ELEARNINGNEWS ARTICLE

Year 9 - number 319 Wednesday 29 january 2025

Storing information: how does eLearning help us?

Explore the key factors influencing information recall in eLearning and discover the cognitive psychology strategies used to minimise these problems.

In today's increasingly fast-paced and technology-driven world, eLearning is an integral part of vocational education and training. While it offers convenience and accessibility, it also poses challenges in maintaining learner engagement and concentration and ensuring long- term retention of information. To be truly effective, eLearning must address **cognitive** barriers to information recall. Leveraging insights from **cognitive psychology**, instructional designers can implement strategies to mitigate these barriers and create more impactful learning experiences.

Factors influencing information recall in eLearning

Reduced attention span

The digital age has **significantly reduced attention spans**. A study conducted by Microsoft in 2015 found that the average attention span has dropped to eight seconds, highlighting the difficulty of keeping learners' attention in an online environment. The constant influx of notifications, multitasking and the volume of digital content exacerbate this challenge. In addition, learners often face difficulties when trying to focus in non-traditional learning environments, such as the home or workplace, where distractions abound. Without the structured environment of a classroom, staying focused in an eLearning course can seem like an uphill battle.

Lower levels of involvement

Traditional classrooms often involve multiple stimuli, such as verbal communication, body language, group interactions and hands-on activities. In eLearning, these stimuli are often reduced or absent, leading to lower levels of engagement. Passive consumption of content, such as watching long videos or reading static texts, further contributes to disengagement. Furthermore, eLearning platforms sometimes lack opportunities for emotional connection or curiosity, both of which play a crucial role in fostering engagement. When learners feel disconnected from the content, they are less likely to absorb and retain the material presented.

Cognitive overload

When learners are presented with too much information at once, their working memory becomes overloaded, making it difficult to process, memorise and subsequently retrieve the information. This problem is particularly prevalent in poorly designed eLearning courses, which lack clear organisation and prioritisation of content.

Cognitive overload is often aggravated by:

Excessive multimedia: overloading a course with animations, videos and sounds can overwhelm students rather than aid comprehension.

Complex interfaces: a poorly designed user interface with too many options or unclear navigation can confuse students.

Lack of content hierarchystudents may struggle to identify and retain key concepts.

Lack of immediate feedback and interaction

In traditional learning environments, learners benefit from real-time **feedback** and interaction with instructors and peers. In eLearning, the absence of immediate feedback may hinder the learner's ability to correct misunderstandings in real time, which is crucial for memorisation and recall. Likewise, the lack of interaction can be impersonal, reducing motivation.

Cognitive psychology to improve information recall

To overcome these challenges, instructional designers can apply evidence-based psychology strategies to improve information recall in eLearning environments.

The spacing effect

The **spacing effect**, first studied by Hermann Ebbinghaus, argues that information is better retained when learning sessions are spread out over time rather than crammed into a single session. This principle can be applied in eLearning through functions such as:

Microlearning: division of content into smaller, digestible modules that can be revised over time.

Spaced repetition tools: incorporate quizzes or flashcards that prompt students to review key concepts at carefully planned intervals.

Periodic summaries and reviews: integration of summary sections at the end of modules or periodic review sessions.

Dual coding theory

Allan Paivio's **dual encoding** theory is based on the premise that the human brain processes information through two interconnected channels: one for verbal input and another for visual input. When both are active, information is more easily encoded in memory.

Integration of multimedia content: the use of a combination of text, images, animation and video to convey information satisfies different learning styles and reinforces understanding.

Interactive visualisations: incorporating interactive infographics, diagrams and graphs helps students visualise abstract or complex concepts.

Storytelling with images: combining textual content with visual narratives, such as comics, timelines or illustrated case studies, can make the material more engaging.

Cognitive load theory

John Sweller's **cognitive** load theory emphasises the importance of reducing extraneous cognitive load to ensure that students can concentrate on the material. This theory classifies cognitive load into three types:

intrinsic (related to the complexity of the content)

extraneous (caused by inadequate design)

germinal (associated with processing and understanding). Strategies for managing cognitive load in eLearning include:

Breakdown of content: organising information into smaller, more meaningful parts facilitates its processing and retention by students.

Minimalist design: avoiding cumbersome interfaces and excessive on-screen elements ensures that students' attention is directed towards essential content.

Clear navigation: ensuring that the eLearning platform is intuitive and easy to use reduces the mental effort required to access and engage with the materials.

Progressive dissemination: presenting information gradually, rather than all at once, helps students focus on one concept at a time.

The test effect

The practice of retrieval, or **test effect**, refers to the phenomenon whereby active recall of information reinforces memory more effectively than passive review. eLearning platforms can exploit this phenomenon with:

Quizzes: short formative assessments throughout the course to encourage recall.

Simulated scenario-based learning: case studies, role-plays or simulations that require students to apply knowledge in realistic contexts. Technologies such as virtual or augmented reality can be used to make these scenarios realistic.

Gamification

Gamification exploits intrinsic motivation and engagement by incorporating game elements into learning. Strategies include:

Badges and awards: recognising achievements to motivate students.

Rankings: encouraging friendly competition among peers.

Challenges: interactive tasks or puzzles that make learning more enjoyable.

Personalisation and adaptive learning

Personalised learning paths, also guided by artificial intelligence, can be adapted to the needs and preferences of individual learners. This ensures that content is relevant, appropriately stimulating and aligned to students' progress, thus improving engagement and recall.

Designing for involvement and conservation

To maximise the recall of information, eLearning courses must be designed taking into account both the cognitive limitations and motivational needs of the learner. Best practices include:

Set clear objectives: provide clear and measurable goals to guide attention.

Encourage active participation: incorporate interactive elements such as drag-and- drop activities, simulations and group discussions.

Provide **feedback:** offer timely and constructive feedback to reinforce learning and correct misunderstandings.

Creating a community: facilitating peer interaction through discussion forums, virtual study groups or collaborative projects.