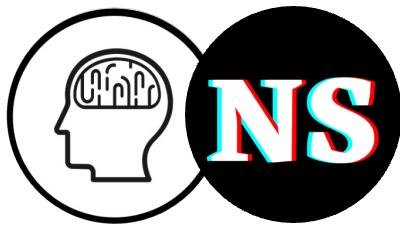


# The science of learning AND STUDENT AGENCY

**DR NATHANIEL SWAIN**

nathanielswain.com

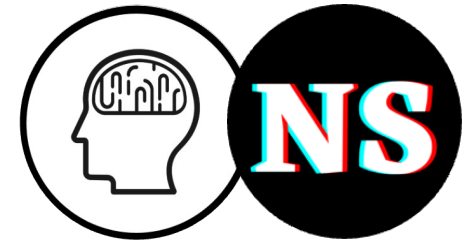


**SOLAR LAB**  
Science of Language  
and Reading Lab



# OVERVIEW

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Activating Prior Knowledge



Initial, explicit instruction



My wonderings



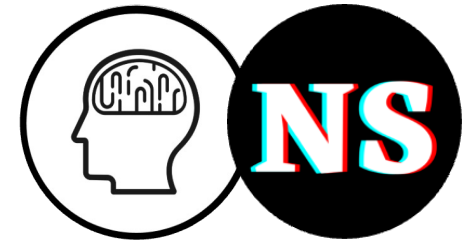
Guided discussion



Reflections and next steps

# OVERVIEW

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## Activating Prior Knowledge

Initial, explicit instruction

My wonderings

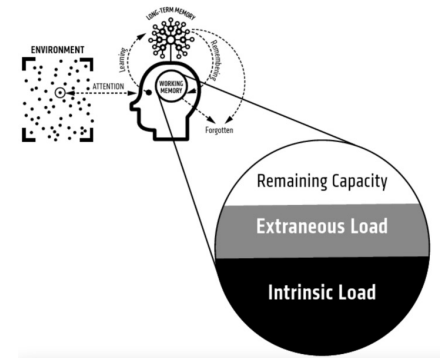
Guided discussion

Reflections and next steps

THE FUNDAMENTAL RECOMMENDATION OF CLT IS TO ...

**OPTIMISE INTRINSIC LOAD**

**AND MINIMISE EXTRANEEOUS LOAD**



# EXCELLENT INSTRUCTION

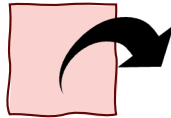
**ENGAGING**  
ENTERTAINING



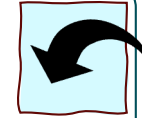
→ Engaging through teaching



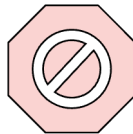
**INCLUSIVE**  
EXCLUSIVE



→ Inclusive: differentiation by support



**RESPONSIVE**  
DISMISSIVE



→ Responsive with the long-term in mind



# Knowledge and stories are the anchor point for building language and literacy

Can't teach vocabulary in a vacuum

Can't teach comprehension strategies in a vacuum

Knowledge-rich units, and narrative texts are strong anchor points for retention

Tricot, A., & Sweller, J. (2014). Domain-specific knowledge and why teaching generic skills does not work. *Educational Psychology Review*, 26(2), 265–283.  
<https://doi.org/10.1007/s10648-013-9243-1>



# Matthew Effect

The rich get richer, and the poor get poorer.

Stanovich, K. E. (2009). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Journal of education*, 189(1-2), 23-55.



# Peter Effect

I cannot give what I do not have.

Binks-Cantrell, E., Washburn, E. K., Joshi, R. M., & Hougen, M. (2012). Peter effect in the preparation of reading teachers. *Scientific studies of reading*, 16(6), 526-536.

**See Pamela Snow's work on this too.**

**EXPLICIT TEACHING PAVES WAY  
FOR INDEPENDENT INQUIRY..**



Pearson and Swain:

“Students should **inquire** from  
a place of knowledge”

Knowledge is **what we think with** (see [Ashman](#))

Creativity & critical thinking is **domain-specific** (see Tricot and Sweller)



There is a tributary going to the river.

The rocks are to show peoples houses.

Irrigation of crops next to the river

There is fish in the ocean

cool!

Well done!



The source of the river is at the base of the mountain.

trap and bush along the river.

There is a bridge.

There is a boat made from leaves next to the bridge

People here somewhere why do people settle close to rivers?

river going in to the ocean.

The mouth of the river where the river goes out to the ocean

Brandon Park Primary School, 2022  
Year 4 Student of Mrs Georgia Pattie

### Mode A

- You Explain
- You Model
- They practise
- Check and give feedback
- Test them. And again a bit later.

80%

### Mode B

- Explore; Discover
- Hands-on Experience
- Inspire some AWE
- Go off-piste
- Make things; do projects; set open-ended tasks, give choices,

20%



<https://teacherhead.com/2018/04/22/mode-a-mode-b-effective-teaching-and-a-rich-enacted-curriculum/>

teacherhead.com

# WHITEBOARDS



Dr Nathaniel Swain 2024

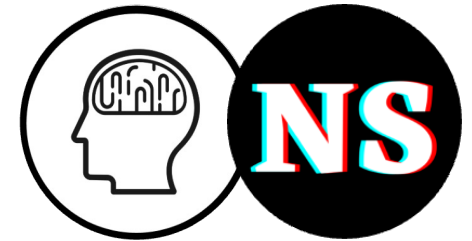
[www.nathanielswain.com](http://www.nathanielswain.com)

SOLAR LAB  
Science of Language  
and Reading Lab



# OVERVIEW

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Activating Prior Knowledge

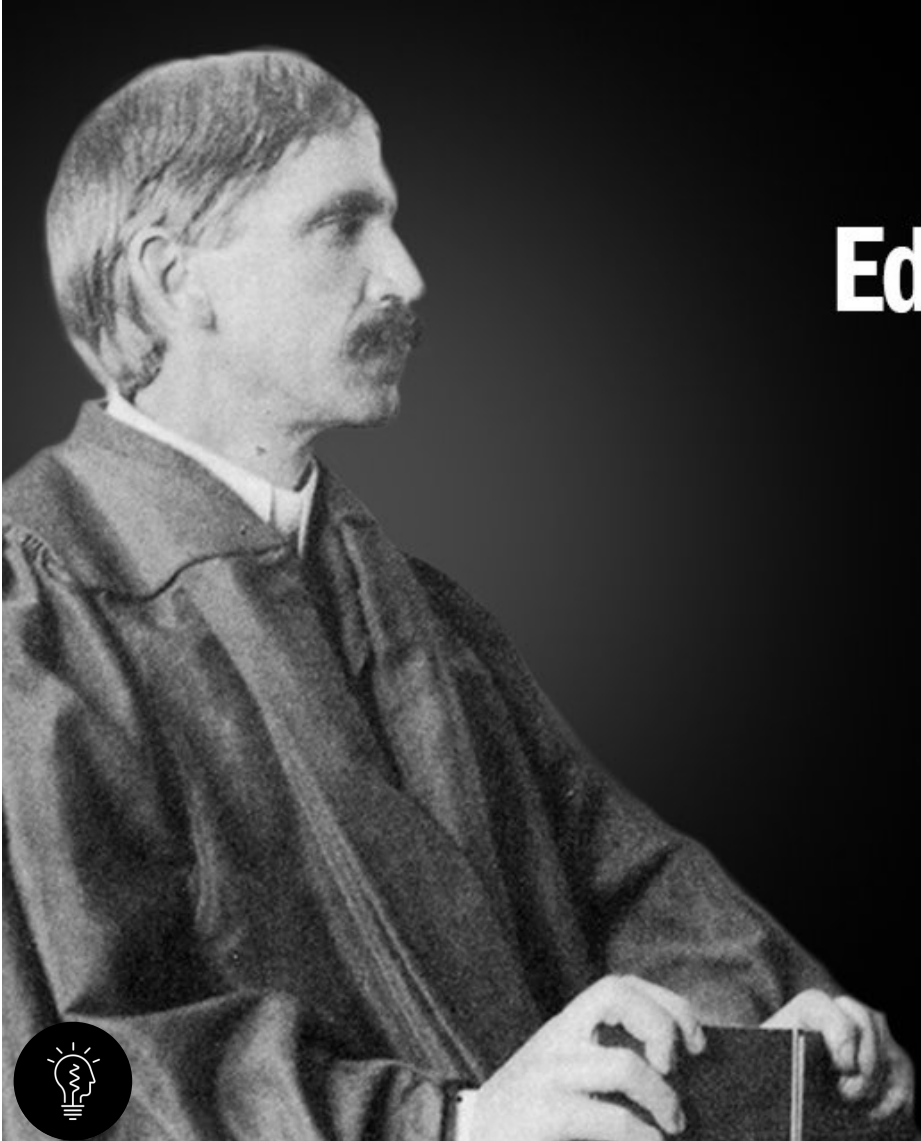


Initial, explicit instruction

My wonderings

Guided discussion

Reflections and next steps

A black and white profile photograph of John Dewey, a man with a mustache, wearing a dark suit jacket over a white shirt. He is looking to the right.

**Education** is not an affair of  
'telling' and being told,  
but an **active and**  
**constructive process.**

— *John Dewey*

AZ QUOTES



# Paulo Friere – Critique of ‘Banking’ Model

“

Narration ... leads the students to memorize mechanically the narrated content. Worse yet, it turns them into “containers” ...to be “filled” by the teacher. The more completely she fills the receptacles, the better a teacher she is.

Analysis Paper 63 | February 2024

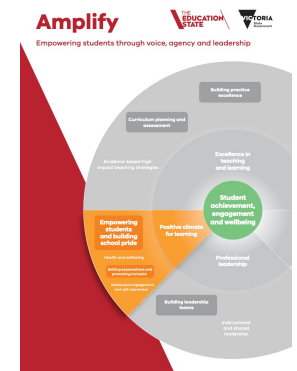
**WHAT IS THE  
SCIENCE OF LEARNING?**

Trisha Jha



***Educating for the unknown, far from an unapproachable paradox, can be an alluring and inspiring agenda. Rather than counselling despair, educating for the unknown favours a vision of learning aggressive in its effort to foster curiosity, enlightenment, empowerment and responsibility in a complex and dynamic world. It favours a broad and visionary reach for meaningful learning.***

**(David Perkins, 2014)**





Students with a strong sense of agency...

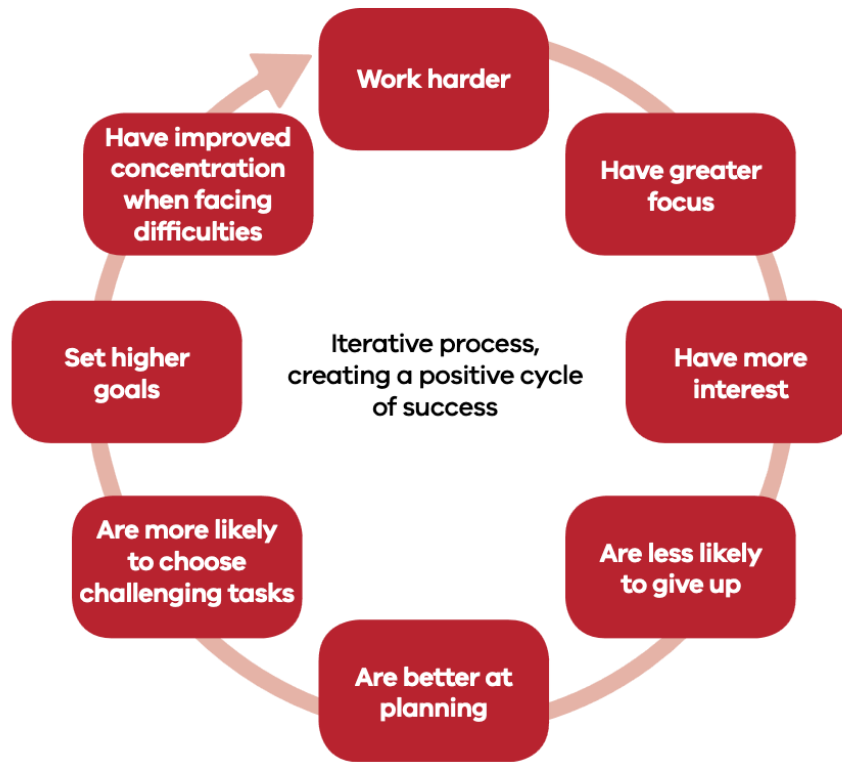
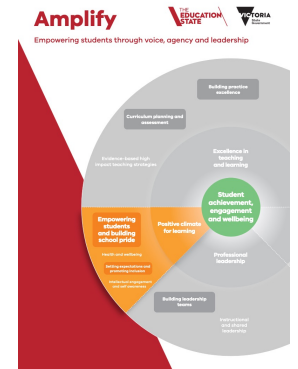
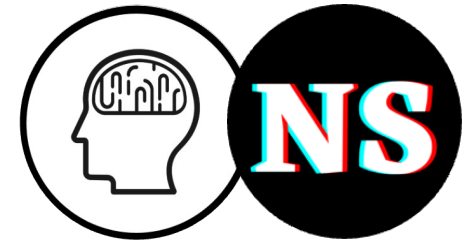


Figure 2: Generating a positive cycle of learning (Johnston, 2004)



# OVERVIEW

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# 3 possible reasons to increase agency and voice

**Individualise and personalise**

**Avoid imposition of ‘pre-determined knowledge’**

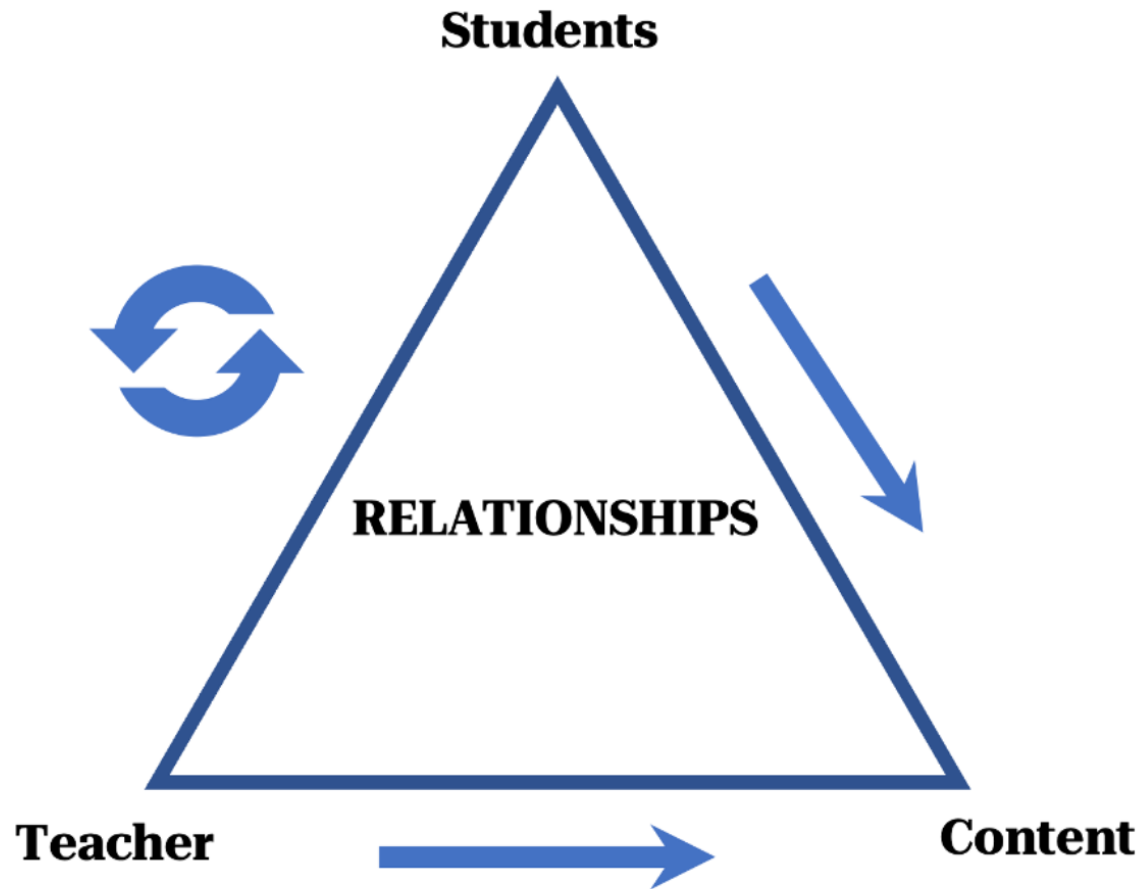
**Build relationships; make it *relevant***



# Shouldn't learning always be fun???

- **Many schools push the priority that learning should always be fun.**
  - Critical View: Not all learning is *always* fun
  - Lemov (2020) : But joy is there!
- **Teacher's role: maximise opportunities for success and building a culture that values hard work, persistence, and error**
- **When things get hard for students ... We cannot be pressured to lower the bar.**
  - Instead - do the work to get your students experiencing success and a sense of trust and being valued.
  - Add supports, break it down, build it back up



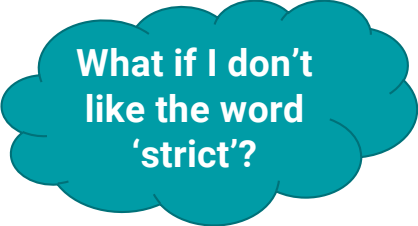


Adeyemi Stenbridge's Triangle

The [Adeyemi Stenbridge Triangle](#) highlights the interconnected relationships between students, teachers, and content in the learning process.

# HIGH EXPECTATIONS

## TLAC TECHNIQUE 61 WARM/STRICT



What if I don't like the word 'strict'?

### The "Warm" Aspect:

1. Building positive relationships with students
2. Demonstrating care, empathy, and respect
3. Creating a supportive and welcoming classroom environment

### The "Strict" Aspect:

1. Setting clear expectations and boundaries
2. Establishing consistent rules and consequences
3. Providing a structured and disciplined learning environment

### **Combining Warmth and High Expectations:**

1. Believing in students' potential and capabilities
2. Supporting student growth and achievement
3. Creating a conducive learning environment for academic and social success

# PAIR SHARE



# A note on individual goal setting





# What can *actually* increase agency and voice

- Great teaching
- Knowledge rich curriculum
- Informed choice on:
  - Aspects of applied learning
  - Subject decisions



# **We need informed choice in education**

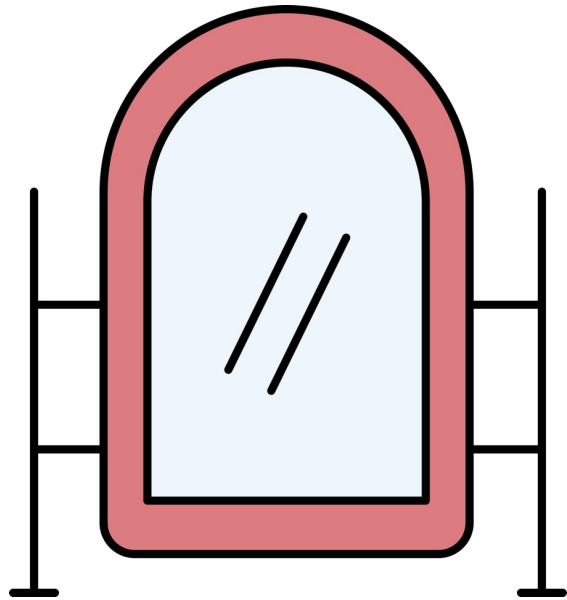
# *Whose curriculum?*

What knowledge is worth teaching?

How do we decide?

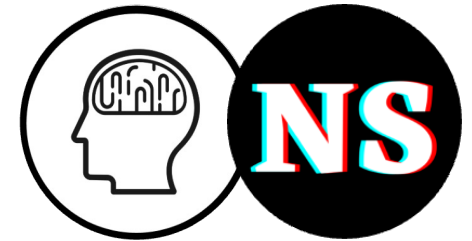
Can we avoid these decisions any longer?





# OVERVIEW

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Activating Prior Knowledge

Initial, explicit instruction

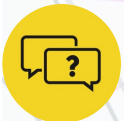
My wonderings



Guided discussion

Reflections and next steps

# PAIR SHARE



# Student Voice – Any Conflicts with SoL?



- Provide opportunities for students to give feedback to peers and teachers.
- Use student feedback to diagnose issues and inform practice improvement.
- Promote dialogue as a means of learning.
- Ensure there are opportunities for regular small group or whole class discussions that create inclusive opportunities for students to share their learning interests and assessment preferences.
- Explicitly teach collaborative learning skills where students actively participate in negotiating roles, responsibilities and outcomes.
- Design learning activities which incorporate student interests and extend learning beyond the school.
- Use exit cards at the end of each lesson to confirm progress on learning and assess student engagement (e.g. what did you learn today, what questions do you have).
- Discuss feedback one-to-one with students to stimulate their thinking about learning, and provide opportunities for them to ask questions and provide input.
- Use three-way conferences (parent, teacher and student) or peer reviews to provide feedback on pieces of work and learning progress



# Student Agency – Any Conflicts with SoL?



- Develop skills and competencies that assist students to set their own goals and direct their own day- to-day learning. (See Case Study 2).
- Adopt project-based learning strategies that support students to explore real world topics deeply.
- Provide students with peer learning opportunities through which they become mentors of other students.
- Try a ‘Design for Change’ project in which students go through the design process of creating a new product or service for other people.





# DISCUSSION



# TO RESPOND TO STUDENT NEEDS SHOULD WE:

(A) CATER TO STUDENT **INTEREST**, OR (B) BUILD STUDENT **FOCUS AND CAPABILITY** ?

---

*In both of these classes, students are not enthusiastic about or confident with writing.*

**TEACHER A -  
ANASTASIJA**

**TEACHER B -  
KIARA**

# TO RESPOND TO STUDENT NEEDS SHOULD WE:

(A) CATER TO STUDENT **INTEREST**, OR (B) BUILD STUDENT **FOCUS AND CAPABILITY** ?

---

*Both teachers below face a common challenge: their students are not enthusiastic about or confident with writing. However, they each try a different approach to address this issue.*

## **TEACHER A - ANASTASIJA**

Anastasija noticing the lack of student interest in writing, decides to tap into their students' passion for Marvel Heroes. Believing that incorporating their interests will make writing more enjoyable and meaningful, Anastasija enthusiastically shares their plan with the class.

Despite Anastasija's initial enthusiasm and efforts to engage the students with writing through Marvel Heroes, the outcomes were not as expected.

The students did write some piecemeal stories about their favourite heroes, but the writing tasks lacked depth, structure, and meaningful learning experiences. As the days passed, it became evident that the students were not growing as writers, and their motivation for writing remained stagnant.

## **TEACHER B - KIARA**

Kiara, understanding the struggle her students faced with writing, decides to take a gradual and supportive approach to build their writing skills.

"Students, I know that writing can be challenging and overwhelming at times... But we can figure it out together step by step! We'll start by focusing on one aspect at a time, and once we feel confident in that aspect, we'll add more elements. And we'll celebrate every success along the way"

As the weeks passed, Kiara's step-by-step approach and individualised support proved useful, as the students' writing skills flourished, and their newfound confidence and motivation for writing came through in the imaginative stories they crafted.

**IT'S NOT ONE-SIZE-FITS-ALL!!**  
**IT'S ADAPTIVE TEACHING**

**ALTERNATIVE TO  
DIFFERENTIATION**

- **PLANNING FOR WHOLE-CLASS SUCCESS IN LEARNING OUTCOMES**
- **AND REAL-TIME CHANGES TO LESSON**
  - Delivery
  - Questioning
  - Scaffolds for tasks
- **BASED ON HOW STUDENTS ARE UNDERSTANDING/PERFORMING**

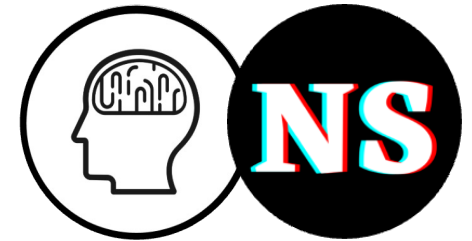
[SEE THIS BLOG ON THE EDUCATION ENDOWMENT FOUNDATION WEBSITE.](#)

# WHITEBOARDS



# OVERVIEW

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Activating Prior Knowledge

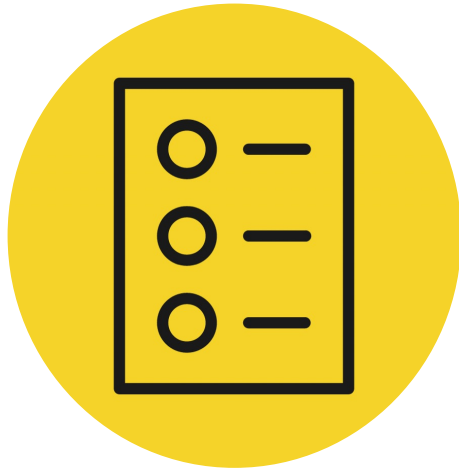
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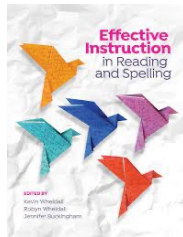
## PROVOCATIONS

1. Can we foster agency with a low variance curriculum?
2. What are legitimate, useful ways to include choice?
3. How do we counter the one-size-fits-all critique?

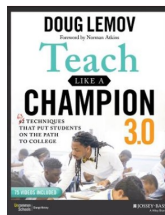
# SOME READING



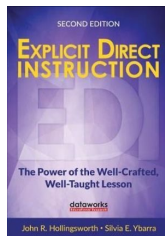
Kirschner, P., & Hendrick, C. (2020). *How Learning Happens: Seminal Works In Educational Psychology and What They Mean In Practice*. Routledge.



Wheldall, Wheldall and Buckingham (2023). *Effective Instruction In Reading And Spelling*. MRU Press.



Lemov, D. (2021). *Teach like a champion 3.0: 63 Techniques that Put Students on the Path to College*. John Wiley & Sons.



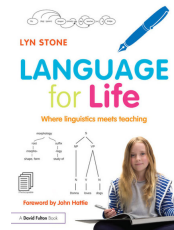
Hollingsworth, J. R., & Ybarra, S. E. (2017). *Explicit direct instruction (EDI): The power of the well-crafted, well-taught lesson*. Corwin Press.



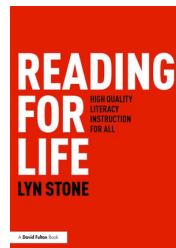
# OTHER GREAT TEXTS



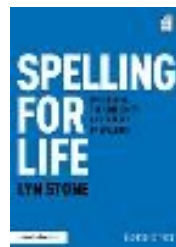
Wheldall, Wheldall and Buckingham (2023). *Effective Instruction In Reading And Spelling*. MRU Press.



Stone, L. *Language for life: where linguistics meets teaching*.



Stone, L. *Reading for Life: High Quality Literacy Instruction for All*.



Stone, L. *Spelling for Life: Uncovering the Simplicity and Science of Spelling*.

# **HARNESSING THE SCIENCE OF LEARNING**

Success stories to kickstart  
your school improvement





**SOLAR LAB**  
Science of Language  
and Reading Lab



ACCESS SLIDES,  
STAY IN TOUCH

# DR NATHANIEL SWAIN

@NathanielRSwain

SENIOR LECTURER – LEARNING SCIENCES AND  
LEARNER ENGAGEMENT



Cognitorium



# MORE RESOURCES

## FURTHER READINGS

- ROSENSHINE'S PRINCIPLES (INTRO) SHERRINGTON CHAPTER.
- INTRODUCTION; CHAPTER 1 DISCIPLINE. DEFINITION AND PROTOCOLS IN ROGERS (2012). YOU KNOW THE FAIR RULE: STRATEGIES FOR POSITIVE AND EFFECTIVE BEHAVIOUR MANAGEMENT AND DISCIPLINE IN SCHOOLS.
- INTRODUCTION. IN DAHAENE, S. (2020) *HOW WE LEARN*.

## FURTHER RESOURCES

- LIST OF READINGS AND THEORIES ON MOTIVATION, [CURATED BY PEPS MCCRAE](#):
- BLOG POST ON [DAHAENE'S FOUR PILLARS OF LEARNING](#)
- [EVIDENCE SNACKS](#) FROM PEPS MCCRAE
- TOM SHERRINGTON ON [WHAT MAKES A GREAT TEACHER](#)
- BALLARAT TEACHER AND ASSISTANT PRINCIPAL, [GREG ASHMAN'S BLOG FILLING THE PAIL](#)
- [VIDEO ON GAINING ATTENTION](#) FROM BILL ROGERS

# MORE RESOURCES

## FURTHER READINGS AND RESOURCES

- CHECK OUT THESE VIDEOS ON CFUS AND EXPLICIT INSTRUCTION FROM [OCHRE EDUCATION](#)
- READ [PART 1: THE A, B, C, D, E OF CLT](#) IN LOVELL (2020). SWELLER'S COGNITIVE LOAD THEORY IN ACTION.
- WATCH THIS OVERVIEW OF COGNITIVE LOAD THEORY: [\[HTTPS://WWW.YOUTUBE.COM/WATCH?V=UPA6RDE0AYO\]](https://www.youtube.com/watch?v=UPA6RDE0AYO)
- NSW CESE [GUIDE TO CLT](#)
- A BLOG POST ON [BRIGHTEN THE LINES](#)
- A TEACHER'S [GUIDE TO RETRIEVAL PRACTICE](#).
- TWO BLOG POSTS ON CFU: [TEACHER HEAD](#), AND [HEAD GURU TEACHER](#).
- IDEAS FOR [CLASSROOM SEATING ARRANGEMENTS](#)