SCIENCE OF LEARNING

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Gradual Release

What The Research Says About How We Maximise Retention, Consolidation and Application of Learning

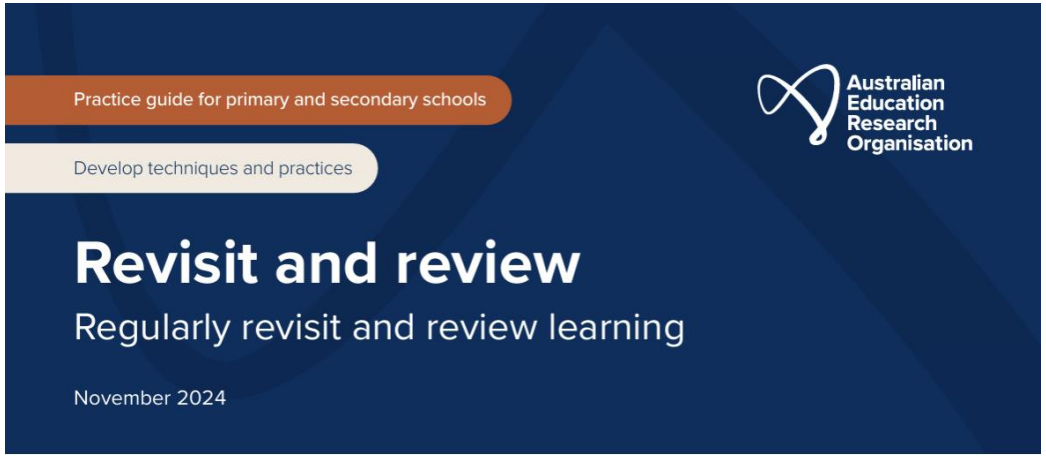
Dr Zid Mancenido

So I promised you a quiz...

Should we believe that "the best way to learn is to teach"?

What is a "go" vs "stop" approach? Which has been shown to be more effective?

Why do you think that quizzing can improve retention of content that is not quizzed?



Revisiting learning is the practice of regularly coming back to content so students can review what's already been taught. Reviewing can consolidate what's been taught, as well as support new learning by activating prior knowledge. When combined with checks for understanding, reviewing learning can help you determine what students have learnt and what additional instruction you need to provide.

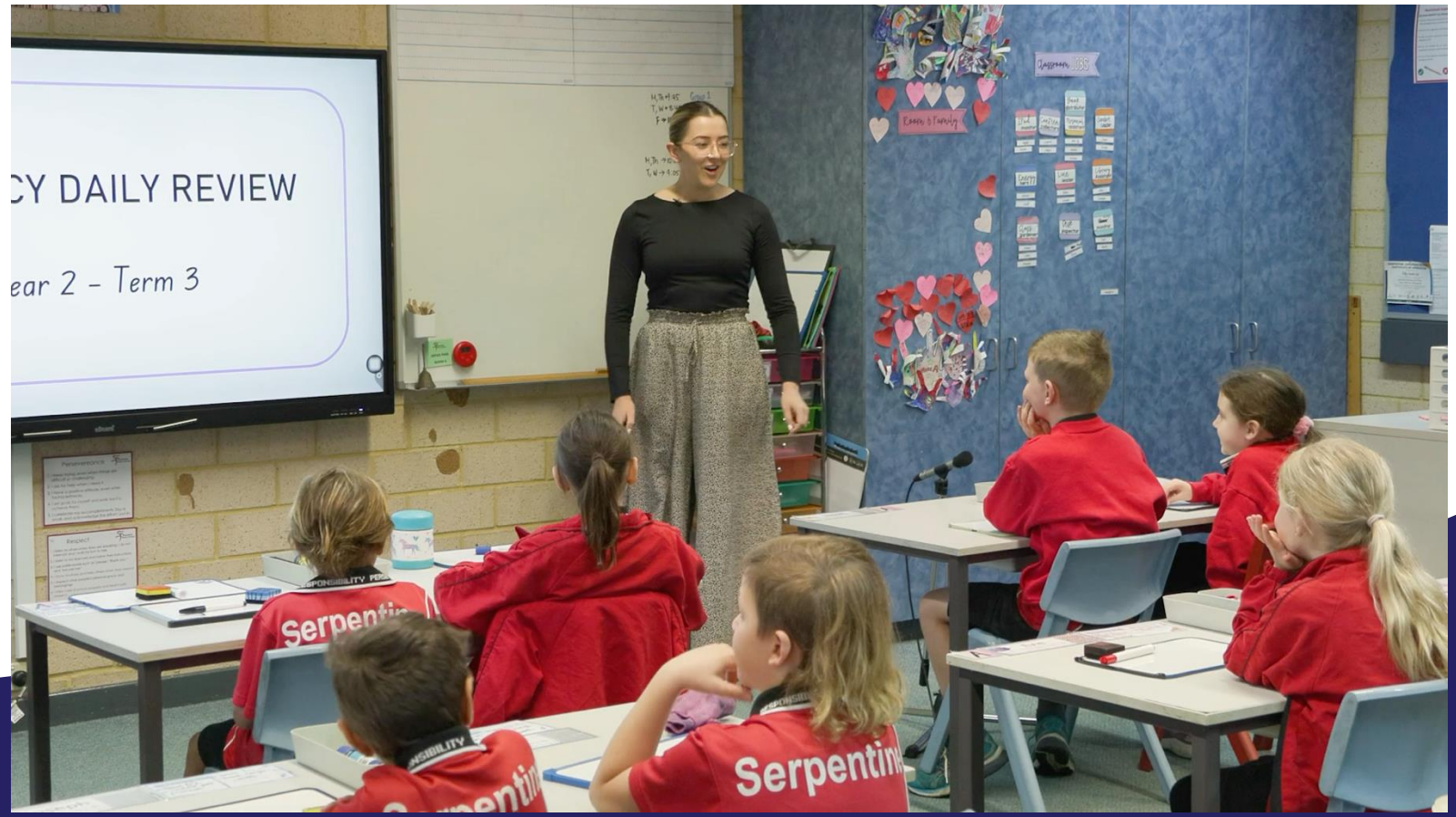
Australian Education Research Organisation

A model of learning and teaching: aligning teaching with how students learn

Scan to read AERO's model and overview of *How Students Learn*

Demonstration of practice: daily review

1. What do you observe about this teacher's approach to supporting students to revisit and review?
2. What techniques do you notice this teacher use?
3. How does this teacher provide a safe space for students to review and share their learning?



From 0:55 to 3:15

Demonstration of practice: daily review

1. What do you observe about this teacher's approach to supporting students to revisit and review?
2. What techniques do you notice this teacher use?
3. How does this teacher provide a safe space for students to review and share their learning?

From 1:25 to 3:35

1. Recall what they've learned when prompted
2. Make connections between what they've learned and other relevant knowledge to build conceptual understanding
3. Identify similar contexts and adapt what they've learned
4. Build on what they know, exploring and wondering beyond what we can teach them

AERO's model of learning and teaching

Four key learning principles: Mastery and application

01

Spaced, varied and repeated practise consolidates learning in long-term memory for easier retention, retrieval and application

02

Students develop more complex mental models as they recall and connect knowledge from across their learning

03

Solving unfamiliar problems and thinking critically and creatively draws on knowledge consolidated in long-term memory

04

Students can generate new learning by applying their mental models

AERO's model of learning and teaching

Four implications for teaching: Mastery and application

01

Spaced, varied and repeated practise consolidates learning in long-term memory for easier retention, retrieval and application

Regularly revisit and review learning

02

Students develop more complex mental models as they recall and connect knowledge from across their learning

Space and vary tasks for guided and independent student practice

03

Solving unfamiliar problems and thinking critically and creatively draws on knowledge consolidated in long-term memory

Teach the connections between ideas using models and tasks that build in complexity, detail and abstraction.

04

Students can generate new learning by applying their mental models

Provide appropriately challenging opportunities for students to apply, extend and demonstrate mastery of their learning.

1. Recall what they've learned when prompted
2. Make connections between what they've learned and other relevant knowledge to build conceptual understanding
3. Identify similar contexts and adapt what they've learned
4. Build on what they know, exploring and wondering beyond what we can teach them

Revisit and review

Regular revisit and review learning

Revisit and review: What it is

- Supporting students with revisiting their prior learning for consolidation.
- Planned, regular reviewing – and reteaching where necessary – focused on recent or past learning.
- A supportive technique for students who need additional instruction and opportunities to practise.
- A formative assessment opportunity to guide decisions about the teaching and student practice needed before moving on.

Revisit and review

Key strategies	Key techniques
Identify what information to revisit and how you'll review it	Focus on knowledge and skills that will maximise learning progress Match techniques to the purpose of the review
Structure review opportunities to optimise active retrieval	Include regular, short, appropriately paced reviews (each lesson, weekly and monthly) Design review for high participation rates
Develop clear and well-structured review routines	Use a variety of review routines

Vary practice

Space and vary tasks for guided and independent student practise

Vary practice: What it is

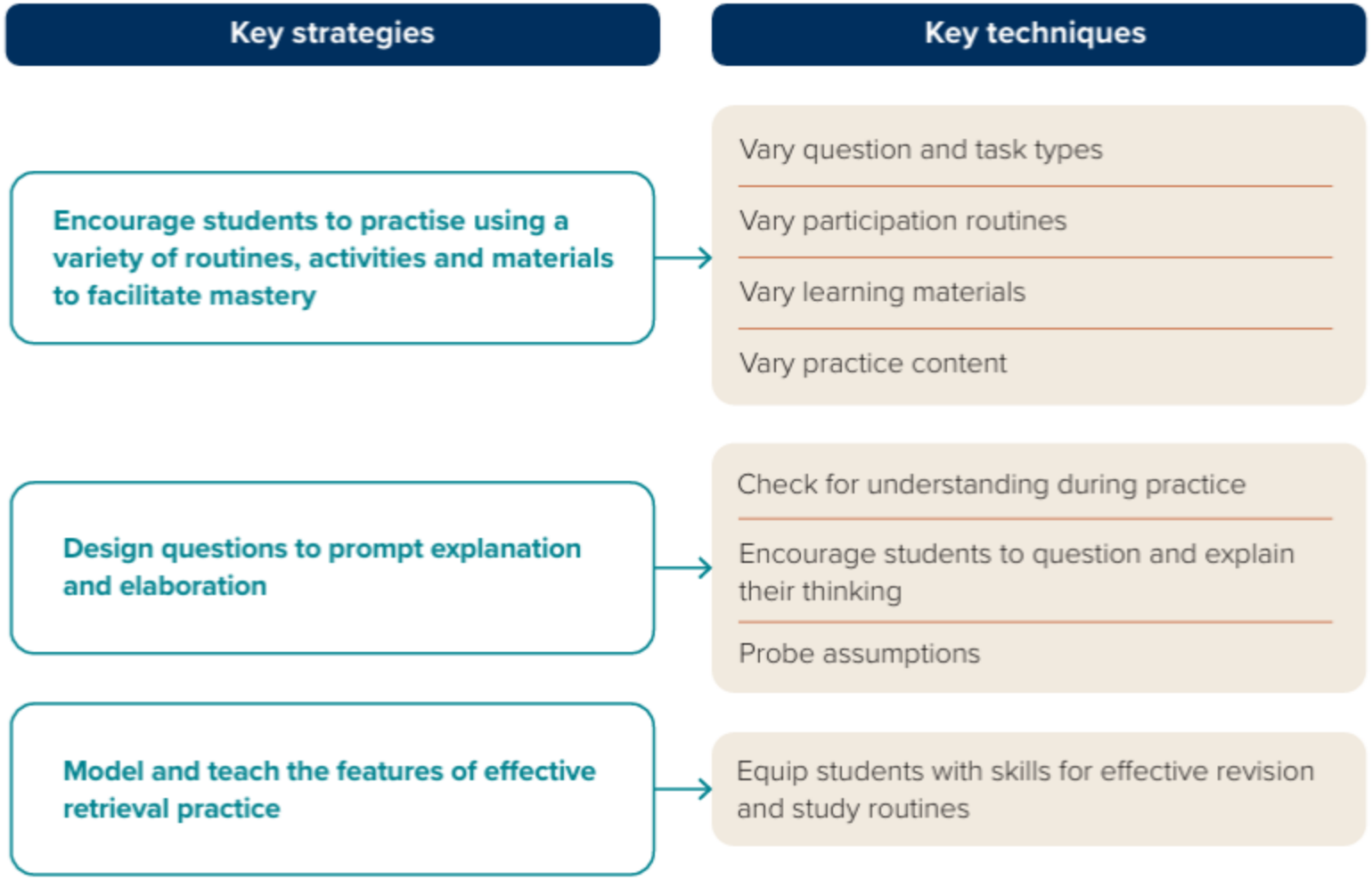
Providing multiple opportunities for students to consolidate their learning at spaced intervals.

Using learning and assessment tasks that vary how students interact with and apply what they're learning.

Explaining and modelling to students how spaced and varied practice supports their learning.

Explicit explanation and modelling to guide students' own development of effective approaches to learning.

Vary practice



Organise knowledge

Teach the connections between ideas using models and tasks that build in complexity, detail and abstraction

Organise knowledge: What it is

Applying a sequenced teaching and learning plan, building from concrete to abstract ideas and applications.

Making meaningful connections between the intended learning objectives and students' prior knowledge, skills and experiences.

Providing an overview of the topic or content and explicitly teaching the components of the topic to then relate back to the overview.

Creating opportunities for questions, sharing and testing knowledge, adjusting ideas and integrating new knowledge.

Organise knowledge

Key strategy	Key techniques
Connect and organise learning content during instruction	Encourage the use of advance organisers Integrate visual and textual or visual and verbal representations Demonstrate, narrate and think aloud Include examples and non-examples Connect familiar with unfamiliar content Build metacognitive knowledge

Extend and challenge

Provide appropriately challenging opportunities for students to apply, extend and demonstrate mastery of their learning

Extend and challenge: What it is

Designing learning activities following explicit teaching and practice that enable all students to transfer what they know and can do to new or unfamiliar problems, situations or contexts

Students using their knowledge and skills in increasingly complex situations, deepening their understanding and strengthening their skills

Providing opportunities for all students to demonstrate mastery of the knowledge and skills they've learned via problem-solving and real-world tasks

Extend and challenge

Key strategies	Key techniques
Provide tasks that allow students to develop and demonstrate mastery in unique ways	Use generative learning activities Provide open tasks relevant to students' prior knowledge and lives
Guide students to apply their learning with greater independence	Provide exemplars and frameworks for independent practice Model approaches to problem-solving Establish protocols for collaborative problem-solving Prompt and scaffold self-regulation and evaluation

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