
GROWTH
ENGINEERING
GAME
CHANGER
GAME-BASED LEARNING &
THE FUTURE OF L&D FROM
THE ENGAGEMENT EXPERTS

CONTENTS

INTRODUCTION

LEARNING GAME

noun

/ˈləːnɪŋ geɪm/

1. A learning game is a type of game that is designed to satisfy a learning outcome.

If you're not getting the kind of results you expect from your training, maybe your content is just a little too boring (sorry, somebody had to tell you). If you want something that can actually deliver your objectives, you need to think really hard about engagement.

Engagement is the measure of how committed an employee is to their job. Lack of engagement is one of the biggest challenges faced by all organisations today. Even though engaged employees perform 202% better than disengaged employees, 71% of employees are not fully engaged.

Despite the evidence, organisations have been slow to improve engagement in almost every area of business. The good news is that, when it comes to learning and development, an poor engagement is an easy problem to solve with the power of learning games!

Learning games are the key to unlocking maximum engagement from your training content. Instead of subjecting your learners to passive eLearning, learning games demand interaction at every point.

Despite the proven effectiveness of learning games, there is still some resistance when it comes to trying something new. In this white paper, we'll examine the reasons for this, along with a treasure trove of other resources including:

- What learning games are and why they work
- Case Studies of Game-based learning
- Advice on implementing learning games

And a whole lot more! So without further ado, pop a coin into the slot and press START to begin!

LEARNING GAMES AREN'T FOR ME
(AND OTHER COMMON OBJECTIONS)

Game-based online learning is taking the training world by storm and changing the way L&D professionals think about instruction. Learners are finding a new kind of training, free of the dullness of traditional online learning. Everything is getting better, looking up and moving forward.

Despite this quantum leap in learning technology, there's still a hard core of learning professionals who are reluctant to take the plunge and discover the possibilities that game-based learning offers. Every step into the unknown comes with a degree of risk, but one shouldn't confuse risk with failure.

If you're someone who's still on the fence about learning games, you probably have a few concerns but game-based learning isn't as terrifying as you might think. Let's look at some of the most popular misconceptions surrounding learning games and shine some light on the way things *really* are.

GAMES FOR KIDS

> "We don't stop playing because we grow old; we grow old because we stop playing."
>
> **- George Bernard Shaw**

> "Video games are ingrained in our culture. Driven by some of the most innovative minds in the tech sector, our industry's unprecedented leaps in software and hardware engages and inspires [a] diverse global audience."
>
> **- Michael D. Gallagher, the president of the Entertainment Software Association**

When it comes to embracing the possibilities of learning games, the first hurdle is an obvious one. The word 'game' immediately conjures up images of fun, frivolity and everything that happens outside the realm of serious, grown-up work.

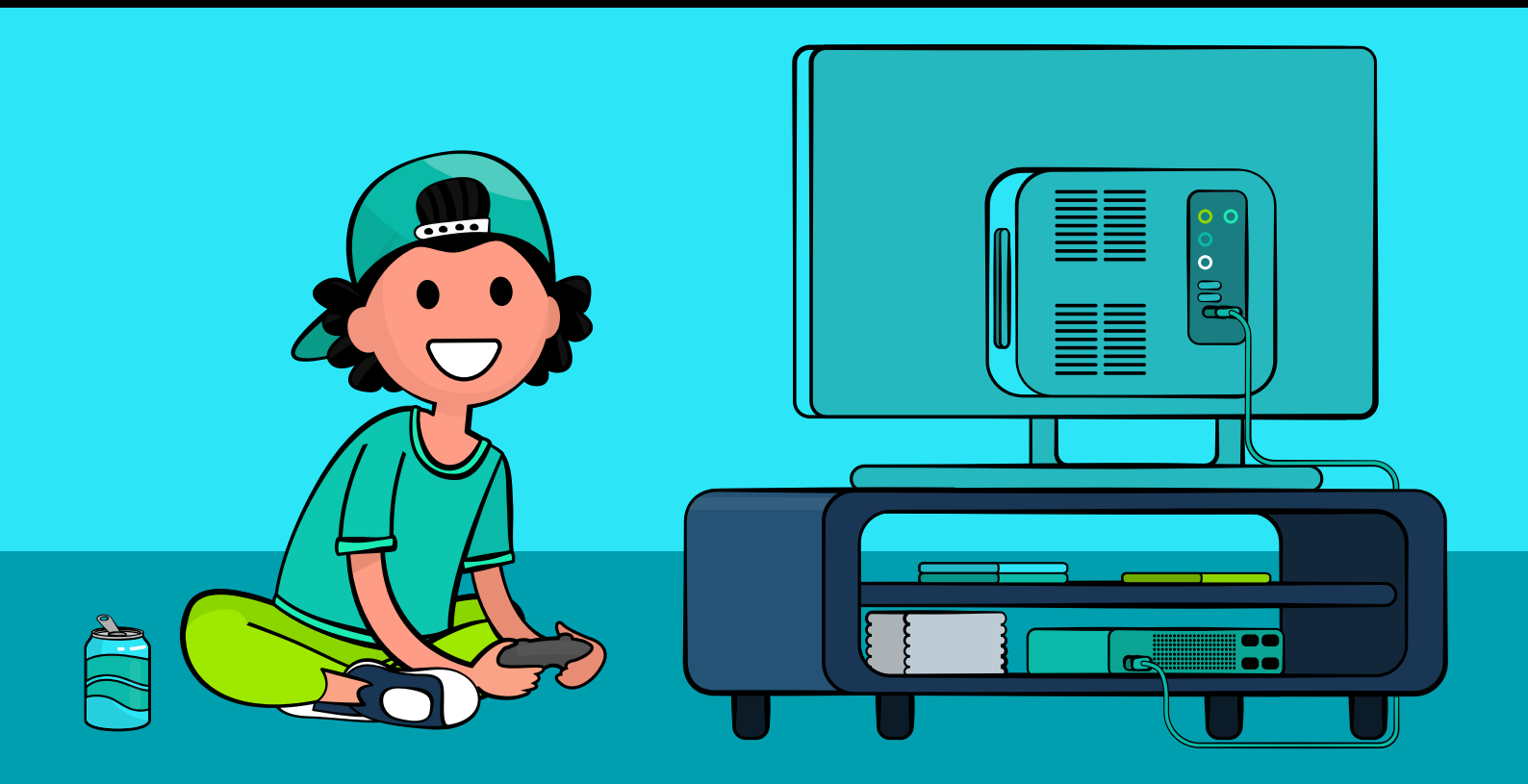
One of the most persistent myths about games (video games in particular) is that they appeal chiefly to teenage boys and children. This might have been true in the 80s and early 90s, but the industry has come a long way since the days of Sonic and Mario.

It might then come as a shock that **the average game player is 35 years old and that 27% of gamers are over 50 years old** – a larger percentage than those under the age of 18 (26%).

The very elements that make games engaging have been adapted to non-game scenarios in a process known as **gamification.** This covers everything from coffee shop discount cards (for boosting loyalty) to progress bars on your LinkedIn profile page (for encouraging completion).

The main thing that defines video games from all other forms of entertainment is that they include interactivity as the primary element. With the **global games market expected to grow to a total of $118.6bn by 2019,** there's plenty of evidence out there for the power of video games to engage players.

This hasn't gone unnoticed by the L&D community who are turning more and more to game-based learning as a solution to disengaged learners. If you want to boost engagement in your learning programmes, you can't afford to think of games as merely toys for children.



LEARNING GAMES AREN'T FOR ME
(AND OTHER COMMON OBJECTIONS)

I DON'T KNOW HOW TO MAKE GAMES

Not everyone has a background in game development, so it's understandable that this area might seem, to an L&D professional, like uncharted territory. On the contrary though, the worlds of game development and instructional design are fundamentally similar.

Games and eLearning units share a common structure. Just like the learner's quest for professional development, a game will usually involve a goal at the end and a series of obstacles to overcome on the journey.

To generate any kind of engagement or meaningful change in the learner, a good learning unit also needs to provide a challenge. If you're an instructional designer, this won't come as a huge revelation. You might however be surprised to learn that the exact same principle is the driving force behind the most successful games.

One key to developing more engaging learning content is to focus more on these challenges and try to identify opportunities to test the learners in various ways, not just with multiple-choice questions. If you're struggling for ideas on how to do this, the world of video games is a treasure trove of inspiration.

NORMAL ELEARNING WORKS FINE FOR ME

It's a sad truth that some learning managers aren't interested in engagement within their online learning. Instead, they focus on creating functional content and delivering it on a very basic learning platform.

Their confidence in their current methods masks their fear of the unknown and unwillingness to change. This stubbornness can be the death knell for a learning programme. According to CLO Media, **92% of new software projects are classified as failures.** The #1 reason for this is internal resistance and a lack of communication.

The fact of the matter is that learning programmes that focus on engaging learners have more success than those that don't. If you don't at least try something new, you'll never know if it works or not.

Did you know... Clients using our gamified LMS have seen **engaged learners outperform disengaged learners by 75%** in terms of sales.

LEARNING GAMES AREN'T FOR ME
(AND OTHER COMMON OBJECTIONS)

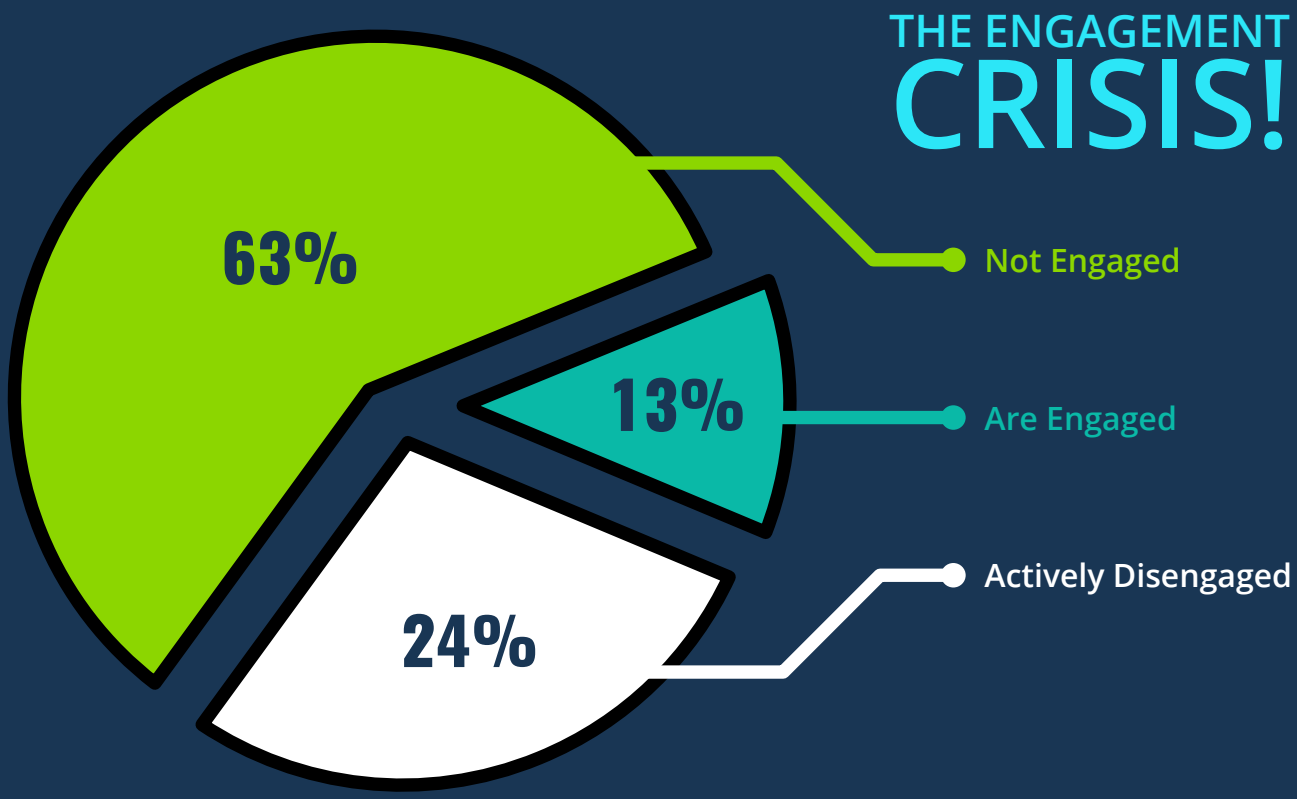
I DON'T WANT MY EMPLOYEES WASTING TIME ON GAMES

When you're paying employees for their time, you naturally want to get the best return you can. Many managers (and even learners) see time spent on training as time that isn't spent making that return. It's understandable that they might want to reduce training time as much as possible.

For these people, the idea that employees might be so engaged with their training that they can't tear themselves away from it seems counter-productive. However, focusing on the short term denies the possibility of the real, long term gains that can come from an engaging training programme.

Learning games are, by their nature, even more engaging than traditional training methods and employees are likely to spend more time learning what they need. This isn't a bad thing – since learners are more engaged, the rate of retention is much higher and the training is more effective. Better trained employees are more capable of doing their jobs and helping the business thrive.

Whatever your misgiving with learning games might be, it's hard to deny that they address the biggest challenge facing L&D today – the engagement crisis. Gallup polls found that just **13% of employees worldwide are engaged. A worrying 63% are not engaged at all and an even more concerning 24% are actively disengaged.** These disengaged employees don't just slow your organisational growth; they might actively seek to reverse it.



Even if you do decide that learning games won't work for you, your number-one priority should be to engage your learners with their training by any means necessary. But don't make your decision just yet – keep reading to find out more about just who can benefit from learning games (if only you'd let them)!

WHO ARE LEARNING GAMES FOR?

Learning games have been popular in schools for decades, but the potential of game-based learning is gradually being realised by the wider learning and development sphere. As they wake up to the massive problems with learner engagement, training professionals have been asking themselves where it all went wrong.

When did learning stop being fun?

The answer is simple: learning lost its lustre when the focus was taken off of the people taking the training. Now that the truth is out, there has never been a better time to be a learner. Let's take a look at the types of people who are reaping the benefits.

NEW STAFF

What would you think if your first experience in a new job was being locked in a cold room with an ancient TV/VCR combo, forced to watch a poorly produced induction video? When you're welcoming newbies to your organisation, you want to give them the best first impression possible. Nobody wants to be thought of as boring and organisations are no different.

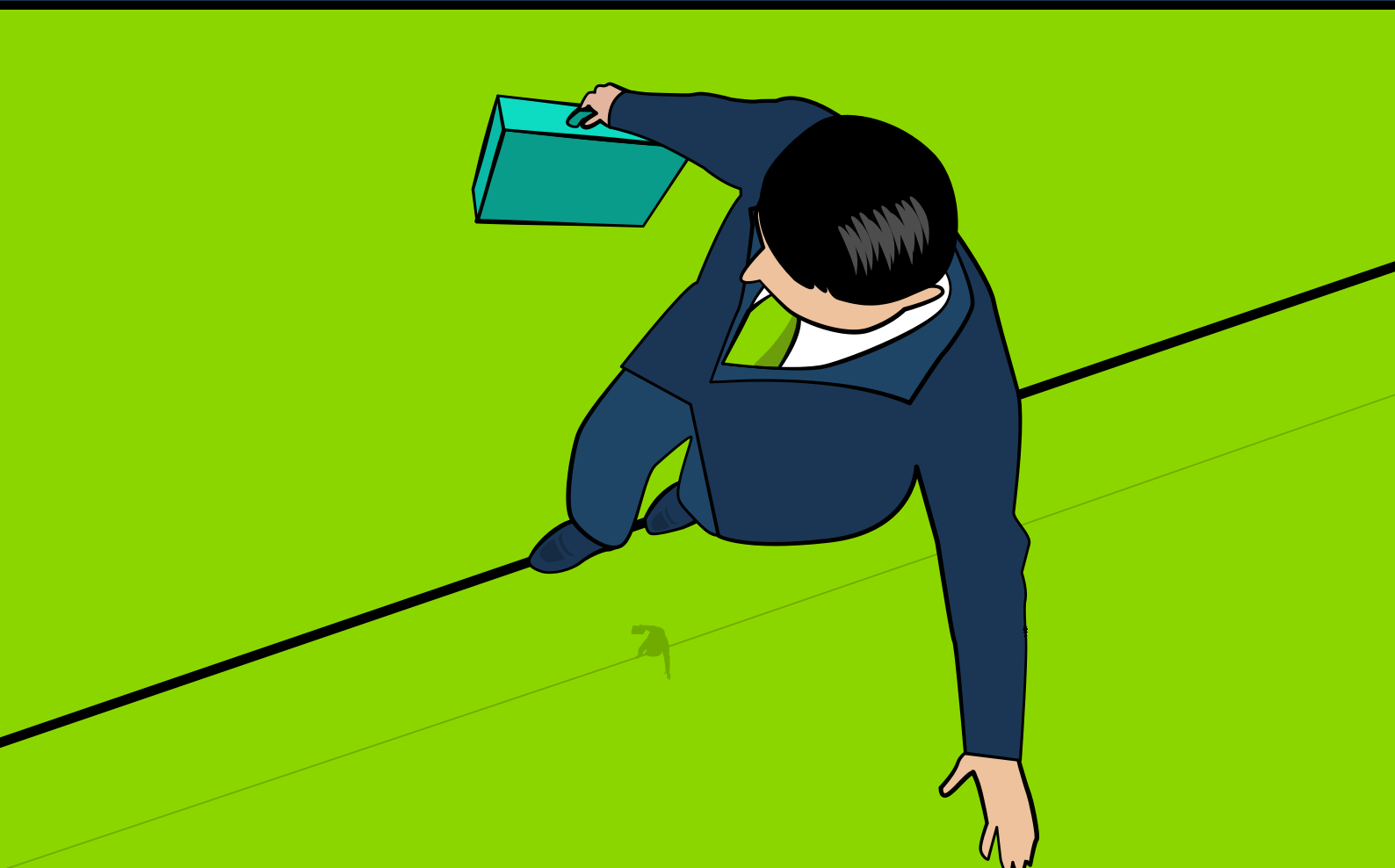
Using learning games is a great way to conduct a successful onboarding programme. They give your new starters all the information they need to get off on the right foot, but that's not all. Using learning games give you a chance to show your new recruits that your company isn't one of those dull, stuffy companies – it's a place of enthusiasm, excitement and fun!

PEOPLE IN HIGH-RISK JOBS

It's not all fun and frolics though – some learning games are designed to provide a safe environment to practice skills needed for high-risk jobs.

Every time you step aboard a flight, you can bet that the pilot didn't practice in an actual aeroplane. Flight simulators are, in essence, learning games and they've been around since the First World War! Pilots-in-training use flight simulators for the simple reason that aeroplanes don't grow on trees and mistakes can mean the difference between life and death.

Your bottom line is arguably just as important and no company can afford to lose revenue on account of mistakes made by trainees. Many retailers are creating **learning games that replicate a sales environment.** This lets employees practice various processes without risking a costly mistake.



WHO ARE LEARNING GAMES FOR?

PEOPLE WHO DON'T STOP

The importance of mobile in online learning is also becoming increasingly apparent. For learners in busy jobs, sometimes their only opportunity to take training is on the commute to work. In 2016, no legitimate online learning solution would dare to neglect a mobile offering.

The challenge here is the same as that of non-mobile solutions – how can your learning material (mobile or otherwise) compete with the engagement-factory that is the rest of the internet?

Learning games are particularly effective on mobile devices because they do the job of providing training, whilst offering the same level of engagement as Angry Birds or Candy Crush Saga.

GENERATION Y

The problem of learner engagement has only gotten more serious as the workforce has been populated with the next generation of young employees. These children of the 80s and 90s have grown up with instantaneous enjoyment from mobile phones and the internet.

Although that's not necessarily a bad thing, it does mean that attention spans have gotten shorter and demands for engaging media have taken the forefront. The unfortunate truth is that they won't give dull eLearning a second glance and this is precisely why engaging learning solutions receive much better results.

As millennials take over the job market, it's becoming a greater priority to create training programmes that are tailored for them. Let's take a closer look at the changing face of your workforce.

HOW LEARNING GAMES APPEAL TO YOUR CHANGING WORKFORCE

The world is changing all of the time. Technology is advancing, society is evolving and a whole new breed of employee is taking over the workforce. Generation Y is loosely defined as those people born in the 80s and 90s who are now inheriting the Earth. In fact, it's thought that **by 2020, millennials will represent at least 40% of the total working population.**

This is a reality that cannot be ignored – especially when it comes to learning and development. With a community of learners that's trending towards Generation Y, the big question on the lips of learning managers is 'what do these millennials want?'

As the workforce gets younger, learning games are becoming more and more popular. The conclusion to draw from this is that millennials respond well to game-based learning initiatives, but what do learning games have that appeals so much to them?

GENERATION Y IS MORE DEMANDING

Compared to a few decades ago, one of the defining features of today's workforce is that businesses need employees more than employees need businesses. If a millennial isn't happy with their job, it won't cost them a thought to get another one that satisfies them.

Similarly, if your learners don't get what they want from their training, they'll switch off instantly and the training will have failed before it's even been consumed.

Learning games counteract this by providing something more interactive and more engaging than a bog-standard eLearning unit and your learners will appreciate that you've gone to the effort of trying to engage them, rather than forcing dull training upon them.

GENERATION Y IS SELFISH

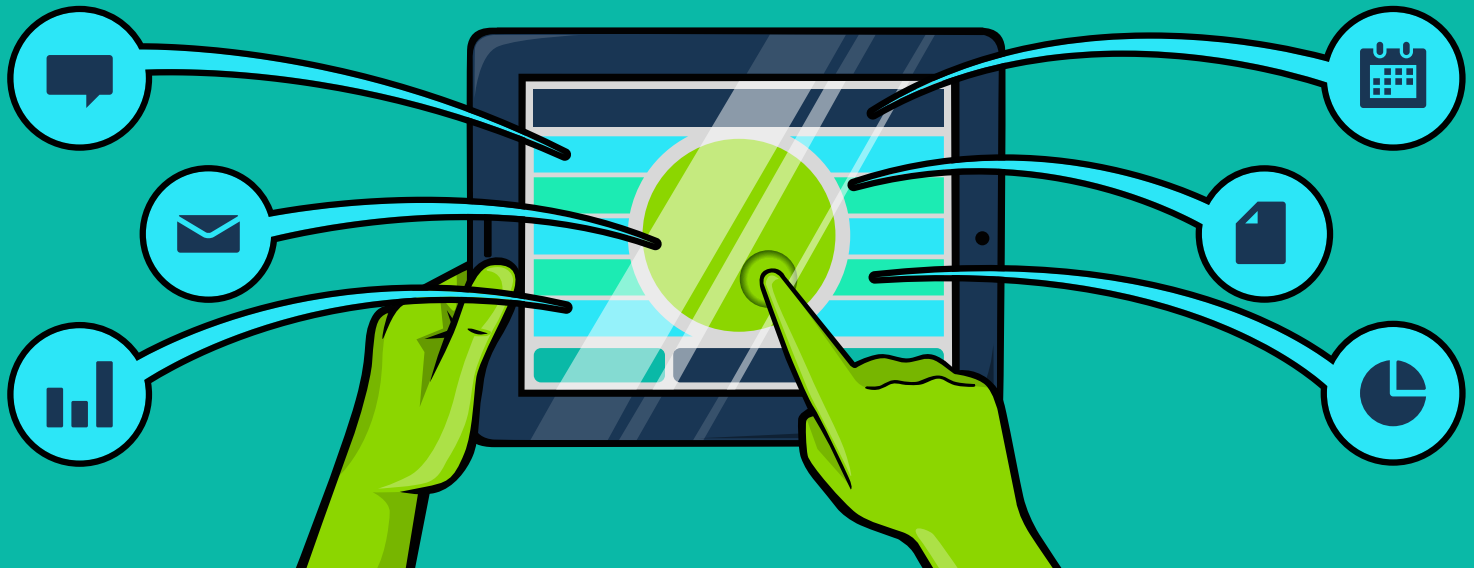
Well, that's probably how the typically cynical Generation X might see it. The fact is that most millennials have grown up in a world that's prepared to tailor experiences to suit their users. It's not that long ago that we only had 2 types of biscuit and 3 TV channels to choose from. Now we're bombarded with choice.

Traditional click-through eLearning has all of the custom-tailored features of a prison uniform. Learning games however, let you put your learners into their own learning journey. With the right solution, you can encourage participation within the unit and give the sense that what the learner does within the game actually affects the outcome.

GENERATION Y SEEKS CHALLENGES

According to research by Ashridge Executive Education, **the top priority for Generation Y in their professional lives is a challenging and interesting working environment.** Since millennials always have their eyes on the next step in their development, they'll hungrily seek out every challenge they can find.

Dull eLearning provides a challenge only in the sense that it's difficult to finish a unit before you fall asleep from boredom. Learning games are intrinsically challenging and, properly designed, can take your learners on a journey that gets progressively more difficult as their skills improve.



5 CASE STUDIES THAT PROVE LEARNING GAMES WORK

Since game-based learning is a relatively new approach to instruction, research into the efficacy of learning games isn't very widespread. However, the mechanics behind it have been covered in depth.

Learning games focus on interaction rather than instruction, and **evidence** supports the hypothesis that learners are more engaged with the learning material when they have more control over it.

In another **study,** it was found that computer-based simulations elicit better learner performance and knowledge retention than non-simulation instruction.

This is backed up by **research** carried out by Traci Sitzmann, University of Colorado Denver. The meta-study found that, compared to other methods, simulation games deliver:

- 20% higher post-training self-efficacy
- 11% higher declarative knowledge
- 14% higher procedural knowledge
- 9% higher retention

Academic studies are one thing, but what about the practical applications...?

SAVVIS DRIVES ROI WITH MERCHANTS

US IT service provider, **Savvis,** introduced *Merchants* to their sales teams. *Merchants* is a learning game designed to improve negotiation skills and customer communication. They sought an interactive solution that gave the learners a chance to practice their skills, whilst engaging them.

Within 6 weeks of launching the 8-10 hour programme, a whopping 80% of learners had completed it. Savvis' CLO, Jim Sokolowski was understandably delighted:

> "Getting 80% completion on a comprehensive sales learning intervention is no small accomplishment, since training time takes away from their time selling. This high completion percentage indicates a high perceived value to the sales force since this became a priority for the team."
>
> **- Jim Sokolowski, Savvis' CLO**

TRISKELION CHANGES BEHAVIOUR

Triskelion is a time management game developed by Gamelearn. It was created to help individuals in fast-paced jobs to manage their workload more effectively and become more productive.

Built as an around-the-world treasure hunt, Learners playing Triskellion need to manage the workflow of Professor Robert Wise. As they keep his inbox clear and his schedule up-to-date, learners also have to keep his stress down and his energy up to improve his productivity.

As proof of its ability to engage, the course saw a 92% completion rate and the potential for cultural change was also emphasised with 97% of students applying the training in their jobs.

POST-TRAINING SELF-EFFICACY

DECLARATIVE KNOWLEDGE

PROCEDURAL KNOWLEDGE

RETENTION

5 CASE STUDIES THAT PROVE LEARNING GAMES WORK

CODECADEMY: SIMULATIONS TO SUCCESS

With the explosion in information technology in the last few decades, more and more people want to learn and improve on their programming skills.

Codecademy answers this need with their online programming tutorials. Although this is more of a gamified learning experience, Codecademy shares a lot of traits with learning games.

In each lesson, coding simulators let learners practise each command and line of code as they go. This interactive format has made it one of the most popular training resources, with 24 million users completing 100 million exercises as of January 2014.

The real wins are demonstrated in the **individual stories,** like Ash Robinson's:

> "I set about using what I'd learned through Codecademy as the basis for learning C, C++ and Objective-C and within a few months I had my first app on the App Store."
>
> **– Ash Robinson (Codecademy User)**

DUOLINGO MAKES LEARNING MORE EFFICIENT

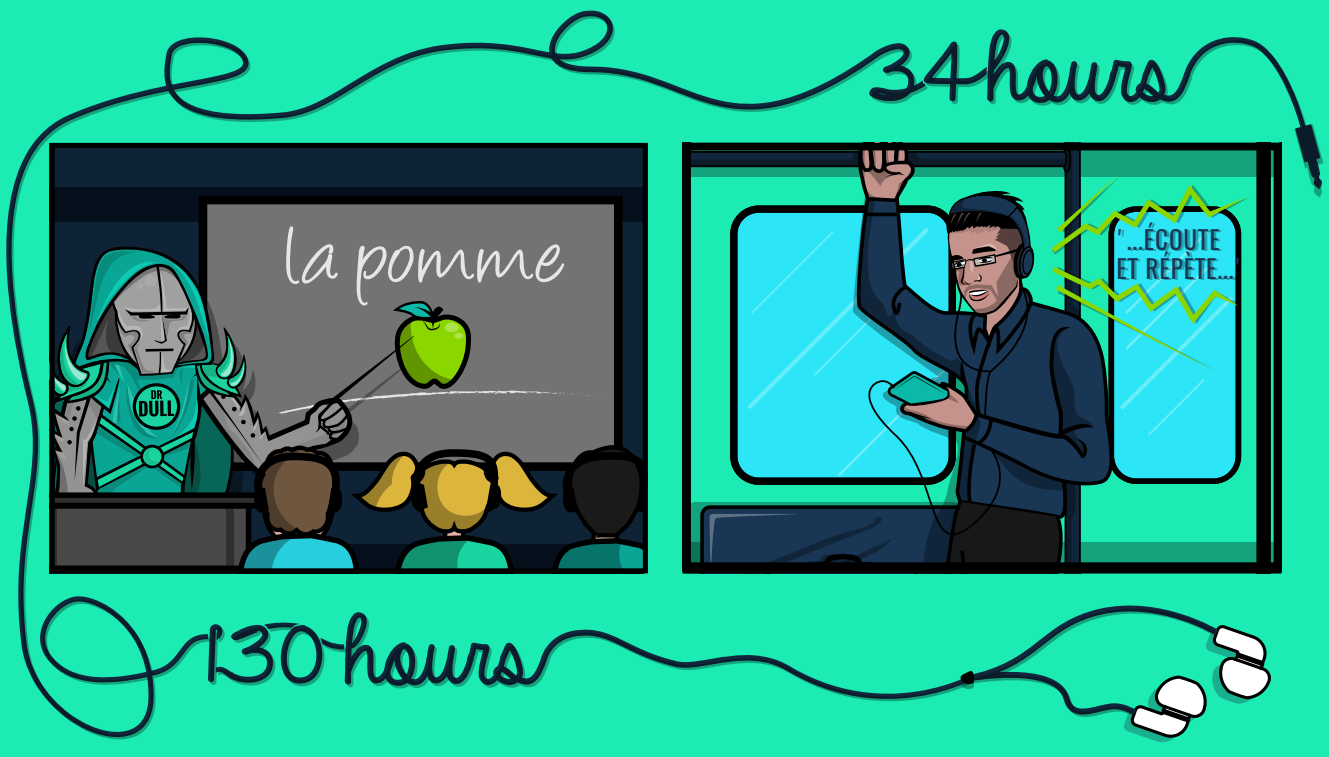
Duolingo is an app designed to help people learn another language. As their skills improve, learners earn experience points and climb a gamified skill tree. The app also features timed challenges in which the learner has to answer 20 questions in 30 seconds, gaining XP and additional time for every correct answer.

Professors at City University of New York and the University of South Carolina found that after 34 hours using Duolingo, learners could reach a level that would take over 130 hours in a traditional college scenario.

THE MCDONALDS TILL GAME EARNS £23.7 MILLION

The McDonalds Till game is a simulation designed to improve sales by making till service more efficient. Although the game wasn't a mandatory part of their training, the game attracted 145,000 visits in its first year. The initiative also got positive reviews from the learners with 85% stating that the game helped them understand the system, thereby improving their performance.

Since launch, till transactions have been reduced by 7.9 seconds and the cost of a cheque has gone up by 15p. That might not sound like much, but it amounts to an additional profit of £23.7 million – and that's just in the UK!



HOW GAMERS LEARN: THE GAME PLAYER'S BRAIN

If you're embarking on your first game-based learning odyssey, you might be wondering where to start. When moving from a traditional eLearning model to a gamified one, you'll find that there's a whole world of learning methods that you'd never even considered before.

Although the structure is similar, games behave differently from the eLearning of old. Any instructional designer will have a good idea of the theory behind how people learn, but a gamified solution needs to also consider how gamers learn.

To make that transition a little easier, here are a few pointers to help you get inside the mind of a gamer and find out what makes them tick!

GAMERS ARE BETTER AT SOLVING PROBLEMS

There's nothing terribly challenging about the classic eLearning setup – first the learner is given a piece of learning content (say a video, or a document), and then they are asked some questions to gauge whether they've grasped it or not.

With games, the player is thrown into an environment and they're often given no instructions on how to proceed. Furthermore, the last thing a true gamer will do is to look for a manual – part of what makes games so engaging is that there's no obvious solution to the challenge at hand.

Modern video games can occasionally throw puzzles at us that make a typical MENSA conundrum look like a tabloid wordsearch. The advantage that this medium has over all others is that it can simulate entire worlds, including the laws of physics, the passage of time and the occasional alien invasion.

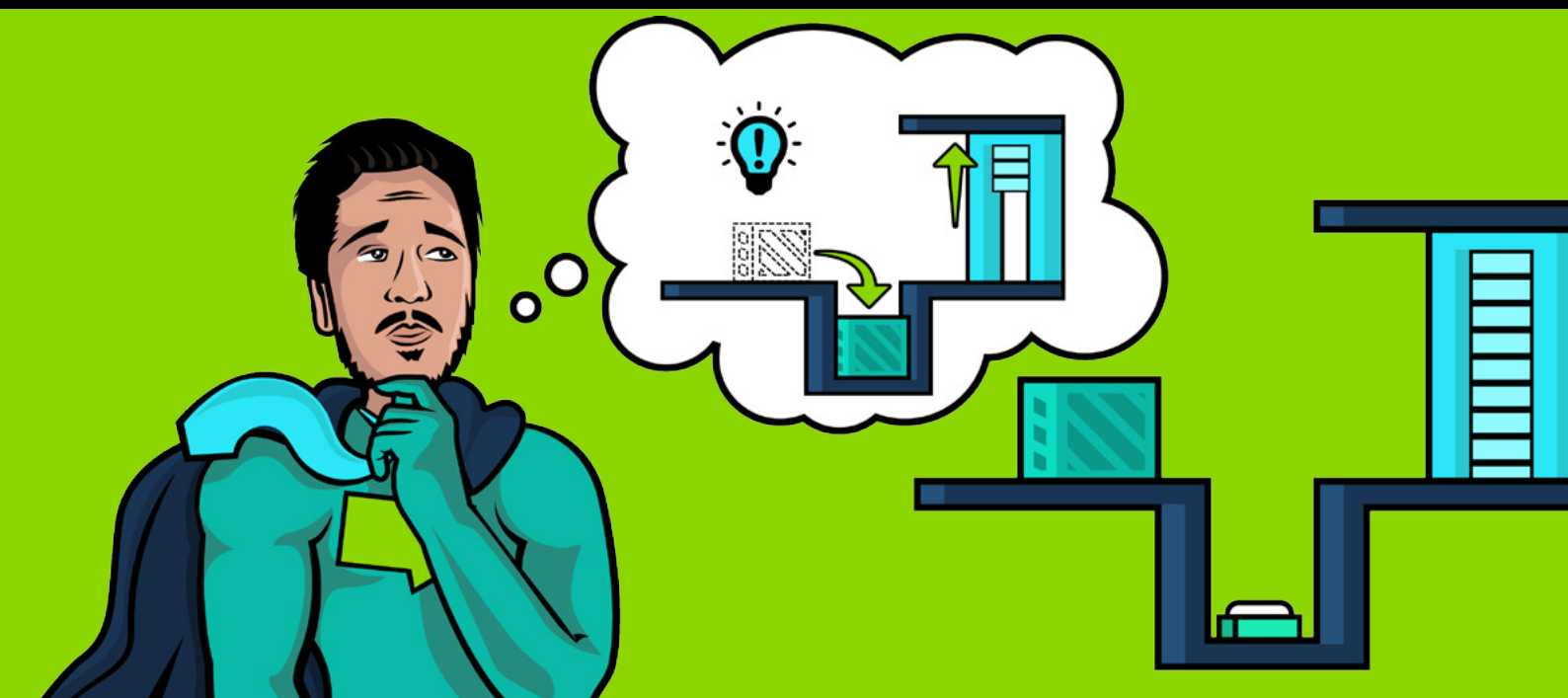
GAMERS ARE LATERAL THINKERS

Although traditional eLearning can serve as the foundation of a robust formal learning programme, it's very limited in the peripheral lessons it can teach. Outside of the subject matter itself, learners only learn how to click on the answer of a multiple choice question.

Games are rich in interactive elements which keep the player engaged and because they seldom come with a rule book, gamers have learned to think outside the box in order to solve the problems they encounter.

To get by in video-game-land, gamers need to employ a keenness of thought that they rarely have a chance to hone in the real world. How often, in your daily working life, have you found the need to move crates, to access a vent, to find a keycard, to unlock a door, to turn a valve (with a handle you had to find in a previous puzzle), to open a hatch... you get the picture – video games offer an exaggerated level of complexity.

Though at the time these tasks can be infuriatingly difficult to work out, the payback is huge – not only do you have the satisfaction of beating the game, you've also rewired your brain a little bit to better cope with similar tasks in the future, be they virtual or based in reality.



HOW GAMERS LEARN: THE GAME PLAYER'S BRAIN

GAMERS THINK MORE CREATIVELY

Following on from the previous point, by solving a variety of different puzzles, gamers gradually acquire a knack for seeing the world from unique perspectives. You see, video game developers, like many creative professionals, are constantly under pressure to come up with unique content. To satisfy the audience of today, developers have to merge genres and create new situations, otherwise the player won't feel challenged and therefore won't keep playing.

To survive in this ever-changing landscape, gamers need to view things from all angles, find links in unlikely places and think as creatively as those developers. The great thing is, once they've completed the game, they don't just dump these new powers of lateral thinking – **they carry them into their everyday life.**

GAMERS EXPERIMENT

When a learner gets a question wrong in an eLearning unit, they have a better chance of answering the question correctly the next time around. This will help them remember a piece of information, but it won't necessarily change their behaviour.

Games are supposed to be difficult, otherwise there's no reason to play them for very long. Gamers learn how to master an environment by failing – again and again. By experimenting with the game, they learn what works and what doesn't by experience, not just by reading about it.

GAMERS ARE STRATEGIC PLANNERS

Some of the most important lessons you'll ever learn in your life might just come from 6-hour marathon sessions of Sid Meier's Civilization III. On the face of it, it's a game of global conquest where you choose a civilisation from history (Romans, Aztecs, etc.) and lead them to victory. A rookie might be tempted to build the biggest army and attack their enemies en masse, but that is a sure recipe for defeat. The game incorporates layers of diplomacy and economics which cannot be ignored if you plan on winning.

It's much the same in reality. Victory is never a straight-forward goal and if you are to succeed in anything, you need to consider all angles. This is a lesson most people will eventually pick up without playing video games, but they'll undoubtedly fail more than once in the process, wasting a great deal of time and money (and legionaries and war elephants). At least in a virtual environment, you can learn this lesson whilst avoiding any actual risk.

HOW GAMERS LEARN: THE GAME PLAYER'S BRAIN

GAMERS LOOK FOR PATTERNS

In a non-game learning environment, there are few chances to observe how one action leads on to another. This can be illustrated in a scenario, but even so, these stand-alone examples only give a glimpse at the larger picture.

The issue is an unfortunate consequence of the systemic reliance on the traditional eLearning model as the one-and-only way to impart information online. This outdated format has more in common with a presentation slide show than a participative learning experience.

Gamers are used to observing a system as a whole and in most cases, pattern-recognition is essential to beating the game. This habit of mind proves useful in the real world and it's a difficult skill to engrain in any other way.

GAMERS ARE SOCIAL LEARNERS

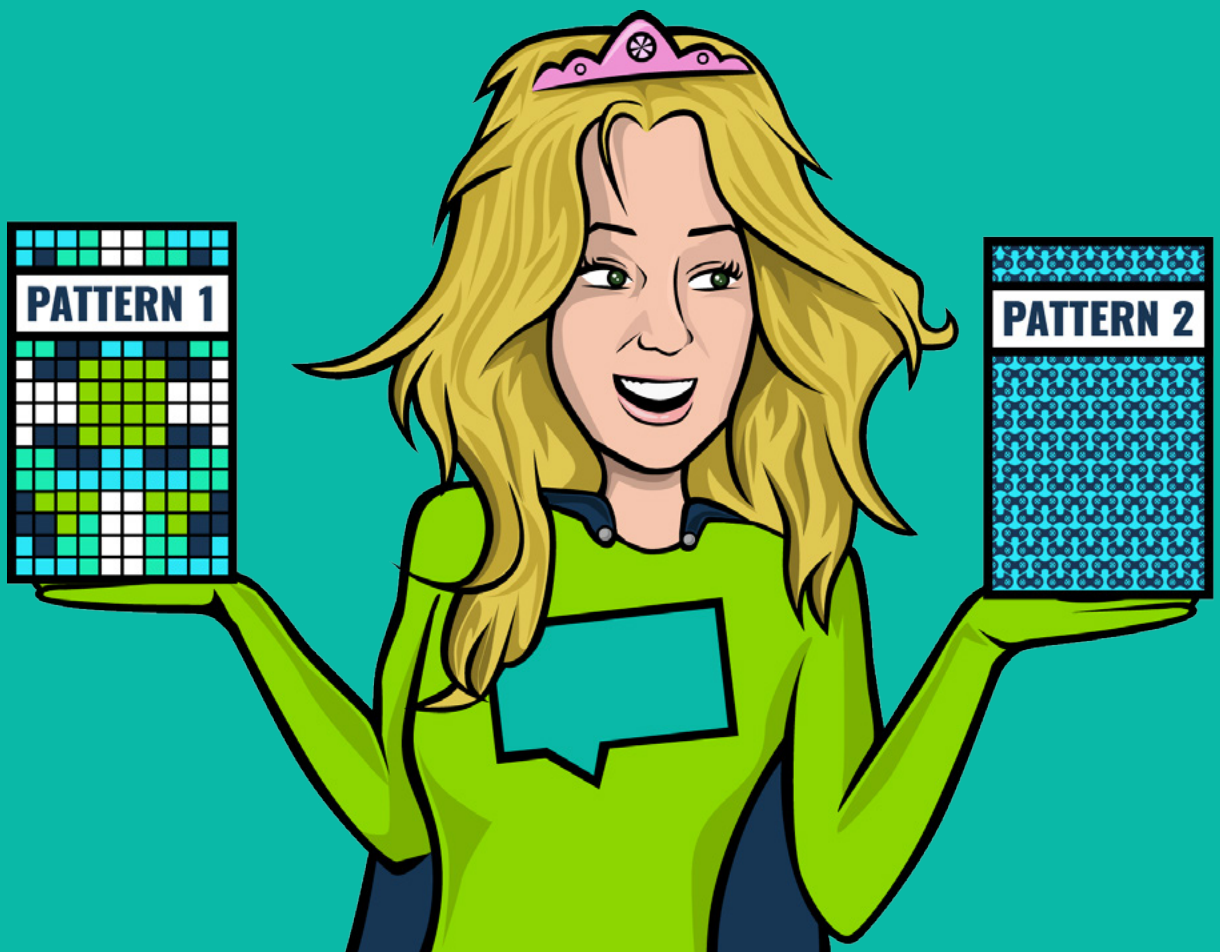
When online learning first became a reality, detractors feared that this method of delivery wouldn't have the 'human touch' of a classroom setting. Although there have been advances in social training platforms, many learners still have limited options when they need help.

Gamers will waggle their thumbs and bash buttons for hours on end trying to overcome an obstacle, but sometimes even this tenacious breed will get stuck. When that happens, they don't hesitate to turn to their fellow gamers online and get a few pointers.

One of the biggest issues with traditional training is that it's a one-way street. Learners are given the essential information during their formal training and that's where it ends. Few companies realise that their own people can provide a rich source of training, if only they are given the chance.

MMORPG: Massively Multiplayer Online Role Playing Game

The meteoric success of MMORPGs like World of Warcraft demonstrates the engaging power of a social gaming experience. This multiplayer online game boasted 12.5 million users at its peak in 2010, and it still commands a modest user base of a 6 million.



HOW GAMERS LEARN: THE GAME PLAYER'S BRAIN

If you've spent any time at all on YouTube, you've probably already noticed that it's rife with game tutorials. Gamers work hard to beat the game and when they find a method that works particularly well, the first thing they'll do it share it with their fellow gamers.

GAMERS HAVE BETTER VISUAL ACUITY

Gamers that indulge in 10 or 15 hours of gameplay per week actually tend to have very good vision – better than those who never play video games. Gamers' eyes can resolve really small details, which means they can easily read the small print on a prescription pill bottle and figure out which tiny screw is which when they're assembling their new flat-pack furniture.

Gamers can also discern between different shades of grey better than non-gamers. In foggy conditions, a serious gamer will be able to spot a car up ahead faster than a non-gamer. Clearly a good thing for preventing car accidents, no matter what people say about the **'Grand Theft Auto' effect!**

GAMERS HAVE BETTER ATTENTION SPANS

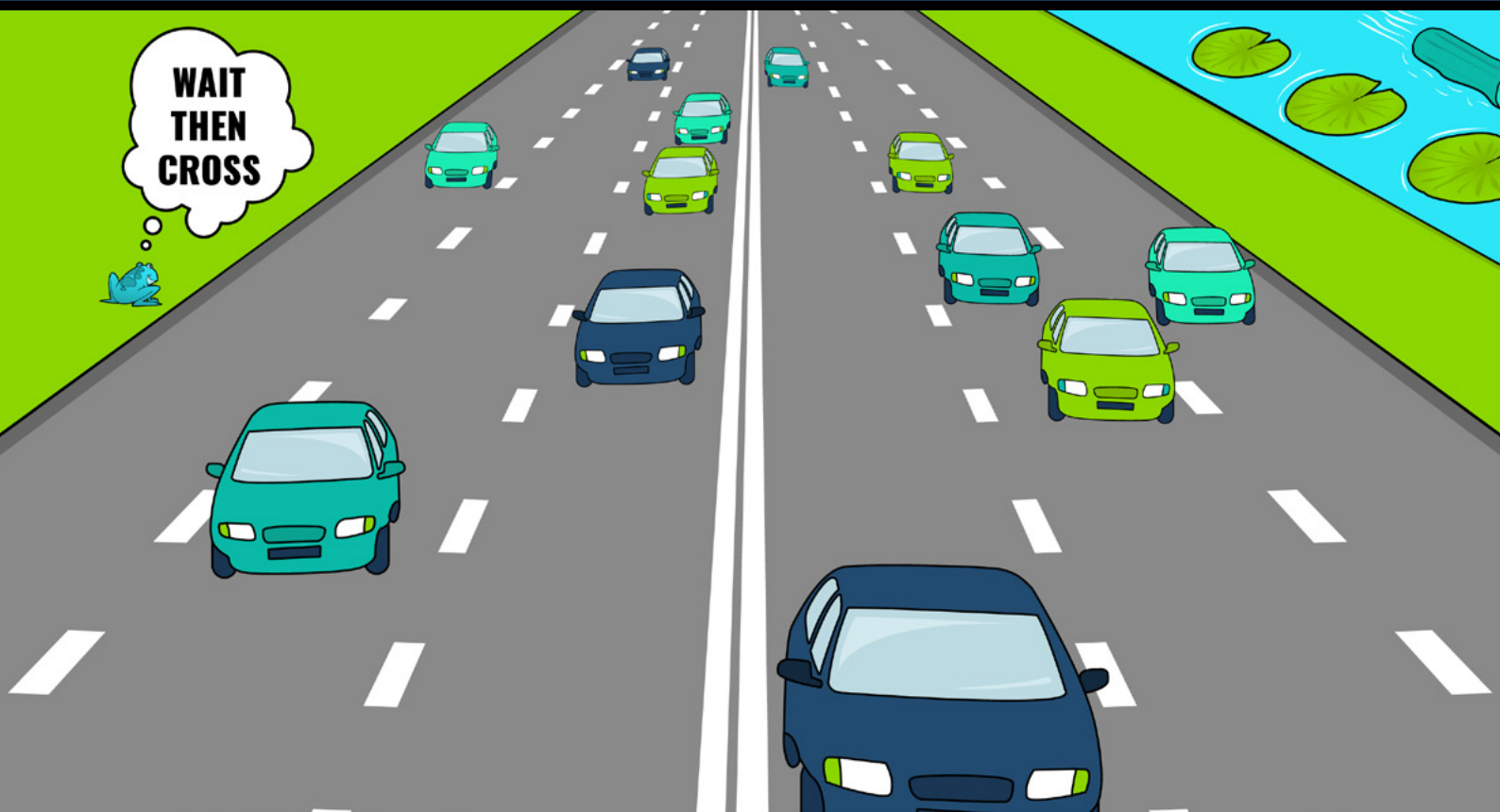
Gamers are able to focus on more objects at once than non-gamers. For instance, **Daphne Bavelier and colleagues tested gamers and non-gamers** to see how well they could track the movement of blue dots once they turned yellow.

Daphne et al. found that the average person could focus on three dots and successfully state whether a random dot was always yellow or originally blue. Gamers, on the other hand, had such great attention to detail and superior attention spans that they could focus on 6 or 7 dots at once!

This study indicates that the gamer's brain is more adept at spotting hazards when driving, for example, or tracking the positions of team-mates in a football match. Of course, you don't need a degree in education to know that attention spans are a critical factor in a successful training initiative. Anything that can keep learners engaged for longer can only be a bonus.

It's long been assumed that people learn by sitting still, keeping quiet and paying attention to the lesson. Gamers show us a new way of learning that's more interactive, more engaging and one that provides tons of opportunities for the lessons to grow into something bigger.

Aside from giving you a consequence-free stage on which to make mistakes, video games make a great tool for personal development. They offer sophisticated mental challenges that are unequalled in the real world.



THE NEUROSCIENCE OF LEARNING GAMES

As we've seen, games aren't just mindless entertainment – they can actually transfer useful work skills – lessons that can't be learned by simply reading a manual or watching a video. But what's really going on here? Let's find out how games work in harmony with the most complex informational hardware in the known universe – the human brain.

GAME-BASED LEARNING FORGES AN EMOTIONAL CONNECTION

Game-based learning involves creating a narrative around the learning activity that describes why the task is relevant to the learner. Research has shown that **attention spans are affected by the subject's emotional connection with the activity.**

> "We found that participants' attention is affected by emotion and priority, such that they pay more attention to particularly vivid information or details that are highly relevant to them, but their retention of low-priority information is impaired,"
>
> **-Michiko Sakaki**

THE HIPPOCAMPUS CONTROLS RECALL

The hippocampus is an area in the lower section of the brain which is largely responsible for knowledge recall. During learning, **a strong hippocampal activation makes the content easier to remember and recall.** In clinical tests, game play has been shown to stimulate these conditions.

> "Identifying a direct connection between the stimulation of neural circuits and game play is a key step in unlocking the potential for game-based tools to inspire positive behavior and improve health,"
>
> **- Brian Knutson, associate professor of psychology and neuroscience at Stanford University**

DOPAMINE CREATES POSITIVE ASSOCIATIONS WITH LEARNING

Dopamine, or the feel-good hormone, is released whenever we are rewarded for a specific action. Learning games focus on giving learners instantaneous feedback which might not otherwise be available. By giving virtual rewards for achieving learning goals, learners begin to associate the learning with positive emotions, prompting them to try to repeat it (ie, seek out more learning).

THE BRAIN PROCESSES STORIES BETTER THAN FACTS

One of the key components of a compelling game is **a good story.** People tend to remember stories better than lists of unconnected facts. This isn't just a matter of preference; it's a physiological imperative. When we are engaged in a strong narrative, the brain releases oxytocin – a chemical that generates feelings of trust and empathy. As a result, when the brain receives information presented as a story, it recognises it as being more valid.

THE NEUROSCIENCE OF LEARNING GAMES

BADGES AND REWARDS CAN TRIGGER SEROTONIN RELEASE

Serotonin is a hormone that governs our overall mood. Plenty of serotonin makes for a sunny disposition whereas a drop in serotonin might leave you feeling a bit grumpy. Aside from eating properly, serotonin release is also **triggered by remembering past successes.**

In most game-based systems, users earn badges for completing tasks and these are usually housed in a prominent badge cabinet or an achievements area. On a gamified learning platform, learners get a serotonin rush on demand whenever they look at rewards they have earned.

PLAYING GAMES RELEASES ENDORPHINS

The thrill and excitement of playing a game is the result of endorphins being released. Endorphins are the body's natural painkiller but they can also lower stress and anxiety levels, and even create a sense of euphoria. Combined with other neurotransmitters, this helps create an ideal environment for **focused learning.**

PLAYING GAMES KEEPS THE BRAIN FIT

Studies have shown that gameplay can improve brain functions. In **a study conducted by BBC's Horizon,** a test group of older subjects played a popular racing game for 15 hours over 5 weeks. When they were evaluated after that period, their memory and attention span scores had improved by around 30%.

GAMEPLAY REDUCES STRESS

Cortisol is known as the stress hormone and it controls the body's reaction to stressful situations. When it comes to learning, high levels of cortisol force the brain into survival mode, distracting from the learning in order to deal with the stress. By adding game-like elements to the journey, this effect can be mitigated. Results of **a Texas A&M International University study** showed that "games reduce depression and hostile feelings in players through mood management."

LEARNING GAMES HELP DEAL WITH COGNITIVE OVERLOAD

The brain can only handle a finite amount of information. If the **cognitive load** is too great, the learner could miss information, resulting in incomplete training. One way that gameplay can deal with cognitive load is to present the learning in a more game-like, challenge-based format. Along with the other neurological benefits of game-based learning, this approach helps to chunk the content into smaller pieces that are easier to retain.

GAMES TEACH WORK SKILLS

The workforce is filling with people who grew up playing complex video games that require a lot of intricate coordination. By commanding a Roman army to victory or managing the facilities of a virtual city, players can gain skills like resource management and prioritisation.

> "These young people may be better equipped to switch between tasks easily, adapt to new information, and modify their strategy as new input comes in."
>
> **– Judy Willis, M.D., American Academy of Neurology**

As game-based learning produces more outstanding results, the scientific community is conducting more research into the power of gameplay in non-game scenarios. All that remains is for the learning and development community to take these findings on board and improve their own programmes.

5 THINGS THAT MAKE AN AWESOME LEARNING GAME

Now that you know the effects that games have on the brain, you need to think about how to get the most out of them. The video game market might have you believe that to be a true success, a game needs to have ground-breaking graphics, an enormous budget and a wide range of associated merchandise.

History has shown that none of these things can guarantee a commercially successful video game, nor can they have an impact on your training programme. To create something that makes a real difference, you need to look at the fundamental elements that separate a good game from a great game.

A NARRATIVE

Since humans first descended from the trees, we've told each other stories. As a species, we've been telling stories for so long that our brains are hard-wired to interpret them. A list of unconnected events won't spark much of an interest in your learners, but when you add a narrative to the picture, everything changes.

Even archaic gaming classics like Space Invaders place the player in the lead role of Earth's last defence against a surging alien horde. Without a story, Space Invaders would simply be a bunch of coloured blocks moving around on the screen.

Creating learning games lets you create a gaming experience, but with a bit of thought, you can also tie the game's narrative to the learning objective. For example, if you're creating a piece of content about customer service, your game might involve satisfying disgruntled customers.

CHOICE AND INFLUENCE

The thing that differentiates a learning game from a bog-standard eLearning unit is interactivity. In order for the learner to be engaged, they must feel like they're in control of the game, at least to an extent.

With the proliferation of mobile devices, attention spans have never been shorter. Unless you keep your learners active and involved, they'll drift off, leave your learning content, and in all likelihood, play a game on their phones.

By giving the learner choices and letting them influence their own progress, you're making the learning journey more interesting which means they are more likely to complete their training.

5 THINGS THAT MAKE AN AWESOME LEARNING GAME

RISK AND CHANCE

Random encounters and rolls of the dice have been common features in games throughout the ages. This element of a great game doesn't necessarily affect the learning at all, but it can grip your learners on a basic level. By figuratively flipping a coin the learner relinquishes their control of the game and leaves the outcome to chance.

As their fate hangs in the balance, mild anxiety settles in, followed by either glorious victory or crushing defeat! Even in the latter case, your learners have forged an emotional connection with the game and will be ever more determined to try again and get their own back!

VIRTUAL REWARDS

With any game, the first thing the player needs to understand is how to win. In most cases, the player's success is determined by how many points they have earned. Although the world of gaming has gotten more sophisticated, few of them have left out this virtual currency.

Points are so prevalent in gaming that some learners might simply take this gaming mechanic for granted, or not notice at all. In-game Achievements are much more visible, after all, is there anything more exciting than a big, bombastic badge alert?!

These rewards also tap into the player's urge to complete a collection which means your learners will be more likely to finish, or even return for a second go!

REAL REWARDS

Once they've beaten their high score and filled their badge cabinet, the learner has effectively finished the game. They can't pry their hard-earned virtual riches out of the system, but luckily for them, they've already earned a very real reward.

They've seen that online learning can be something more than just a click-through slideshow. They've completed some training and even enjoyed the process. By giving them a game-based learning experience, you've shown them that learning doesn't have to be dull.

Most importantly of all, you've given them the tools they need to do their jobs better which affects not just their career, but the success of the company as a whole. What could be more rewarding than that?

WHERE DO YOU START?

If you're excited about the idea about adapting a game-based approach in your training programme, it's tempting to jump straight in and start planning your next big hit. Calm yourself just a little though. Like so many things, preparation can make the difference between a success and a flop.

Here are a few pointers you should follow to make sure your game-based training initiative gets off to the best start.

FIGURE OUT THE EPIC MEANING

The Epic Meaning is the frame that holds your entire project together. This defines what makes your business tick, what matters to you and your overall mission. All good games have a narrative that helps the player (or in this case, the learner) identify their place in the bigger picture. This is an essential factor in getting the learners' buy-in.

ALIGN TO BUSINESS OBJECTIVES

The vision and values that support your organisation should filter down through every aspect of your game-based learning initiative – If you try to shoehorn a gamey element into a pre-existing learning unit, you could doom yourself to failure.

In all cases, the learning game and the learning objective should complement each other. By aligning the activity to the business objectives, you ensure that you're motivating your learners to progress and to contribute to your overall business goals.

USE THE RIGHT TECH

Make sure your means of delivery is up to the task of generating meaningful engagement. You can't hope to bewitch your learners if your LMS is plagued with usability issues and it **looks like its last UI overhaul was in 1996.** A learning platform that supports gamification and social interactions will be a big help, but make sure that it has enough custom options to let you craft a relevant and meaningful journey for your learners.

Your instructional designers need to have a smooth journey also. Make sure that they have the right tools at their disposal that can allow them to easily build the most engaging learning games without hassle. We'll cover implementation methods in more detail in the next chapter.

PICK YOUR TEAM

As with so many things, it's the people behind a project that largely determine its success. Take time to evaluate your resources – is your design department up to the task? Does your tech team have the necessary experience? Are your instructional designers and Subject Matter Experts savvy with the theory of games and gamification? Before you start down the yellow-brick-road of game-based learning, make sure you've got the support you need to make it happen!

WHERE DO YOU START?

DON'T FORGET ABOUT THE SOCIAL ELEMENT

Games are fun to play alone, but only up to a point. A social aspect can make the game much more fun and keep players returning again and again. Needless to say, return visits are just as important for a learning game. Consider how you can use leaderboards to encourage healthy competition between learners, and capture informal learning by letting them challenge each other.

DON'T RUIN A GREAT SYSTEM WITH BAD CONTENT

Some people still think it's enough to use a gamified LMS to deliver the same dull content they would on any other system. If you want your game-based learning experience to work, you need to commit to it on every level. This doesn't mean that every piece of content needs to be a game – but it will be a lot more effective if it feels like a part of the rest of your training programme and helps to foster a sense of epic meaning.

DON'T EMULATE GAMES (WITHOUT GOOD REASON)

Don't try to recreate a game that already exists if you don't need to. Remember that your learners absorb knowledge by the various activities they complete within the game. Even if you think a particular element would be pretty cool, you need to make sure it's also tied to the behaviours you're trying to encourage.

DON'T PATRONISE YOUR LEARNERS

With the prevalence of gamification in all aspects of life, your learners already know the difference between a meaningful game mechanic and something that's just been thrown in to make the learning look like a game. Instead, before you include something in your learning game, ask yourself if it will empower your learners and encourage them to complete the training.

ADD MORE INTERACTIONS

The eLearning units of days-gone-by might have demanded your learners' attention for at least 15 minutes at a time, without giving them an opportunity to interact with the learning. Games are engaging because they are interactive by nature, but also because the player knows immediately if their interaction was a good one or a bad one. This constant, instantaneous feedback is key to real behavioural change.

WHERE DO YOU START?

GIVE EACH LEARNER A UNIQUE EXPERIENCE

The video games industry is successful because it gives consumers what they want – and it appears that players want their decisions to have an effect on the course of the game. A game-based learning experience needs to allow the creation of learning pathways specific to the needs of individual learners. If your learners feel that they are in control of their destiny, they'll be more likely to take ownership of their professional development.

TEST IT

Games work so well because they have clear rules. Part of the joy of playing a game is discovering these rules and adapting to them. The game mechanics in a game-based learning environment need to work according to a set of rules. Take a points-based level mechanic for example; the learner needs to earn enough points to pass a particular level, but if poor level design doesn't allow this, the learner will be frozen on their journey. Luckily, with some rigorous, pre-launch testing, these things are easy to spot.

BUILD ANTICIPATION

The last thing you want to do is to spring a brand-new gamified learning platform on your unsuspecting learners! If you don't make the effort to drum up a bit of excitement, the best you can hope for is mild apathy. Your online learning roll-out shouldn't be announced with a simple email – you should rally your troops, emphasise the importance of the activity and make sure each learner knows their part in it and what they stand to gain.

GET FEEDBACK

Now that your game-based solution is up and running, you can sit back and relax, right? WRONG! You now have the task of fine-tuning and finessing the platform to get the best results. A solid reporting tool will let you know (among other things) who is learning what and how often they are visiting. Your system should also let your learners rate each piece of content they consume, letting you know whether or not they find it useful.

A game-based learning experience can boost learner engagement and change behaviours, but only if you avoid the pitfalls. If you're just branching out towards gamified online learning, or you've been in the game for a while, these tips will help you get the most out of the tools available to you.

WAYS TO IMPLEMENT GAME-BASED LEARNING

By now, you must be pretty excited about building a game-based training solution. You might think that learning games are out of your reach, but there are several options available.

Before you begin, clarify the goal you want to achieve. If you don't know what problem you're trying to solve, you run the risk of building a learning game for the sake of building a learning game.

There are different types of learning game available and which one you go for will depend on your budget, how much time you're prepared to devote to the project and whether the particular solution can deliver what you need to address your goals.

HIRE A DEVELOPER

If you've got big ideas (and big pockets), and you know exactly what you want, there's a game developer out there who's just waiting for your call. A game developer will be able to guide you through the process of nailing down the perfect learning game for your company.

Custom development like this **doesn't come cheap,** averaging at around $20,000 (£14K) to $30,000 (£21K) for a 15-minute, entry-level game, but this can easily go up as far as $250,000 (£176K). Similarly, for more complex learning games, you can expect a longer lead time.

TEACH YOURSELF TO DEVELOP GAMES

If you've truly been bitten by the learning game bug and you want to see your ideas come to life, why not teach yourself some game development? People with no prior coding experience have **created commercially successful games** using applications like GameMaker Studio. If you go down this route, you'll not only have complete creative control over the project, but you'll acquire a new skill to boot!

On the downside, even simplified developing engines like GameMaker Studio come with a fairly steep learning curve. There are plenty of tutorials and discussion forums online, but you'll need to be prepared to invest a lot of time into the project. On a more practical note, you may also sacrifice the ability to report on your learners' progress.

WAYS TO IMPLEMENT GAME-BASED LEARNING

GET AN AUTHORING TOOL

A **game-based authoring tool** addresses the needs of trigger-happy gamers and learning managers alike. With the right application, you can collaborate with your team, add assets, create questions and build these into an engaging game template. If you're looking for a quick and easy learning game solution, this might be the one for you.

What you gain in convenience, however, you will lose in custom options. The game templates, though engaging, won't necessarily match your brand perfectly, although many authoring tool providers will develop custom templates at an additional charge.

USE COTS GAMES

Have you considered the possibility of using commercial off-the shelf games? **Research** has uncovered successes using games that weren't designed for training purposes. Games like SimCity teach skills like resource management and reinforce the notion that all processes in a system affect each other.

With a little imagination, you can adapt the training to make the best use of these games' functionalities. Unfortunately, you won't be able to change any elements within these games to ensure they map directly onto your learning objectives.

USE REAL-WORLD GAMES

Learning games don't necessarily require technology – the point is to make the learning activity more interactive, thus securing the learners' engagement. Role playing, competitions and puzzle solving can all be integrated into classroom sessions to make them more interesting and to encourage participation – and they probably won't cost you a penny!

The main downside is that they require a lot more coordination. This is a handy solution if you already have training sessions planned, but organising a real-world learning game from scratch can require more planning than you might think.

SEND CHALLENGES ON YOUR LMS

Finally, why not examine the technology you already have at your disposal? Most LMSs will have an in-built testing functionality. You can use this to push quizzes to your learners on a regular basis and, if your LMS is gamified, you can give special badges for these quiz exercises. You could roll a quiz out every Friday and track the results on a league table or on the LMS's leaderboard.

Turning your learning management system into a game is a lot easier if it's already gamified, but if you're not that lucky, you'll face a bigger challenge. That doesn't mean that it's impossible to make a game of a non-gamified LMS, it just means that you'll need to be more creative!

THE EFFECTS OF A GOOD LEARNING GAME

So, let's say you've followed all of the advice in this white paper so far and you've created a learning game – how will you be able to tell if it's any good? At their core, learning games should be built to satisfy some wider organisational goal. For most learning managers, this is the bottom line that defines whether or not they've done their jobs.

Although this is the point of a training programme, it's all too easy to get hung-up on the end result. Many learning managers are driven to despair by learning efforts that yield low completion rates and that don't appear to have any effect on behaviour. However, by focusing on the bottom line these learning managers are forgetting about the most important part of the puzzle – the learners themselves.

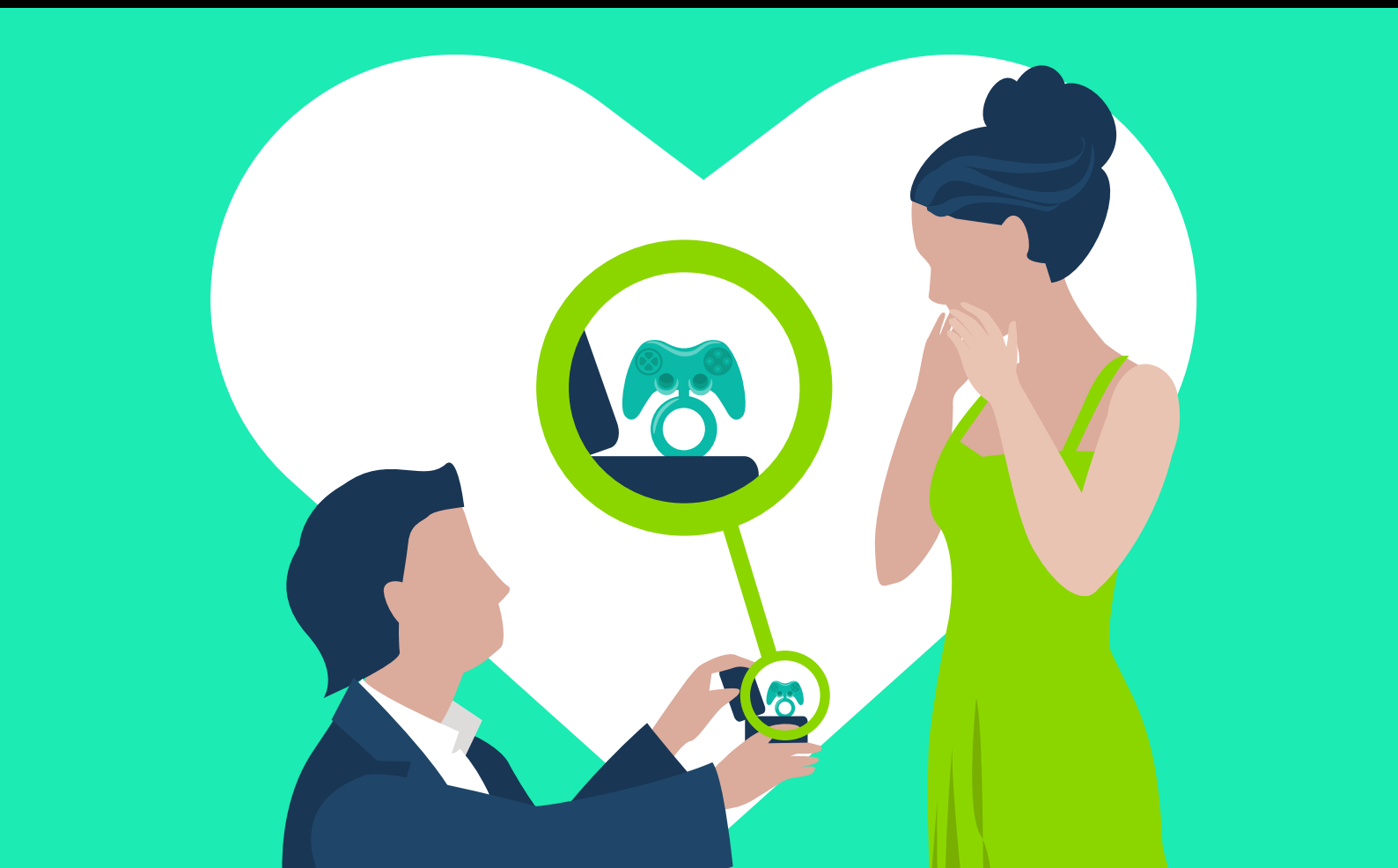
Learning games have the edge on traditional eLearning because they are designed with the learner experience in mind. Instead of spoon-feeding a tasteless gruel of dull content to an uninterested audience, learning games act as a delicious and irresistible cake that the learners simply can't ignore!

So, how do you know your cake is delicious and irresistible enough? To answer that question, let's look at the characteristics of a successful learning game.

IT ENCOURAGES ENGAGEMENT

Your first measure of success is the most important one – do your learners actually care about it? A good learning game will engage your learners and this will initially be reflected in a marked improvement in completion rates.

Secondly, if your learners have enjoyed the experience, they will say so. If you have an in-house social network, you can expect to see a lot of buzz. Even without such a platform, word of your learners' excitement will find its way to you somehow. Can you say the same for some dull, click-through eLearning..?



THE EFFECTS OF A GOOD LEARNING GAME

IT PROVOKES THOUGHT

Bombarding your learners with facts and figures is all very well, but if you want to change the way they think and behave, you need another approach. Active participation in the learning material is a more effective way of getting the message across to your learners.

A good learning game should include a large element of interaction and it should provide an opportunity for your learners to reflect on their own experience. Not only does this provoke thought, but it also helps craft a unique personalised experience for each learner.

After implementing a game-based learning solution, you might notice that your learners are more prepared to examine their jobs more closely, look for more ways to improve their performance and question the processes that stand in their way.

IT REINFORCES BRAND, VISION AND VALUES

The most successful organisations get to the top by sticking to a core set of values and a clear vision. In a learning programme, these are particularly important. Rather than simply focussing on how a task should be done, they answer the more important question of why.

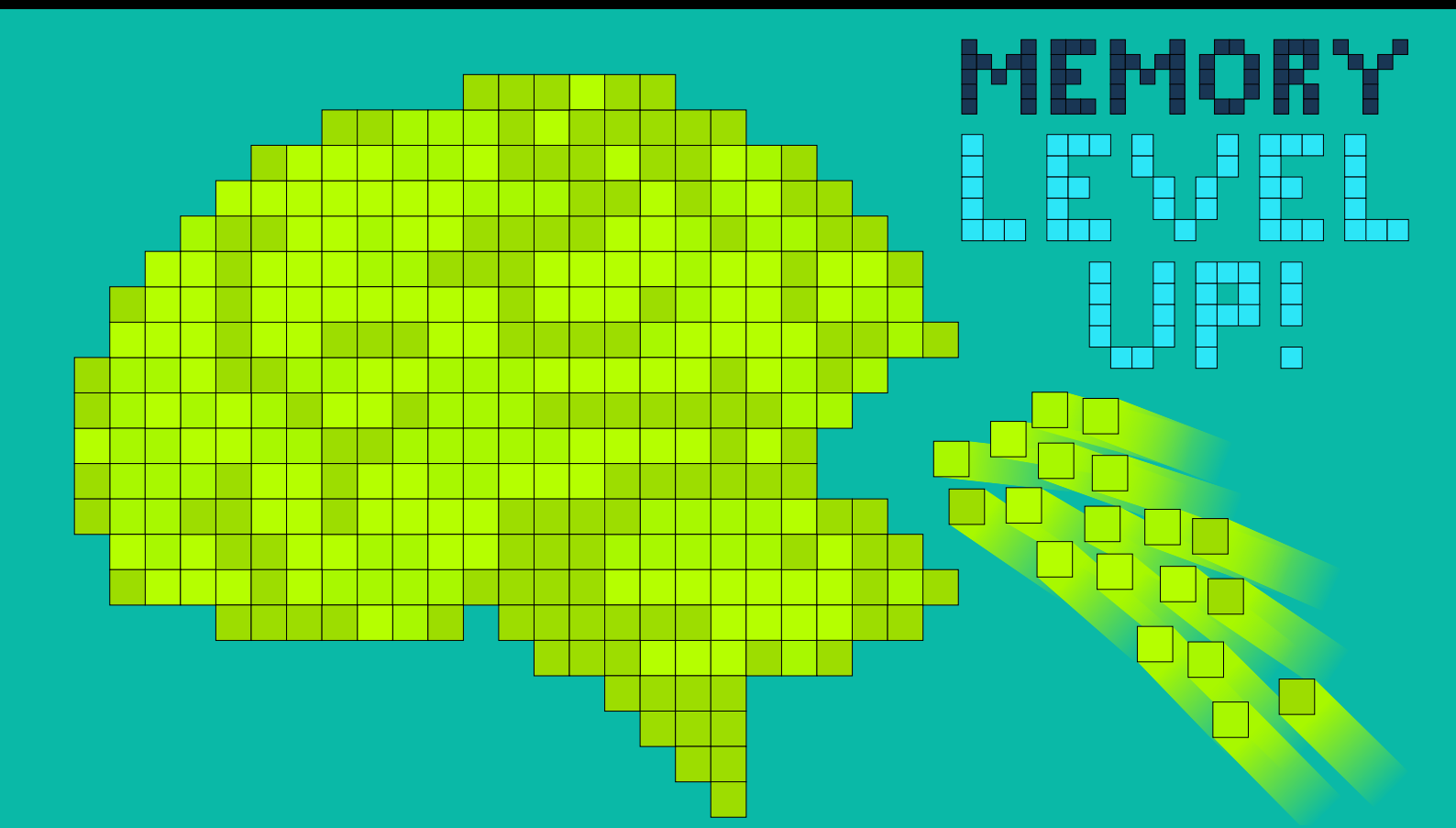
Because learning games are highly interactive and participative, they're a great tool for engraining the bigger themes. By highlighting your organisational principles at every interaction, games help to teach learners about the motivation that lies behind everything they do, and encourage the behaviours that mean the most to your company.

IT IMPROVES RETENTION

One of the main drivers behind any training programme is creating a real change in learner behaviour. This is impossible if the learning doesn't stick. Ebbinghaus' Forgetting Curve hypothesis describes the exponential loss of knowledge after something has been learned. Although there's no magic formula to completely negate this effect, there are ways to mitigate it.

Learning games help by creating an additional context around the learning material and act as a subconscious mnemonic technique. In many cases, the learning objective won't necessarily be linear. With a learning game, the learner can associate each step of the learning journey with a similar stage in the game.

Coupled with the increase in engagement and the elements of personalisation, a really great learning game can reinforce the overall learning objective on three fronts. That's good news for the business, good news for you and most importantly, great news for your learners!



THE FUTURE OF GAME-BASED LEARNING

Did you know that the word 'gamification' was first uttered only in 2001? You might have seen it in your Facebook feed back then... if Facebook had been invented! To think, we still had to wait another six years for the iPhone!

Technology is shooting ahead faster than we can keep up with it and the world of learning games is no exception. The future of game-based learning is right on our doorstep and if you're wondering how you're going to stay on the cutting edge, preparation is half the battle.

So, become a techno-scout and be prepared! To help you earn your badges, we've travelled through time to help uncover the top ten things to look forward to in game-based learning.

1. TRADITIONAL ELEARNING DIES

Because it's just not up to the task of training people in today's connected world, the traditional slideshow eLearning model will all but cease to exist. Aside from the challenge of engaging people with this kind of eLearning, it's inherent inflexibility will spell its downfall.

As **Simon Berg of Ceros** says: "...you simply require multiple experiences based on how people are interacting with your content. The idea of a one-size-fits-all model for designing content is completely broken."

2. MORE RESEARCH INTO GBL IS CONDUCTED

Game-based learning has been a subject of research since the early 20th century. With the advent of computers came a revived interest in the potential of digital learning games. As of 2016, a significant body of research exists that shows how effective game-based learning can be compared to other methods.

However, it has been recognised that **much more is needed** if we are to understand how exactly it works: "...it is important we develop a more analytic approach that considers how the different elements that operate within video games impact in an educational setting."

3. GBL BECOMES THE STANDARD TRAINING METHOD

As more research uncovers the mechanics behind successful game-based learning, learning managers will be in a better position to deliver effective learning games.

As more of these initiatives prove successful, game-based learning will make up a greater share of the learning programme as a whole. Trends in the game-based learning market reflect this with **compound annual growth rate in this sector forecasted at 8.3%.**

4. GBL SHIFTS TOWARDS MOBILE

In 2008, mobile usage accounted for only 12% of the total consumption of digital media. As of 2015, the tide has turned with **51% of all media being consumed via mobile.**

Game-based learning will be developed with mobile technology in mind, but it will also adapt to the way people consume content on mobile devices.

5. NO TIME TO LEARN" STOPS BEING A VALID EXCUSE

Today, people are bombarded with many more outlets and ways to consume media than ever before. To deal with the way people access media today, learning material will be produced in a more bite-sized format.

The success of this format has already been demonstrated by companies like Lynda and Udemy where millions of learners consume content voluntarily on a daily basis.

THE FUTURE OF GAME-BASED LEARNING

6. LEARNING GAMES BECOME MORE ACHIEVABLE

As little as 10 years ago, the prospect of creating a game of any kind was a daunting one. Now, major distributors such as Steam include areas that let users create their own game assets.

Game creation applications like Game Maker Studio will continue to improve, unlocking yet more opportunities for the instructional designer to become an amateur game creator. On the other side of the scale, content authoring tools will borrow from game-building software and include more options to build game-based content for learning.

This will in turn create a larger library of game templates that instructional designers can use to build learning games quickly and with ease.

7. LEARNING CONTENT DEVELOPERS FOCUS MORE ON INTERACTIVITY

Following on from the success of gamification in learning, and the advances in custom game creation, instructional designers will seek to include more ways for the learner to interact with the learning material. Smaller challenges will also provide more opportunities to deliver instant feedback, giving the learners a clear idea of their progression.

8. LEARNER-LED TRAINING FOR A CONSUMER-LED WORLD

A learning content strategy based on smaller training assets will make it possible to create more adaptive learning pathways. Learning game designers will consider a more organic, learner-led curriculum structure with various branches open to the learner depending on their abilities and skills.

With this technology available to them, learning content producers will also have a greater freedom to attach a relevant narrative to the learning which bolsters the overall vision and values behind the training.

9. SOCIAL GAMING INSPIRES COLLABORATIVE LEARNING

Twitch is a platform that lets gamers watch other gamers play. It might seem like a pointless service, but with 120 million viewers signing on each month, the social element in gaming can't be ignored.

As broadband speeds improve, learning games will focus more on creating a social gaming experience. Instructional designers will also take inspiration from games like Candy Crush, which require some form of social interaction to proceed through the game.

10. MORE LEARNER ACTIVITY IS TRACKED

With a shift to bite-sized mobile learning content, learning managers will re-evaluate the way they measure their learners' activity. Rather than focusing solely on test results and compliance check-boxes, learners' rate of engagement will also be measured on a regular basis.

This way, content that doesn't engage the learners will be highlighted, giving a clearer idea where the training efforts should be focused.

CONCLUSION

Thanks for joining us on our journey through the wonderful world of learning games and game-based learning. We hope it's inspired you to think of your training programmes in a new light. As you can see, there's a whole world of game mechanics waiting to be explored and each new discovery just opens up more opportunities.

At Growth Engineering, we've been pioneering gamification in online learning since 2004. Our Academy LMS is the undisputed champion among gamified learning platforms and our game-based authoring tool, Genie, makes creating learning games easy.

Get in touch with us and let us help you turn your game-based learning dream into a reality!

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ADDENDUM

(10 SERIOUS GAMES THAT CHANGED THE WORLD)

'Serious Games' is a term used to describe any game that's been created with a primary function besides entertaining the user. Game-based learning is just one area covered by serious games, but their diverse uses have had a serious impact on society.

Here's a list of 10 ways the world has been transformed by play.

1. MICROSOFT FLIGHT SIMULATOR (1982)

Flight Simulators are the grandfathers of serious games so it seems only right to mention the most successful commercial flight simulator of them all. Going since 1982 Microsoft Flight Simulator was designed to be a comprehensive simulation of civil aviation and it's one of the few non-combat flight simulators in existence.

2. TILTFACTOR (2003)

Established in 2003, serious game research centre, Tiltfactor Laboratory, saw success in the last few years with their innovative card games. The company's motto is "Game Design for Social Change" and with games like Pox and Awkward Moment, they teach players about serious topics like the impact of the anti-vaccination movements and avoiding social stereotypes.

3. A FORCE MORE POWERFUL (2006)

In 1999, PBS released A Force More Powerful, a documentary about non-violent resistance. Breakaway Games developed a video game-based on the series in collaboration with one of the leaders of Serbia's Otpor! Movement. The game was designed to teach nonviolent methods for waging conflict using player-built scenarios.

4. DARFUR IS DYING (2006)

Between its launch in April 2006 and the following September, Darfur is Dying attracted 800,000 players. Under the umbrella of 'serious games', it is classified as a newsgame. In the journalistic spirit of exposing the truth, Darfur is Dying helped to shed a light on the war in Darfur and the consequent humanitarian disaster.

5. PEACEMAKER (2007)

Originally a university project, PeaceMaker became 'a video game to promote peace', focused on the Israeli-Palestine conflict. In this government simulator, players need represent one of the sides and make social, political and military decisions. The positive and negative consequences of these decisions teach the players about a vastly complex situation.

6. WORLD WITHOUT OIL (2007)

"Play it – before you live it." So reads the tagline for World Without Oil, an alternate reality game (ARG) that lasted for 32 days in April-June, 2007. The game sought to make players understand how an oil crisis might affect their lives by getting them to describe how the crisis is affecting their area. After the 32 days were up, the game produced a valuable record to help anticipate problems and avoid a worst-case-scenario.

7. FOLDIT (2008)

Three years after its release, players of the online puzzle game, FoldIt helped decipher the crystal structure of the Mason-Pfizer monkey virus, an AIDS-causing virus. Although the solution had troubled medical science for the preceding 15 years, the combined efforts of thousands of players produced an accurate model of the enzyme in only 10 days.

8. IBM CITY ONE (2010)

With the world becoming more industrialised, IBM's City One provides a comprehensive educational resource. City One is designed to simulate the complexities of urban planning from water management to finance planning. Maxis' Sim City created a similar challenge over 20 years previously. The reason Sim City isn't in this list is that it was primarily designed for entertainment.

9. AMNESTY THE GAME (2011)

In this game, players take the role of a Special Amnesty International Agent tasked with convincing populations and governments to abolish the death penalty. While the game does a lot to publicise the work of Amnesty International in general, it also encourages people to consider a politically volatile subject from new angles.

10. SUPERBETTER (2012)

Finally, Superbetter is the brainchild of Jane McGonigal – world renowned gamification guru. After she suffered a concussion in 2009, the resulting symptoms left Jane feeling depressed and suicidal. While she recovered, she created Jane the Concussion-Slayer, a game designed to treat her condition (as well as keeping her occupied). Seeing the success of her game, she renamed it 'Superbetter' and developed a gamified application to help people achieve goals and overcome obstacles.

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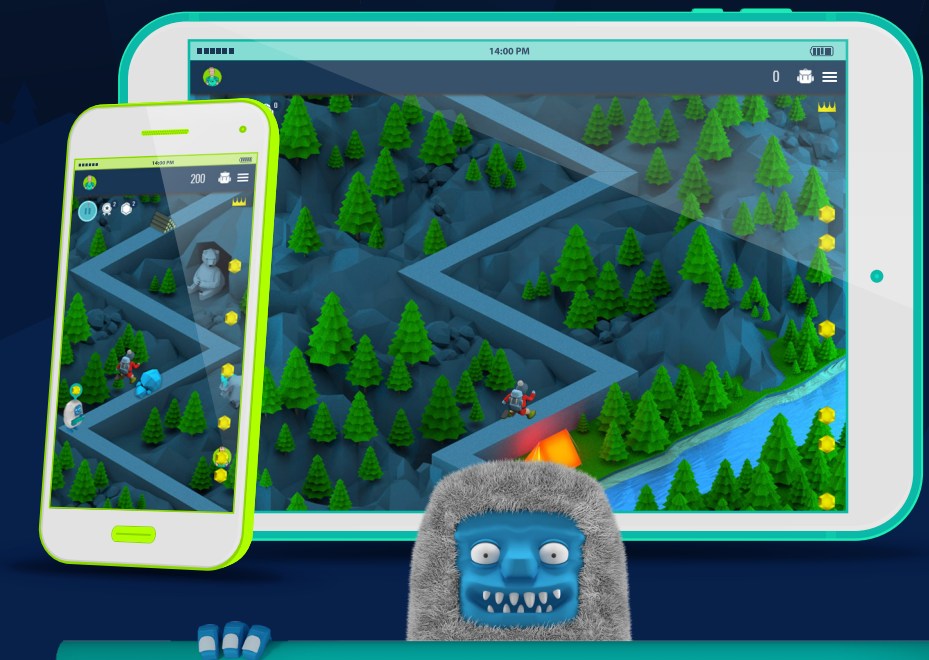

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