

Brain Science of Learning Habits



How do we build habits?

Though we experience habits based on our environments and what we believe is our chosen behavior, habits have moved beyond decision-making (choice) into automatic behaviors and reactions. Habits are built in the brain by moving a learned behavior, which is performed in the prefrontal cortex, into an automatic one, which is performed in the back of the brain, skipping our decision-making completely.

Habit is formed based on three (3) core elements: Trigger (Cue), Behavior and Reward. Each of the elements of habit creation occur physiologically in the brain's medulla oblongata, a faster, yet less intelligent, part of our brain.

1. The Cue & Behavior are linked and recorded in the Basal Ganglia, as a 'habit'.
2. It then gets reinforced by the brain's dopamine when you experience reward.

Translating Habits into Microburst Challenges

Our habit-builder uses challenge-based learning techniques to activate brain processes in these three areas using context, content and feedback.

Learning component	...operates as...	Habit-building component
Context of challenge	=	Trigger
Content of challenge: Skill, process or attitude change	=	Behavior (desired)
Feedback and Game score	=	Reward

We use challenges rather than mere presentation of information, to activate the action-based activity of the brain, reinforcing the chemicals that drive the pathways of the habit formation - particularly the link between the cue and the behavior, and the correct behavior itself.

Applications

Learning & Development
Training Providers
Behavior Change

Solution

Eterna Habit-builder
Adaptive Microlearning™

How does this differ from traditional learning?

Our habit-building differs from traditional training (even e-learning) in that it focuses on permanent habituation, over initial decision-making, awareness and skill-building. Training of new aptitudes and attitudes focuses on the initial development of skills and behaviors, even awareness or use of procedures, and this learning is experienced through the prefrontal cortex.

But this initial training fails when it does not address the habits that may (or likely) contradict the new skills, abilities and attitudes once the learner returns to the 'real world' - their natural environment. When existing habits are encountered, what was learned via the prefrontal cortex is not used, and so the 'decision' to use the new skills is never activated and is lost or forgotten.¹

How does a habit-builder work?

In Learn.net's habit builder, Eterna, challenges are crafted as brief microbursts, in either question format or vignettes (or both), that take less than 60 seconds to complete. These challenges are sent to the learner via text, email or app on a daily² basis.

The learner responds to the challenge, and is provided immediate feedback, reinforcing the correct response, and may include further reinforcement. Upon completion of a given day's challenges, the learner can be presented with their ranking on the gamified scoreboard.³

Over time, the system will present questions in areas where the learner is weakest, to increase their proficiency overall, using AI-driven heuristics. If desired, Adaptive Microlearning™ can be configured to direct learners to retraining in areas where they need recovery.⁴

The crafted string of challenges, organized in the competencies for a given behavior, provides three distinct elements for positive habituation:

1. Link of the cue and the behavior
2. Selection of the 'correct' behavior or decision by the learner
3. Reinforcement through immediate feedback, plus positive rewards

The habituation elements represented include:

Diagnosis - System spends learner time on gaps, driving proficiency

Repetition - Consistent attention to the desired performance or behavior

Reward - Feedback (validating), ranking (competitive) and award badges (positive)

Correction - Redirection to desired performance or behavior

Retraining - Where deeper relearning is needed, to reduce frustration (the learner has reached threshold where reinforcement is less valuable than retraining)

¹ Forgetting Curve studies show 50%-70% loss of learning in just a day (Ebbinghaus and more current validations) Murre, J. M. J., & Dros, J. (2015). Replication and Analysis of Ebbinghaus' Forgetting Curve. PLoS ONE, 10(7), e0120644. <http://doi.org/10.1371/journal.pone.0120644>

² Schedule of challenges is configurable, including how many challenges a day, which days, and holiday schedules.

³ Gamification is configurable, including learner groups, leaderboard, award types and badges.

⁴ Thresholds for Adaptive Microlearning™ assignments and competency hierarchies are configurable.