THE EDUCATION STATE

VICTORIA State Government

HIGH IMPACT TEACHING STRATEGIES

Excellence in Teaching and Learning

Curriculum planning and assessment

Excellence in teaching and learning

Evidence-based high impact teaching strategies

Student achievement, engagement and wellbeing

Empowering students and building school pride

Positive climate for learning

Health and wellbeing

Professional leadership

Setting expectations and promoting inclusion

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Introduction

When teachers work together to improve their practice, students learn more. This simple yet powerful idea is at the heart of effective schools. Collaboration builds collective responsibility for constantly improving teaching practice and so student learning. The challenge for teachers and schools is to develop a shared understanding of what excellent practice looks like. While it will not look exactly the same in every classroom, there are some instructional practices that evidence suggests work well in most.
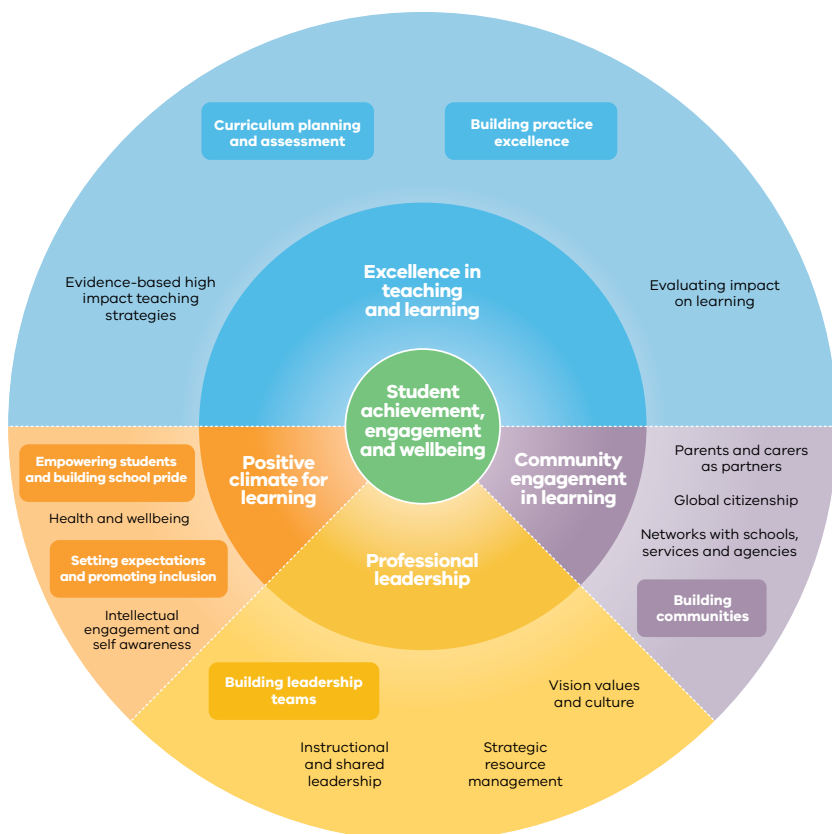
These High Impact Teaching Strategies (HITS) have been brought together here to support the thousands of increasingly collaborative and evidence-based conversations taking place between teachers in schools each day. These strategies provide teachers and teams with opportunities to observe, reflect on and improve a range of fundamental classroom practices.

The HITS are not intended to replace other teaching strategies teachers might already use with success. Instead, they will add to the repertoire of effective strategies that teachers can apply to the wide variety of learning needs that students present with each day.

Since 2016, school leadership teams have drawn on the Framework for Improving Student Outcomes (FISO) to drive strategic and annual planning at the whole school level. By clearly and insistently directing that planning toward student learning, FISO is helping to identify and address persistent challenges for individual teachers and to build collective teacher efficacy.

The HITS provide a clear link between the 'Evidence Based High Impact Teaching Strategies' dimension of FISO and classroom practice. Teachers can plan and adjust their practice in response to one or more of the HITS and monitor the impact on student engagement and learning outcomes. This resource provides a focus for the professional development efforts of individual teachers, which can be linked to the goals and feedback components of their own Performance and Development Plans.

Teachers in all schools are encouraged to use the HITS to challenge themselves and their colleagues as part of our collective and ongoing commitment to improving learning outcomes for every Victorian child.

What are the High Impact Teaching Strategies (HITS)?

The HITS are 10 instructional practices that reliably increase student learning wherever they are applied. They emerge from the findings of tens of thousands of studies of what has worked in classrooms across Australia and the world. International experts such as John Hattie and Robert Marzano have synthesised these studies and ranked hundreds of teaching strategies by the contribution they make to student learning [see 'What is effect size?' box]. The HITS sit at the top of these rankings.

Some teachers will ask, "But will they work in my classroom, with my students?" Only the professional judgement of teachers, both individual and collective, can answer that question. For any concept or skill that students need to learn, using a HITS to teach it increases the chances that students will learn it, compared to using other strategies. But they are reliable, not infallible. Knowing their students and how they learn, teachers are well-placed to judge whether a HITS or another strategy is the best choice to teach that concept or skill.

The HITS will not be new to most teachers. The purpose of this resource is to bring them together in one place, along with practical examples of how other Victorian teachers are using them successfully.

The HITS alone do not constitute a complete framework for professional practice. They are part of the full set of instructional practices that contribute to a comprehensive pedagogical model [see diagram below].
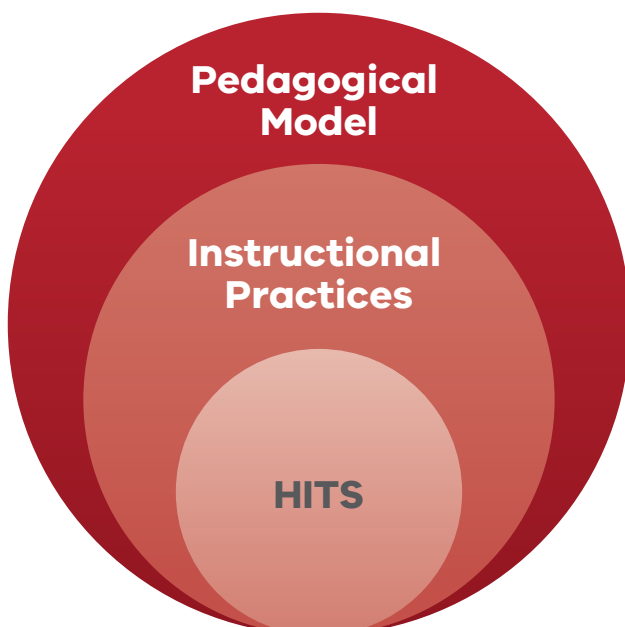
This resource offers:

- **accessible, succinct guidance on using high impact, evidence-based strategies**

- **bite sized insights that enable you to focus on one or more HITS, and to progressively build expertise, and**

- **scalable possibilities, allowing individual teachers, Professional Learning Communities, and whole schools, to set goals and actions centred on the HITS.**

What is effect size?

Effect size is a measure of the contribution an education intervention makes to student learning. It allows us to move beyond questions about whether an intervention worked or not, to questions about how well an intervention worked in varying contexts. This evidence supports a more scientific and rigorous approach to building professional knowledge.

Highly regarded educational researchers and resources, including Hattie, Lemov, Marzano, and the Teaching and Learning Toolkit*, have used slightly different methodologies to measure effect size and identify HITS. Despite their varied approaches and terminology, all agree on a number of powerful strategies. These strategies are reflected in this HITS resource and the AITSL Standards and the Classroom Practice Continuum.

* Evidence for Learning (2017) *Teaching and Learning Toolkit - Australia.* http://evidenceforlearning.org.au/the-toolkit/

Pedagogical Model

Instructional Practices

HITS

Who are the HITS for?

Teachers

The HITS will support teachers at every career stage. Each strategy is accompanied by two examples. The examples show teachers how to adapt the HITS to different learning goals and needs, and to respond to different school contexts.

For beginning teachers, the HITS are a bank of reliable instructional practices they can use with confidence.

For experienced teachers, this resource can add to their understanding of the HITS they are already using, and suggest new ways to use them in the classroom.

Even teachers highly familiar with the HITS will benefit from this resource as they pursue mastery of these valuable instructional practices through practice, reflection, shared observation and feedback.

Professional Learning Communities

Confined to individual teachers and classrooms, the HITS will not contribute to the collective efficacy that marks out high-performing schools. In these schools, teachers come together to pool their knowledge of effective teaching into a collaborative approach to planning, implementing and monitoring teaching interventions.

By using the HITS to build their pool of knowledge, these professional learning communities can anchor their interventions in evidence-based practices and so increase the likelihood of those interventions being effective.

School leaders

For school leaders the HITS are a professional learning opportunity. The HITS are linked to each other, and connected to a broader repertoire of teacher skills and knowledge. They can be connected to collaboration between teachers in professional learning communities and integrated into classroom and school planning around curriculum, instruction and assessment.

Understanding the interdependencies and developing a whole of practice approach is complex work for teachers which requires classroom embedded professional learning and a supportive high performance learning culture in a school. A sustained focus on HITS can be supported by coaching, modeling, observation and feedback to ensure widespread use of successful teaching practices.

Using the HITS

This resource offers teachers and school leaders an opportunity to embed and share the use of successful instructional practices by providing:

- a common language to use in planning, monitoring and reflecting on classroom practice
- a developmental continuum to measure proficiency across ten high-impact teaching strategies, and
- initial resources to guide a practice improvement journey.

The HITS will have the strongest impact on student learning when used as part of an ongoing improvement cycle embedded in professional learning communities.

Effective teams use the improvement cycle to:

- diagnose a classroom need
- investigate a problem of practice
- identify one or more of the HITS as a possible intervention
- unpack, discuss and model the strategies
- collectively review them as part of observation rounds.

The review and evaluation phase of the improvement cycle is critical to using the HITS for maximum impact on student learning. While the strategies are reliable, their effectiveness in any particular school context can only be determined by applying a HITS to an individual or group of students and measuring its impact on student learning.

Mastery of the HITS requires you to draw on both your deep curriculum knowledge and your skills in assessment for, as and of learning. Applying the HITS effectively relies on tapping into your expertise to develop and implement rich, authentic learning tasks. Importantly, adept application of the HITS will stimulate your students to take agency for, and reflect on, their own learning.

The continuum of practice included with each HITS will support you to reflect on your practice, assess proficiency levels and set improvement goals, which can be linked to the performance and development cycle. The broader FISO continua for the 'Evidence Based High Impact Teaching Strategies' dimension will also assist leaders and teachers to maintain a whole of practice focus.

Deliberate practice and feedback on HITS in a trusted and collaborative environment will help you to develop new skills and extend existing ones, impacting both teacher and student learning over time.

Providing feedback

This resource is the result of the generous collaboration of numerous teachers from across Victoria. The Department welcomes questions, comments and feedback on the HITS. Your engagement and contribution will contribute to the ongoing development and improvement of our resources, including future versions of this publication. To contact the Department with regard to HITS, contact: professional.practice@edumail.vic.gov.au

1. **Setting Goals**	2. **Structuring Lessons**	3. **Explicit Teaching**	4. **Worked Examples**	5. **Collaborative Learning**

Overview

Setting Goals

Lessons have clear learning intentions with goals that clarify what success looks like.

Lesson goals always explain what students need to understand, and what they must be able to do. This helps the teacher to plan learning activities, and helps students understand what is required.

Structuring Lessons

A lesson structure maps teaching and learning that occurs in class.

Sound lesson structures reinforce routines, scaffold learning via specific steps/activities. They optimise time on task and classroom climate by using smooth transitions. Planned sequencing of teaching and learning activities stimulates and maintains engagement by linking lesson and unit learning.

Explicit Teaching

When teachers adopt explicit teaching practices they clearly show students what to do and how to do it.

The teacher decides on learning intentions and success criteria, makes them transparent to students, and demonstrates them by modelling. The teacher checks for understanding, and at the end of each lesson revisits what was covered and ties it all together (Hattie, 2009).

Worked Examples

A worked example demonstrates the steps required to complete a task or solve a problem.

By scaffolding the learning, worked examples support skill acquisition and reduce a learner's cognitive load.

The teacher presents a worked example and explains each step. Later, students can use worked examples during independent practice, and to review and embed new knowledge.

Collaborative Learning

Collaborative learning occurs when students work in small groups and everyone participates in a learning task.

There are many collaborative learning approaches. Each uses varying forms of organisation and tasks.

Collaborative learning is supported by designing meaningful tasks. It involves students actively participating in negotiating roles, responsibilities and outcomes.

Key elements

Setting Goals
- Based on assessed student needs
- Goals are presented clearly so students know what they are intended to learn
- Can focus on surface and/or deep learning
- Challenges students relative to their current mastery of the topic
- Links to explicit assessment criteria

Structuring Lessons
- Clear expectations
- Sequencing and linking learning
- Clear instructions
- Clear transitions
- Scaffolding
- Questioning/feedback
- Formative assessment
- Exit cards

Explicit Teaching
- Shared learning intentions
- Relevant content and activities
- New content is explicitly introduced and explored
- Teacher models application of knowledge and skills
- Worked examples support independent practice
- Practice and feedback loops uncover and address misunderstandings

Worked Examples
- Teacher clarifies the learning objective, then demonstrates what students need to do to acquire new knowledge and master new skills
- Teacher presents steps required to arrive at the solution so students' cognitive load is reduced and they can focus on the process
- Students practice independently using the worked example as a model

Collaborative Learning
- Students work together to apply previously acquired knowledge
- Students cooperatively solve problems using previously acquired knowledge and skills
- Students work in groups that foster peer learning
- Groups of students compete against each other

Related effect sizes*

Setting Goals
- Goals – 0.56
- Teacher clarity – 0.75

Structuring Lessons
- Scaffolding – 0.53
- Formative evaluation – 0.68
- Teacher clarity – 0.75

Explicit Teaching
- Goals – 0.56
- Worked examples – 0.57
- Time on task – 0.62
- Spaced practice – 0.60
- Direct instruction – 0.59
- Teacher clarity – 0.75

Worked Examples
- Worked examples – 0.57
- Spaced practice – 0.60

Collaborative Learning
- Peer tutoring – 0.55
- Reciprocal teaching – 0.74
- Small group learning – 0.49
- Cooperative learning vs whole class instruction – 0.41
- Cooperative learning vs individual work – 0.59
- Cooperative learning vs competitive learning – 0.54

Months of progress**
- Collaborative learning +5
- Peer tutoring +5

6. Multiple Exposures	7. Questioning	8. Feedback	9. Metacognitive Strategies	10. Differentiated teaching
Overview Multiple exposures provide students with multiple opportunities to encounter, engage with, and elaborate on new knowledge and skills. Research demonstrates deep learning develops over time via multiple, spaced interactions with new knowledge and concepts. This may require spacing practice over several days, and using different activities to vary the interactions learners have with new knowledge.	**Overview** Questioning is a powerful tool and effective teachers regularly use it for a range of purposes. It engages students, stimulates interest and curiosity in the learning, and makes links to students' lives. Questioning opens up opportunities for students to discuss, argue, and express opinions and alternative points of view. Effective questioning yields immediate feedback on student understanding, supports informal and formative assessment, and captures feedback on effectiveness of teaching strategies.	**Overview** Feedback informs a student and/or teacher about the student's performance relative to learning goals. Feedback redirects or refocuses teacher and student actions so the student can align effort and activity with a clear outcome that leads to achieving a learning goal. Teachers and peers can provide formal or informal feedback. It can be oral, written, formative or summative. Whatever its form, it comprises specific advice a student can use to improve performance.	**Overview** Metacognitive strategies teach students to think about their own thinking. When students become aware of the learning process, they gain control over their learning. Metacognition extends to self-regulation, or managing one's own motivation toward learning. Metacognitive activities can include planning how to approach learning tasks, evaluating progress, and monitoring comprehension.	**Overview** Differentiated teaching are methods teachers use to extend the knowledge and skills of every student in every class, regardless of their starting point. The objective is to lift the performance of all students, including those who are falling behind and those ahead of year level expectations. To ensure all students master objectives, effective teachers plan lessons that incorporate adjustments for content, process, and product.
Key elements • Students have time to practice what they have learnt • Timely feedback provides opportunities for immediate correction and improvement	**Key elements** • Plan questions in advance for probing, extending, revising and reflecting • Teachers use open questions • Questions used as an immediate source of feedback to track progress/understanding • Cold call and strategic sampling are commonly used questioning strategies	**Key elements** • Precise, timely, specific, accurate and actionable • Questioning and assessment is feedback on teaching practice • Use student voice to enable student feedback about teaching	**Key elements** • Teaching problem solving • Teaching study skills • Promotes self-questioning • Classroom discussion is an essential feature • Uses concept mapping	**Key elements** • High quality, evidence based group instruction • Regular supplemental instruction • Individualised interventions
Related effect sizes* • Time on task – 0.62 • Spaced practice – 0.71 • Feedback – 0.73	**Related effect sizes*** • Questioning – 0.46	**Related effect sizes*** • Feedback – 0.73	**Related effect sizes*** • Teaching problem solving – 0.63 • Study skills – 0.60 • Self-questioning – 0.64 • Classroom discussion – 0.82 • Concept mapping – 0.64	**Related effect sizes*** • RTI - 1.07 • Piagetian programs - 1.28 • Second and third chance programs - 0.5
Months of progress** • Mastery learning +5		**Months of progress**** • Feedback +8	**Months of progress**** • Metacognition and self-regulation +8	**Months of progress**** • Individualised instruction +2 • Mastery learning +5

1

High Impact Teaching Strategy
Setting Goals

Effective teachers set and communicate clear lesson goals to help students understand the success criteria, commit to the learning, and provide the appropriate mix of success and challenge.

Strategy overview

Hattie found an effect size of 0.56 for setting goals (Hattie, 2009).

What is it?

Lessons need clear learning intentions with goals that clarify what success looks like. Lesson goals always explain what students need to understand, and what they must be able to do. This helps the teacher to plan learning activities, and helps students understand what is required.

How effective is it?

Research shows goals are important for enhancing performance. It is important to set challenging goals, rather than 'do your best' goals relative to student starting places (Hattie, 2009).

Considerations

Learning goals must provide challenge for all students. By setting challenging goals, the teacher develops and maintains a culture of high expectations.

Learning goals should be achievable for students of varying abilities and characteristics. They must also have a firm base in assessed student needs. Assessment provides teachers with evidence of prior learning, and the information they need to set goals that offer each student the appropriate level of stretch/challenge.

Effective teachers design assessment tasks that require students to demonstrate knowledge and skills at many levels. Tasks will include lower order processes like comprehension, and higher order processes like synthesis and evaluation.

When teachers explain the connections between learning goals, learning activities and assessment tasks, then students can use learning goals to monitor and progress their learning.

This strategy is demonstrated when the teacher:

- assesses students' prior knowledge
- uses evidence to differentiate learning goals for groups of students based on need
- demonstrates a purpose for learning by linking a specific activity to the learning goals
- provides realistic but challenging goals, and recognises effort towards achieving them.

This strategy is not demonstrated when the teacher:

- implies by words or actions that some students are not expected to achieve the learning goal
- praises all work regardless of quality and effort
- assesses student work against other students' work, rather than against prior achievement and individual learning goals.

This strategy is demonstrated when students:

- actively engage with the learning goals to plan their own learning
- self-monitor their progress, and provide evidence they believe demonstrates they have achieved their goals
- frame future learning goals based on identified strengths and areas for improvement.

Resources:

- **AITSL videos:**
  Setting challenging and achievable learning goals:
  www.youtube.com/watch?v=uXx8Szy7lZE
  Sound routines:
  www.youtube.com/watch?v=N0r1SLXloAo
  High expectations:
  www.youtube.com/watch?v=6GZqusdspPM
  Flash dance:
  www.youtube.com/watch?v=kvaKvgXut0Q
  Circle time:
  https://www.youtube.com/watch?time_continue=2&v=wOlKoXz_5t0&feature=emb_logo
- **Learning intentions:**
  www.assessmentforlearning.edu.au/professional_learning/learning_intentions/learning_examples_intentions.html#3

- **Insight Assess Platform:**
  www.vcaa.vic.edu.au/Pages/insightplatform/index.aspx
- **Effective Assessment:**
  www.education.vic.gov.au/school/teachers/teachingresources/practice/Pages/insight-effective.aspx
- **Assessment in principle**
  https://www.education.vic.gov.au/school/teachers/teachingresources/practice/Pages/insight-principle.aspx
- **Guide to Formative Assessment Rubrics**
  https://www.vcaa.vic.edu.au/assessment/f-10assessment/formative-assessment/Pages/default.aspx
- **Practice Principle 1: High expectations for every student promote intellectual engagement and self-awareness**
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/principlesexcellence.aspx
- **Pedagogical Model: Engage**
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/pedagogical-model.aspx

Examples that illustrate the strategy

Example 1: Secondary – Health and Physical Education

The Health and Physical Education (HPE) Team at a Melbourne secondary school invited the Professional Learning Coordinator to their Team meeting to discuss using goal setting and success criteria for the upcoming Year 8 Dance Unit. The Team wanted to ensure students developed the required knowledge, understanding and skills identified in the achievement standard. Discussion during the meeting underlined the importance of providing students with clear learning intentions, success criteria and a common assessment language. The Team decided to create a unit plan that included a proficiency scale for the unit, with clear learning intentions and success criteria for each lesson in the unit.

At the start of the dance unit teachers presented their students with a unit overview, and provided them with opportunities to demonstrate their current knowledge and skills on a proficiency scale. Students were also introduced to the unit's learning intentions and success criteria so they could self-monitor their progress throughout the unit.

At the end of the dance unit, students reviewed the proficiency scales, and self and peer-assessed their gains in knowledge and skills. Teachers supported individual students to identify their strengths and areas for improvement, and to set new learning goals. HPE teachers collected the data and used it for overall student assessment, and to support reflection on the impact of their teaching practice.

Using proficiency scales allowed students and teachers to recognise prior learning levels, and created opportunities to reflect on student growth in engagement and academic outcomes. Consistently articulating learning intentions and success criteria allowed teachers to set challenges that fostered student commitment to learning, and built their confidence in attaining the learning intentions.

Example 2: Secondary – Whole school approach

At an outer suburban secondary college, the Attitudes to School Survey results revealed a high level of student disengagement. Students reported learning was not engaging. Parents complained their children were often unable to articulate what they learnt at school. The school leadership team decided to respond with a suite of whole school initiatives that would roll out progressively through the year. The interventions focused on making learning visible to students. The first step was to implement a consistent approach in every lesson to setting goals and success criteria.

Resources were allocated to support the initiative. Over the summer holidays all classrooms were fitted with small whiteboards with pre-set sections for learning outcomes, success criteria, activities and review questions. During the professional development and planning day at the start of Term 1, all teachers were trained to use the mini-whiteboards, and to develop learning outcomes clearly linked to lesson activities and success criteria. During Term 1, Professional Learning Communities focused on supporting implementation of the strategy and monitoring its impact on student learning.

By the end of Term 2, after achieving a high level of consistency and precision in using the mini-whiteboards, teachers reported an increase in student engagement. The results of a student survey were even more promising, showing a sharp increase in engagement with learning, even when teachers had not yet noticed shifts in performance.

In Term 3, teachers continued to evaluate the effectiveness of their practice, monitor student engagement and learning, and seek feedback from colleagues and students to gauge the impact of changed practices.

Continuum of practice

1. Emerging	2. Evolving	3. Embedding	4. Excelling
Teachers set learning goals that explain what students need to understand, and what they must be able to do.	Teachers set explicit, challenging and achievable learning goals for all students, drawing on students' backgrounds, interests and prior knowledge.	Teachers develop and maintain a culture of high expectations for all students by setting challenging learning goals.	A culture of high expectations for all students is embedded. Students regularly set their own learning goals, self-reflect and evaluate, and share feedback with peers.
Teachers use student assessment data and prior learning to set learning goals.	Teachers work together to design learning activities and assessment tasks that require students to demonstrate knowledge and skills at many levels.	Teachers use moderation of student assessment tasks to refine learning goals, and to provide appropriate levels of challenge for each student.	Teachers support students to use evidence to personalise and revise their learning goals, based on identified strengths and areas for improvement.
Teachers design learning activities and assessment tasks that reflect the learning goals.	Teachers make explicit the connections between learning goals, learning activities, and assessment tasks.	Teachers support students to use learning goals to monitor and progress their learning. They encourage students to review and set their own learning goals.	Teachers use data to evaluate the impact of setting goals to raise achievement and engagement levels.

Evidence base

- Evidence for Learning: *Teaching and Learning Toolkit – Australia*. http://evidenceforlearning.org.au/the-toolkit/
- Hattie, J. (2009). *Visible Learning: A synthesis of over 800 meta-analyses relating to achievement.* Milton Park, UK: Routledge.
- Lemov, D. (2015). *Teach like a champion 2.0: 62 techniques that put students on the path to college.* San Francisco, USA: Jossey-Bass.
- Marzano, R. J. (2007). *The art and science of teaching: A comprehensive framework for effective instruction.* Alexandria, USA: ASCD.

2

High Impact Teaching Strategy
Structuring Lessons

Effective teachers plan and deliver structured lessons which incorporate a series of clear steps and transitions between them, and scaffold learning to build students' knowledge and skills.

Strategy overview

Hattie (2009) found an effect size of 0.53 for scaffolding.

What is it?

A lesson structure maps teaching and learning that occurs in class. Sound lesson structures reinforce routines, scaffold learning via specific steps/activities, and optimise time on task and classroom climate using smooth transitions. Planned sequencing of teaching and learning activities stimulates and maintains engagement by linking lesson and unit learning.

How effective is it?

The way teachers structure lessons can have a large impact on student learning. Some research shows student achievement is maximised when teachers structure lessons so that they:

- begin with overviews and/or review objectives;
- outline the content to be covered and signal transitions between lesson parts;
- call attention to main ideas; and
- review main ideas at the end (Kyriakides et al, 2013).

A 2013 meta-analysis found an effect size of 0.36 when lessons are structured by summarising main points, gradually increasing the difficulty level, and connecting to previous lessons (Kyriakides et al, 2013).

There is no specific measure of the effect size of structuring lessons. However, a sound lesson structure contributes to effective scaffolding of student learning, which has an effect size of 0.53.

Considerations

It is useful to integrate structuring lessons with other High Impact Teaching Strategies. By coherently organising teaching and learning, sound lesson structures create synergies between the strategies, cumulatively enhancing their effectiveness.

Teachers must also consider sequencing and the pace of the curriculum.

This strategy is demonstrated when the teacher:

- explains to students the steps in the lesson, including presenting learning intentions, explicitly presenting new knowledge, identifying planned opportunities for practice, outlining questioning techniques the class will use, and describing the assessment formats
- makes clear connections between the learning goals, activities and assessment tasks
- creates transparent, predictable and purposeful routines for students
- identifies clear transitions between each step in the lesson
- plans the sequence of steps to scaffold student learning
- monitors student understanding and provides feedback.

This strategy is not demonstrated when:

- lesson structures keep changing, producing unhelpful unpredictability in the classroom environment.

This strategy is demonstrated when the students:

- understand the learning goals and success criteria
- understand the lesson routine and confidently negotiate the sequence of steps/activities.

Resources:

- AITSL videos:

  Multiple activities to engage students:
  www.youtube.com/watch?v=lyYrAgnKe1A

  Deep questioning to support research:
  www.youtube.com/watch?v=0-Au253dMS4

  Transformative classrooms:
  www.youtu.be/BDCyNlmmxlo

  Making money amounts:
  www.youtube.com/watch?v=-Sc8RqZw-0o

  Well-sequenced mathematics teaching:
  www.youtube.com/watch?v=gijBHH0Z8M0

  Humpty Do Primary School, NT:
  www.youtube.com/watch?v=zWDny7Nk7Xk

- Practice Principle 4: Curriculum planning and implementation engages and challenges all students
  https://www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/principlesexcellence.aspx

- Pedagogical Model: Explore
  https://www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/pedagogical-model.aspx

Examples that illustrate the strategy

Example 1: P-9 – Science

A graduate Science teacher in a P-9 metropolitan school is working with a mentor teacher to ensure their Plate Tectonics lessons are structured, succinct and aligned to the Science Understanding and Inquiry Skills standards. The teachers devise a lesson structure that ensures each lesson links to previous student learning, has clear learning intentions, details specific activities, and provides opportunities for assessment of learning.

After gauging student prior knowledge through questioning, the teachers collaboratively set appropriate learning objectives and success criteria. They are presented as the lesson begins using acronyms: WALT (We Are Learning To) refers to learning objectives, and WILF (What I'm Looking For) refers to success criteria.

The teacher sets clear expectations by defining WALT and WILF at the start of the lesson, ensuring students understand the lesson's objectives and content. As the class moves through the activities, the teacher provides opportunities to measure student learning. Using Traffic Light questioning, students indicate their level of content understanding. The teacher has structured the lesson to allow time to work with the students requiring additional support. At the same time, those who indicate they have understood the concept are working on an extension activity. When students demonstrate a clear understanding of the concept they can transition to the next activity.

At the end of the lesson, the teacher summarises and reinforces the main ideas, then poses a question to students in the form of an Exit Card. The teacher analyses their answers to assess whether they have grasped concepts well enough to progress in the unit.

The lesson design reinforces routine through a scaffolded approach to learning informed by clearly identified goals and formative assessment. Time on task is optimised and student engagement maintained.

Example 2: P-12 – Performing arts

A Performing Arts teacher at a regional P – 12 school emphasises lesson designs with clear learning intentions and success criteria. This approach embeds a sequential structure students can rely on as they build skills and content knowledge. The scaffolded approach provides smooth transitions between activities, ensuring students build on prior knowledge, identify links between lesson activities, and can discern the relevance of the activities.

In a Miming unit, lesson and unit structures are designed to scaffold student learning. Opportunities are created to build their improvisation skills, and to demonstrate competence against the achievement standards in the level 5/6 band.

To begin, the teacher identifies students' prior knowledge through questioning and a short performance. Students perform a short mime in front of a small audience so the teacher can gauge individual skill levels. The teacher then provides a brief overview of miming with worked examples.

The unit's focus then turns to skill development. Each lesson has clearly articulated success criteria – a set of activities scaffold the learning and explicitly address the learning intentions, with clear transitions linking to skills developed in previous lessons. Lessons are designed so students can participate in mime games and activities that furnish opportunities for self-assessment, peer feedback and teacher feedback. The teacher's clear instructions assist all students to build skills. This scaffolding approach is intended to make learning visible and predictable, helping students to feel comfortable, prepared and capable of presenting a short mime by the end of the unit.

The unit concludes with a summative assessment. Students perform a short mime in front of an audience, similar in design to the initial assessment activity. By comparing both performances, the teacher can assess and provide feedback on individual student growth and skill development.

Continuum of practice

1. Emerging	2. Evolving	3. Embedding	4. Excelling
The teacher identifies the learning goals, sets learning activities, and assesses student understanding. The teacher explains the lesson structure, including timeframes for learning activities.	The teacher plans and delivers structured lessons that include reviewing previous lessons, signposting new content to be covered, explaining learning activities, and checking for understanding at the end of the lesson. The teacher ensures the lesson's steps are clear transparent and predictable for students.	The teacher assesses prior knowledge, signposts new content, and clearly explains the learning goals of the current lesson. The teacher designs sequenced learning activities that scaffold the learning. Teaching is adapted during the lesson in response to students' understanding.	The teacher ensures all students understand the learning intentions and success criteria. The teacher reinforces routines, scaffolds new learning via specifically selected steps/activities, and uses smooth transitions to optimise time on task and classroom climate. The teacher spontaneously adjusts instructions during a lesson to increase learning opportunities and improve students' understanding. In closing the lesson, the teacher reviews, clarifies and reinforces key points, and assesses student understanding.

Evidence base

- Hattie, J. (2009). *Visible Learning: A synthesis of over 800 meta-analyses relating to achievement.* Milton Park, UK: Routledge.
- Kyriakides, L., Christoforou, C. and Charalambous, C. (2013). 'What matters for student learning outcomes: A meta-analysis of studies exploring factors of effective teaching,' *Teaching and Teacher Education*, 36, 143–52.
- Lemov, D. (2015). *Teach like a champion 2.0: 62 techniques that put students on the path to college.* San Francisco, USA: Jossey-Bass.
- Marzano, R. J. (2007). *The art and science of teaching: A comprehensive framework for effective instruction.* Alexandria, USA: ASCD.

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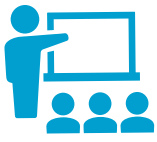
High Impact Teaching Strategy
Explicit Teaching

Effective teachers use explicit teaching to provide instruction, demonstrate concepts and build student knowledge and skills. In explicit teaching practice, teachers show students what to do and how to do it, and create opportunities in lessons for students to demonstrate understanding and apply the learning.

Strategy overview

Hattie (2009) found an effect size of 0.59 for direct instruction.

What is it?

When teachers adopt explicit teaching practices they clearly show students what to do and how to do it. Students are not left to construct this information for themselves. The teacher decides on learning intentions and success criteria, makes them transparent to students, and demonstrates them by modelling. In addition, the teacher checks for understanding, and at the end of each lesson revisits what the lesson has covered and ties it all together (Hattie, 2009).

How effective is it?

Explicit teaching is effective in accelerating student performance. The aim is to teach generalisations beyond rote learning, and to sequence learning. In explicit teaching practice, teachers constantly monitor students' progress towards challenging goals.

The effects of explicit teaching are similar for students in all school settings. It also has the highest effect size for reading among students at every year level. It supports both low-level word-attack and high level comprehension.

Considerations

Explicit teaching is systematic and sequential. It directly supports guided practice using a series of steps. First, teachers are explicit about the learning goals and the success criteria. Teachers then demonstrate how to achieve them by modelling and providing examples. The final step is to provide students with opportunities to practice and to demonstrate their grasp of new learning.

A high level of teacher-student interaction characterises explicit teaching. Teachers actively support students to achieve success as they move through the learning process. Teacher feedback is critical. Teachers closely monitor student understanding and target further individual support when it is needed.

This strategy is demonstrated when the teacher:

- explains what students need to know and be able to do by the end of the lesson or unit
- uses worked examples to show students how to do something
- allows students sufficient time to practice what they have learned
- guides student practice by monitoring their work and providing help when it is needed
- reinforces the main points at the end of the lesson.

This strategy is not demonstrated when the teacher:

- is didactic, using teacher-centred, uninterrupted monologue with few opportunities for students to be active in the learning
- restricts class discussions and student input is discouraged
- responds judgmentally to students' attempts at problem solving activities rather than treating each attempt as an opportunity for further learning.

This strategy is demonstrated when students:

- understand the learning goals and success criteria
- have access to multiple examples before undertaking the learning task
- master the new knowledge and skills before moving on
- receive feedback as needed.

Resources:

- **AITSL videos:**
  Explicit instruction:
  www.youtube.com/watch?v=t4zuYXLodRA
  Transformative classrooms:
  www.youtube.com/watch?v=BDCyNlmmxIo&feature=youtu.be
  Literacy teaching strategies:
  www.youtube.com/watch?v=_jWXL_fmhTw

- Allen Luke, 'On explicit and direct instruction,' Australian Literacy Educators' Association (2014):
  www.alea.edu.au/documents/item/861
- **Practice Principle 4: Curriculum Planning and implementation engages and challenges all students**
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/principlesexcellence.aspx
- **Pedagogical Model: Explain**
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/pedagogical-model.aspx

Examples that illustrate the strategy

Example 1: Primary – English

An inner city primary school has endorsed a whole school approach that encourages teachers to target writing mechanics. This emphasis encouraged a group of teachers in an English Professional Learning Community to interrogate their student achievement data on writing. Developing explicit teaching lesson segments quickly became the focus of PLC meetings. They decided to use an explicit teaching framework for a collaboratively designed model lesson plan – an approach that assisted all PLC members to learn more about explicit teaching techniques.

The broad learning intention they adopted was that students will know how, and be able to, write an introduction. Their planning first focused on how to clearly demonstrate to students what they need to know and how to do it. They collaborated on designing a persuasive writing lesson plan that explicitly taught and modelled how to write an introduction.

The model lesson plan opened with explanations of the learning goals and success criteria. It moved on to explicitly teach the structure of an introduction, clearly naming and explaining all the components. The next step was for the teacher to present varied exemplars demonstrating what a good introduction looks like. The model plan's next step was to check students' understanding, and clarify misunderstandings before students embarked on guided practice.

The plan built in time to closely monitor individual student performance in guided practice activities, and to provide feedback. The plan noted possible support strategies that may assist students. The model plan then progressed to whole group practice and individual practice, again with close performance monitoring.

Drawing on their learning from working together to fashion a model lesson plan, PLC members constructed lesson plans appropriate to the year levels they teach. Teachers collected student feedback about the lessons based on explicit teaching practice. At PLC meetings they discussed the feedback, which was very positive. Students said they were able to focus on a specific goal for the lesson, they felt assured they had the knowledge and skills required to achieve the goal, and they felt confident about independently completing the task.

Example 2: Year 8 – Humanities

After introducing a History research project to a Year 8 Humanities class, the teacher recognised most students were struggling with bibliography writing skills which had been addressed in Year 7 but obviously needed revision.

In response, the teacher planned a lesson that used explicit teaching to scaffold students' knowledge and competence in how to reference sources consulted during their research.

The teacher commenced the review lesson by presenting the learning goals and success criteria, taking time to establish students' prior knowledge and connecting that knowledge to the new project. A class discussion followed about how students can find information for their research projects from many sources, such as the internet, books and television programs. The teacher then explained the importance and function of taking notes from each source during the research phase. She used explicit teaching to show students how to reference various information sources.

The teacher modelled notetaking and bibliography writing, pointing out key features of each and how they related to achieving the learning goals and success criteria. She then provided students with source material examples so they could practice creating their own references. As the teacher monitored students' progress, she ensured they had opportunities to seek feedback. The review lesson was concluded by checking for understanding, again modelling aspects of referencing as required, and asking her students to provide further examples necessary.

In the next History lesson students returned to the research project. They applied their knowledge from the review lesson, along with the skills they had worked on. The teacher checked students' progress as they worked in class, making sure they recorded source information correctly.

For this Year 8 class, explicit teaching was effective in scaffolding student learning, and ensuring all students had the skills necessary to complete the research project in line with the learning goals and success criteria.

Continuum of practice

1. Emerging	2. Evolving	3. Embedding	4. Excelling
Teachers know what students should know and be able to do by the end of the lesson. Teachers explain new knowledge and skills. Teachers plan learning activities that enable students to demonstrate their understanding.	Teachers make the learning intentions clear before students undertake the learning task. Teachers explain new knowledge and skills, and model how to apply them in practice. Teachers plan learning activities and assessment tasks that enable students to practise their skills and demonstrate their understanding.	Teachers clearly explain the learning intentions and success criteria before students undertake the learning task. Teachers provide worked examples and assess student understanding before students independently practice their skills and demonstrate their understanding. Teachers monitor individual students and provide feedback.	Students can articulate the learning intentions and success criteria. Teachers provide worked examples and opportunities for guided practice. They check for understanding before students engage in independent practice. Teachers closely monitor individual students' progress and offer targeted feedback as needed. Teachers conclude the lesson by reinforcing the main points to consolidate the learning, and to support students to apply their learning in new contexts.

Evidence base

- Archer, A. L. & Hughes, C. A. (2011). *Explicit Instruction: Effective and efficient teaching*. New York, USA: Guilford Press.
- Evidence for Learning: *Teaching and Learning Toolkit – Australia*. http://evidenceforlearning.org.au/the-toolkit/
- Hattie, J. (2009). *Visible Learning: A synthesis of over 800 meta-analyses relating to achievement*. Milton Park, UK: Routledge.
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4

High Impact Teaching Strategy
Worked Examples

Effective teachers use worked examples to reduce student cognitive load, enabling them to focus on understanding a process which leads to an answer, not the answer itself.

Strategy overview

Hattie (2009) found an effect size of 0.57 for worked examples.

What is it?

A worked example is a demonstration of the steps required to complete a task or solve a problem. By scaffolding the learning, worked examples support skill acquisition and reduce the cognitive load for learners.

Usually, the teacher presents a worked example to students and explains each step. Later, students can use worked examples during independent practice, and to review and embed new knowledge.

How effective is it?

Worked examples are effective in demonstrating what success looks like, and how to achieve success. This reduces the cognitive load for students by helping them to focus on the process required to complete a task or find the solution to a problem.

Research demonstrates that worked examples are most effective when the teacher explicitly teaches the steps taken to complete the worked example, and when learners use self-explanations to describe the steps to themselves and others. The overall impact on student learning is high, measured at 0.57 in Hattie's research.

Considerations

Using a series of worked examples can assist teachers to scaffold student knowledge and skill acquisition. However, when progressively incorporating additional stretch, each new example needs to be adequate to challenge the learner – not too great, not too little. Formative assessment is used to monitor student understanding and target teaching to the appropriate level of challenge.

Gradually omitting steps from worked examples can be effective too. This approach supports the students' transition from learning by using worked examples as references, to using problem solving and metacognition (for example, self-verbalisation and self-questioning).

The effectiveness of worked examples is related to the learners' relative expertise. Reliance on worked examples decreases as learners' proficiency increases.

This strategy is demonstrated when the teacher:

- scaffolds the acquisition of new knowledge and skills by presenting students with a clear, step-by-step example
- designs worked examples that are accessible to students (self-explanatory) and unpacks the learning process, highlighting options available to arrive at the correct solution
- monitors student learning and supports students to move towards more independent practice.

This strategy is not demonstrated when the teacher:

- introduces new knowledge and skills with worked examples that are too complex and inaccessible to learners
- uses the same worked examples for all learners, including those with an already advanced knowledge of the topic or subject matter.

This strategy is demonstrated when students:

- are engaged and on task because the worked example is pitched at the right level of challenge
- understand that the focus is on understanding the process required to complete the task
- can move with confidence from using worked examples to independent practice.

Resources:

- AITSL videos:
  Motivating Learning:
  www.youtube.com/watch?v=29u938fYS-o
  Well-sequenced mathematics teaching:
  www.youtube.com/watch?v=gijBHH0Z8M0
  Why do objects sink or float:
  www.youtube.com/watch?v=6iIWMRY_FNg

- Practice Principle 4: Curriculum Planning and implementation engages and challenges all students
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/principlesexcellence.aspx

- Pedagogical Model: Explain
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/pedagogical-model.aspx

Examples that illustrate the strategy

Example 1: Year 6 – Mathematics

At the beginning of a unit of work on Financial Literacy, a Year 6 Mathematics teacher planned to use worked examples as a foundation for building her students' skills. She applied this high impact teaching strategy to demonstrate a method of calculating percentage discounts of 10%.

After presenting a video of discount sales and linking the learning intentions and success criteria to real-life problems, the teacher demonstrated the method on the board. She emphasised each step of the process, clearly articulating the method and the links between the steps. With this strategy the teacher was able to demonstrate the complete process and provide a worked example that would assist students to find solutions to like problems.

She built upon this knowledge by tasking students to use the worked example to apply the process learnt. In small groups, students worked through the steps using the processes that were clearly articulated at the start of the lesson and annotated on the board. Once they had mastered using the method for calculating 10% discounts, the teacher provided additional worked examples demonstrating how to apply the knowledge to percentage discounts of 25% and 50%. Students used the new worked examples as a guide for their independent practice.

Working in groups and using the worked examples opened up opportunities for students to discuss any step they needed further clarification on, prior to a period of independent practice.

Using worked examples enabled the teacher to scaffold the learning which reduced the cognitive load for the learners and supported their skill acquisition.

Example 2: Secondary – Writing in an EAL class

At a secondary school in central Victoria, worked examples were used to develop simple essay writing skills among English as an Additional Language (EAL) students. The teacher had been using the hamburger structure and co-construction in the classroom to scaffold student learning. However, many of his students were finding it hard to become independent writers. To support the transition from guided competence to independent confidence, the teacher decided to structure a recurrent activity around worked examples.

The first EAL lesson every week was dedicated to writing a short essay that recounted the three most important events of the weekend. To scaffold student learning, the teacher initially modelled the steps involved in planning and writing the essay. The steps included writing a list of activities, ranking the activities from most to least important, identifying two fun facts about each of the most important ones, and using this information to write short sentences that were then assembled into a brief essay. The resulting planning notes and sample essay were shared with the students as a fully annotated worked example. The students used this worked example as model for their own writing.

Each Monday lesson started with sharing a new worked example, followed by discussion about the process the teacher used. As students became more familiar with the process, the annotations on worked examples became progressively less comprehensive, encouraging students to own the writing process. Students who were still struggling had access to a bank of worked examples. They could refer to the more comprehensive annotations made on worked examples completed earlier in the term.

The scaffolding provided through worked examples enabled students to become more independent and their writing skills improved. When the teacher asked students whether worked examples were helpful, their responses were positive. They reported that worked examples enabled them to engage with increasing confidence in what they considered a complex task, and to focus more closely on their spelling and grammar.

Continuum of practice

1. Emerging	2. Evolving	3. Embedding	4. Excelling
Teachers access professional learning to build teacher knowledge and skills in using worked examples. Teachers sometimes use worked examples to introduce new knowledge and skills.	Teachers identify worked examples as a focus for learning and development in Performance and Development Plans. Teachers regularly use worked examples to present new knowledge and skills, and to scaffold student learning. Teachers collaboratively develop and share worked examples in Professional Learning Communities. They monitor the impact on student learning outcomes to evaluate their effectiveness.	Professional Learning Communities support building knowledge and skills in effectively using worked examples, as referenced in teachers' Performance and Development Plans. Teachers collaboratively develop and share worked examples. They use them to scaffold student learning and to foster metacognition. Teachers analyse a range of data, including student feedback, to measure the impact on student learning and to evaluate the effectiveness of worked examples.	Worked examples are used deliberately and systematically, and embedded in lesson and unit structures. They are used consistently across learning areas. As part of the school improvement focus on evidence-based high impact teaching strategies, the school monitors the use of worked examples, and evaluates their effectiveness in improving the quality of learning.

Evidence base

- Atkinson, R.K., Derry, S.J., Renkl, A. and Wortham, D.W. (2000). 'Learning from examples: Instructional principles from the worked examples research.' *Review of Educational Research*, 70, 181–214.
- Clark, R.C., Nguyen, F. and Sweller, J. (2006). *Efficiency in learning: evidence-based guidelines to manage cognitive load.* San Francisco, USA: Pfeiffer.
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5

High Impact Teaching Strategy
Collaborative Learning

Effective teachers provide opportunities for students to participate in flexible groups that collaborate on meaningful tasks, and respond to questions that support achievement of learning goals.

Strategy overview

Hattie (2009) found:

- **an effect size of 0.59 for cooperative learning when compared to individual work**
- **an effect size of 0.54 for cooperative learning when compared to competitive learning.**

What is it?

Collaborative (or cooperative) learning occurs when students work together in small groups and everyone participates in a learning task. There is a range of collaborative learning approaches, each involving different kinds of organisation and tasks (Education Endowment Foundation, 2015).

With a focus on meaningful learning, the teacher uses strategies (such as cooperative learning strategies and strategic selection of groups) to establish an atmosphere of cooperation and collaboration. Collaborative learning is supported by designing meaningful tasks and inviting group responses to questions.

Collaborative learning relies on students actively participating in negotiating roles, responsibilities and outcomes. Their collaboration may involve projects undertaken by the whole class, such as an environmental project in the school or a community survey.

How effective is it?

Hattie (2009) found an effect size of 0.59 for cooperative learning. A 2013 meta-study found an effect size of 0.54 (Kyndt et al, 2013). The Australian Teaching and Learning Toolkit cites an average effect size of 0.41 (Education Endowment Foundation, 2015). Studies show that variations in effect size for collaborative learning are associated with the learning area, students' ages and their cultural backgrounds (Kyndt et al, 2013).

Some analyses indicate cooperative learning has a much stronger effect on achievement for adolescent children than for younger children (Nunnery et al, 2013).

Considerations

Group selection and composition is an important consideration.

Group membership should vary according to the activity's purpose and individual learning goals.

Team building skills are taught explicitly so students learn to collaborate, negotiate and contribute to joint assignments. Group members experience sharing roles, responsibilities and ownership of outcomes.

Group learning activities are specifically designed so that student collaboration is necessary to accomplish the task.

This strategy is demonstrated when the teacher:

- regularly sets group tasks and establishes ground rules about how groups operate
- explicitly teaches students to work as a team by assigning different roles within groups so that students take responsibility for particular aspects of tasks
- differentiates learning by assigning group content based on student readiness
- designs tasks that require sharing expertise and ensuring each student's contribution is valued by other students
- promotes interactions by organising students in flexible groupings in which group membership varies and may be based, for example, on friendship, mixed academic ability or common interests.

This strategy is not demonstrated when the teacher:

- dominates class discussion
- allows a few students to dominate discussion
- gives students few opportunities to interact with, and support, each other.

This strategy is demonstrated when students:

- understand the protocols for working collaboratively
- accept individual responsibility for participating and contributing to group tasks
- are skilled at providing feedback to each other.

Resources:

- AITSL videos:
  A collaborative learning space:
  www.youtube.com/watch?v=X58leKRgi3A
  Managing student learning:
  www.youtube.com/watch?v=T-XIdeotfg8

- Jigsaw cooperative learning:
  www.readwritethink.org/professional-development/strategy-guides/using-jigsaw-cooperative-learning-30599.html
- Practice Principle 2: A supportive and productive learning environment promotes inclusion and collaboration
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/principlesexcellence.aspx
- Pedagogical Model: Explain
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/pedagogical-model.aspx

Examples that illustrate the strategy

Example 1: Primary – Years 5/6

Senior school teachers at a primary school in Melbourne's outer east wished to encourage and develop collaborative learning in their Year 5/6 classes. After consulting their students the teachers decided to participate in the Victorian Solar Boats Challenge. The Solar Boats Inquiry Unit provides opportunities for all students to collaborate, negotiate and contribute to a real life assignment.

Teachers structured participation around achieving clear goals and success criteria which included working collaboratively in groups. They used explicit teaching to teach collaborative learning skills, including negotiating and jointly contributing to the assignment. Expert mentors, including engineers and electricians from the school community, were invited to participate in the project and share their expertise, knowledge and skills. Thanks to these practices, students were supported to work collaboratively, and with success in mind.

Throughout the unit, teachers continually monitored their students' learning and progress. They modified practice when necessary and evaluated success of the unit by reference to data which showed improved quality of student learning. As a result of the scaffolding and guidance, the students organised themselves into small groups that functioned effectively, and they experienced sharing roles, responsibilities and project ownership.

At the end of the unit all students had contributed to designing and constructing their team's solar powered boat, with each group approaching the task by negotiating roles, responsibilities and outcomes. Students reported they learned to value the contributions of all group members, as everyone contributed to achieving their common goal.

Example 2: Secondary – Year 10 History

A Year 10 History teacher introduced a unit on the Chinese Revolution. To engage students, the teacher used questioning to elicit prior knowledge, stimulate interest, and connect learning to real world experiences. She set challenging goals, including understanding the causes of the revolution, and developing cooperative learning skills. The assessment and performance requirements were made clear.

The teacher had tried group work in the past but students were resistant and groups did not function effectively. Reflecting on those circumstances, this time the teacher decided to use the explicit teaching model. She explicitly taught her students to work as a team on an activity specifically designed to require each student to contribute, share their expertise and collaborate to successfully achieve the learning goals.

Using the Jigsaw Strategy, she organised students into 'home' groups, and each home group member was assigned a different text. Students then reformed into 'expert' groups to work with other students allocated the same text. Together they researched and discussed until they became experts on one issue. Finally, students returned to their home groups where they shared their knowledge with other group members.

Students were responsible for learning their own parts and for teaching it to other group members. Learning goals of independence and interdependence became clear as students synthesised information from multiple sources and built their collective knowledge of the topic.

The Jigsaw Strategy allowed the teacher to scaffold a large task into smaller chunks. It also provided for differentiation of content as the teacher allocated different texts to each home group member. Peer tutoring provided opportunities for students to become content experts, creating positive interdependence and mutual respect.

Continuum of practice

1. Emerging	2. Evolving	3. Embedding	4. Excelling
During lessons, teachers allow students to share and reflect on their ideas with their peers. Occasionally, teachers structure learning activities in small groups.	Teachers work together in PLCs to build their knowledge of, and skills in, collaborative learning.	Teachers consistently structure learning around differentiated group tasks that require students to work collaboratively.	Cooperative learning is embedded in classroom practice. Students understand the protocols for working collaboratively and they are skilled at providing considered feedback to each other.
Teachers engage in professional conversations to investigate the evidence base for collaborative learning and share examples of their practice.	Teachers collaborate to design group tasks that help students work and learn together on specific learning goals.	Teachers support students to provide feedback to each other using feedback protocols.	Students design challenging and differentiated individual or group tasks to achieve identified learning goals.
	Teachers collaboratively develop and implement protocols for group work that build student understanding of how effective groups operate.	Teachers observe experienced colleagues, trial new strategies, and seek feedback to support changes to their practice.	Teachers collect data, including feedback from students, to monitor and evaluate the impact of collaborative learning strategies.

Evidence base

- Evidence for Learning: *Teaching and Learning Toolkit – Australia*. http://evidenceforlearning.org.au/the-toolkit/
- Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Milton Park, UK: Routledge.
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6

High Impact Teaching Strategy
Multiple Exposures

It takes 'three or four experiences involving interaction with relevant information for a new knowledge construct to be created in working memory and then transferred to long-term memory' (Nuthall, 2000, p.93).

Strategy overview

Hattie (2009) found an effect size of 0.71 for spaced practice.

What is it?

Multiple exposures provide students with multiple opportunities to encounter, engage with, and elaborate on new knowledge and skills. It is not simple repetition or drill work. Research demonstrates that deep learning is developed over time via multiple and spaced interactions with new knowledge and concepts. This may require distributing practice across several days, and using different activities to vary the interactions learners have with the new knowledge.

How effective is it?

Research demonstrates that multiple exposures greatly improve learner retention of new knowledge. It is most effective when exposures are used deliberately to assist learners to master new knowledge and skills, and when the exposures are spaced over time. Massed practice is less effective with an effect size of 0.41.

Considerations

Multiple exposures are most effective when strategically spread over time, as part of a unit and/or lesson structure.

To make the repetition meaningful, it is essential to clearly state the link between the learning intentions and the work being done.

Multiple exposures require planning and structure. They provide opportunities to engage, and re-engage, with concepts and ideas, and to practice new skills in different contexts. Planned, intentional repetition supports transfer of learning from earlier exposures to later exposures.

It is vital to offer feedback on how well a student is achieving the learning goals. Timely feedback on practice remediates student misunderstandings and prevents them repeating mistakes in multiple exposures. Feedback also informs teacher practice and pinpoints where teaching strategies need be adapted.

This strategy is demonstrated when the teacher:

- links multiple exposures to the learning goals
- plans units of work that clearly identify new knowledge and skills that will benefit from multiple exposures
- uses a variety of learning and assessment tasks that vary students' interactions with the knowledge and/or skills, and support transfer of learning.

This strategy is not demonstrated when the teacher:

- repeats the same activity many times with no variation in context, resulting in dull repetition
- does not provide timely feedback, resulting in students repeating mistakes multiple times.

This strategy is demonstrated when students:

- consolidate their learning through opportunities that engage and re-engage them with new content over a period of time
- feel supported and confident about new learning.

Resources:

- AITSL videos:
  Multiple activities to engage; students:
  www.youtube.com/watch?v=lyYrAgnKe1A
  Making money amounts:
  www.youtube.com/watch?v=-Sc8RqZw-0o
  Engaging through ICT:
  www.youtube.com/watch?v=S3AEvPZJLFY

- Practice Principle 5: Deep learning challenges students to construct and apply new knowledge
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/principlesexcellence.aspx
- Pedagogical Model: Explain
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/pedagogical-model.aspx

Examples that illustrate the strategy

Example 1: Years 7/8 – Humanities

The Humanities teachers of a secondary school in regional Victoria identified the need to actively and consistently address literacy skills as part of their everyday teaching. By building the core vocabulary of their students, they aimed to support them to engage more deeply with complex issues and ideas. Working with a literacy coach, they planned and trialled a yearlong intervention designed to expose students to carefully selected 'target words' linked with the learning area content. The intervention sought to reinforce the use and meaning of target words via multiple exposures over a period of time.

Working in Professional Learning Communities (PLCs), teachers reviewed the unit topics to identify a list of content specific vocabulary all students need to understand and be able to use. They then pre-tested students to identify levels of understanding. The teachers collaborated to design learning activities that incorporated multiple exposures in different contexts over the year. Their intent was to teach and reinforce specific vocabulary and support transfer of learning across the planned units of work.

Students initially encountered the words when reading a text or watching a video. From the moment a new word was introduced, students were exposed to it repeatedly via 'friendly descriptions' of what the word meant. Other strategies included using a vocabulary log, drawing a picture of the word, peer discussion on how and when to use the word, and consolidation activities at the end of each lesson. Over time, the use of the words was reinforced via 'Do Now' activities at the start of each lesson. These activities included games such as Pictionary, traffic light cups, homework activities, self-assessment and vocabulary walls.

The PLC monitored the intervention's implementation and at the end of the year teachers measured the impact of multiple exposures on student learning. The initiative was particularly successful because at the end of each unit students were able to track their progress by comparing their pre-test scores to the final vocabulary test scores.

Example 2: Multiple exposures in the VCE

A VCE teacher in south-west Victoria planned structured multiple exposures to strategically support knowledge acquisition, transfer and deep understanding. The VCE unit plan calendar was set up to ensure key knowledge areas were addressed over a series of lessons rather than a single lesson, and that earlier Areas of Study were revisited halfway through the year and again before the exam. When relevant, the class discussed links between current and previous topics.

Students encountered and revisited content and skills on multiple occasions and in different settings – initially through pre-reading, then being explicitly taught the concepts in class, and by completing 'Do Now' activities and exit slips that addressed content from previous and current lessons. Additional reinforcement strategies included watching short, relevant video clips in their own time, completing practice questions, receiving feedback on practice questions, completing and receiving feedback on practice SACs, being taught active revision strategies, and ultimately completing and receiving feedback on the SACs.

Over the longer term, students completed Unit 3 practice exams halfway through the year to revise content from earlier in the year. They revisited the content prior to the end-of-year exam.

Thanks to clear structuring of the units, spaced practice, and multiple exposures to the content and vocabulary, students deepened their understanding of the subject. They were able to draw links between classroom learning and everyday life. This ensured students were ready for their exams, and prepared both to apply their knowledge and become active citizens.

Continuum of practice

1. Emerging	2. Evolving	3. Embedding	4. Excelling
The teacher uses repetition to review and reinforce new learning, particularly when introducing new concepts and skills.

Professional learning activities focus on building teachers' understanding of evidence based high impact teaching strategies. | The teacher plans the use of repetition to review and reinforce new concepts and skills, explicitly linking each exposure to the learning goals.

The teacher assesses student competence at each stage and provides timely feedback to remediate student misunderstandings and/or mistakes.

Teachers work in Professional Learning Communities to develop multiple exposures learning activities in different contexts which support transfer of learning. | Across learning areas, teachers are skilled in planning and structuring multiple exposures.

Teachers collaboratively plan and develop learning and assessment activities that incorporate multiple exposures.

Teachers analyse a range of data, including student feedback, to measure the impact of multiple exposures on student learning and to evaluate their effectiveness. | Use of multiple exposures is deliberate, systematic and embedded in lesson and unit structures, and applied strategically to support knowledge acquisition, transfer of knowledge and deep understanding.

An integrated, whole-school approach to using high impact teaching strategies is implemented, and regular monitoring and evaluation processes ensure teacher accountability. |

Evidence base

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7 | ?

High Impact Teaching Strategy
Questioning

Effective teachers regularly use questioning as an interactive means to engage and challenge students, and use it as a tool to check student understanding and evaluate the effectiveness of their teaching.

Strategy overview

Hattie (2009) found an effect size of 0.46 for questioning.

What is it?

Questioning is a powerful tool. Effective teachers deploy it regularly for many purposes. It engages students, stimulates interest and curiosity in the learning, and makes links to students' lives. It unfolds opportunities for students to talk together, discuss, argue, and express opinions and alternative views. Used effectively, questioning yields immediate feedback on student understanding, supports informal and formative assessment, and captures feedback on the impact of teaching strategies.

How effective is it?

Questioning by teachers of students is one of the most widely studied aspects of teaching. Effective questions have varied levels – they focus on both product and process, and elicit more information if a student gives a partial (or partially correct) answer (Kyriakides et al, 2013; Muijs et al, 2014). Hattie measures the general effect size of questioning as 0.46, which is above average and within the zone of desired effects on student learning. Questioning is a flexible tool. It is used to provide feedback to students, to check for understanding, and to quickly assess student progress. Feedback to students and teachers has an effect size of 0.73 (Hattie, 2009).

Considerations

Teachers use questioning for many purposes. Effective teachers understand that specific types of questions are appropriate for particular learning goals and activities. As the types of questions used vary according to the learning goals, questions need to be planned. Is the purpose to engage, revise, challenge, encourage reflection and deep understanding, or provide the teacher with feedback?

Questioning is most successful when teachers maintain a respectful, trusting learning environment in which students feel confident to contribute. So that students understand how to conduct discussions, teachers introduce protocols which are framed in ways that encourage students to respect the rights of others to hold differing views.

Providing appropriate feedback is critical in encouraging all students to contribute, to extend and deepen their thinking, to correct misunderstandings, to acknowledge their learning, and to support students to generate their own questions that lead to further inquiry.

This strategy is demonstrated when the teacher:

- negotiates conversational protocols which support all students to make meaningful contributions
- targets questions, or responds to answers, in ways that acknowledge individual needs and potential contributions
- models acceptance and valuing of unusual ideas
- provides stimulus materials that challenge students' ideas and encourage discussion
- engages students in dialogue, continuously extending their thinking and refining students' understanding
- asks questions that probe student thinking and prompt them to justify their responses
- provides feedback and structures opportunities for students to give feedback to one another.

This strategy is not demonstrated when the teacher:

- mainly asks questions that are closed, focuses on recall of information, and having one 'right' answer
- allows insufficient wait time for students to think about the question and their possible responses
- consistently relies on a few students to respond and does not engage all students in discussion
- allows the class discussion to wander without focus
- dominates the discussion and does not allow students to interact, challenge viewpoints and speculate.

This strategy is demonstrated when students:

- feel confident to ask questions, speculate and hypothesise, and when they respect others' views
- understand how different types of questions are used to identify and clarify information
- give feedback to one another, and when they build on and challenge one another's ideas.

Resources:

- AITSL videos:
  Deep questioning to support research:
  www.youtube.com/watch?v=0-Au253dMS4
  Engaging every learner:
  www.youtube.com/watch?v=AyDA12mOaSs
  Supporting children's development:
  www.youtube.com/watch?v=93KpPrcM1F4

- Practice Principle 3: Student voice, agency and leadership empower students and build school pride, and Practice Principle 6: Rigorous assessment practices and feedback inform teaching and learning
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/principlesexcellence.aspx

- Pedagogical Model: Engage, Explore and Evaluate
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/pedagogical-model.aspx

Examples that illustrate the strategy

Example 1: Primary – Science

Over several meetings of their Professional Learning Community (PLC), a group of primary school science teachers discussed alternative approaches to fostering more active student participation in science lessons. After referring to the evidence base, they concluded strategic use of questioning held particular benefits. They agreed to collaborate on selecting productive questioning strategies and building their knowledge and skills in using them.

To create a learning environment where students were confident to make contributions, their first step was to write agreed protocols that emphasised the importance of trust and respect among students. The teachers then decided to concentrate on three aspects of questioning practice: asking open-ended questions, using wait time, and supporting students to question each other. They backed up these priorities with jointly composed classroom norms, including a strict five seconds wait time after either the teacher or students posed questions.

A more challenging norm to embed was an expectation that all students would be 'active sceptics'. They made this tangible by designing tasks with many possible solutions. One student would present their favoured solution to the class. The whole class would be invited to offer a view on that solution. Those who offered a view different to the presenter would be required to formulate a follow-up question to put to the presenter.

To support implementation of the intervention, the PLC members agreed that every lesson would incorporate time for open-ended questions that generated discussion. They also agreed to schedule regular peer observations focused on question quality and student responses.

The shared goal was increased student participation. With that in mind, PLC members monitored and evaluated the effect of wait time by observing its impact on the receiver of a question, and the extent to which wait time encouraged deeper thinking. They used peer observation to build a shared bank of practices that cultivate students' skills in framing open-ended questions so they could better question each other.

Data collected from peer observation indicated greater teacher attention to quality, open-ended discussion from which questions emerged, as well as increased depth of student articulation. They found that when their protocols were consistently implemented, over time there was more student-led discussion. This effectively reduced the amount of teacher talk time in science lessons.

Example 2: Year 9 – History

Year 9 and 10 History teachers at a recently opened school in a suburban growth corridor expressed their concern that many students in their classes were making limited progress. In a regular PLC meeting, they analysed assessment data for Years 9 and 10 students and were struck by the consistent absence of higher order thinking skills. This led PLC members to consider how they could use higher order questioning to encourage deeper learning. They agreed to research and trial effective questioning techniques that would promote high order thinking and ensure all students felt engaged, challenged and extended.

To encourage deeper student learning, the teachers agreed to structure their lessons around strategic use of effective questions, particularly at higher cognitive levels.

Two PLC members, responsible for teaching a Year 9 History unit, designed questions for every class that asked for evidence and/or clarification. In addition, they framed different kinds of questions for selected topics, including linking or extension questions, hypothetical questions, cause and effect questions, and summary and synthesis questions.

They devoted attention to establishing explicit links to the learning goal of developing deeper understanding of the lesson content. During Terms two and three, they provided explicit instruction in various types of questions and their uses, modelled effective questioning, and encouraged students to ask questions of themselves.

Their lesson plans incorporated learning activities that revolved around peer questioning, reciprocal teaching and student self-questioning. These approaches served to engage students in discussion, continuously extend their thinking and refine their understanding. The Year 9 teachers provided explicit instruction in each strategy, modelled its use, allowed students time for practice, provided feedback, and structured opportunities for students to give feedback to one another.

The teachers monitored implementation of changes to their practice. They and other PLC members undertook peer observations which enabled sharing and debriefing about how well questioning techniques were supporting deeper learning. The Year 9 teachers regularly sought student feedback and were confident that by the end of Term 3 their students were more engaged, motivated and independent learners. Their confidence was reinforced when they analysed student achievement data in Term 4 to evaluate the impact of the changes to their practice.

Continuum of practice

1. Emerging	2. Evolving	3. Embedding	4. Excelling
Teachers use questioning to identify prior learning and gauge levels of understanding. Teachers provide positive feedback on responses to encourage student participation and to engage students in higher order thinking and learning.	Teachers work in teams to develop their questioning skills, including open and closed questions, probing questions and using 'wait time'. Teachers provide appropriate feedback and support students to generate questions that lead them to further inquiry. Teachers collaboratively develop and implement protocols to build a respectful, trusting learning environment in which students feel confident to contribute. Teachers monitor student participation and learning progress to self-assess the effectiveness of their questioning skills.	Teachers work in Professional Learning Communities to collectively build and refine their capability to deploy a range of question types appropriate to the learning goals. Teachers consistently implement and reinforce agreed classroom protocols to build a respectful, trusting learning environment in which students feel confident to contribute. Teachers use peer observation to share and debrief about how well they are asking questions to gain evidence of student learning, to encourage thoughtful and considered responses, and to facilitate discussion.	Teachers are highly skilled at using questioning for a variety of purposes, including informal and formal assessment. Teachers support students to think critically by developing questions, posing problems and reflecting on multiple perspectives. They foster deep thinking, and facilitate discussion to engage all students in learning. Teachers use a range of data, including student feedback and peer observation, to monitor and evaluate the effectiveness of their questioning skills.

Evidence base

- Craig, S., Sullins, J., Witherspoon, A. and Gholson, B. (2006). 'The deep-level-reasoning-question effect: The role of dialogue and deep-level-reasoning questions during vicarious learning.' *Cognition and Instruction*, 24(4).
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8

High Impact Teaching Strategy
Feedback

Effective teachers use two-way feedback to gather information about a student's understanding, to assist students to advance their own learning, and to verify the impact of their own practice.

Strategy overview

Hattie (2009) found an effect size of 0.73 for feedback.

What is it?

Feedback informs a student and/or teacher about the student's performance relative to learning goals. Its purpose is to improve the student's learning. Feedback redirects or refocuses the actions of teacher and student so the student can align effort and activity with a clear outcome that leads to achieving a learning goal.

Both teachers and peers can provide formal or informal feedback. It can be oral or written, formative or summative. Whatever its form, it always comprises specific advice a student can use to improve their performance.

Hattie underlines feedback's two-way benefits. Teachers learn about how their practice influences student learning. When teachers use feedback to guide their practice, then they amplify their impact on student learning.

How effective is it?

Research shows appropriate feedback has very high effects on learning. Its effectiveness is evident for students and teachers (Education Endowment Foundation, 2015).

Studies with the highest effect sizes involved students receiving feedback about a task and how to do it more effectively. Feedback in the form of praise, punishment and rewards has lower effect sizes (Hattie & Timperley, 2007).

There is evidence that feedback is more effective if it focuses on the task, not the person, and that feedback on familiar tasks has more impact (Kluger & DeNisi, 1996).

Considerations

Positive feedback is powerful. It can have a negative influence too, unless close attention is paid to the type of feedback and the way it is given. Feedback is most useful in resolving misconceptions, and less useful in resolving a lack of understanding. Research suggests positive feedback is specific, accurate and clear.

Signature characteristics of positive feedback are that it:

- provides detail, such as 'You achieved a good outcome because you...,' rather than just 'correct' or 'incorrect'
- compares what a student is doing now with previous work, such as, 'I can see you focused on improving X –the result is much better than when you did Y last time'
- providing specific guidance on how to improve, and not just tell students when they are wrong
- is framed to encourage and support further effort
- is given sparingly so that it is meaningful
- is supported by effective professional development for teachers.

This strategy is demonstrated when the teacher:

- provides feedback on tasks that challenges students to review, reflect on and refine their understandings at various points in a learning sequence
- gives timely feedback, acknowledging areas well-handled and suggesting areas for improvement
- structures feedback to support further learning
- organises a variety of audiences to provide feedback
- uses student assessment data as a source of feedback on the effectiveness of their teaching practice.

This strategy is not demonstrated when the teacher:

- provides feedback that is about the person (such as, 'you are my best student') or vague (such as, 'good job')
- only provides feedback about students' performance in formal, summative assessment situations, without the opportunity for students to refine and develop understandings on the basis of instructive feedback.

This strategy is demonstrated when students:

- understand what they need to do to improve
- feel encouraged and supported to achieve the learning goals
- use feedback to monitor and self-regulate their learning.

Resources:

- **Efective Assessment:**
  www.education.vic.gov.au/school/teachers/teachingresources/practice/Pages/insight-effective.aspx
- **Assessment in principle**
  www.education.vic.gov.au/school/teachers/teachingresources/practice/Pages/insight-principle.aspx
- **Infographic, Things to Remember About Feedback**
  www.ascd.org/ASCD/pdf/journals/ed_lead/el201209_takeaways.pdf
- **AITSL Feedback resources:**
  www.aitsl.edu.au/feedback

- **AITSL videos:**
  Providing feedback:
  www.youtube.com/watch?v=APvBYYV2I9A
- **Learning through feedback:**
  www.youtube.com/watch?v=DOeF7FTYIIo
- **Using ICT to teach Languages:**
  www.youtube.com/watch?v=O2BxsdgPLmQ
- **Practice Principle 3: Student voice, agency and leadership empower students and build school pride, and Practice Principle 6: Rigorous assessment practices and feedback inform teaching and learning**
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/principlesexcellence.aspx
- **Pedagogical Model: Evaluate**
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/pedagogical-model.aspx

Examples that illustrate the strategy

Example 1: Primary

A group of regional primary teachers working in a Professional Learning Community (PLC) identified the need to make more consistent and effective use of feedback in the classroom. They formulated an objective to deliver richer qualitative feedback to students. They also decided to elicit feedback from students more regularly as a source of data about how to improve their teaching and learning practice.

Collaboratively, they developed two interventions to trial and implement simultaneously during Terms 1 and 2. The first intervention involved using Learning Observations to intervene in student learning, challenge students, and note their approach to set tasks. The second intervention involved using Exit Placemats to gather student feedback.

The teachers recognised that successfully implementing their chosen interventions relied on ensuring all students understood the learning goals and success criteria. They agreed to adopt a lesson structure that would be consistent for all classes.

For the first feedback intervention, the PLC focused on how to deliver meaningful, timely feedback about skills required to complete specific tasks. The teachers concentrated on framing feedback so that students could take specific actions to improve their performance and achievement. Their practice goal was to guide students to either the next area of focus, or to a new learning objective.

The second trial intervention involved Exit Placemats. They encouraged students to reflect on their confidence in a topic, and to self-assess their own learning from the unit. Each teacher analysed the data gathered from student reflection and self-assessment. They then used their findings to inform a classroom discussion in which students offered feedback to the teacher on their teaching practice.

Working in their PLC, the teachers monitored the implementation of their selected interventions, reflected on what worked, and modified practice based on the data they collected. Exit Placemats proved to be an effective way of enabling two-way feedback, supporting teachers to reflect on their practice, and evaluating the impact of their teaching.

Example 2: Secondary

A graduate teacher at a metropolitan secondary college identifies collecting and providing feedback as a key development area. With a mentor's help, the teacher designs a protocol for using verbal and digital feedback as an effective two-way information exchange with students.

Knowing the importance of linking data with feedback, the mentor demonstrates how to use centralised tests to extract individual achievement data. This data becomes the foundation for meetings with individual students. Together, the teacher and mentor establish a meeting structure. During the meetings, feedback focuses on the task, what needs improvement, and how to go about it. Drawing on the learning intentions and success criteria, the teacher provides feedback on specific aspects of the student's work, and offers specific advice on how to improve performance.

It proves incredibly powerful to assist students to review results in structured meetings. By centering discussion on clear feedback that encourages reflection, students deepen awareness of their learning. In monitoring the effect of this practice, the graduate teacher makes two observations. First, students are motivated to understand why they made a specific mistake. Second, they have data to help map a pathway for developing the required skills in preparation for next time.

As a second area of professional learning, and leveraging on digital technology skills, mentor and mentee trial Plickers (https://plickers.com/) to track student understanding of, and confidence in, lesson content. Building on traditional mini-whiteboard questioning techniques, each student is assigned a unique QR code. The code is photographed at key lesson stages and used to generate and share polls. This allows students to instantly and confidentially disclose how they think they are progressing. This provides data that captures the extent to which content is understood. As it is recorded automatically, feedback collected using Plickers is not only easy to track it is more accurate as students can answer honestly without being concerned that their peers might judge their responses adversely.

Continuum of practice

1. Emerging	2. Evolving	3. Embedding	4. Excelling
Teachers provide students with feedback on strengths and areas for improvement.	To progress learning, teachers provide students with targeted feedback based on informed and timely judgements of each student's achievement, relative to their learning goals and their needs.	All teachers use formative and summative assessment strategies, and provide students with timely feedback that supports individualised learning. Teachers use assessment data as a source of feedback on their teaching practice, implementing changes and interventions where and when required.	A range of comprehensive assessment data provides the basis for regular feedback to students and parents. Teachers strategically gather and analyse assessment data to reflect on their practice. Student feedback is actively used to inform teaching.

Evidence base

- Evidence for Learning: *Teaching and Learning Toolkit – Australia*. http://evidenceforlearning.org.au/the-toolkit/
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High Impact Teaching Strategy
Metacognitive Strategies

Effective teachers use metacognitive strategies to help students develop awareness of their own learning, to self-regulate, and to drive and sustain their motivation to learn.

Strategy overview

Hattie (2009) found an effect size of 0.69 for metacognitive strategies.

What is it?

Metacognitive strategies empower students to think about their own thinking. Awareness of the learning process enhances control over their own learning. It also enhances personal capacity for self-regulation and managing one's own motivation for learning. Metacognitive activities can include planning how to approach learning tasks, evaluating progress, and monitoring comprehension.

How effective is it?

Evidence shows teaching metacognitive strategies can substantially improve student learning. Hattie measured the average effect size of metacognitive strategies at 0.69. The Australian Teaching and Learning Toolkit reports an impact equivalent to 8 additional months of progress.

Considerations

Students use metacognitive strategies to make the most of classroom instruction and to extend the learning beyond it. Metacognitive strategies do not directly influence how content knowledge is presented to students. In a sense, teaching metacognitive strategies entails teaching students to teach themselves.

Metacognitive strategies are taught explicitly, extensively modelled, embedded in routines and the lesson structure, and linked to the content being taught. Most importantly, the advantage of using a metacognitive strategy must be clear to students. These considerations apply to basic cognitive skills like notetaking and summarising, and to self-regulation strategies such as self-questioning and self-consequences.

This strategy is demonstrated when the teacher:

- provides students with specific strategies to set goals, and monitor and evaluate their learning progress
- assists students to identify and use strategies that support them to achieve learning goals
- demonstrates how to use a particular metacognitive strategy in ways that make content knowledge more accessible, malleable and intriguing
- uses a variety of learning and assessment strategies to scaffold and personalise the learning process
- provides support and scaffolding for tasks through checklists, self-questioning, student-teacher conferences and self-assessment
- uses ICT to increase student choice and flexible learning.

This strategy is not demonstrated when the teacher:

- gives students a choice of activities but does not explain how they can use specific strategies to achieve particular learning goals
- does not encourage students to take responsibility for their own learning, or for applying metacognitive strategies.

This strategy is demonstrated when students:

- have a repertoire of learning strategies and can select strategies appropriate for the learning goals
- reflect on their learning processes, self-assess and acknowledge the impact of effort on achievement
- actively seek out feedback because they value it as a way to improve understanding of how they learn
- are capable of self-regulation and proactively take control of, and responsibility for, their own learning.

Resources:

- AITSL video:
  Inquiry learning in play spaces:
  www.youtube.com/watch?v=G4BEMQuUk9s
- New Pedagogies for Deep Learning – Examples from Victorian schools:
  www.fuse.education.vic.gov.au/Resource/LandingPage?ObjectId=fadaf2dd-1faf-4626-a300-126b09b1951f
- Practice Principle 3: Student voice, agency and leadership empower students and build school pride, and Practice Principle 5: Deep learning challenges students to construct and apply new knowledge
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/principlesexcellence.aspx

- Pedagogical Model: Elaborate and Evaluate
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/pedagogical-model.aspx
- Professional practice note 14: using metacognitive strategies to support student self-regulation and empowerment
  https://www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/ppn14.aspx
- Education Endowment Foundation report - Metacognition and self-regulated learning
  www.educationendowmentfoundation.org.uk/tools/guidance-reports/metacognition-and-self-regulated-learning/

Examples that illustrate the strategy

Example 1: Levels 9–10 – Critical and Creative Thinking

A Humanities teacher decided to help her students develop metacognitive skills. From the start of the year every lesson included a planned discussion in which students shared the strategies they had used to complete lesson tasks and which strategies were most effective. The benefits of attention to metacognitive strategies were clear from the increasingly articulate manner in which her students explained their thinking processes.

In term two she realised that the metacognitive strategies would be more effective if embedded into learning activities. Her thinking led her to devise a plan for a unit on the Reconciliation Movement in Australia that emphasised metacognitive strategies. The learning goals related to students' knowledge of the Reconciliation Movement, and to their skills in interpreting and evaluating multiple evidence sources. The teacher selected a range of primary and secondary sources, including videos and transcripts of Prime Minister Keating's 1992 'Redfern Address' and Prime Minister Rudd's 2008 'Sorry Speech'.

Throughout the unit, she assisted students to describe strategies that supported them to achieve the learning goals, including whole class discussion, small group work, independent research and analysis. She demonstrated the links between particular strategies and productively engaging with the content knowledge.

Students researched government initiatives and policies during the 16 years between both speeches. They speculated on why it took so long to make the 'Apology to the Stolen Generations'. She scaffolded tasks with self-monitoring checklists and peer feedback. In the final assessment task students acted as journalists covering the 'Apology' speech and wrote about its part in the Reconciliation Movement.

Students were frequently reminded to think about how to approach learning tasks, evaluate progress, monitor comprehension, and when to redirect effort. Explicitly teaching metacognitive skills supported students to develop self-regulation and proactively take control of, and responsibility for, their own learning.

Example 2: Self-regulation in a specialist setting

A teacher became increasingly concerned about the difficulties experienced by a group of students with Autism Spectrum Disorder (ASD). When the classroom grew louder during on task activities, this group found learning particularly hard. He formulated a goal of supporting them to extend their repertoire of metacognitive strategies and considered a number of possible interventions. The teacher decided to explicitly teach tangible strategies that would enable them to problem solve independently, and to self-regulate in the classroom.

The teacher drew on his knowledge about learning and teaching practices that support good learning outcomes for students who have ASD. They learn well when they have opportunities to process information visually, when teachers use language appropriate to their receptive skills, and when they have sufficient time to process the information. Using these learning characteristics to guide the design of an intervention, the teacher scaffolded the self-regulation learning around clear instructions, visual cues and progressively reducing assistance.

When the class was becoming louder, the teacher brought these elements together. He moved towards the students and said, 'The room is getting loud – you can use your headphones.' He showed them a photograph of the headphones, prompted them to go where the headphones were located, and assisted them to put on the headphones. After working through this routine several times, prompts and verbal language were slowly reduced and the students began to enact the routine independently. It was apparent they could recognise their sensory triggers and use strategies to overcome them. They were developing metacognitive skills of self-regulation and understanding links between their thoughts, feelings and actions.

Reflecting on the intervention's effectiveness in a PLC meeting, another teacher commented that a key part in its success was observing what gave rise to the challenging behaviours or sensory meltdowns. Tracking the cause and creatively reducing its influence assisted students to recognise their thought processes and build appropriate self-regulation strategies.

Continuum of practice

1. Emerging	2. Evolving	3. Embedding	4. Excelling
Teachers participate in professional learning to build their knowledge of metacognitive strategies.	Teachers identify metacognitive strategies as a focus for learning and development in Performance and Development Plans.	Professional Learning Communities support building knowledge and skills in using metacognitive strategies, as referenced in all teacher Performance and Development Plans.	An integrated, whole-school approach to using metacognitive strategies is implemented, accompanied by regular monitoring and evaluation processes that ensure teacher accountability.
Teachers encourage students to be self-reflective learners by assisting them to think about their own thinking and about how they learn.	Teachers introduce students to a number of differentiated learning strategies they can apply to completing a range of problems.	Teachers explicitly teach a number of metacognitive strategies, model their use, and embed them in routines and the lesson structure.	Teachers effectively diagnose individual students' abilities, then select and coach them in appropriately challenging tailored strategies.
Teachers emphasise that a person's ability to learn is not fixed and that it is always possible to learn effective learning strategies that improve performance.	Teachers explain how to make informed choices about which strategies to use in particular situations to achieve the learning goals.	Teachers encourage students to reflect critically on the strategies they use to complete tasks, and to identify which learning strategies are most effective for them.	Metacognitive strategies are explicitly taught, extensively modelled, embedded in routines and the lesson structure, and linked to the content being taught.
Teachers introduce learning strategies that students can apply to tackle specific tasks.	Teachers teach students how to reflect on and monitor their own learning.	Teachers support students to consider their learning goals, plan and monitor their own learning, and evaluate their learning.	Students take responsibility for their past and future learning – they understand the standards expected of them, set and monitor their own learning goals, and develop strategies for working towards them.

Evidence base

- Evidence for Learning: *Teaching and Learning Toolkit – Australia.* http://evidenceforlearning.org.au/the-toolkit/
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10

High Impact Teaching Strategy
Differentiated teaching

Effective teachers use evidence of student learning readiness, learning progress, and knowledge of individual student learning profiles, to make adjustments for individuals so all students experience challenge, success and improved learning.

Strategy overview

Hattie (2012) found an effect size of 1.07 for Response to Intervention.

What is it?

Differentiated teaching refers to methods teachers use to extend the knowledge and skills of every student in every class, regardless of their starting point. The objective is to lift the performance of all students, including those who are falling behind and those ahead of year level expectations.

Differentiated teaching provides appropriate challenge for all students in a class. It does so by responding to student differences in readiness, interest and learning profile.

To ensure all students master objectives, effective teachers plan lessons that incorporate adjustments for content, process (how students make sense of content), and product (how students demonstrate what they know and understand).

Teachers use assessment strategies to monitor student learning readiness and learning progress. They apply targeted interventions as components of differentiation.

How effective is it?

Differentiated teaching strategies, consistently applied, offer foundations on which all students can build meaningful learning.

Response to Intervention (RTI) combines highly tailored differentiation with evidence-based interventions which are monitored constantly (RTI is also known as Multi-Tier System of Supports).

Research shows a remarkable effect size of 1.07 for RTI.

Considerations

Differentiated teaching involves teachers supporting students to achieve success as they move through the learning process. It recognises all students have different abilities. It acknowledges and values the effort each student puts into improving their work.

Teachers who differentiate effectively call on information that pinpoints what students know now, and what they are ready to learn next. They use formative assessment to monitor learning,

and to guide selection of targeted interventions corresponding with individual needs. Teachers implement interventions using fluid groupings to address students' current needs. As students gradually master the required skills teachers adjust groupings and may cease interventions.

This strategy is demonstrated when the teacher:

- uses pre-assessment of student readiness, interest and learning profile to understand individual student's needs and strengths
- sets high expectations for all students
- provides students with realistic, challenging goals, and recognise effort
- relies on formative assessment to monitor student learning progress toward and beyond learning goals
- uses a range of teaching strategies that support different abilities and ways of thinking and learning
- sets open-ended tasks that allow students to work at different levels and paces
- uses group and targeted interventions to remediate learning difficulties
- assesses student work against prior achievements rather than against other students' work.

This strategy is not demonstrated when the teacher:

- sets the same work for all students
- provides little variation in teaching strategies, resources and groups composition
- assesses all student work against general criteria
- applies differentiated teaching strategies only for gifted students
- establishes consistently inflexible groupings.

This strategy is demonstrated when students:

- can choose learning activities based on agreed goals
- are assessed against prior achievements, rather than against other students' work
- are supported and challenged to reach their learning potential.

Resources:

- **Abilities Based Learning and Education Support:**
  www.education.vic.gov.au/school/teachers/learningneeds/pages/ables.aspx
- **Effective Assessment:**
  www.education.vic.gov.au/school/teachers/teachingresources/practice/Pages/insight-effective.aspx
- **Assessment in principle**
  www.education.vic.gov.au/school/teachers/teachingresources/practice/Pages/insight-principle.aspx
- **AITSL videos:**
  Supporting Japanese language learners:
  www.youtube.com/watch?v=E8Z7snMqQDY
  Ancient Rome:
  www.youtube.com/watch?v=jqITEmbhM2Q

- **Practice Principle 4: Curriculum planning and implementation engages and challenges all students, and Practice Principle 6: Rigorous assessment practices and feedback inform teaching and learning**
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/principlesexcellence.aspx
- **Pedagogical Model: Engage, Explore and Explain**
  www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/pedagogical-model.aspx
- **Professional practice note 6: formative assessment**
  https://www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/ppn6.aspx

Examples that illustrate the strategy

Example 1: Years 7-9 – Languages

Language teachers at a Melbourne secondary school were aware many students were not progressing at the expected rate. In their Professional Learning Community (PLC) during Term 2, they discussed their existing differentiation practices (giving students' either extension or revision tasks). They agreed these strategies were failing to extend all students. PLC members decided to monitor students' learning using student assessment data. Their analysis of the data prompted the PLC to consider how they could use student assessment data to improve design of differentiation strategies that meet diverse student needs.

In Term 3, the school appointed data managers for each year level. They assisted teachers to build accurate class profiles, and to establish precise learning objectives that specifically targeted student needs. The data enabled teachers to match learning goals with teaching and learning strategies, and supported lesson planning based on explicit teaching (see HITS 3). Teachers adopted flexible groupings which fostered mastery of new skills, allowing students to progress quickly to new learning.

Teachers agreed to implement new strategies consistently, and to monitor their impact on student outcomes. They used formative assessment to monitor individual student progress and to provide students with real time feedback. Teachers used on-the-spot interventions to clarify and correct misunderstandings, and when appropriate, to guide students to the next learning objective.

Throughout Terms 3 and 4, student data was shared at PLC meetings. The PLC studied the data to identify trends, evaluate student progress, and refine the strategies put in place. The data flow was encouraging as it showed students were more engaged and individual achievement levels were increasing.

Teachers welcomed this school-wide approach. They were empowered to use the collective knowledge and expertise in the PLC. They found the approach effective because it enabled them to target their teaching to the exact point of student need.

Example 2: Primary – Mathematics

A group of primary school teachers in a Mathematics PLC adopted a flipped classroom model to address a problem of practice. First, they wanted to provide effective differentiated instruction to a diverse range of students with mixed abilities. Second, they were determined to do so without compromising the quality of explicit teaching.

PLC members decided to substitute the explicit instruction phase of their lessons with video based instruction using online resources, including recordings of their own teaching. This approach allowed students to access the videos in their own time, thus freeing classroom, group and individual practice time.

School funds supported the purchase of Ziggy Cams, and with the use of web-based document sharing, teachers created an online repository of videos that were shared and viewed across classes. This approach yielded many benefits. It enabled effective scaffolding of learning. It provided students with greater virtual access to their teachers through videos on demand. It increased face-to-face student access to their teachers by freeing up time for group and one-on-one classroom feedback. Teachers were able to increase frequency and depth of individual and small group interventions. The videos provided explicit instruction delivered at the student point of need, creating opportunities for revision, extension and acceleration. Finally, teachers had increased opportunities to monitor student progress

The model developed and implemented by PLC members was a successful response to the challenge they set for themselves. Using videos in a thoughtfully calibrated manner proved effective in providing differentiated instruction. At the same time, teachers were able to maintain their emphasis on providing clear instructions, demonstrating the application of knowledge, and using worked examples.

Continuum of practice

1. Emerging	2. Evolving	3. Embedding	4. Excelling
Teachers use assessment strategies to identify what students know, and to monitor learning.	Teachers use a range of assessment activities to identify prior learning, and to diagnose student learning needs.	Student assessment data is analysed and findings explicitly inform curriculum planning and teaching practice.	After effectively diagnosing individual students' abilities, teachers select and explicitly teach using tailored, appropriately challenging strategies.
Teachers use a variety of teaching strategies to accommodate the range of abilities and interests.	Teachers modify and diversify their instructional delivery and behaviour management to meet the different needs of students.	Teachers use data to determine the targeted interventions required for individual students.	Teachers contribute to the ongoing development of whole-school assessment policies and strategies, which support teachers to build their capability to use a range of assessment data to diagnose students' learning needs and inform planning for student learning.
		Teachers 'teach-up' – that is, they teach high quality, rich curriculum to all students and scaffold learning so students achieve high level goals, rather than teach 'down' to students they perceive as having less ability.	Differentiation is central to planning and delivery in all lessons.

Evidence base

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- Marzano, R. J. (2007). *The art and science of teaching: a comprehensive framework for effective instruction.* Alexandria, USA: ASCD.
- Pirozzo, R. (2014). *Differentiating the Curriculum: Supporting teachers to thrive in mixed ability classrooms.* Melbourne, Australia: Hawker Brownlow.
- Shaddock, A., Packer, S. and Roy, A. (2015). *Schools for all children and young people: Report of the expert panel on students with complex needs and challenging behavior.* Australian Capital Territory Government, Canberra: Australia.
- Tomlinson, C. (2014), *The Differentiated Classroom: Responding to the needs of all learners.* Alexandria, USA: ASCD.
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