High Quality Classroom Teaching – Wave 1

"Sustained high quality classroom teaching is the right of every child"

What teachers do matters particularly those who teach in the most deliberate and visible way. These teachers intervene in calculated and meaningful ways to alter the direction of learning in order to attain the desired goals. They also provide students with a range of learning strategies, including direction and re-direction and maximising the power of feedback from the student. Hattie suggests that teachers need to deliberately intervene to enhance teaching and learning, particularly when the content is not understood. He argues that successful classrooms have visible teaching and learning, where there is great passion displayed by the teacher and learner, and where there is a variety and depth of skill and knowledge by both teacher and student. Teachers must know when learning is correct or incorrect; learn when to experiment; learn to monitor, seek and give feedback; and know how to try alternative learning strategies[1]. A key message is "the more the student becomes the teacher and the more the teacher becomes the learner" the more successful the achievement outcomes.

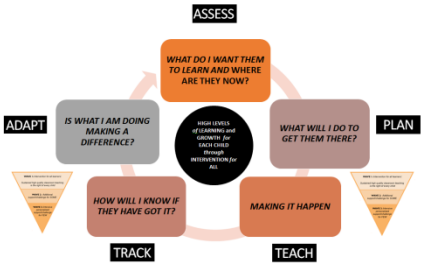
Teachers who use high quality, evidence-based approaches are intervening with every child, every day in every classroom. The power of teachers to enact high level learning for each child comes from[2]:

- Building expert learners[3] - ***Rigour***
- Personalising and connecting learning[4] - ***Relevance***
- Creating safe conditions[5] - ***Relationships***

TFEL Domain 3 Building expert learners with rich conceptual knowledge and mastery of complex skills **Rigour**	TFEL Domain 4 Personalize and connect learning in real world/ authentic contexts **Relevance**	TFEL Domain 2 Create safe conditions for rigorous learning through high expectations for achievement and behaviour **Relationships**
Highly effective teachers demonstrate a flexible range of instructional strategies and reflect deep knowledge of curriculum, assessment and reporting frameworks, e.g. ✓ Intentionality ✓ Explicitness ✓ Differentiation ✓ Assessment as, for and of learning	*Highly effective teachers are adept with monitoring, assessing and feeding back on learner progress and achievement, e.g.* ✓ Explicit success criteria ✓ Targeted feedback to learners ✓ 12 months or more growth for each learner	*Highly effective teachers deepen their pedagogical content knowledge and keep up to date with research about how students learn, e.g.* ✓ Challenge their own thinking and that of others ✓ Improve performance through observation and feedback ✓ Develops understanding of curriculum standards through moderation
Highly effective teachers have high expectation and design learning tasks that challenge, engage and extend thinking, e.g. ✓ Problem solving and critical and creative thinking ✓ Metacognition ✓ Dialogue ✓ Learning Dispositions	*Highly effective teachers develop active learning partnerships and negotiate learning goals with students, e.g.* ✓ Posing of guiding questions ✓ Connection to prior knowledge and the needs and interests of learners ✓ Respond to learner feedback ✓ Multiple entry points	*Highly effective teachers are proficient at maintaining an optimal classroom climate for learning, e.g.* ✓ Learning and behaviour referenced against criteria for high standards ✓ Foster resilience and risk taking ✓ Skills for collaboration ✓ Skills for communicating in multiple modes ✓ Skills for self-regulation and responsibility

Enacting the Principles: Intentional, Responsive, Targeted Teaching

Using the model ASSESS – PLAN - TEACH – TRACK – ADAPT[6] (which aligns with TfEL Learning Design) teachers are able to intervene and not wait for children to fail. Identifying learning needs through multiple-sources of high quality evidence and adapting their teaching in response ensures students receive the instruction they need to achieve their full potential.



[1] http://www.education.vic.gov.au/Documents/about/research/ravisiblelearning.pdf
[2] Highly Effective Teaching for 21C learning Joy Milward
[3] TfEL Framework Domain 3 https://www.decd.sa.gov.au/sites/g/files/net691/f/tfel_framework_guide_complete.pdf
[4] Ibid Domain 4
[5] Ibid Domain 2
[6] Goss P & Hunter J 2015 *Targeted teaching: How better use of data can improve student* learning Gratten Institute

Know thy impact – What teachers do matters

General			Literacy			Maths	
Instructional Strategy	*Effect Size*[7]	*Growth*[8]	*Instructional Strategy*	*Effect Size*[9]	*Growth*[10]	*Instructional Strategy*	*Effect Size*[11]
Teacher estimates of achievement	1.62						
Collective teacher efficacy	1.57						
Visible Learning	1.44	+8m					
Self-reported grades	1.33						
Piagetian Programs	1.3						
Response to Intervention	1.07						
						Student think alouds	0.98
Micro Teaching	0.90						
Classroom Discussion; Teacher Clarity	0.80						
Providing feedback	0.73	+8m					
						Providing feedback	0.71
Reciprocal Teaching; Creativity programs	0.70						
Providing formative evaluation	0.68						
						Explicit teaching (Direct Instruction)	0.65
			Vocabulary Programs	0.62			
Explicit teaching practices (Direct Instruction); Self-verbalisation & self-questioning; Time on task; Spaced vs Mass practice; Study Skills; Peer tutoring;	0.60		Repeated Reading programs[12]	0.60		Problem-solving teaching	0.60
Mastery Learning	0.60	+5m					
			Comprehension Programs	0.53	+5m		
			Phonics Programs	0.50	+4m		
			Writing Programs	0.50			
Effective classroom management	0.52		Oral Language Interventions		+5m		
Teacher-student relationships; Questioning; Play programs	0.50						
Early Intervention	0.47	+5m					

Hattie developed a way of ranking various influences in different meta-analyses related to learning and achievement according to their effect sizes to find out what works best in education. He found that the average effect size of all the interventions he studied was 0.40. Hattie's research is now based on nearly 1200 meta-analyses (originally 800 in 2009) and is being constantly updated through his visualization of effect sizes available from: http://visible-learning.org/nvd3/visualize/hattie-ranking-interactive-2009-2011-2015.html.

[7] Hattie J 2009 Visible Learning; 2012; 2015
[8] Teaching and Learning Toolkit Australia http://evidenceforlearning.org.au/the-toolkit/
[9] Hattie J 2009 Visible Learning; 2012; 2015
[10] Teaching and Learning Toolkit Australia http://evidenceforlearning.org.au/the-toolkit/
[11] Hanover Research 2014 Best Practices in Maths Interventions http://www.hanoverresearch.com/media/Best-Practices-in-Math-Interventions.pdf
[12] Well-designed, reliably implemented, 1-1 intervention for students with poor reading skills Hattie 2009 p 140

Further information: High Quality Teaching Strategies

Teacher estimates of achievement (Effect size 1.62)

Students are more likely to meet expectations than not, whether these expectations are good, bad, correct or misguided. Not only do student achievement outcomes support the idea of establishing high expectations for all students, but the learners themselves appreciate the effectiveness of setting equal, high expectations for both themselves and their peers. Hattie suggests that such expectations are self-fulfilling prophecies, as "students are reasonably accurate in informing on when teachers favour some students over others[13]", by placing higher expectations on some. While differentiated instruction, or tailoring teaching approaches to students' individual needs, is paramount to high achievement, it is important to distinguish between differentiating teaching approaches and establishing expectations, ensuring that all student s are challenged equally, even if the desired outcomes for each one may vary significantly[14].

Collective Teacher Efficacy (Effect size 1.57)

Teacher quality impacts significantly on students' learning and the role of professional learning and collaboration can play a role in improving teacher quality. Collaborative practices between teachers within and across schools where teachers can share successful and innovative teaching practices that explicitly aims to improve student outcomes is a powerful strategy. Collaborative approaches should include a focus on students' outcomes, open classrooms, use of external expertise and have a whole school focus[15].

Visible Learning (Effect size 1.44; +8m)

Visible teaching and learning occurs when learning is the explicit goal: when there is feedback given and sought and when there are active, passionate and engaging people, including teachers, students and peers participating in the act of learning. Hattie points out that the main feature of the research evidence is that "the biggest effects on student learning occur when teachers become learners of their own teaching and when students become their own teachers. This allows students to show self-regulatory attributes that are most desirable for learners, such as self-monitoring, self-evaluation, self—assessment and self-teaching"[16]. This approach allows learners to think about their own learning more explicitly. This is usually by teaching students specific strategies to set goals, and monitor and evaluate their own academic development and has high impact (+8months) for very low cost, based on extensive evidence[17].

Self-reported Grades (Effect size 1.33)

Children are most accurate when predicting how they will perform. Hattie states that, that if he could write his book Visible Learning for Teachers again, he would re-name this learning strategy "**Student Expectations**" to express more clearly that this strategy involves the teacher finding out what are the student's expectations and pushing the learner to exceed these expectations. Once a student has performed at a level that is beyond their own expectations, he or she gains confidence in his or her learning ability.

Piagetian programs (Effect size 1.30)

These are teaching methods based on Jean Piaget's theory of cognitive development and his concept of children's stages of learning. Hattie found that in primary school age there is a close correlation between the performance on Piagetian tests of the thinking level and achievement tests in mathematics and reading. The Piagetian stages include[18]:

- **Sensorimotor stage** (new born – 2 years old): Infants learn by the basic senses including seeing, hearing and touching and construct an understanding of the world by coordinating those experiences with physical, motoric actions.
- **Pre-operational stage** (2 – 7 years old): Children are able to understand basic concepts and symbols, but do not yet understand concrete logic and cannot mentally manipulate information.
- **Concrete operational stage** (7-12 years old): Children in these ages start solving problems in a more logical fashion but abstract, hypothetical thinking has not yet developed.

[13] Hattie 2009 p 122
[14] http://danhaesler.com/wp-content/uploads/2015/02/High-Expectations-Mindset.pdf
[15] NSW Education & Communities October 2014 What works best: Evidence based practices to help improve NSW student performance
[16] http://www.education.vic.gov.au/Documents/about/research/ravisiblelearning.pdf
[17] Teaching and Learning Toolkit Australia http://evidenceforlearning.org.au/the-toolkit/
[18] http://visible-learning.org/glossary/

- **Formal operational stage** (12 years old onwards): Children and adolescents develop abstract thinking and are able to perform hypothetical and deductive reasoning.

Response to Intervention (Effect size 1.07)

This is an educational approach that provides early, systematic assistance to children who are struggling in one or many areas of their learning. RTI seeks to prevent academic failure through early intervention and frequent progress measurement.

Micro Teaching (Effect size 0.90)

Hattie[19] describes micro-teaching as a practice that "typically involves student-teachers conducting (mini-) lessons to a small group of students, and then engaging in a post-discussion about the lessons." They are usually video-taped for later analysis allowing teachers to get a microscope-view on their own teaching. Under the guidance of a supervisor, the student-teacher is first asked to present a self- feedback of the mini lesson. The team then gives feedback to provide positive reinforcement and constructive criticism.

Classroom Discussion (Effect size 0.80)

This is a method of teaching that involves the entire class in a discussion. The teacher stops lecturing and students get together as a class to discuss an important issue. Classroom discussion allows students to improve communication skills by voicing their opinions and thoughts. Teachers also benefit from classroom discussion as it allows them to see if students have learnt the concepts that are being taught. Moreover, a classroom discussion creates an environment where everyone learns from each other[20].

Teacher Clarity (Effect size 0.80)

It is important for the teacher to communicate the intentions of the learning and the notion of what success means for these intentions.

Reciprocal teaching (Effect size 0.70)

Reciprocal teaching was devised as an instructional process to teach students cognitive strategies that might lead to improved learning outcomes 9initially in reading comprehension). The emphasis is on teachers enabling their students to learn and use cognitive strategies such as summarizing, questioning, clarifying and predicting and these are supported through dialogue between teacher and students as they attempt to gain meaning form the learning.

Creativity programs (Effect size 0.70)

Creativity programs are grounded in a common idea that training, practice and encouragement of using creative thinking skills can improve an individual's ability to use creative thinking techniques such as thinking with fluency, flexibility and with an element of the unusual responses to questions or problems.[21] Like most other programs, an emphasis on instructional strategies and direct instruction makes a major difference in the effectiveness of creativity programs. Those programs, across learning areas, with a high level of structuring, questioning and responding to student questioning have the biggest impact. The effects were greatest in mathematics (0.89), science (0.78) then reading (0.48). The most successful programs also focus on developing thinking strategies.

Providing feedback (Effect size 0.73; +8m)

Based on moderate evidence feedback has high impact for very low cost (+ 8 months). Feedback is information given to the learner and/or the teacher about the learner's performance relative to learning goals. It should aim to (and be capable of) producing improvement in students' learning. Feedback redirects or refocuses either the teacher's or the learner's actions to achieve a goal, by aligning effort and activity with an outcome. It can be about the learning activity itself, about the process of activity, about the student's management of their learning or self-regulation or (the least effective) about them as individuals. This instructional feedback can be verbal, written, or can be given through tests or via digital technology and should focus on

[19] Visible Learning 2009 p 112
[20] http://visible-learning.org/glossary/
[21] Hattie 2009 p 155

informing students the specific things they need to do in order to get it right or to improve their performance in some way. It can come from a teacher or someone taking a teaching role, or from peers. In addition, when teachers seek, or at least are open to, feedback from students as to what students, know, what they understand, where they make errors, when they have misconceptions, when they are not engaged – the teaching and learning is most powerful. Feedback to teachers makes the learning visible.[22]

Providing formative evaluation (Effect size 0.68)

Formative evaluation provides feedback to teachers on what is happening in their classroom so they can ask "How am I going?" in achieving the learning intentions they have set for their students, such that they can decide "Where to next?" It is the attention to the purposes of innovations, the willingness to seek negative evidence (ie seeking evidence on where students are not doing well) to improve the teaching innovation, the keenness to see the effects on all students, and the openness to new experiences that make the difference. The major message is for teachers to attention to the formative effects of their teaching, as it is these attributes of seeking formative evaluation of the effects (intended or unintended) of their programs that makes for excellence in teaching[23].

Explicit Teaching Practices (Direct Instruction) (Effect size 0.60)

Explicit teaching practices involve teachers clearly showing students what to do and how to do it, rather than having students discover or construct information for themselves. It recognises that learning is a cumulative and systematic process, starting with building strong foundations in core skills in literacy and numeracy. Effective teacher practices ensure that students have clear instruction on what is expected of them, and what they need to learn from tasks. It ensures that students are given time to engage with the learning process, ask questions and get clear feedback. Students who experience explicit teaching practices make greater learning gains than students who do not experience these practices.

Self-Verbalisation & Self-Questioning (Effect size 0.60)

This is a form of self-regulation and is of more use to those in the early to immediate phase of skill acquisition and for those of lower to middle ability. The effects were higher for pre-lesson questioning and post lesson questioning compared to questions dispersed during the lesson, and where there was teacher modelling. The most effective questions are high order 'Why?' 'How?'' and 'Which is best?' questions that really make students think. Students need to be given time to think, and do better if they work in pairs than work alone[24].

Time on Task (Effect size 0.60)

This is practice needs to be deliberate, particularly when learning new material. Deliberate practice refers to the relevant practice activities aimed to improve performance, at an appropriate, challenging level of difficulty, and enable successive refinement by allowing for repetition, giving room to make and correct errors, and providing informative feedback to the learner[25].

Spaced and Mass practice[26] (Effect size 0.60)

This is a distributed practice (not just rote learning and lots of practice). It is the frequency of different opportunities rather than spending 'more' on task that makes the difference in learning. Teachers need to provide deliberate practice opportunities until minimal levels of mastery (defined by success criteria) are met. Deliberate practice increases opportunities to not only enhance mastery but also fluency. This is not drill and practice but rather use of a range of effective practices (eg direct instruction, peer-tutoring, mastery learning and feedback).

Study Skills (Effect size 0.60)

Study skills can be classified as *cognitive, meta-cognitive and affective.* Cognitive interventions focus on task-related skills such as note taking and summarizing. Meta-cognitive interventions focus on self-management learning skills such as planning; monitoring; and where, when and how to use strategies. Affective interventions focus on non-cognitive features of learning such

[22] Hattie p 173
[23] Hattie p 181
[24] http://www.teacherstoolbox.co.uk/T_effect_sizes.html#Questioning
[25] Hattie 2009 p 185
[26] Hattie 2009 pp185-6; http://research.acer.edu.au

as motivation and self-concept. The key message is that courses in study skills alone have limited impact, whereas combining study skills with subject content can make a real difference.

Peer tutoring (Effect size 0.60)

If the aim is to teach students self-regulation and control over their own learning then they must move from being students to being teachers of themselves. Peer tutoring has many academic and social benefits for both those tutoring and those being tutored. Research has found that when peer tutoring is student controlled (when peers are involved in setting goals, monitoring performance, evaluating performance and selecting rewards), the effects are greater than when it is controlled by teachers. We need to remember that students can be producers of teaching and learning, rather than just recipients.

Mastery Learning (Effect size 0.60; +5m)

The claim underlying mastery learning is that all children can learn when provided with clear explanations of what it means to "master" the material being taught. Other features involve: appropriate learning conditions in the classroom, high levels of teacher feedback that is both frequent and specific using diagnostic formative assessments and the regular correction of mistakes students make on their learning journey[27]. Mastery learning breaks subject matter and learning content into units with clearly specified objectives which are pursued until they are achieved. Learners work through each block of content in a series of sequential steps and based on moderate evidence, has moderate impact (+ 5 months) for very low cost, based on moderate evidence.[28]

Effective classroom management (Effect size 0.52)

This is important for creating the conditions for learning and links directly to student performance. Research points to the positive effect of well-managed classrooms[29] on:

- Student behaviour (Effect size 0.71)
- Student engagement (Effect size 0.62)
- Student Achievement explicitly (Effect size 0.52)

There are 5 key pro-active effective strategies[30]:

- Foster and maintain student engagement
- Establish and teach classroom rules to communicate expectations for behaviour
- Build structures and establish routines
- Reinforce positive behaviour
- Consistently impose consequences for misbehaviour

Teacher-student relationships (Effect size 0.50)

In classes with person-centred teachers, there is more engagement, more respect of self and others, there are fewer resistant behaviours and there are higher achievement outcomes. Building relationships with student implies agency, efficacy, and respect by the teacher for what the child brings to the class (from home, culture, peers) and allowing the experiences of the child to be recognised in the classroom. Developing relationships requires the teacher to have well developed skills such as skills of listening, empathy, caring and having positive regards for others[31].

Questioning[32] (Effect size 0.50)

Feedback can also come from teachers asking questions of their students, although it is an adage that teachers already know the answer to most of the questions they ask. The use of questions, especially higher order questions can be a powerful strategy for building comprehension and opens up possibilities of meaning. Questioning can lead to improved comprehension, learning and memory. So much of class time is spent by teachers asking questions of their students but usually these are not open, inquiry questions, they are "display questions" that the teacher knows the answer to and do not enhance understanding or thinking. Skilled, high cognitive questioning by teachers can guide students to thoughtful and reflective answers and so facilitate higher

[27] Hattie 2009 p 170
[28] http://evidenceforlearning.org.au/the-toolkit/
[29] NSW Education & Communities October 2014 What works best: Evidence based practices to help improve NSW student performance p 20
[30] NSW Education & Communities October 2014 What works best: Evidence based practices to help improve NSW student performance p 21
[31] Hattie 2009 p 118
[32] Hattie 2009 pp 182-3

levels of academic achievement. In addition perhaps more important than teacher questioning is analysing the questions that students ask. Structuring class sessions to entice, teach and listen to students' questioning of students is powerful.

Play programs (Effect size 0.50)

Play promotes improved performance outcomes both in cognitive-linguistic and affective0-social domains. Socio-dramatic play has the most striking effect and the smallest effect comes from imaginative play. Adult-directed play showed no more gains than for other play conditions. For younger children, play makes a difference and this difference is likely to be related to learning about peer relations and learning how to learn from peers, facing and meeting challenges, the consequence of deliberate practice in play, and the satisfaction from deciding or becoming aware of both the learning intentions and the success criteria from being involved in play.

Early Intervention (Effect size 0.47; +5m)

The overall effect of early intervention (any intervention with pre-school aged students) is .50 and for pre-school programs (eg kindergarten) is 0.52. The overall finding is that early intervention programs are more effective if they are structured, intense, include about 15 or more children, and the children are in the program for up to 13 hours a week[33]. This is supported by the Australian Teaching and Learning Toolkit, where based on extensive evidence, there is moderate impact (+5 months) for very high costs and appear to be particularly beneficial for children from low income families.[34]

Targeted Teaching

Targeted teaching requires teachers to identify learning needs and adapt their teaching in response. Before they can teach each new topic, they need to understand what each student can already do, is ready to learn, including their pre-requisite skill and content knowledge. As they teach, they need to check how each student is going and provide tailored feedback or more support to address obstacles or misconceptions and help each student stay on track. Over time, teachers need to see and understand the impacts of their teaching in order to be able to continuously improve it. Targeted teaching involves using strategies – including formative assessment, teacher-student feedback and evaluation of teaching programs. This is enacted through the ASSESS-PLAN- TEACH-TRACK-ADJUST[35] cycle.

Differentiated Learning[36]

At its most basic level, differentiation consists of the efforts of teachers to respond to variance among learners in the classroom. Whenever a teacher reaches out to an individual or small group to vary his/ her teaching in order to create the best learning experience possible, that teacher is differentiating instruction. Teachers can differentiate at least four classroom elements based on student readiness, interest, or learning profile:

- **Content** – what the student needs to learn or how the student will get access to the information;
- **Process** – activities in which the student engages in order to make sense of or master the content;
- **Product** – culminating projects that ask the student to rehearse, apply, and extend what he or she has learned in a unit;
- **Learning environment** – the way the classroom works and feels.

[33] Hattie 2009 p 58
[34] Australian Teaching and Learning Toolkit Early Years Intervention
[35] Adapted from Goss & Hunter 2015 Targeted teaching How better use of data can improve student learning Gratten Institute
[36] Tomlinson CA What is Differentiated Instruction? August 2000 www.ldonline.org/article/263

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