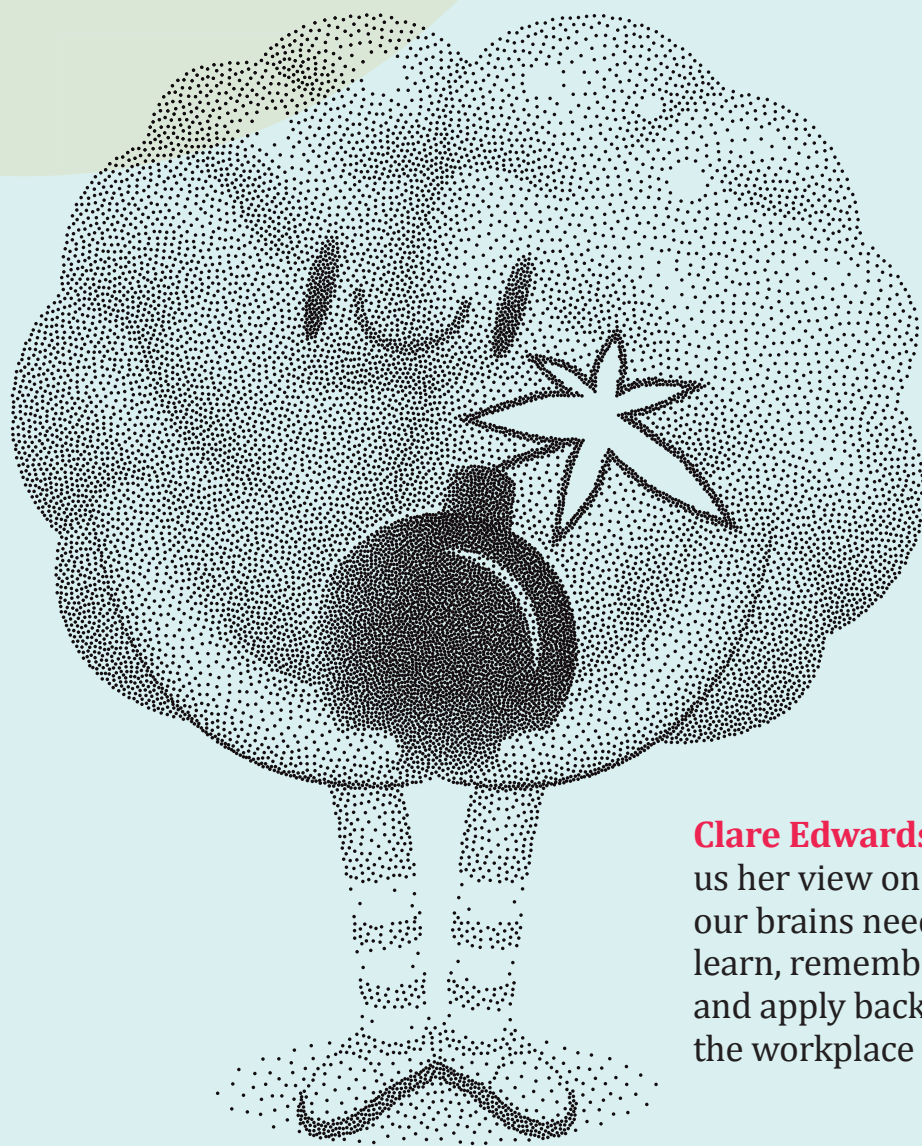


WAKING UP THE BRAIN



Clare Edwards gives us her view on what our brains need to learn, remember and apply back in the workplace

We are all acutely aware of the significant investment organisations make in upskilling their workforce through training. It makes sense, therefore, to ensure that we do everything in our power to help our learners remember, recall and apply what they have learned for it to have been a worthwhile investment on everyone's part.

For facilitators and trainers, high-scoring happy sheets at the end of a programme may boost ego, but they do not accurately reflect that learning has taken place. That can only be measured over a period of time back in the workplace with observation of changes in skill, behaviour and attitude.

Advances in brain imaging technology are revealing at a detailed level how we learn. With this new knowledge comes the ability to create learning environments that will enhance the learning experience and, in turn, increase levels of retention and application.

So what are some of those conditions that stimulate an enhanced, learning experience?

How do our brains learn?

"Learning is a process by which changes in your brain allow you to behave and respond in particular ways." Stella Collins

Learning changes the physical structure of the brain. This is called neuroplasticity.¹ When we learn something new there is a firing and connection of neurons in a new pattern and it's a big job for the brain – a bit like a stunt rider jumping over a canyon. This new learning is then stored first in our short-term memory then distributed (usually after a good sleep) in our long-term memory over a period of time. The interesting aspect here is that the new memories that are created are compared to and 'bolted on' to existing memories and life experiences. We can use this knowledge in our training environments to enhance retention levels.

How can we create conditions for optimal learning?

Many of the conditions here are common sense, and you may be creating them already. What they all have in common is that they can contribute to the necessary neurological changes in the brain required for learning.

Sensory input

We learn by taking information in through our five senses and there is no evidence that we have individual preferences for visual, auditory or kinaesthetic learning, debunking learning styles as a neuromyth.² We may though have a preference for visual stimulus as the largest of all our sensory cortices is the visual cortex.

If we want to maximise learning and retention, we need to appeal to all senses when designing our learning environment, especially the visual. Making the learning environment visually appealing with the use of posters, colour, light and pictures can enhance the process and enjoyment of learning.

Studies from Harvard Medical School have shown that memory is strengthened by multiple sensory



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inputs, so the more we can cater to the different senses in our learning environments, the greater the chance of retention, recall and application.

Ways we can stimulate the various senses include playing music or having learners create a song or jingle, having items available for learners to touch and feel (I always have Play-Doh in my learning environment and my learners love it).

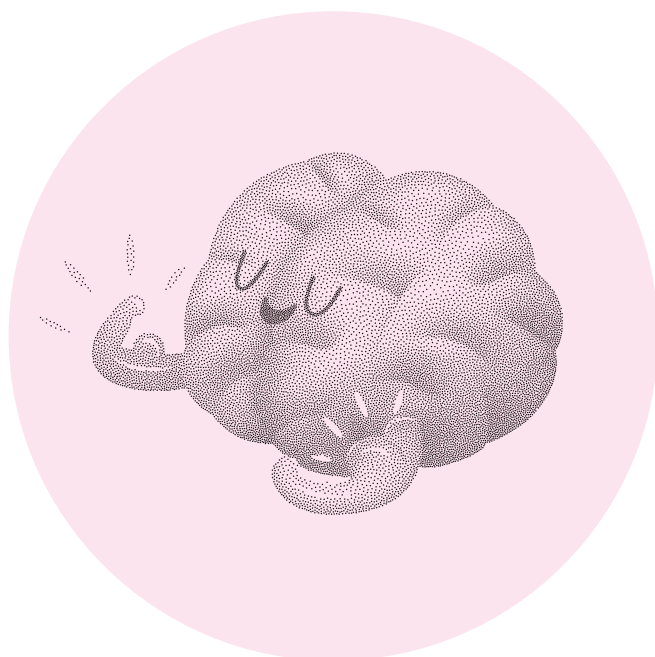
For smell you can use scented highlighters or food with a pleasant smell (I often use lemons and oranges in exercises). Beware of using scented oil or perfume as the part of the brain responsible for smell, the olfactory bulb, is located in the emotion centre of the brain and linked directly to memory, so we don't for example, want a learner to be distracted as they are reminded of an 'ex' when learning something new. For taste you can offer something pleasant to eat or use food as part of experiential exercises (like my M&M's game).³

Multiple Intelligences

The concept of multiple intelligences⁴ was devised by Howard Gardner, professor of cognition and education at the Harvard Graduate School of Education, and he identified eight strengths or intelligences that we each excel in to differing degrees. This directly challenges the idea of IQ being the only measure of intelligence as we all excel in different ways. My husband, for example, would last less than five minutes in a traditional classroom environment, but take him outside and get him to work something out by pacing, measuring or using tools and he's got it sorted!

Here is a list of the intelligences and how people display their trends.

- ▶ **Visual/Spatial** – think in terms of physical space and are very aware of their physical environment. Learn best by being stimulated visually, creating images, imagining and visualising.
- ▶ **Bodily/Physical** – use their body effectively and skilfully, communicating well through body language. Learn best by 'getting stuck in' through physical exercises.
- ▶ **Musical** – show a sensitivity to rhythm and sound, sensitive to sounds in their environment. May study better with music in the background.
- ▶ **Interpersonal** – strong communicators displaying empathy and understanding. Learn through interacting with others.
- ▶ **Intrapersonal** – work with inner feelings, strong reflectors and self-aware. Building in time for reflective practice is important for people with this strength. They are the most independent of the learners.
- ▶ **Linguistic** – using words effectively and enjoy auditory aspects of learning. Listening to, or creating, stories is a favourite of this strength and using acronyms, mnemonics and rhymes facilitates learning.
- ▶ **Logical/Mathematical** – skilled in analysis, evaluation, calculation and reasoning. Will often ask multiple questions as patterns and connections arise from what is being taught. They enjoy concepts and complex problem-solving.
- ▶ **Naturalist** – usually the most difficult to explain. People with this strength enjoy categorising, sorting and chunking, looking for similarities and differences so exercises that allow for this will be preferred by these learners. →



Curiosity

When we are in a state of curiosity we release a neurotransmitter called dopamine. This forms part of our reward system and creates an experience of wanting more or wanting to repeat the action that stimulated the release.⁵

When setting out a learning environment, leave physical exercises half-planned, for instance masking tape on the floor, or an exotic bag on the table which learners are asked not to open. Use stories that have an element of suspense or a twist and sometimes start a story and leave it suspended, returning to it later. Problem-solving games and exercises that gradually unfold are effective stimulators of curiosity.

Storytelling

When we listen to facts and data being presented there are two main parts of the brain that are activated, Broca's and Wernicke's. These areas process language input and interpretation which are mainly found in the left hemisphere. Tell a good story, however, and hey presto, we have a neural party! In addition to Broca's and Wernicke's, all the sensory cortices are activated which means that when we talk about certain tastes and smells our brains are 'tasting' and 'smelling' at the same time. When we paint a picture using descriptive words our visual cortex lights up, painting a picture in our mind's eye.

Stories are remembered seven times more than facts and data⁶ so will naturally enhance learning. The beauty

of story is that it is interpreted uniquely by each individual who identifies with it and therefore increases the chances of behavioural and attitudinal change through accountability. For example, it's much easier to tell a story about something that went wrong because



A good review of what was learned will help embed learnings and facilitate transfer from short- to long-term memory

of lack of due diligence than to lecture someone on the necessity of performing due diligence. Stories also evoke emotion – another enhancer of learning.

Emotion

Emotion strengthens memory, both positive and negative. While we should be careful about our use of negative emotion, we actually remember negative experiences and emotions more strongly as this is related to our brain's need to keep us out of danger (Evian Gordon 2000).⁷ So for example, using stories of things that went wrong as a result of lapses in health and safety will be remembered longer and more effectively than talking about health and safety policy and procedure.

How can we create an environment of positive emotion in our learning environment? Remembering to give specific positive feedback, acknowledging good questions, use of humour, and a good dose of laughter all go a long way. And most of all, make learning enjoyable.

When we attach emotion to a learning it's like a Post-it note for the brain.

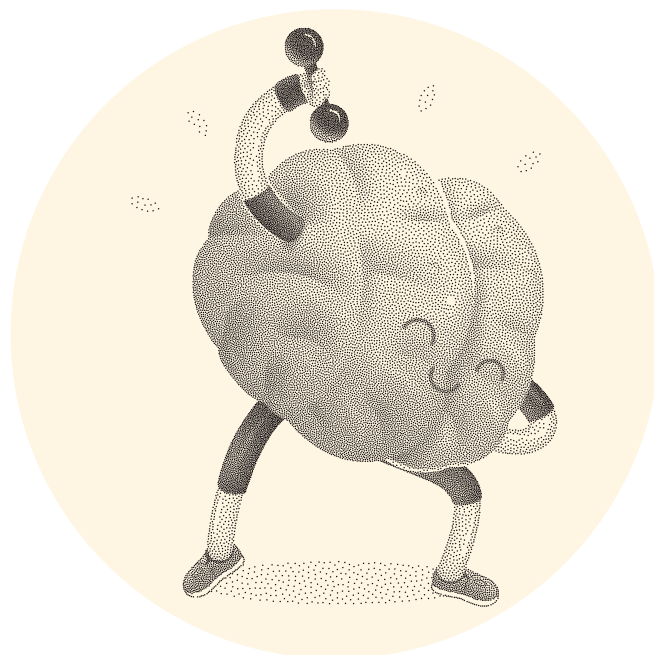
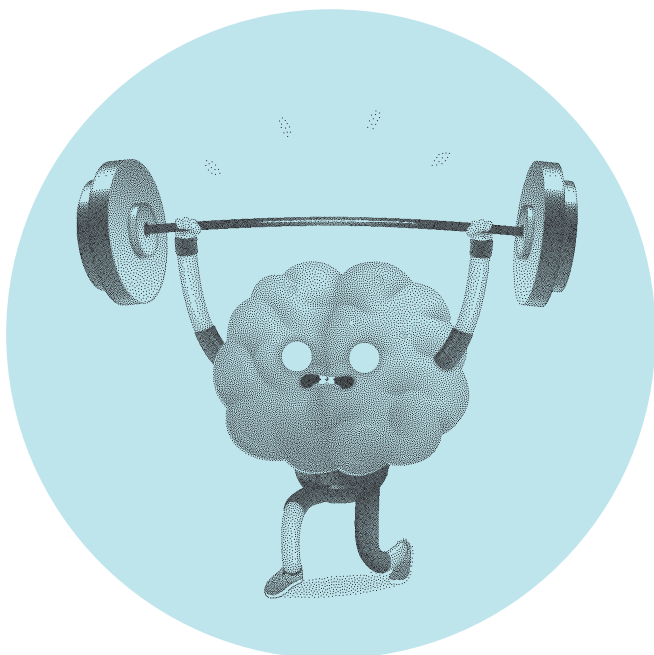
Novelty

There is a part of our brain (the anterior cingulate cortex) that is on the constant lookout for novelty – remember that, as part of our early evolution, novelty could have meant death ("Oh, look at that lion that's just turned up!"). Novelty, therefore, produces a slight emotion of discomfort which is actually conducive to learning and retention as the emotion centre of our brain is activated and we become alert and aware.

Ways to create novelty in sessions include doing something that isn't on the agenda or simply introducing something unplanned. It's a really good strategy for the early afternoon graveyard shift as you see people sit up and take notice.

Building on existing knowledge

The brain learns in an iterative manner by adding new information to that which is already known. If the new information isn't novel enough then the most recent information is discarded and the 'old' information stays the same. This is exactly what we don't want as trainers and facilitators so, in addition to making the new information novel, it's important to



establish what the learner already knows about the concept as this minimises the discounting of the new information.

Another strategy that helps to embed learning is to have learners guess answers, even if they get the answer wrong – they will remember the correct answer for longer than had they just been told the information.⁸

These are just some of the ways to stimulate our brains to learn and remember more effectively in a training environment. The real learning, as we all know, happens when we leave the workshop.

How can we optimise recall, retention and application back in the workplace?

So we can tick the box for having delivered the training, but how do we ensure that learning is transferred back to the work environment?

Reflection and review

This is often an overlooked element of training, especially if time is tight, yet a good review of what was learned will help embed learnings and facilitate transfer from short- to long-term memory. If cutting anything from the programme, don't let it be this.

Repetition

I used to work for a global software company and often the systems training for clients would take place up to six months before the system went live. The poor users were

expected to remember how to use the system and, of course, very few remembered much, if anything at all.

We know from the work of Herman Ebbinghaus⁹ that even after the first day we can forget up to 70% of what we have learned, so leaving large spaces of time before someone gets to apply their learning can be a real challenge. Frequent, and recent, repetition is the key to strengthening those newly carved neural pathways. The more we repeat the action, the deeper the pathway is carved and the more automated and easier the response becomes. Researchers at the University of California Irvine identified that repetition of learning leads to creation of more complete memories and easier recall.

Ways you can facilitate application of learning include ensuring that your learners get to brief others as soon as possible after the training. Ask the learner's manager to have them present their key findings *and* how this applies specifically to their role. Ask the learner to create a post-training plan and check in regularly that this is being implemented.

Follow up follow through

As a facilitator and trainer, my greatest sense of achievement comes from positive feedback months or longer after the training. A good system is to schedule follow up communications with the learner 24 hours, a week, a month, three months and six months after training.¹⁰ These communications act as reminders for what was covered

and also gradually introduces expansions on the concept or additional sources of learning related to the original topic.

In summary, it's important to acknowledge that yes, additional effort is required to operate in this way, but consider the true cost of learners not applying what they have learned back in the workplace. Aren't we all – client, learner and trainer – looking for a healthy return on investment? **TJ**

Clare Edwards is director of BrainSmart. Follow her on Twitter @BeingBrainSmart or contact her at clare@brain-smart.com

References

- 1 Doidge N, *The Brain that Changes Itself*, Penguin Books, 2008.
- 2 Riener C, Willingham D, *The Myth of Learning Styles*, University of Virginia.
- 3 Fifth Sense, psychology and smell, <http://bit.ly/1nJiTa8>
- 4 Gardner H, *Frames of Mind: The Theory of Multiple Intelligences*, New York Basic Books, 1983.
- 5 Curiosity prepares the brain for better learning, <http://bit.ly/2i0x3Vy>
- 6 Narrative stories as mediators for serial learning, <http://bit.ly/2ondE0k>
- 7 McGaugh JL, How emotions strengthen memory, <http://bit.ly/2oGe2uo>
- 8 Kornell N, Hays MJ, Bjork RA, 'Unsuccessful retrieval attempts enhance subsequent learning', *Journal of Experimental Psychology: Learning, Memory, and Cognition*, Vol 35(4), Jul 2009, 989-998.
- 9 On the form of forgetting, <http://bit.ly/2oEUJr>
- 10 Stellar Learning – how to be a brain friendly trainer, <http://bit.ly/2oGbMTG>

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