can evaluate the students' reactions and claims about these (through interviews), can ask what was actually learnt, rather than what was intended to be learnt (through examples of student work), and not have the tunnel vision that can come from looking for evidence for the intended goals and thus overlook many positive or negative unintended side effects. Scriven noted that merit is determined by relating program effects to the relevant needs of the affected population – in this case, the students. The teacher may then see what the students experienced, and reflect on how close this was to his or her own intentions and notions of success.

The lesson experience from a formative and summative perspective

VISIBLE LEARNING – CHECKLIST FOR THE END OF THE LESSON

42. Teachers create opportunities for both formative and summative interpretations of student learning, and use these interpretations to inform future decisions about their teaching.

One major mistake is to consider that the notions of 'formative' and 'summative' have something to do with tests; in fact, there is no such thing called summative or normative tests. 'Formative' and 'summative' refer to *the time at which* a test is administered and, more importantly, to the nature of the interpretations made from the tests. If the interpretations from the test are used to modify the instruction while it is ongoing, it is formative; if the interpretations from the test are used to sum up the learning at the end of the teaching, it is summative – as illustrated by Bob Stake's maxim: 'When the cook tastes the soup, it is formative; when the guests taste the soup, it is summative.'

In the same way that the goal of the cook is to make the best soup possible for the guests, it is imperative that teachers have excellence summative evaluation in place in their classes, because that can be among the most powerful evidence that there is likely to be excellent formative evaluation in place. If a school has poor summative assessment in place, then it is unlikely that teachers will have the ability, purpose, or wherewithal to be concerned with formative interpretations. Serving poor soup to the guests is probably the best indicator that the cook was lousy at tasting it during the preparations. Too much reliance on tasting the soup, as well, may lead to inattention to the goals – with the result, for example, that the soup is cold when the guests arrive.

Many systems are emerging that help teachers in their assessments, although most tend to be summative. Even the so-called 'predictive' tests tend to be more about what the student is supposed to know at the end of the lessons, and thus can be less effective in providing information that can lead to change during the instruction. Tests that are most powerful for formative interpretations tend to be those created to measure what is to be taught in a series of lessons (not a whole term or year), drawn from a large item pool that references the learning intentions from the curricula, and that aim for *each* student to get 50 per cent correct and 50 per cent incorrect – because, in that way, the students and

teacher can know what has been accomplished and what still needs to be accomplished. This may mean adaptive assessment (the computer choosing the optimal set of items to administer to each student), but the emphasis needs to be on the quality of interpretations made from the assessments for this to have an effect on what the teacher and student do next.

Our own system, as one example, was developed less as a repository of 'tests' and more as a reporting engine – which made us concentrate on providing worthwhile and dependable interpretations to teachers about who they taught well, what they taught well, their strengths and weaknesses, their effects and progress, and what they could do next to enhance levels of performance and progress (Hattie, 2009).

While these kinds of reporting engine are not inexpensive, schools need to make a decision about the best reporting engine to use or whether to devise their own school report about how successful teachers are teaching all students, both in terms of students' progress and their levels of performance – with the proviso that the system needs to be available during, and not only at the end of, instruction.

The notion suggested here is for a report for teachers (and students) to monitor a teacher's effect, progress, and success with each student – for example, by using data teams to share interpretations across the school to ensure maximum effect. Unlike many more public reports, the essence of the suggested reports relates to informing teachers' overall judgements in a collaborative manner: if we cannot inform and enhance these judgements, we are missing the components that have a major effect on students – the teacher's expectations and notions of challenge and progress.

Conclusions

The lesson does not end when the bell goes! It ends when teachers interpret the evidence of their impact on students during the lesson(s) relative to their intended learning intentions and initial criteria of success – that is, when teachers review learning through the eyes of their students. What was the impact, with whom, about what, and how efficiently? Often, answering these questions requires help from others observing and thus providing extra 'eyes' into student learning, video analyses to provide extra 'eyes', and various forms of informal and formal assessment to provide extra 'eyes'. Did the lesson 'invite' students to participate, engage, and progress? Were there sufficient starting points, given the various phases of prior achievement and learning of the students? Were there any unintended consequences of your teaching? How many students gained the criteria of success – and for those that did not, what is now needed to assist them to meet the criteria? Underlying these questions is whether the students became active partners in evaluating their progress. As evaluators of the teaching impacts on their learning, students are at least as effective as teachers – and often well ahead of most administrators and parents.

A key question when reviewing the effect of the teacher and lessons is not only effectiveness, but also efficiency. Could there have been more efficient methods for having an effect on the learning and achievement of all students? 'Efficiency', in this context, does not necessarily mean 'speed', but rather, more cognitive efficiency. Such efficiency comes from many sources – especially the use of diverse learning strategies. Such versatility in the use of learning strategies can lead to less time taken, greater effort invested, reduced error rates, and opportunities for the further development of a multiplicity of strategies.