Sticky learning

Paul Davison discusses why it's vital to design education and training systems that accommodate humans being human

The Space Shuttle didn't survive atmospheric re-entry because it had one perfect heat shield. It survived because more than 24,000 individually engineered thermal protection tiles worked together as a single system. Each designed for its precise location because every part of the orbiter experienced different temperatures, forces and stresses.

NASA understood that resilience wouldn't emerge through standardisation alone. Instead, it required understanding the environmental variability and a bespoke design of each component.



Perhaps organisations aren't so different. No organisation succeeds because it contains a homogenised set of employees. It succeeds through tens, hundreds or thousands of different people, each working within distinct roles, pressures, relationships and constraints, yet collectively contributing to organisational resilience.

We accept this when designing work, yet when we design learning, variability often disappears, replaced with a single course, slide deck, assessment and certificate.

If an ergonomist proposed designing every workstation, cockpit or operating theatre on the assumption that one size fits everyone, the idea might not get beyond the drawing board. So why do we continue to design workplace learning as though variability somehow disappears when people enter a classroom?

Perhaps instead of asking, 'How engaging is our training?' we ought to ask, 'How well have we designed the learning system to accommodate each person?'



About the author

Paul Davison is co-founder of human-centred performance group PPWD.

Learning is an emergent property of a well-designed human system. Modern work is becoming increasingly complex, yet our instinctive response is often to provide more information, believing knowledge alone will compensate for uncertainty. Experience tells us otherwise. Most presentations are forgotten within days, while practical experiences, conversations and meaningful challenges remain vivid decades later. The difference is rarely intelligence – it's design.

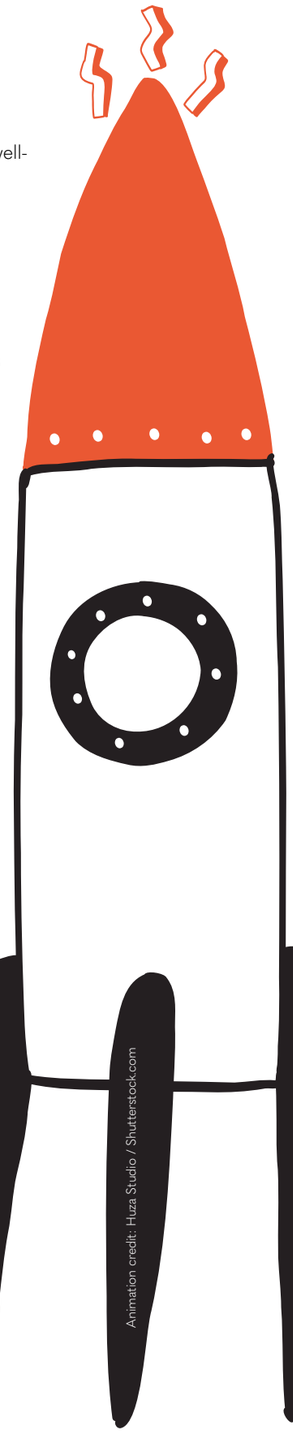
Research across cognitive psychology shows that durable learning depends less upon exposure to information than upon the conditions under which information is experienced, retrieved, challenged, discussed and applied. Malcolm Knowles recognised this through adult learning theory. Adults arrive with existing experience, mental models and practical problems. They seek relevance, autonomy and authentic problem-solving rather than passive instruction. These principles mirror ergonomics. Both disciplines begin with the same question: How do humans function? How are they really thinking, remembering, deciding and adapting under operational conditions?

Over the past 15 years, this question has shaped PPWD's approach. Here, I offer six ergonomics-based principles as to how we can make learning sticky.

1. Learning is designed, not delivered

Organisations frequently speak about delivering learning as though knowledge can simply be transferred from one person to another. Yet learning, like safety or culture, is an emergent property. Capability develops after learning interventions when those involved actively compare innovative ideas with existing experience, retrieve knowledge repeatedly, test assumptions, integrate expectations and apply understanding within meaningful contexts.

The learning facilitator therefore becomes less concerned with covering slides and more concerned with designing conditions that stimulate curiosity, participation and reflection.



Animation credit: Huza Studio / Shutterstock.com

2. Emotion strengthens memory

Decades of cognitive psychology demonstrate that surprise, curiosity, humour, uncertainty and manageable challenge activate multiple cognitive systems simultaneously, strengthening attention and long-term retention. Stories become memorable because they connect facts with emotion. They help to link theory to practice and the practice back to theory. Simulations, artefacts and dilemmas create emotional experiences.

This can be witnessed with delegates discussing exercises during breaks and long after courses have finished. Where the learning has escaped the classroom and begun reshaping existing mental models.

The emotional content is not entertainment, instead it is a design feature.

3. Learning is social

Ergonomics has consistently shown that human performance appears through interaction. For example, situation awareness, workload management and decision making are rarely individual activities. Learning follows the same pattern.

Understanding develops through interaction with others and participation within communities of practice. Practical judgement is acquired through conversations, mentoring, operational experiences and reflective dialogue.

Ideas such as psychological safety become essential to learning in safety critical contexts. Learning flourishes where people feel able to question, admit uncertainty and challenge assumptions without fear of embarrassment.

4. Desirable difficulty improves retention

Conditions producing the strongest long-term learning often feel more difficult in the moment. Easy presentations create an illusion of learning because familiarity is mistaken for capability. The recognition of something isn't recall. The superficial understanding generated during the course isn't the same as deeper held performance six months later.

The use of retrieval practice, solving unfamiliar problems, generating solutions before receiving answers and revisiting concepts over time all strengthen memory in a far more effective way than just passive reviews.

Sticky learning methods deliberately introduce these desirable difficulties. The objective isn't confidence within the classroom environment, it's capability beyond it.

5. Context matters

Learning divorced from operational reality transfers poorly. Stories, simulations, tabletop exercises and operational dilemmas recreate the patterns of thinking needed in real work. Delegates remember not only the concept but where they were sitting, who challenged them and the uncertainty they experienced. Context is not decoration surrounding learning but part of the learning system itself.



6. Reflection creates meaning

Experience alone is an unreliable teacher. Repetition can reinforce ineffective habits just as easily as excellent practice. However, reflection transforms experience into judgement.

Within sticky learning methods, reflection is woven throughout rather than confined to the final evaluation sheet. Delegates continually ask themselves: "What surprised me? What challenged my assumptions? How will this change my own practice?"

The neuroscience community suggests that memory consolidation continues long after formal teaching has finished. The most memorable learning therefore continues during conversations on the journey home, around the coffee machine or when someone unexpectedly remarks: "Do you remember that exercise?" That is learning that sticks.

Not because people remember the activity, but because the activity changed how they interpret future experience.

Designing learning systems

Taken together, these principles suggest something rather profound: Learning is itself a socio-technical system. Like every socio-technical system, it consists of people, goals, environments, technologies, cultures and interactions. Success here depends less upon any single part, instead more upon how effectively those components function together.

This ought to be familiar territory. We routinely apply human-centred design to planes, control rooms, healthcare systems and industrial workplaces because we understand that performance emerges through interaction rather than individual capability alone. Learning deserves precisely the same treatment.

Perhaps sticky learning isn't simply a collection of engaging training techniques but is an invitation to apply ergonomic thinking to learning itself.

Because if we genuinely believe that ergonomics is the science of designing systems that accommodate humans for being human then surely the most important system we have left to redesign is not the classroom but the conditions through which people learn, adapt and ultimately become the resilient human components upon which every complex organisation depends. ■

