- For teachers who set practice, drill or rehearsal work

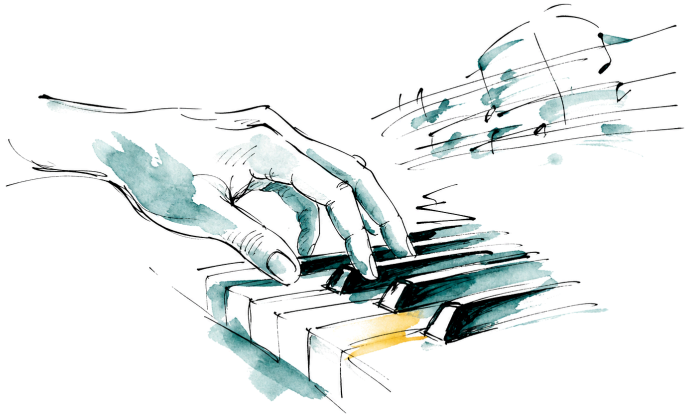
COGNITIVE SCIENCE: PRACTICE & SKILL-BUILDING

Practise the hard bit: what actually predicted better performance

Evidence from a university piano practice room, translated for any subject where learners drill a skill.

When your learners practise, do they replay the whole thing again, or hunt down the one bit that keeps going wrong?

In a study of 17 advanced piano majors, practice time and the number of repetitions didn't predict next-day performance, but pinpointing and repeating the exact hard bit until it was fixed did.



●●○ **Evidence: Promising**

Independent experimental replications across instruments and learners, testing whether deliberately practising difficult passages causes improvement.

Duke, Simmons & Cash (2009). 'It's Not How Much; It's How: Characteristics of Practice Behavior and Retention of Performance Skills.' Journal of Research in Music Education, 56(4), 310–321. doi.org/10.1177/0022429408328851

WHAT HAPPENED

It wasn't how much they practised. It was how.

Researchers observed 17 graduate and advanced-undergraduate piano majors learning a difficult three-bar passage from a Shostakovich concerto, then tested them the next day. Total practice time, the number of times they repeated the passage, and the number of complete run-throughs had no significant relationship with how well they played it back the following day. What did line up with next-day performance: how much of each attempt was played correctly, how often a full run-through was completely error-free, and how many mistakes crept in along the way.

Conventional benchmark: small link (r = .10)	**r = .10**
Conventional benchmark: medium link (r = .30)	**r = .30**
Found here: number of mistakes while practising	**r = .48**
Found here: % of all attempts correct	**r = −.51**
Found here: % of complete run-throughs correct	**r = −.71**

These are correlations (r), a standard way of measuring how closely two things track together, from −1 (perfectly opposite) to +1 (perfectly matched). Bars are scaled to the same axis, so length is directly comparable. By convention, r = .10 is read as a small link and .30 as medium. This study found links at or beyond that range between practice accuracy and next-day performance, and no significant link at all for practice time or repetition counts (no r reported for those, so they aren't plotted here).

Three moves that made practice count

1

Hunt down the exact spot

The higher-performing pianists identified precisely where and why each error happened, not just that it happened, then rehearsed and corrected that exact spot.

2

Vary the tempo on purpose

Tempo across practice attempts changed in a deliberate, logical way rather than staying fixed, consistent with slowing the hard bit down and building back up.

3

Repeat until it holds

The target passage was repeated until the error was corrected and the passage was stable, not simply played once and left.

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MAKE IT YOURS

Across your subjects and classes

This is one study of 17 advanced piano majors learning one short passage, not a classroom trial in your subject. What follows are sensible ways the "hunt down and drill the hard bit" pattern could translate to your subjects, worth trying, not proven for your specific class.

Subject	How it could translate
Maths	Instead of redoing a whole worksheet, learners identify the exact step where their method breaks down (e.g. carrying a digit, a sign error) and drill just that step until it holds.
English / spelling	Rather than rewriting a whole spelling list, learners isolate the letter pattern or word they keep getting wrong and repeat that one until it's fixed, not the whole list again.
Languages	Pinpoint the specific verb form or sound that keeps tripping a learner up, and drill that in isolation, varying the pace, rather than repeating a full sentence or dialogue.
PE / practical skills	Isolate the exact part of a technique that breaks down (the follow-through, the grip, the footwork) and drill that segment at varied speeds, rather than repeating the whole skill end to end.

Adapt it to the class in front of you

Quieter or less confident classes

Isolating one small, named "hard bit" is lower-stakes than being asked to redo a whole piece of work; it narrows what they have to get right next.

Livelier or lower-attaining classes

A short, specific target ("just this line," "just this step") is easier to sustain focus on than an open-ended "practise it again."

Top set or higher-attaining group

An easy place to start: ask learners to name their own hard bit before they practise, then check whether they actually drilled that bit or just repeated everything.

EAL or SEND learners

This study didn't test SEND or EAL learners specifically, a genuine gap. Isolating one small target may help reduce load, but treat it as worth testing individually rather than assumed to help.

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HOW SOLID IS THIS?

A real signal, from one small study of one instrument

Developing

This rates the evidence's firmness, not our endorsement of the idea. A carefully measured, peer-reviewed study with real numbers reported, but small, single-domain, and not a controlled experiment.

- Small sample, one task: 17 pianists learning one three-bar passage. It doesn't tell us this holds for other instruments, other subjects, or larger groups.
- Correlation, not an experiment: no one was randomly assigned to practise "well" or "badly." The study measured what higher and lower performers already did; it can't prove the strategies alone caused the better performance.
- One sitting, one overnight test: performance was checked the next day, not weeks or months later, so it says nothing about longer-term retention.

What that means for you: treat "hunt down and drill the hard bit" as a promising, well-measured pattern worth trying with your own learners and watching closely, not as a proven method for every subject or age group.

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TRY IT THIS WEEK

Your first small step

THIS WEEK

Before your next practice task, ask learners to name their own "hard bit" first. Then have them drill only that, varying the pace, until it holds, rather than repeating the whole piece of work again.

Try it and watch: notice whether learners who named and drilled their hard bit make fewer of that same mistake next lesson, compared with learners who just repeated the whole task. That's your own evidence, not just the study's. The study's own conclusion: *"the strategies employed during practice were more determinative of performance quality at retention than was how much or how long the pianists practiced."*

Go deeper

Retrieval practice: a teacher's guide · structural-learning.com/post/retrieval-practice-a-teachers-guide

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