In Action Series, ed. Tom Sherrington, summary by Helen Reynolds @itsalearningcurve.education

Book/theory	Main points	Do this
Rosenshine's Principles – Rosenshine (1982) Author: **Tom Sherrington**, July, 2020 Contribution: **Direct instruction (di)**	• 10 Principles: Daily review, small steps, ask questions, provide models, provide practice, check for understanding, high success rate, scaffold difficult tasks, indep. Practices, weekly/monthly review • 4 strands: 1. Sequencing concepts and modelling – present material in small steps, give clear/detailed instructions/explanations, think aloud/model steps, many examples, re-teach when necessary 2. Questioning – ask a LOT of questions, get them to explain what they've learned, check response of ALL, provide systematic feedback and corrections, 3. Reviewing material - begin with a review of previous learning, re-teach if necessary, 4. Stages of practice – high level of practice, guided at first, prep and monitor independence practice	• link abstract to concrete/tacit • use writing frames/scaffolds • anticipate errors/misconceptions • plan questions and answers to check for the understanding you want • revisit list of 'probes' often • 'what have you understood' • review in different formats • craft the transition to independent practice/work
Generative Learning – Fiorella & Mayer (2015) Authors: **Zoe & Mark Enser**, Oct 2020 Contribution: **Generative learning concept**	• Generative learning involves 'making sense' of our experience by testing it against what we already know (constructing schema). • SOI = Select, Organise, Integrate (Mayer's model of memory) = generating learning, but taking into account cognitive load • Mighty 'Ms' = metacognition and motivation, to promote self-efficacy and independence/motivation • Use SOI to structure all the strategies w/effect size/e.g.: 1. Teaching/0.77, get them to teach others 2. Imagining/0.65, actively try to make a mental model 3. Mapping/ 0.62, use half-filled in maps, 3. Self-testing/0.62, make flash cards, SLOP 5. Self-explaining/0.61, self-Socratic questioning 6. Enacting/ 0.51, concrete models to help concrete-abstract 7. Summarising/0.5, Cornell notes 8. Drawing/ 0.4, turn text into drawings • Make sure they have the requisite background knowledge to implement the strategies to avoid misconceptions • (from my reading of original F &M) notice the Boundary Conditions of any study that is cited	• make the metacognition explicit as they're working • introduce SOI • teach effective note taking • use video clips as opportunities to practice summarizing • longer infrequent summaries > short and often • use concept maps, knowledge maps, graphic organizers (@olicav book) • prefill maps to reduce cl • uses as spaced learning • use gesturing/encourage enacting • try structured self-explaining • try structured imagining
Cognitive Load Theory - John Sweller (1988) Author: **Oliver Lovell,** Oct 2020 Contribution**: Cognitive load theory**	• *CLT is the single most important thing for teachers to know* – Daniel Willingham (• Maximize learning: reduce extraneous load, optimize intrinsic load • Purpose of instruction is to increase knowledge in long-term memory • Think about cognitive load (CL) in terms of: ○ **A**rchitecture – environment = unlimited external store of info, LTM = unlimited internal store, WM is limited, new info takes lots of WM ○ **B**iology – bio primary = speaking, faces etc. is automatic (can't be taught), bio secondary = reading, math etc is not (has to be taught), ○ **C**ategorization – of load into intrinsic CL, ICL (due to nature of task) – reduce by keeping as simple as possible , extraneous CL, ECL (not to do with the task), monitor WM overload due to both ○ **D**omains – domain-general skills = bio primary, domain-specific skills = bio secondary, experts have domain-specific knowledge that novices don't have, so can't use same strategies for novices as for experts, expertise-reversal effect – novices need worked examples not problem solving (or they're slowed down), experts need the opposite, can learn with/from more ECL/more variation ○ **E**lements – element interactivity = source of CL associated with elements + level of complexity of interactions • In reducing ECL, redundancy will mean ECL (more for experts than novices), use modality effect - brain uses parallel visual/auditory channels in parallel which helps WM = dual-coding when in LTM	• use practice to move to ltm • don't confuse bio primary and bio secondary • optimize icl through ○ good curriculum sequencing ○ pre-teaching vocab/ content/skills ○ chunking/break down skills (part→whole) ○ overview first (whole→part) ○ chaining: forwards – teach skills in order they will meet them, or backwards ○ snowball – pick up previous stuff ○ manipulate the emphasis to suit task • reduce ecl ○ stop talking when they're reading ○ integrate text with images ○ remember split-attention effect ○ remember transient effect ○ remember modality effect ○ do an example then get them to do similar one immediately so they 'borrow from an expert' ○ make worksheets that include self-explanation of how to solve problems ○ use more goal-free problems (with restricted actions, rapid feedback) to reduce element interactivity, focus on learning

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Cognitive Apprenticeship Collins et all (1991)
 	
Author: **John Tomsett**, Feb 2021
 	
Contribution: **Assimilation theory**
	• Expert physicists: identify essential features, and what to ignore, then codify the essential features into physics model, then work logically to solve it.
	A cognitive apprenticeship (Making Thinking Visible) environment has
	• Subject content: 1. Domain knowledge 2. Strategic knowledge = heuristics (tricks of the trade)/control (using metacognition) +how to learn heuristics or metacognitive strategies
	• Teaching methods: 1. Changing their brains with modelling (externalizing the internal)/coaching (helping them)/ scaffolding (providing support) 2. Developing their skills with articulation (answering questions, talking about strategies) / reflection (comparing to experts or other students) 3. Encourage autonomy with exploration (trying it on their own)
	• Sequencing: 1. Global (map of the terrain) before local (tasks or bits of task) 2. Increasing complexity (skills need are harder) 3. Increasing diversity (lots of different skills are needed)
	• Sociology: 1. Situated learning (contexts should reflect the uses of knowledge in the domain) 2. Community of practice (sharing experience) 3. Motivation (becomes intrinsic in a community, they set personal goals) 4. Cooperation (working together to achieve goals)
		• tell students what you think when you start a problem specifically:
		  ○ how you identify the essential
		  ○ how you codify
		  ○ how you solve (not just this one)
		• be explicit about heuristics/metacognition
		• start with an overview – zoom in/zoom out
		• *deliberately* decide types and order of tasks
		• explicitly coach them
		• be able to articulate why the environment you create promotes cognitive apprenticeship
		• focus on what it means to 'see it like I see it'

MARGE Model of Learning Shimamura (2018) Author: **Nimish Lad**, July 2021 Contribution: **MARGE model**	• Learning = our ability to acquire knowledge from sensory experiences • Treat you subject as a tour and you are the guide • Can be perceptual - senses, conceptual – new info linked to prior K, skill – sport, music • Can be bottom-up using senses, inefficient, or top-down so prior K guides assimilation, efficient • **M**otivate – help them expand the spectrum of 'pleasure-seeking' experiences/get them to push themselves to explore new stuff • **A**ttend – attention requires effort, they need to know what to attend to, have ways to attend, reasons to attend • **R**elate – things stick when we can relate them to prion K so as to securing in LTM, or have places to put them in cognitive architecture • **G**enerate – memories are long-lasting if they are reactivated, or elaborated on after initial learning, use it or lose it • **E**valuate – 'how do I know I've learned it?' metacognition important to develop, help them with self-regulatory strategies, distinguish between 'recollection' and 'familiarity' ≠ knowledge	• ask big picture questions • tell stories • ask questions that need an emotional response e.g. ethics • ask qs about new places/ideas • make learning goals explicit • when chunking don't make it unrecognizable/overcomplicate • do linking with compare/ contrast/ categorize • visual images/metaphors stick • use graphic organizers • get them talking to each other • use Frayer model • teach difference between knowing and illusion of knowing
Five Formative Assessment Strategies Wiliam and Leahy (2015) Author: **Kate Jones**, Sept 2021 Contribution **Formative assessment**	• FA = range of evidence-informed strategies we use to support learners to make progress, informs both, teacher/learner/peer: TLP • Where are we going? – TLP – clarifying, sharing, understanding learning intentions and success criteria, LIs may cover many lessons, should be clear, specific, desirably difficult, SC should be transparent, checked regularly with retrieval practice, beware toxic mutation = doing it every lesson, telling them exactly so it's no fun • What do they know? – T – engineering effective discussions, tasks, activities, RP, TLAC strategies, discussion SHAPE Sentences, Hand away from mouth, Articulate, Project, Eye contact + elaboration works, use MWBs often, care with MCQs, • How should we feed back? – T – they don't necessarily learn what we teach them, good feedback is acted on by the learner, should be understandable, helpful, actionable, Inside the Black Box/comment *only* marking, only grade when absolutely necessary, online works too • How can they collaborate/assess each other? – S – collaboration/ peer tutoring/peer assessment can save time, enhance learning, be motivating, focus on Kind, Specific, Helpful feedback • How can they own their own learning? – S – we work towards our own redundancy, they leave with passion, teach metacognition and self-regulation skills, online tools can help	• use Big Question for LIs • make LI context free • check for clarity, difficulty of SC • check with RP/spaced/varied • use Austin's butterfly/peers • use TLAC techniques for questions • get more talk, use SHAPE • elaborate from MWB answers • use hinge questions for MCQ • use 25% each: mark in detail, skim, self-assess + check, peer assess • use detective work strategy • redraft/redo, rehearse/repeat, revisit/respond, re-learn/re-test, research/record (Sherrington) • use peer placement mats • use think/pair/share, paired retrieval • teach plan/monitor/evaluate • use online Carousel, Seneca

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An Ethic of Excellence Ron Berger (2003) Author: **Sonia Thompson**, Feb 2022 Contribution: **Austin's Butterfly**	• Austin's butterfly = don't accept mediocrity, especially from the disadvantaged, great model of critique and revision, how to give specific feedback, power of perseverance, power of pushing on, • Culture of excellence –ethics/values that compel students to achieve more, engender culture so it's cool to care about academic excellence, evidence informed practice = best research evidence + context + teacher experience • Work of excellence – make modelling exemplify success criteria, make multiple drafts with time/guiding/collaboration produce evidence of progress, make goal of critique sharing knowledge and skills to get fluency, make work public to value/appreciate/raise the bar/witness • Teaching of excellence – teaching is hard, doing it well needs reading/ researching/observing others/finding best practice	• go for widespread equitable routines/procedures • love learning and show it • use models and intermediate steps • use critiquing of models/steps • give time for comments • beware expertise reversal effect • talk about fluency as explicit goal • 'name it to know it' • relish the scholarship needed to teach well
The Extended Mind – Annie Murphy Paul (2022) Authors: **D. Goodwin, E. Turner, O. Caviglioli,** May 2022 Contribution: **Embodied cognition**	• cognition extends beyond the brain to the body tools, environments • 4 cognitions: 1. Embodied - gestures enhance thinking and learning as movement (congruent, novel, self-referential, metaphorical) helps memory, the body stores information (interoception), capacity to regulate attention/behaviour/ movement is limited – cognitive load 2.Situated – external representations reduce transience/integrate cognitive loops, including drawing/note-taking/mapping, you do more, more tools, extend working memory we record memories like spaces, larger spaces reduce cognitive load 3. Distributed – running our thoughts through others' minds, cognitive apprenticeship, Lemov STAR, paired teaching/retrieval, 4. Integrated – intelligence=interactions brain/body/space/others, fluid (rises then declines) vs. crystallized intelligence (grows with effort)	• big up my use of gestures/get them to try it – plan for that • watch their gestures movement for information • finger tracing of maps/graphs • remember CL and stillness • utilize situation- transient effect • use manipulatives (maps etc.) • think about use of physical space • care confirmation bias • make my expert thinking visible • learn how to do good group work • more saying out loud
Strengthening the Student Toolbox – Dunlosky (2013) Author: **Amarbeer Singh Gill**, June 2022 Contribution: **Strategies that work**	• Research identified 'spectrum of effectiveness' • There are few 'bad' strategies – less effective strategies done well >> more effective strategies done badly. • Willingham's model of learning means we should expect forgetting • Learning is invisible and is a permanent change in LTM Most effective strategies (reviewed by Dunlosky) are: • 1/2. Practice testing/Distributed practice = very effective in lots of formats/ages/prior knowledge/subjects/levels. 2. Interleaved practice = effective in maths/concept learning (needs more research (NMR)) 3.. Elaborative interrogation- NMR 4. Self-explanation – NMR 5. Rereading – distributed rereading ok, but time could be better spent 6. Highlighting and underlining – not very effective, can be a stepping stone 7. Summarisation – they must be taught how to do it, may not be worth time 8. Keyword mnemonic – short lived use in languages 9. Imagery for text – benefits limited to image laden text, NMR.	• teach students to consciously choose an effective strategy • plan for forgetting • don't confuse good retrieval strength for learning • plan to improve storage strength through testing with feedback (immediate + delayed) • space out testing, tell them • interleave within the subject • use similarities/differences • make sure question order is not predictable
Meaningful Learning – Ausubel (1963) Author: **Sarah Cottinghatt**, July 2023 Contribution: **Assimilation theory**	• Goal – students develop a body of knowledge (BoK) (vast, connected, organised, stable…) • Meaningful learning (ML) = connecting new information to existing knowledge to make new meaning in the minds of students (which we can't see) – happens through assimilation → meaningful forgetting, leaving accessible and dissociable residue • BoKs have hierarchy: subsumers (generalised/inclusive ideas) assimilate details = subsumptive learning. • Initial meaning not enough – must integrate under correct subsumer • Existing knowledge = cognitive structure determines speed/ quality of ML, to do so requires effort. • Organizers can help: advance/ expository/ comparative ONLY if info is not already well organized. It is links that make meaning – be explicit • Checking for meaning (reprhased) ≠ checking for understanding (verbatim or as expected on rubrics), Keeping meaning alive = meaningful forgetting, needs review to stabilize memories	• teach/indicate subsumers at start/end • make similarities/ differences explicit to get under correct subsumer • check for needed prior knowledge • make links explicit • identify subsumers at each level • use organizers • use self-explanation and concept mapping • use recapping, re-reading, retrieval practice • tell students why all this matters

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Desirable difficulties Bjork & Bjork (2011) Authors: **Jade Pearce, Isaac Moore,** March 2024 Contribution: **Desirable difficulties concept**	• Performance (during/soon after instruction) ≠ learning (change in LTM) • Storage strength in LTM ↑ when retrieval strength ↓ (by forgetting) • (undesirable difficulties: immediate performance ↓, learning ↓) • Desirable difficulties: immediate performance ↓, learning ↑ by 1. Spacing (spreading out teaching/testing - upset forgetting curve) 2. Varying conditions of practice (deeper understanding/ increased flexibility due to richer variety – NB they won't like this) 3. Interleaving (mixing different types of qs, egs challenges STM, but improves discrimination - short term performance ↓ LTM↑) 4. Practice testing (testing effect is strong + desirable if retrieving not recognizing so use MCQs with caution or add confidence weighting • Ss will NOT use desirable difficulties when working independently because 1. Those strategies impede performance 2. they judge their learning inaccurately 3. they think people are just smart 4. they do the easy thing because they don't know any different	• space homeworks/ tests/ make tests cumulative /revisit lessons • switch up conditions – the place (home/school) / time/ way materials are presented examples/ explanations • interleave content+ lots of varied compare/contrast • do effortful spaced retrieval practice over time with feedback they process • teach them why they should choose hard things
Self-Efficacy Theory Albert Bandura (1977) Authors: **Dr Neil Gilbride,** Jan 2025 Contribution: **Self-Efficacy Theory**	• Definition: "People's judgements of their abilities to organise and execute course of action required to attain designated types of performance": judgements may not be accurate. • Key research: how we interact with the environment/other people affects our behaviour (Social Learning Theory), what we believe about our ability affects our motivation, effort and success (Self-Efficacy SE), our learning and behaviour depends on personal/environmental factors/behaviour (Social Cognitive Theory) • You are more likely to act if you believe you will be successful • You can understand others' behaviour through the lens of self-efficacy • Interplay of SE specific to the domain or behaviour/we learn from watching others/self and environment interacting/agency can be developed (ours and others)/break the self-fulfilling prophecy cycle • SE is NOT: confidence (too general/ill-defined) or self-esteem (global evaluation/self-worth) • SE + Instruction design - insight: we learn by watching others (focus on attention, retention, reproduction, motivation, credibility) • SE + Understanding practice – insight: mastery and managing failure (focus on timing, chunking, scaffolding) • SE + Understanding behaviour – insight: SE affects behaviour and we can intervene (focus on using SE lens to interpret/intervene	• Remember definition! • SE is domain/behaviour specific • SE NOT fixed – modelling works • SE → Action → Agency → SE • SE is a lens to give us insights • Develop student belief they can enact the behaviour we want • Scaffolding helps bridge the lower SE at the start of learning • Failure must be normalised • Both the model and the teacher must have credibility • Success and motivation are bi-directional • Be explicit about how their actions/effort lead to success through feedback • Adjust behaviour with goal setting, role modelling, pep talk or practice
Hidden Lives of Learners Graham Nuthall (2007) Author: **Bennie Kara**, Dec 2025 Contribution: **'Three worlds of instruction/ Rule of Three'**	• Hard to judge teaching quality, there's many poor proxies for learning • Teacher gauging 'with-it-ness' in class cannot be replicated with AI • Students have 'unique learning fingerprint' from prior knowledge (PK) + experience (exp) + how they navigate their cognitive framework (CF) • Three worlds: Public (what the teacher sees), Social (roles students establish), Private (where they grow, learn, change beliefs - invisible) • ***'Rule of Three'*** – need to encounter learning material in at least 3 significant ways in order to learn it (3 or 4), 80-85% accurate • Determine PK= v. important, determine how S make meaning= v. hard • Engagement with cultures (social/academic) affects learning more than ability, need to be positive, in a safe space • Feedback: written comments, grade, verbal comments, tech based all have pros and cons, + group/peer/individual, metacognition vital • Individualisation = observing Ss, providing multiple entry points • 3 x via teacher-managed or self-generated impactful activities • Model culture of enquiry – make mistakes, be openly curious • Care with data (learning not linear), + with tech (lacks social factors) • No single method works, mix up direct instruction with interactions • Ethnicity ≠ ability, but diverse perspectives help to bridge gaps	• Use evidence-based, flexible methods + adapt to how Ss learn • Mini-whiteboards, cold-calling, show-telling access Private world • Address all 3 worlds in teaching • Plan for variation: PK, exp, CF • Use diagnostic tests, informal obs, misconceptions, metacognition to diagnose PK • Quality interactions > ability • Feedback should be frequent and diverse, not just summative • Talk about 'how they learned it' • Teaching = dynamic response to needs of all learners (PK, exp, CF) • Clear up misconceptions early • Avoid too much passive listening; optimise self-generated activities • Learning is multi-layered.