Becoming an Expert Teacher (2026) by *Nidhi Sachdeva and Paul Kirschner*

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Content	Do This/Thoughts
Preface: Teaching is consequential but 'expert' is ill-defined, little research. Expertise (E) in sport/medicine (unlike teaching) cultivated deliberately using sustained practice + feedback, in teaching →strategies/programs, not developing E. Teaching at intersection → scientific knowledge (K) (cogpsy/edsci/learning) & professional craft (develops over time, translates K to practice), E = integration of both. Research on E: Anders Ericsson's work E ≠ innate talent/experience, E=long term development based on domain K (DK) → E is accessible to many. Across domains E *not* about time or repetition, *not* automatic, needs deliberate practice (DP) to transform experience to E, *not* an add-on – DP *is* the mechanism for E.	• Evidence says teaching quality matters (matters most to most vulnerable → equity issue) • Treat like other professions in terms of developing expertise, think of as adaptive performance • Experts *not* like novices (N) in: their practice, use of feedback, how they refine performance • Profound difference between experience and E, not just efficiency/confidence
1. Why does expertise in teaching matter, & why do we need to talk about it? Teaching directly influences student outcomes (& teacher (T) student (S) satisfaction). Good teaching (competent to plan/teach/assess) vs great (able to spot patterns/use deep K/adapt on the fly/deal with challenge/diverse needs). Definition of E : deep content K, pedagogical content K, ability to adapt, classroom management, use evidence-informed practices → meaningful learning. Expert teachers (ET): continuously reflect/refine, make micro-calculations, push boundaries, shape K & experience with purposeful & intentional practice→ improve. E developed via: 1. Domain K (extensive) 2. Chunking + pattern-based encoding of K → ETs see things differently to NTs 3. Organisation of K → richly interconnected in schema (recognizing) + mental models (reasoning) 4. Time investment + practice: time alone = naïve, needs DP = purposeful + goal → improved performance. 5. Being reflective practitioner = before/during/after lessons: thinking deeply ↔ DP ↔ learning. Developing E informed by theory driven empirical evidence → evidence-informed (adaptive, thoughtful, responsive) practice.	• Expert teachers are the cornerstone of education • E ≠ following steps, E = ability to use deep K • Every day a teacher makes over 1200 decisions • ET makes it look effortless but illusion • Teaching one of the most challenging tasks ever • ETs have K organised differently →used more efficiently/spot solutions (via schema) faster • Intuition = recognition (not magic/innate) • Faulty mental models →errors of judgement • Go for DP = work with coach/mentor, get info/ strategies/feedback • Adopt cycle of reflection/learning/practice • Your growth as a teacher good → great impacts student growth & quality of T profession • Start with 1 small intentional change/DP/reflect
2. What is teaching? Is it science or craft or both? Both. ETs not 'born', can be made. Needs both science (K) AND craft (how to apply K flexibly/effectively). Science of teaching: 1. DK (what to learn) = foundation (accuracy + depth), pedagogical content K (PCK) = how to make it understandable to others (accessibility + clarity), ETs can adapt on the fly 2. Cognitive-/educational psychology (how people learn): science of learning → working memory (WM) is limited/long-term memory (LTM) is unlimited/prior K (PK) shapes new learning/combining /beginners are not little experts. 3. Didactics/instructional techniques (how to teach): segmenting/sequencing/modelling with worked example (WEs)/guided practice/scaffolding/questioning/feedback/review + consolidation/differentiation through representation/classroom discourse techniques/practice variation/checking for understanding/gradual release of responsibility → different techniques needed at different stages, acquisition/building fluency/generalisation/adaptation, maintenance needed to retain over time. 4. Instructional tools (what to teach with): tools are *not neutral*, choose wisely based on DK/how Ss learn. 5. Pedagogy (why & for whom we teach): = values/purposes/relationships, more than efficient/effective, T is building trust/equity & inclusion/balancing guidance & independence/connecting to broader purposes, = moral compass. Craft of teaching: = integrated K/belief/wisdom re teaching practice/K of Ss/DK/K of curriculum, developed over time in a classroom via trial/reflection/interaction with colleagues (mentoring/coaching/(C)PD), initially 'shock of practice' → beginning Ts need support, collaboration with peers and mentors *really* helps Ts develop schemata/mental models, ITT can help prepare Ts via evidence to build expertise via structured programme of guaranteed support (not sink or swim).	• ETs 'born not made' is a myth (from 1850s) • Initial teacher training (ITT) focuses on science (DK/SoL/PCK), classroom experience → craft • Audit your DK and PCK & develop throughout your career alongside craft K • "If you don't know we learn, how do you know how to teach?" (Reif, 2017) • Make science of learning central to planning/ instruction/review/reflection • 'Didactic' ≠ lecture-heavy, = repertoire • What you do depends on where they are – match strategy to goal of instruction • Incorporate didactive K into modelling/rehearsal /coaching/ reflection into teacher preparation • Don't be seduced by novel tools • Pedagogy not just teaching methods/ ensures equity/inclusion/justice • Craft K = wisdom in action/experiential wisdom (PCK a part of craft K)… and not just hints/tips/tricks – helps develop deeper frameworks to anticipate/adapt • ITT should be a 2/3 year programme of guaranteed structured support
3. How do we measure expertise? …using student progress (NOT talent/charisma/years of experience/teacher classroom behavior). 1.Talent: vague/romantic concept not relevant to teaching, effectiveness contextual not solely feature of T characteristics. 2. Experience: easy to measure but: ≠ E (necessary) but not sufficient, need opportunity for DP/reflection e.g. via coaching. 3. Measuring E hard: only 1 clear criterium = student learning, beware poor proxies (busy, engaged, calm, getting feedback, curriculum covered, some correct answers), better tests = what are they thinking about, can they: do it independently/after a delay/transfer to new situation/all do it, not just a few 4. S achievement = measure of T effectiveness if viewed through lens of school context. Research (Hattie): outcomes depend on: Ss -50%, Ts – 30%, home/school – 5-10%,	• Need to let go of Dead Poet's Society as model • Experience is necessary but not sufficient for E • What's visible may not be effective (illusion) • Engagement/energy/compliance poor proxies – memories are the residue of thought (invisible) • Observers of lessons need expertise in what to look for (or see as poor proxy) • Teaching is relational: 'effective' →impact on others, not just their own performance

impact/effect of T related actions much bigger than other school-level variables, effective Ts disproportionately benefit low-achieving students → drives equity (less effective Ts slow/impede learning).	• Expert Ts continue to learn from familiar situations, are not lulled into habitual practice • Must judge E by S achievement not T performance
4. What differentiates expert teachers from experienced teachers? We need shared language to describe E – what we can't name we can't develop, need to make the tacit explicit. Dual invisibility: to observer AND practitioner (curse of the expert) → discussion T development focusses on surface features. Visible = impact/progress of learner (more than test scores: depth of U, ability to transfer/critical thinking). ETs are consistent critical evaluators of their own impact. Teaching Quality biggest in-school influence on S learning. Research: value-added = difference: expected vs. actual progress → effective Ts produce measurable value-added with Ss from *all* socioeconomic backgrounds, low attainers benefit most, effects (+/-) compound over time (impacts life chances). Dimensions of ET: 1. Use of learning time (design lessons with clear goals/maximise time thinking/explicit instruction/routines as guardrails/effective level of challenge). 2. Make S thinking visible + use evidence in real time (well-designed questioning/using Ss As & feedback to recalibrate/adapt = formative assessment (FA)). 3. Mobilise deep + well-organised content K to shape learning (knowing what works/models, e.g.s & non-e.g.s/ anticipate & address misconceptions) 4. Design learning for high success + challenge (consciously choose tasks that require deep U for success, + productive scaffolding, differentiate *without* simplifying (give many entry points to same idea), embed FA). 5. Continue to grow through deliberate inquiry, adaptive judgement, prof. learning environment (culture of flourishing = Ts analyse evidence/collaborate/get good feedback/feel safe to experiment, Ts use DP/reflection, develop E that transfers/flexible.	• TE grounded in K, judgement, DP so they can anticipate/interpret/adapt with precision • You can't improve what you can't see/define • Goal to give Ss K to thrive/flourish in society • Move from 'did I teach it well?' to 'did they learn it deeply?' • More effective Ts can produce months/years more progress than less effective Ts (+vice versa) • Goal is maximizing time thinking → learning, not task completion • Plan Qs to elicit learning (show misconceptions /gaps)/interrogate it/respond in real time • It's not just what you know but how you use it • *Actively choose* models/analogies/WEs & non e.g.s to develop S schema/mental models • *Actively choose* tasks to match learning goals & make S thinking visible → use info going forward • Ts 'plateau' without action to grow expertise, need system/school culture →supports growth
5. What instructional practices distinguish expert teachers and make them highly effective? ETs make instructional decisions using K of human cognitive architecture = sensory memory → (attention) WM → (storage via encoding)/←retrieval) LTM Designing for: 1. Attention: gatekeeper, T must orchestrate, fragile, socially contagious, **ETs:** address transience/chunk instruction/maintain selective focus/use norms+ routines to maintain group attention. 2. WM: very limited (time & size), where info manipulated, easily overloaded, cognitive load due to nature of: task (intrinsic)/other (extraneous). **ETs:** use WEs before indep problem solving/avoid splitting attention/use text & images (multiple modalities)/avoid redundancy of info/what works for novices hinders experts (& vice versa)/ 3. Generative (gen) processing: select/organise/integrate, processing = essential (makes accurate representation)/extraneous (clogs WM-avoid), gen. activities = summarise/map/draw/imagine/self-test/self-explain/teach/enact. **ETs:** bring in gen. effort at the right time/design right kind of gen. activity/monitor & adjust gen. effort. 4. LTM: = making learning durable, forgetting a default not failure, retrieval strength (how easily recalled) vs storage strength (how well embedded in LTM) → not the same, effortful → learning stable/flexible/durable. **ETs:** use retrieval practice wisely and often/space or distribute practice/use variability of practice (to develop transfer)/reduce or delay feedback/vary conditions or context e.g. same surface different deep structure problems (SSDD)/know learning is a long-term process.	• Learning = change to LTM, is effortful • Transience enemy of attention – actively consider when planning • Don't assume they're paying attention - remove distractions → actively direct attention • Plan with cognitive load as diagnostic lens but DON'T just simplify • Too much support for expert Ss hinders learning • Never present and read info at the same time • Encoding into LTM requires cognitive work/effort = desirable difficulties ≠ productive struggle • Balance cognitive load in terms of amount of info AND type of processing • Performance ≠ learning (KEY distinction) • If it's easy it's not helping get into LTM (but Ss don't like to struggle, so tell them why) • Be explicit about use of SSDD problems to develop deep not superficial understanding • Rosenshine's Principles embed these ideas
6. How do teachers become expert teachers? ITT/internships/practicum important when training, induction with useful FB helpful. Ts *then* improve by: Route 1: Experience: belief that improvement inevitable/organic, trial & error, novice → competent over 3-5 years, quickly plateaus or declines, get comfortable, reach fluency /automaticity/efficiency *without* growth. Route 2: Professional Development (PD): good to learn more, be with 'your people', doesn't reliably translate to changes in classroom, gap between knowing & doing, new practices compete with established routines/habits, works at level of knowing about instruction NOT expert-level decision-making and doing. Route 3: Deliberate Practice: deliberate = highly structured + feedback-driven → improve one aspect of performance at a time: narrow focus/clear performance goals/immediate feedback/ multiple chances to practice. Teachers lack DP opportunities (low stakes rehearsal), features in teaching: specific goal /just beyond current competence/repeat + structured reflection/immediate task-specific feedback/development of mental models/repeat (i.e. a cycle). DP is lifelong hard work that enriches E and *NOT* about scripting/removing professional judgement or discretion.	• Ts with 20 yrs experience can be no more effective (Ss achievement) than those with 5yrs • Needs more than yrs in classroom to improve (10 000 hours is not a thing) • Research → successful PD needs significant time (e.g. 14 hrs) distributed over weeks/months • Teacher satisfaction with PD poor proxy for impact on S learning • ← PD can be successful if features met • Isolated PD events ineffectual, do not build systematic improvement of E • Few (if any) opportunities for DP – need to be imaginative (e.g. read literature, try 1 idea) • Treat DP as an attitude and discipline covering science AND craft of teaching • Instructional friction is your friend – steers DP
Closing reflection: E matters, but is *not* accidental or inevitable. You have to build it.	• All students deserve ETs.