RECOGNIZE THAT LIGHT AND SOUND ARE TYPES OF ENERGY THAT ARE DETECTED BY EARS AND EYES			
Uni-/multi-structural	Recognize that light/sound are forms of energy and have properties	I can name one/or more properties of light and sound	❑
Relational	Know that sound/light can be transformed into other forms of energy	I can explain how light/sound is transformed into other types of energy	❑
Extended abstract	Understand how light/sound allows us to communicate	I can discuss how light/sound enables us to communicate	❑
SOLO 2: BE ABLE TO DRAW A NORMAL, MEASURE ANGLES, AND DEFINE THE LAW OF REFLECTION			
Uni-/multi-structural	Be able to draw ray diagrams, including the normal, with correctly drawn angles	I can draw a ray diagram with correctly measured angles	❑
Relational	Be able to define the Law of Reflection, linking the terms 'incidence' and 'reflected ray'	I can define the Law of Reflection, linking the terms 'incidence' and 'reflected ray', 'normal' and 'smooth surface'	❑
Extended abstract	Recognize that the Law of Reflection is true for all plane surfaces and can predict what will happen if the surface is rough	I can predict what will happen if light is reflected off a rough surface and explain why it happens	❑
SOLO 3: BE ABLE TO USE RAY BOXES TO UNDERSTAND HOW CONCAVE AND CONVEX MIRRORS BEHAVE			
Uni-/multi-structural	Know that changing the distance of an object from a concave mirror changes the appearance of the image	I can recognize that an image in a concave mirror changes as an object is moved closer or farther away from the mirror	❑
Relational	Be able to explain why concave mirrors are known as 'converging mirrors' and convex mirrors as 'diverging mirrors'	I can explain (using diagrams) why concave and convex mirrors are referred to as 'convergent' and 'divergent' mirrors, respectively	❑
Extended abstract	Recognize patterns in reflected rays from concave and convex mirrors, and be able to make a generalization	I can write a generalization about the patterns of reflected rays in concave and convex mirrors	❑

The curriculum: what should be taught, choice of resources, and progress

VISIBLE LEARNING – CHECKLIST FOR PLANNING

10. All teachers are thoroughly familiar with the curriculum – in terms of content, levels of difficulty, expected progressions – and share common interpretations about these with each other.

Now that the key ingredients of the planning have been outlined, we turn to a critical evaluative question that teachers must address: what knowledge and understanding should be taught? This immediately leads to two sub-questions: what knowledge and understanding is important; and what knowledge and understanding is going to lead to the greatest cognitive understandings and gains?

The starting point when determining what is to be taught, the appropriate complexity, and the desirable goals should be the curriculum – which is usually a hotly contested territory. There can be local, state, national, or international curricula (for example, the International Baccalaureate), and they are all different. They differ, however, more in the emphasis of topics and higher-order themes rather than fundamentally – at least as regards reading and mathematics. The greatest difference is often not at the lowest, more surface levels of curricula, but at the higher-order levels. For example, in our assessment work, we identified 140 specific objectives in reading for New Zealand; when we translated our assessment engine to fit into New York City schools, the same 140 objectives were present, but were grouped into higher-order notions in quite a different manner. Similarly, when New Zealand undertook a major review of its reading curriculum, the higher notions changed from inference, finding information, understanding, connections, knowledge, and surface features (grammar, punctuation, and spelling), to language, inference, purposes, processes, and surface features – but the same 140 objectives were merely re-sorted.

One difference across different curricula can be in order or progressions: some objectives fall before or after others. There is too little evidence as to what is the best order and even, in some domains, whether there is indeed an order. For example, in high-school mathematics, there are many topics that students are invited to learn, but the order of this learning is probably not so critical (as the differences in order among jurisdictions indicate). What seems more important is the increasing level of challenge that can be involved in choosing curricula to be taught. It is the notion of 'challenge' that is most importantly closely tied to the choices of activities, lessons, and outcomes of a lesson. Thus the argument here is that while 'curriculum is the most critical component' for choice of subject matter, it is just as critical that we take account of challenge, commitment, confidence, and conceptual understanding.

It seems that, in many jurisdictions, there is currently an obsession with testing and developing more and more finely grained standards – hence curricula are drafted bottom-up from the standards to the 'rich ideas'. The focus seems to be on the alignment of what is assessed with what is taught, what is reported (that is, the results) and what is taught,

what the standards should be and therefore what is taught, and what is subjected to value-added or other accountability issues. The development of common curricula, the evidence about appropriate ordering for teaching the curricula, and most importantly the debates about desirable curricula in a democratic society are often presumed to be answered by these more test-outcome-based questions, rather than based on a debate about what is worth preserving in our society, and what is worth knowing in order to live the desired 'good life'.

Choice of resources

Planning is so often more about the resources and activities, even though the *Visible Learning* approach is to not start with these until well into the planning cycle. There are a million resources available on the Internet and creating more seems among the successful wastes of time in which teachers love to engage. So many jurisdictions are now providing banks of resources and, in our own assessment engine, we have had much success mapping resources to a two-way grid – success shown in the way in which teachers continue to link to the site. The 'What Next' site (http://www.tki.org.nz/r/asttle/whatnext/reading_e.php), which is part of our assessment engine, is organized by the levels (difficulty) of the curricula (levels 2–6) and curricular themes ('big ideas').

On the 'What Next' site, if teachers choose the current mean (that is, the bold dot within the square), they will be able to access material that is at the curricular level that the average student in the group is already achieving. We recommend that teachers do not keep teaching at this level, but choose more challenging resources. Hence teachers should choose an appropriate button *above* the current mean for at least half of the group. If one or two individuals are at Level 4P while the majority of the class is at 3B, a teacher can select suitable material for those two individuals from the 4A or 5B materials, while providing

What Next Report for Test : help guide-customis
Group : All Test Candidates **Date Tested : 08 December 2006**

	Reading				
	Processes and Strategies	Purposes and Audiences	Ideas	Language Features	Structure
6 Advanced		•			
6 Proficient	•	•	•	•	•
6 Basic		•			
5 Advanced	•	•	•	•	•
5 Proficient		•			
5 Basic	•	•	•	•	•
4 Advanced		•			
4 Proficient	•	•	•	•	•
4 Basic		•			
3 Advanced	•	•	•	•	•
3 Proficient		•			
3 Basic	•	•	•	•	•
2 Advanced		•			
2 Proficient	•	•	•	•	•
2 Basic		•			

http://asttle.org.nz/whatnext/reading

FIGURE 4.12 The *What Next?* report from e-asTTle

material at 3P or 3A for the majority of the class. The achievement objectives can remain the same for the class, if that is the teacher's wish, but the curricular level of the material will be tailored to the individuals or groups (see Figure 4.12).

By clicking on the desired (dark blue) button, the teacher or student will be taken to various websites that have sets of lesson plans, teacher resources, student resources, exemplars of items at this level of challenge, web links, more open-ended items, and links to teaching strategies. The page also describes the skills and strategies expected at each level, and aims to reduce the variability in how teachers make meaning about these levels. While teachers seem to have no difficulty making and finding resources, the skill is tailoring the resources to the next level of challenge for the student – and this is the power of What Next.

Progression

A few years ago, our team analysed the status of achievement in New Zealand schools in reading, writing, and mathematics (Hattie, 2007). New Zealand performs well in these areas in the international comparisons, so the 'levels' of performance are not the major concern; rather, the single greatest issue that we identified was the need for teachers to have common understandings of progress. For too many teachers, it seems a badge of valour to dismiss the evidence of progress from previous teachers and thus every time a student comes into a new class or school, there is a 'hold' on his or her progress while the new teacher reassesses for his or her purposes the levels of this new student. The so-called 'summer effect', whereby students reduce achievement over summer ($d = -0.10$) is probably as much the result of this 'holding' back by new teachers as they reassess to make their own judgements as it is of the students having been on holiday. (For teachers, it is 'starting from scratch' or a 'fresh start'; for students, it is often 'more of the same'.) This leads to an underestimation of what the students can do and suspicions about what deep learning occurred in 'that previous school'; thus the continuity of the curriculum is broken. If there were transfer plans such that teachers valued and used the information from previous teachers, this drop could be reduced (see Galton, Morrison, & Pell, 2000).

Val's work with Anna!!!

Note that a common understanding of progress means that teachers have understanding among themselves within and preferably across schools of what the notions of challenge and difficulty are when implementing the curriculum. This is to ensure that appropriately higher expectations of challenges are provided to students: teachers need to know what progress looks like in terms of the levels of challenge and difficulty for the students such that if they were to interchange teachers across grades and between schools, their notions of challenge would synchronize with the other teachers' understandings of progress. This does not mean that there is a one right trajectory of progress for all students.

The way in which learning progresses is all too often decided by a committee: curricula are full of desired or proscribed orders for teaching content or concepts. There are recommendations about the 'proper sequences for developing numeracy strategies, for learning historical information, for introducing mathematical ideas', and so on. Instead, it is more critical to analyse closely how students actually progress. Steedle and Shavelson (2009) showed that progressions can differ relative to what the students already know (even if this knowledge is incorrect). In a study of the progressions through a unit on force and motion, Steedle and Shavelson showed that there were different progressions for those

The US is about attainment, but we need to think about progress instead

students whose understanding is (nearly) scientifically accurate compared with those who believe that velocity is linearly related to force.

Indeed, the most exciting developments in research on identifying trajectories are under way in many research teams. Popham (2011) distinguishes between two kinds of learning progression, which he classes 'upper case' and 'lower case' learning progressions. The upper case is primary and can inform the lower-case notions (see Confrey & Maloney, 2010; Clements & Sarama, 2009; Daro, Mosher, & Corcoran, 2011). Confrey and Maloney (2010), for example, have interviewed many students and watched them learn, and from that have developed various learning trajectories in teaching aspects of mathematics. They then created assessments that help teachers to understand which trajectory a student is on, where on that trajectory he or she is, and the errors that he or she is making that stop the student from progressing.

So many state and country assessment systems seem overly zealous about the levels of achievement. Although I am not saying that levels of achievement are unimportant, there is also the question of how to move each student forward from wherever they start through these levels of achievement (progression of learning). Indeed, we need both: attainment of standards of achievement *and* defensible rates of progress. But if there is an overemphasis on levels of attainment, then those schools that start with students above the norm will appear to be most effective and conversely those that start with students well below the norm will appear to be least effective. But we send students to school to make progress beyond what they bring at the start; hence *progress* is among the most critical dimensions for judging the success of schools.

TABLE 4.3 Distinction between two ways of considering learning progressions (Popham, 2011)

	UPPER-CASE LEARNING PROGRESSIONS	LOWER-CASE LEARNING PROGRESSIONS
1	Describe how students' learning of particular things develops over a period of time	Describe how students' learning of something develops – because of instruction – over a relatively short period, such as a few weeks or a semester
2	Focus on students' achievement of extraordinarily significant curricular aims, such as the 'big or rich ideas' in a content field	Deal with students' mastery of meaningful, but not momentous, curricular aims
3	Is research-ratified in the sense that the nature and sequencing of the learning progression's building blocks have been confirmed by rigorous empirical studies	Based on educators' conceptual analyses of a curricula aim's necessary precursors, rather than on the results of research investigations

Teachers talking to each other about teaching

VISIBLE LEARNING – CHECKLIST FOR PLANNING

11. Teachers talk with each other about the impact of their teaching, based on evidence of student progress, and about how to maximize their impact with all students.

One of the major messages from *Visible Learning* is the power of teachers learning from and talking to each other about planning – learning intentions, success criteria, what is valuable learning, progression, what it means to be 'good at' a subject. Black, Harrison, Hodgen, Marshall, and Serret (2010) found that asking teachers 'What does it mean to be good at [English, math, etc.]?' was a powerful way in which to engage in a discussion about validity and curricular matters. They noted that teachers readily engaged in this debate, and 'through such engagement began to see that they had, in their practice, neglected to critique their own work in the light of their beliefs and values concerning the purpose of learning in their subject' (p. 222). Only by having some common understanding of what it means to be 'good at' something can the resulting debates about forms of evidence, quality of teaching, and student outcomes make sense. This can then lead to a more informed discussion about what progression means – which is at the core of effective teaching and learning. Sharing a common understanding of progression is the most critical success factor in any school; without it, individualism, personal opinions, and 'anything goes' dominate (usually in silence in staffrooms, but living and aloud behind each closed classroom door). Miller (2010) refers to the 'smart swarm' that occurs when all begin to move in the right direction based on collaborative critique, distributed problem-solving, and multiple interactions.

Finding ways in which to have this discussion about progression is the starting point, the sustenance of any school. This requires many methods: moderation; sharing indicators of milestone performance (using examples of student work); sharing marking across classes; collaborative pre-planning across, as well as within, year cohorts. The most successful method that I have encountered is the 'data teams' model, in which a small team meets a minimum of every two or three weeks and uses an explicit, data-driven structure to disaggregate data, analyse student performance, set incremental goals, engage in dialogue around explicit and deliberate instruction, and create a plan to monitor student learning and teacher instruction. These teams can work at the grade level, curriculum or department level, building level, and even system level. These teams allow focus and deep implementation. Says Reeves (2010: 36): '. . . half hearted implementation was actually worse than minimal or no implementation.'

McNulty and Besser (2011) argue that data teams be formed on the basis of three criteria:

- all teachers on an instructional data team have a common standard or common area of focus;
- all teachers on an instructional data team administer a common assessment that leads to regular formative interpretations; and

- all teachers on an instructional data team measure learning with a common scoring guide or rubric.

They then see the data team model as a four-step process.

1. The first step involves collecting and charting the data, the aim of which is to make the data visible, to place a name for every number, to develop trust and respect to spark improvement from all, and (most importantly) to work out the fundamental questions to be asked of the data team.
2. Next, the team begins to use the evidence to prioritize and set, review, and revise incremental goals. This involves being explicit about what success looks like, what high expectations need to be set, and what degree of acceleration is needed to enable all students to reach the success criteria.
3. The team now questions the instructional strategies and how they are impacting on each student, what needs to change, what needs to remain, and (most importantly) what results would convince the team to change or remain. Such 'results indicators' allow teams to make mid-course corrections.
4. Finally, the team monitors the impact of these strategies and the impact on student learning.

The cycle then repeats.

> The essence of data-driven decision making is not about perfection and finding the decision that is popular, it's about finding the decision that is most likely to improve student achievement, produce the best results for the most students, and promote the long-term goals of equity and excellence.
>
> (Reeves, 2011: 24)

There are now many sources that illustrate such data teams in action (such as Anderson, 2010, 2011).

There are many other systems, like data teams, which focus on the evidence of student learning and then create debates about impact, effect, and consequences. Darling-Hammond (2010) has elaborated on instructional data teams; DuFour, DuFour, and Eaker (2008) have argued that teams work together to clarify the learning intentions, monitor each student in a timely manner, provide systematic intervention, and check to see that all reach the success criteria.

The 'response to intervention' model, and instructional rounds pioneered by Elmore, Fiarmen, and Teital (2009) involve the student and the teacher in the presence of content. The model is based on seven principles, as follow.

1. Increases in student learning occur only as a consequence of improvements in the level of content, teachers' knowledge and skill, and student engagement.
2. If you change any single element of the instructional core, you have to change the other two.
3. If you can't see it in the core, it's not there.

4. Task predicts performance.
5. The real accountability system is in the tasks that students are asked to do.
6. We learn to do the work by doing the work, not by telling other people to do the work, not by having done the work at some time in the past, and not by hiring experts who can act as proxies for our knowledge about how to do the work.
7. Description before analysis; analysis before prediction; prediction before evaluation.

The message is not about whether we form professional learning communities, use smart tools, or conduct data teams; rather, it is about teachers being open to evidence of their impact on students, critiquing each other's impact in light of evidence of such impact, and forming professional judgements about how they then need to – and indeed can – influence learning of all students in their class. So often, the process becomes a mantra and allows for lovely meetings that have little effect other than providing a forum for the talkative to wax lyrical. The message is, however, about the impact.

One early reviewer (Rick DuFour) of the book identified three 'big ideas' from *Visible Learning*, as follows.

1. The fundamental purpose of schools is to ensure that all students learn and not merely that all students are taught. Student learning must be lens through which educators look when examining all of their practices, policies, and procedures.
2. Schools cannot help all students to learn if educators work in isolation. Schools must create the structures and cultures that foster effective educator collaboration – collaboration that focuses on factors within our sphere of influence to impact student learning in a positive way.
3. Schools will not know whether or not teachers are learning unless they are clear on what students must learn, and unless they continuously gather evidence of that learning, and then use the evidence:
   a. to better meet the needs of students through systematic instruction and enrichment; and
   b. to inform and improve the individual and collective professional practice of educators.

The reviewer then provided parallel arguments for the importance of collective responsibility, for the topics of debate in professional learning communities, and to bring these three 'big ideas' to life through a recursive process that focuses on four critical questions for every unit that they teach.

1. 'What is it that we want our students to know and be able to do as a result of this unit?' (Essential learning)
2. 'How will they demonstrate that they have acquired the essential knowledge and skills? Have we agreed on the criteria that we will use in judging the quality of student work, and can we apply the criteria consistently?' (Success indicators)
3. 'How will we intervene for students who struggle and enrich the learning for students who are proficient?'

4. 'How can we use the evidence of student learning to improve our individual and collective professional practice?'

These questions are the critical topics for professional learning, communities, data teams, or whatever the form of collective responsibility in our schools. These are the value propositions that we need to highlight about the impact of our schools. These are the most promising strategies for developing the capacity of people within our schools to assume collective responsibility for improving student and adult learning.

If there is any inference throughout these pages that it is the teachers who are responsible for all students learning or not learning, then this is not intentional. Given the range of students for whom schools are responsible, the expanding curricular and social expectations continually placed on schools, and the press, which can point laser-like attention on accountability in schools, it is not reasonable to assume that a single teacher knows everything. It is a collective, school-wide responsibility to ensure that all students are making at least a year's growth for a year's input, and to work together to diagnose, recommend interventions, and collectively evaluate the impact of teachers and programs.

It would be powerful not only to attend to within-school differences in teachers' conceptions of progression, but also to between-school methods. In our own work, my colleagues and I have invited teachers to engage in a 'bookmark' standard-setting exercise. We provide teachers with booklets of about 50 items ordered on the basis of student performance ('easiest' to 'hardest'). We asked them first to complete each item individually, and then to place a 'bookmark' (a sticky label) between the item that demarcates the change between the previous set of items and the next set of items at key reference points. (In New Zealand, the reference points are levels, because the national curriculum is based on levels of schooling rather than years – but the reference points could comprise years of schooling or other milestone points.) We then displayed on an overhead projector the item that each teacher chose as the demarcation item, and created a discussion of the nature of the skills and strategies that led them to claim that the items before and after this cut-item differed. This certainly led to a robust discussion, after which the teachers were asked to repeat the task – but this time in groups of between three and five – and then to repeat the discussion. This method is powerful for generating debate (in a reasonably safe environment) about what teachers see as progression, and what they see as the skills and strategies underlying this progression; an added benefit is that this leads to greater consistency in judgements across schools.

For example, we ran a series of workshops (N = 438 teachers) aimed at determining the level of performance on a set of reading items. Teachers were asked to answer 100+ items and then place bookmarks between sets of items that best represented their concept of Level 2 of the New Zealand curriculum (usually completed by years 4 and 5 students) and Level 3 (years 6 and 7), up to Level 6 (years 11 and 12). During the first round, they did this independently and their results were then shown to all teachers in the group. After listening to each other's reasoning about the skills and strategies that underpinned their decisions, they completed a second round in groups of four or five teachers.

The mean item at each level hardly changed across the teachers – indicating that, on *average*, teachers in New Zealand have similar conceptions of the *levels* of the curriculum. But the *variability* among the teachers dramatically reduced (by 45 per cent) after they listened to each other. By simply undertaking this exercise, the judgements made by

teachers as to what is meant by student work at different levels of the curriculum became much more consistent. No longer would judgements about levels of performance be based on individual teachers' beliefs, but there could now be assurance that there were more common conceptions of proficiency and progress.

Coaching teachers to talk to each other about the impact of their teaching

Talking is one thing; action is the other. To put the ideas in this book, for example, into action requires having an intention to change, having knowledge of what successful change would look like, and having a safe opportunity to trial any new teaching methods. This often requires some specific coaching. Coaches can serve as 'suppliers of candour, providing individual leaders with the objective feedback needed to nourish their growth' (Sherman & Frea, 2004). Thus coaching is specific to working towards student outcomes. It is not counselling for adults; it is not reflection; it is not self-awareness; it is not mentoring or working alongside. Coaching is deliberate actions to help the adults to get the results from the students – often by helping teachers to interpret evidence about the effect of their actions, and providing them with choices to more effectively gain these effects. There are three elements: the coach; the coached; and the agreed explicit goals of the coaching.

Joyce and Showers (1995) showed the powerful impact of coaching in comparison with other methods for raising understanding, skill attainment, and application. Reeves (2009) has used coaching extensively to facilitate school-based change and he starts from the position that not all coaching is effective. He considers that it is more effective when there is agreement that the focus is on improved performance, when there are clear and agreed learning and performance lesson plans, when there is then specific, relevant, and timely feedback, and when there is an agreed exit from the coaching upon specific planned conclusions. Coaching involves empowering people by facilitating self-directed learning, personal growth, and improved performance.

TABLE 4.4 Impact of various methods of training on outcomes

COMPONENT OF TRAINING	UNDERSTANDING	SKILL ATTAINMENT	APPLICATION
Theory understanding	85%	15%	5–10%
Demonstration	85%	18%	5–10%
Practice and feedback	85%	80%	10–15%
Coaching	90%	90%	80–90%

A well-known method to get teachers talking to each other about teaching

One of the more successful methods for maximizing the impact of teaching and enabling teachers to talk to each other about teaching is direct instruction. I know that many teachers find the mention of this phrase anathema to their concepts of desirable methods, but this is because it is so often incorrectly confused with transmission or didactic teaching (which it is not). It is unfortunate that many implementations of direct instruction are based on purchased, pre-scripted lessons, which certainly undermines one of its major advantages – that is, teachers working together to create the lesson planning. The message here is not to prescribe this as 'the way' (although its average effect size of $d = 0.59$ places it among the more successful programs of which we are aware), but to introduce it as one method that demonstrates the power of teachers working together to plan and critique a series of lessons, sharing understanding of progression, articulating intentions and success criteria, and attending to the impact on student and teacher learning.

The method is more fully outlined in many places (including Hattie, 2009: 204–7). First outlined by Adams and Engelmann (1996), direct instruction involves seven major steps.

1. Before the lesson is prepared, the teacher should have a clear idea of what the *learning intentions* are: what, specifically, should the student be able to do/understand/care about as a result of the teaching?
2. The teacher needs to know what *success criteria* of performance are to be expected, and when and what students will be held accountable for from the lesson/activity. As importantly, the students need to be informed about the standards of performance.
3. There is a need to *build commitment and engagement* in the learning task – a 'hook' to grab the student's attention such that the student shares the intention and understands what it means to be successful.
4. There needs to be guides to *how the teacher should present the lesson* – including notions such as input, modelling, and checking for understanding.
5. *Guided practice* involves an opportunity for each student to demonstrate his or her grasp of new learning by working through an activity or exercise – such that the teachers can provide feedback and individual remediation as needed.
6. *Closure* involves those actions or statements that cue students that they have arrived at an important point in the lesson or at the end of a lesson, to help to organize student learning, to help to form a coherent picture, to consolidate, to eliminate confusion and frustration, and to reinforce the major points to be learned.
7. *Independent practice* then follows first mastery of the content, particularly in new contexts. For example, if the lesson is about inference from reading a passage about dinosaurs, the practice should be about inference from reading about another topic, such as whales. The advocates of direct instruction argue that the failure to follow this seventh step is responsible for most student failure to be able to apply something learned.

Direct instruction demonstrates the power of stating the learning intentions and success criteria up front, and then engaging students in moving towards these. The teacher needs

to invite the students to learn, needs to provide much deliberate practice and modelling, and needs to provide appropriate feedback and multiple opportunities to learn. Students need opportunities for independent practice, and then there need to be opportunities to learn the skill or knowledge implicit in the learning intention in contexts other than that in which it was directly taught.

There are two big messages from the *Visible Learning* research relating to direct instruction. The first is the power of *teachers working together critiquing their planning*. This raises the question of how to construct schools in which teachers talk to each other about teaching – not about the curriculum, students, assessment, conditions, or kicking footballs, but about what they mean by 'challenge', 'progress', and 'evidence of the effects anticipated and gained from the lessons'. It is the critique that is powerful; purchasing ready-made scripts defeats a major source of the power of this method.

The second message is the power of designing and evaluating *lesson scripts*. Fullan, Hill, and Crévola (2006) term these 'critical learning instructional pathways' (CLIPs). Their CLIPS include day-to-day detailed pathways from particular parts of the progression to others. Different students can start at different starting points and make different progress along these paths. The paths need to be built on the multiple ways in which students can learn, and allow for deviations to go back and try a different pathway to achieve progress. There is a high need for rapid formative interpretations of progress and feedback to the teacher and to the student on the success of how teachers are implementing their teaching, such that there is forward movement along the pathways in terms of student learning. Obviously, CLIPs require a very detailed understanding of learning in the domain, and require collaborative study of student progress in specifying these paths, and so on. The professionalism of teachers resides in their evaluative ability to understand both the effect of their interventions, and the status and progress of all of their students. (See Steve Martin's lesson planning as one example, at pp. 54–5 above.)

There are some exciting syntheses of various intervention programs that are leading to more evidence-based scripts. Brooks (2002) has provided a systematic analysis of the effects of about 50 scripted reading programs in the UK. Snowling and Hulme (2010) show how to connect from the excellent diagnosis of a reading problem to the optimally matched intervention. They indicate how to identify 'poor responders' to the intervention, the value of a tiered approach to intervention as the student changes during the treatment, the importance of the degree of implementation or dosage of the intervention, and how to use the results from the intervention to improve the teacher's theories about reading difficulties. Elliot (see the preface to this book) would be pleased.

Conclusions

The co-planning of lessons is the task that has one of the highest likelihoods of making a marked positive difference on student learning. This chapter has identified a number of factors that together impact on the quality of this planning: having a good system of reporting student prior attainment to help teachers to know the prior achievement and progress made by each student – and 'knowing prior achievement' means not only recognizing the cognitive performance of students, but also their ways and levels of thinking, and their resilience and other self-attributes (such as confidence, reaction to failure and success). Other critical factors include setting targets for what is desired for each student

from the lessons, concentrating on evidence of the progress from prior achievement to target, and working with other teachers before delivering the lessons to engage with their critique as to how to optimize the impact of the lessons on the learning of the students. So often, planning involves a solitary teacher looking for resources, activities, and ideas; rarely are these plans shared. By sharing in the planning process, the likelihood of an end-of-lesson sharing of the evidence of impact and the understanding, and the consequences of relating this evidence to the planning, is more likely to occur.

Two powerful ways of increasing impact is to know *and* share both the learning intentions and success criteria of the lesson with students. When students know both, they are more likely to work towards mastering the criteria of success, more likely to know where they are on the trajectory towards this success, and more likely to have a good chance of learning how to monitor and self-regulate their progress.

There are many related notions to learning intentions and success criteria, such as target-setting, having high teacher and student expectations, helping students to set mastery as well as performance goals, setting personal bests, and ensuring that the intentions and criteria are sufficiently challenging for all students – and a major message in this chapter is that these notions apply as much to the teacher as they do to the students. The nature of the intentions can relate to surface or deep learning, and this choice depends on where students are in the cycle, from novice, through capable, to proficient.

Exercises

1. Create a concept map *with your students* about the learning intentions, the relations between these, and the ideas and resources that they are going to experience, and share notions of what success in the lessons would look like.
2. Hold a staff meeting in which teachers bring along their lesson plans. In pairs, choose a learning intention and its related activity, and create a 'child-speak' learning intention and related success criterion. Get each pair of teachers to read out the original learning intention, then the success criterion, and rework these until all agree. Then match the learning intentions with the learning resources (are they matched, efficient, etc.).
3. After about half a term, hold a feedback meeting in which every teacher gives a presentation based on the effects of sharing learning intentions and success criteria, as outlined in Exercise 2, including successes, problems, and strategies to overcome difficulties.
4. Choose three students who do not seem to be 'getting it' in a subject that you are teaching. Develop a profile of their self-processes – that is, their self-efficacy, self-handicapping, self-motivation, self-goals, self-dependence, self-discounting and distortion, self-perfectionism, and social comparison. Choose a student for which any of these processes are not optimal, devise an intervention, then monitor the impact on the students and their learning.
5. Make the presence and value of learning intentions and success criteria high profile in the school by talking about them in assemblies, with the aim that students and teachers see that this is a whole-school approach with a shared language.
6. Interview students about what 'challenge' means to them: what are some examples of lessons that have been challenging and how committed were they when asked to meet these challenges? Interview teachers about the same and see the overlap.

7. For each student, ascertain their progress prior to the series of lessons about to be taught. For each, set a target in terms of the outcome(s) that you wish to reach. Ensure that this is sufficiently above the student's current level of achievement and that the outcome measures (assignment, project, tests) reflect these target levels, and then monitor progress towards the targets.

CHAPTER 5

Starting the lesson

There should be a 'flow' to each lesson from the students' perspective. There are some fundamental premises that lead to this flow – starting with good planning, as outlined in the previous chapter. Other aspects that relate to lesson flow are the conditions for optimal learning environments, the proportions of teacher and student talk, teacher knowledge of the students, and choice of teaching methods.

The climate of the classroom

VISIBLE LEARNING – CHECKLIST FOR STARTING THE LESSON

12. The climate of the class, evaluated from the student's perspective, is seen as fair: students feel that it is okay to say 'I do not know' or 'I need help'; there is a high level of trust and students believe that they are listened to; and students know that the purpose of the class is to learn and make progress.

In *Visible Learning*, the importance of the climate of the classroom was noted as among the more critical factors in promoting learning. These positive climate factors included a teacher's proficiency in reducing disruption to each student's flow of learning, and having 'with-it-ness' or being able to identify and quickly act on potential behavioural or learning problems. There is therefore a certain mindfulness by teachers in the classroom about how what is happening and what is likely to happen can affect the flow of learning for each student.

To achieve such positive classroom control, there needs to be close inspection of the teacher–student relationship. Care, trust, cooperation, respect, and team skills are all present, because these are the skills needed to promote classrooms in which error is not only tolerated, but also welcomed. Teachers and students must be clear of the purpose of a lesson, and understand that learning is a staccato process, full of errors, and that there is a need for all in the class to participate in the learning. (Once again) this requires making explicit the intentions and criteria of successful learning, setting the learning intentions at an appropriately challenging level, and providing support to reduce the gaps between what