

GAMIFICATION, E-LEARNING AND VIRTUAL REALITY

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Learning DevCamp 2018

Games in the Training Room

Finding Learner Motivation
and Adding FUN!

PLUS

▶ **TRAINING GAME EXAMPLES**

What Works?

▶ **GAMER TYPES**

What type of
gamer are you?



VR and Code

Makerspaces, VR, AR, coding
and the future of gaming



STRATEGIES AND RESOURCES FOR GAMIFYING YOUR TRAINING!

WHAT IS A GAME?

Everyone likes games, but what are they? What makes a game a game? They are clearly entertaining, so that has to be one piece. But movies and TV are entertaining and most people wouldn't consider them games.

So how do we define a game? What are common characteristics found in many or most games? Many games include:

- Rules agreed upon by the players or participants;
- A central goal or end-point that determines who "wins" or how/when the game ends;
- Some method of tracking performance, progress, or score;

- An element of engagement, fun, entertainment, or other draw to encourage game play; and
- A defined venue, space, or environment in which players interact with the game.

Combining these elements, we arrive at a working definition:

A **game** is an activity, conducted according to rules, engaged in for diversion or amusement, often with a score, goal or other accomplishment as the end result.



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WHAT IS GAMIFICATION?

What does it mean to “gamify” something? How do we define gamification? As it turns out, it’s more than just adding “fun” to an activity. It involves taking some of the elements of a game and connecting them to an educational goal. Kapp (2012) defined **gamification** as the use or application of game-based mechanics, aesthetics, and thinking to engage people, motivate action, promote learning, or solve problems.

“Game-based mechanics” refer to addition of elements that are typically found in games, but not in learning or training experiences. While there are rules or expectations for behavior at work, there aren’t typically rules for *learning*. If a training experience includes rules, scoring, teams, or other game-play mechanics, however, then it has probably entered gamification territory.

On the other hand, many training activities and learning experiences can already be considered engaging or fun without having any game elements added. The fact that learners *like* doing a particular activity does not automatically mean it’s an example of gamification.

It’s also important to recognize what gamification isn’t. Gamification is not trivial: it’s not something that can or should be “slapped” onto existing training materials. Good gamification is well thought out. Gamification is also not the *only* answer or appropriate for every context. Some subjects lend themselves to gamification others do not. Finally, gamification is not new. The process of adding gaming elements to engage learners and enhance training is as old as teaching itself.

PEOPLE TO FOLLOW...

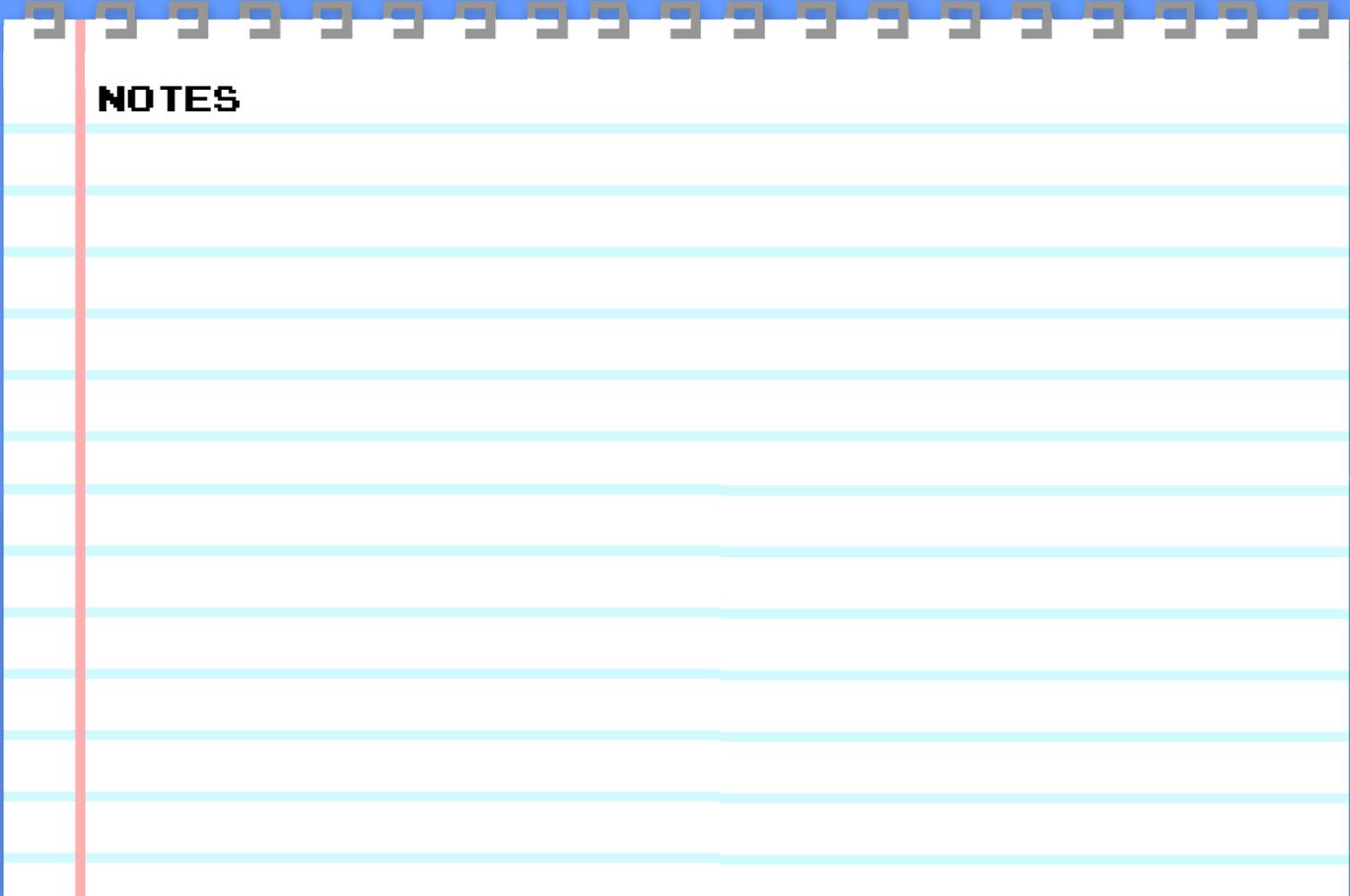
@kkapp - Karl Kapp, author and thought-leader in the field of gamification

@gzicherm - Gabe Zichermann, author and speaker on behavioral design and gamification

@andyhughes - Andrew Hughes, president of Designing Digitally, college professor on game design

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THE GOAL: ENGAGEMENT

Adding badges, rewards, and points to a learning experience might be borrowing from the world of games, but it likely falls short of gamification because it doesn't add anything to promote learning or engage learners. *Good* gamification adds value to the learning experience by keeping learners engaged and motivated to continue.

There is not a lot of research out there on gamification, and what is available seems to indicate that it might not significantly improve learner achievement (Young, 2012). Where gamification does show benefit, however, is in the area of learner engagement (Kingsley & Grabner-Hagen, 2015). Adding game elements — when done well — have been shown to keep learners interested longer.

What does this mean for your training materials? If learner engagement is the most likely outcome, then you want to choose games and experiences related to topics in which your learners aren't typically engaged. Use the game elements not as a way to *teach* the content, but as a vehicle to *motivate* learners to want to learn and explore the content on their own. Games are better motivators than they are teachers.

Games can be a vehicle to drive learner interest. They can be the framework in which they complete training modules, do research, take assessments, or read course content. Once you know *how* you intend to use the game, it's easier to plan *what* the game will be.

DEFINE YOUR AUDIENCE

Before you can start to create games for your training program, you need to understand your audience. Ask yourself:

- Who will be playing the game?
- How will they perceive the game elements?
- Are they likely to already experience with this type of game?
- Is the game competitive? Cooperative? Goal-oriented?
- What does your audience find motivating? Does your planned game make use of this?
- How complex are the rules, procedures, and other game elements?
- How difficult is the game? Are there barriers to participation for any learners?

Not every type of game will be appropriate for every type of learner. The key to finding the right game elements to add to a learning experience is understanding how your audience will respond to and interact with those elements.

Learners of different ages and skill levels respond differently to games. If the game elements require certain skills, it's important to recognize which learners are likely to struggle or haven't developed the skill(s) being used.

Learners' tastes are likely to change over time as well, so it's important to regularly re-visit the question of who will be playing the game. Does the game you created three or four years ago still resonate? Are today's learners at the same skill level? Have tastes changed?



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NEEDS OF ADULT LEARNERS

When creating gaming experiences, it's also important to consider how your audience learns. Adult learners often want to know all of the rules up front. They will usually want to understand the game before beginning, especially how the game is going to be *valuable* or *useful* to them. Adult learners ask, "What am I going to get out of the experience?" Or, "Why do I need to know/do this?"

Adults learners tend to be self-directed, seeking some level of autonomy in choosing their learning—and gaming—

experiences. When in need of assistance, adults are likely to turn to their peers or do research, so things like the ability to communicate with others and having resources available are important considerations in game design.

Because adults learners are likely to come from a wider range of skill levels and experiences, games will need to be flexible and provide variable difficulty levels in order to keep them engaged. Older gamers are also more likely to get frustrated quickly if the interface doesn't behave as expected or if the benefits of the game are not immediately apparent.



RESOURCES

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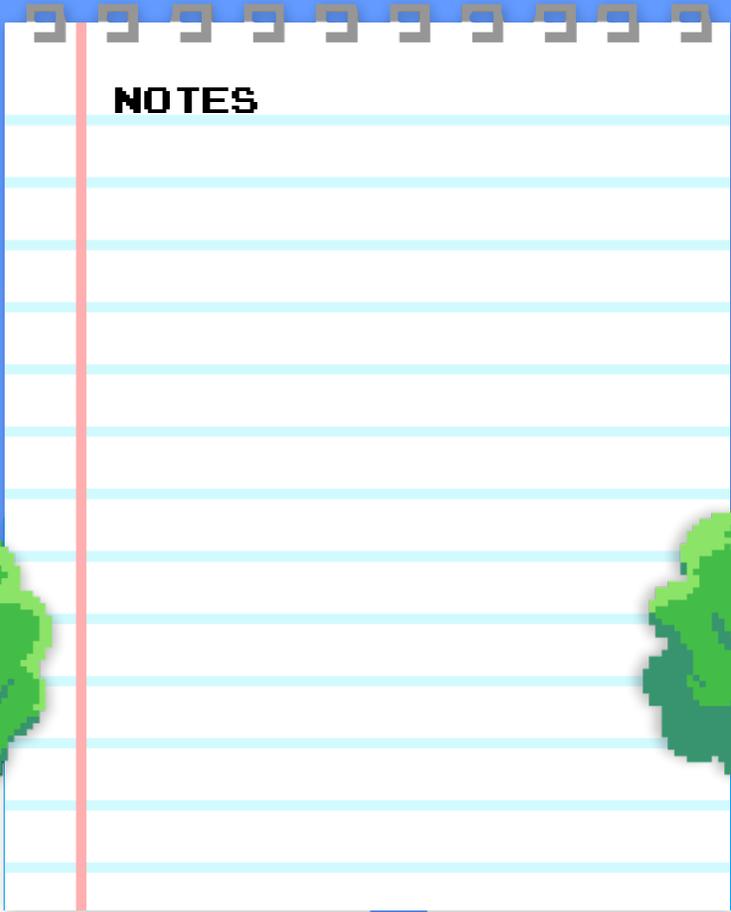
GAMIFYING YOUR LIFE

Whether you realize it or not, you probably already play games in some aspect of your life. You might be part of the 19% of the population that regularly play board games or the 53% of the population that play with video games (Pew Research Center, 2017). Even if you're not in one of those two groups, chances are you add gaming elements into aspects of your life in order to work harder, to achieve more, or even just to pass the time.

Have you even been on a long car trip and you made a point of counting license plates or taking note of cars and trucks that are on the same route as you? Or have you ever made a workout more interesting by counting reps, keeping pace with the person on the treadmill next to you, or trying to get "just one more"

mile, minute, or repetition of an exercise? These are examples of gamification in everyday life. It's possible to add gaming elements to just about anything to make it more engaging and fun.

You don't have to reserve gaming elements for just training content and eLearning modules. Consider ways in which you might "gamify" your everyday work processes. Can you make using an intranet knowledge base or completing annual reviews into a game? How would it work? Would it motivate your audience to change their behavior or become more engaged? What gaming elements lend themselves to "everyday" processes and procedures?



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SOURCES OF MOTIVATION

Once you've identified who your audience is and understand how they approach games, it's time to consider motivation. What will make them *motivated* to play the game as you intended?

Some gamers are **completionists**. These are the people that want to check-off every item in the "to-do" list. Completionists are collectors; they want to get everything out of their game. They complete side-quests and unlock everything that can be unlocked. What elements of your game are likely to appear to a completionist?

Other gamers are **goal-oriented players**. They are looking to get to the end and finish the game's story (if there is one). These people view the game as a single entity with a beginning and end. What does your game have as its goal? Will it appeal to goal-oriented players?

Most **casual gamers** are motivated by **fun**. They are looking for an amusing experience that will distract or entertain them, usually in short bursts, repeated over an extended period of time. Does your game provide enough fun to keep casual gamers engaged and coming back for more?

Competitive gamers are looking to win and want to compare their game performance to others around them. Leaderboards and high scores are geared toward competitive gamers.

The environment for a game can have a powerful impact on motivation as well. Sounds, music, colors, and story all contribute to how engaging the players will find the experience and whether they will be motivated to finish the game and achieve your intended goals.

Below are some smartphone apps that use elements of gamification to encourage physical fitness and healthy habits.



Zombies! RUN!

This app gamifies running or walking by putting the player in a zombie apocalypse. Run/walk faster to get supplied and outrun the undead!

Plant Nanny

This app gamifies staying hydrated by connecting the act of drinking water to the care of a virtual plant. Keep your plant alive by drinking H₂O!



GAMIFYING FITNESS

The most common forms of gamification in daily life revolve around health and fitness. Smartphone apps like **Zombies! RUN!** encourage running and walking by giving the user the image of a hoard of brain-hungry zombies chasing them. It may not be easy to get in a daily walk or run, but when it's life-or-death, the choice is clear.

Fitness-tracking wearable gadgets have been around for awhile, but as the technology matures, many of them have begun to incorporate gamification into how they approach personal fitness. Some trackers use social media and a sense of competition to pit users against their friends and family to get a few more steps or one more workout each day. Some fitness wearables include a virtual pet as the main interface for the user: The more you move, the happier your pet will be.

Competition, completion, goals, fun, and story are all different vehicles for motivation, encouraging users to participate in physical activities and turning physical fitness into a game.



RESOURCES

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Apple Watch

This device gamifies physical activity by encouraging users to “close” rings for active calories burned, workout minutes tracked, and minutes spent standing.



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GAME GENRES IN EDUCATION

Simulation Games

These games put players in a real-world situation, allowing them to experience the results of their actions first-hand and see different perspectives. Simulations appeal to both completionists and goal-oriented gamers by allowing the player to choose how they proceed through the story. Games like *Oregon Trail*, *Lemonade Stand*, *SimCity*, and *Railroad Tycoon* are all examples of useful and engaging simulations.

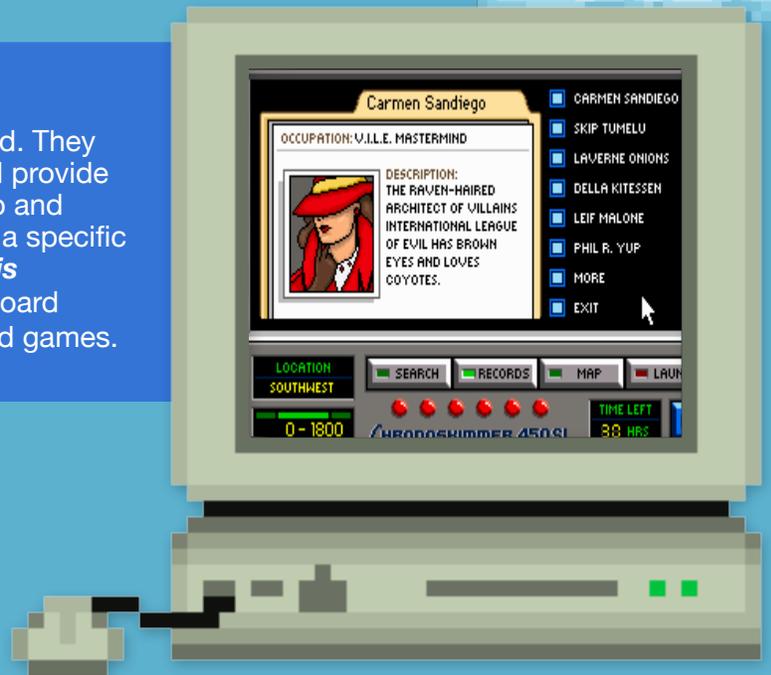


Game Shows and Trivia Games

These games provide opportunities to measure learner understanding and serve as good introductions or reviews. Many of these games can be played as a large-group or on an individual basis, and can even serve as formative assessment. Games like *Jeopardy!*, *Millionaire*, *HQ Trivia*, and *Kahoot!* are all examples of trivia games that can be played or replicated in online or in-person trainings.

Goal-Oriented Games

These games have a specific goal in mind. They tend to be single-player experiences and provide the player with an opportunity to develop and utilize skills to reach an end or complete a specific task. Games like *Where in _____ is Carmen Sandiego?*—along with most board games—are all examples of goal-oriented games.



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All of these games contain an **element of play**, but speak to different audiences and deliver goals differently. Match the type of game to both the **player** and the **educational goals**.



WHY GAMIFY?

CASE STUDY #1 MULTIPLE-CHOICE MAYHEM!

Goal: To train teachers and test-writers on the best-practices for developing multiple-choice test items

Audience: High-school teachers, industry professionals, and post-secondary professors and lecturers

Content Challenge: The content is somewhat dry and it can be difficult to get busy professionals to stay engaged and complete traditional e-learning modules or watch video presentations

The Solution: *Multiple-Choice MAYHEM* flips the traditional “script” for learning. Instead of presenting the content and then testing the learners on their understanding, *MAYHEM* presents the learners with a

multiple-choice quiz first, made-up of flawed test items.

How it Works: By starting off with a general-knowledge quiz, *Multiple-Choice MAYHEM* grabs learners and engages both casual and goal-oriented gamers.

Each question in the quiz includes a common item-writing flaw, making the question easier to answer. After the learner completes the quiz, he or she sees each question again and receives an explanation as to why it was easy to answer, demonstrating the content.

Players experience the *consequences* of poorly written test items first-hand.





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CASE STUDY #2 THE BAIL TRAP

Goal: To expose flaws in the money-bail system in the U.S. legal system and demonstrate how money bail leads to unfair treatment of accused individuals from different socioeconomic statuses

Audience: College students, adults (members of the general public)

Content Challenge: The content is incredibly complex, making it difficult to explain. On its face, the system seems fair, since the bond required is often standardized for specific offenses and charges.

The Solution: *The Bail Trap* allows the learner to experience the process of being

arrested and held pending payment of bail. The game includes three different people, each with a unique set of finances and safety net.

How it Works: By utilizing the same scenario with three different individuals with different backgrounds and from different socioeconomic levels, the player can see that despite being accused of the same crime and being charged the same amount for bail, the real-world impact is significantly different for each of these three individuals.

Simulations are a great way for learners to experience different points of view.

GOOD vs. BAD GAMES

- **Where in _____ is Carmen Sandiego?**
Fun, interactive way to learn geography, astronomy, and history (depending on the specific game)
- **Oregon Trail**
A popular simulation game that allows players to understand the struggles of pioneer life
- **That Dragon, Cancer**
Critically acclaimed game that explores the tragedy and drama of treating a child with terminal cancer

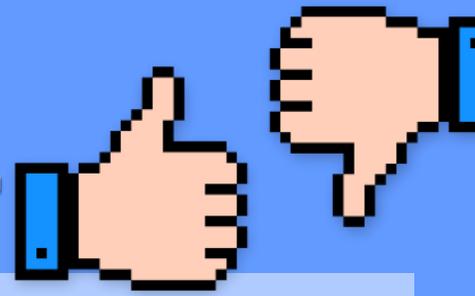


- **Mario Teaches Typing**
Terrible controls and a nightmarish disembodied 3-D Mario head make this one unplayable
- **Encarta Mind Maze**
An encyclopedia game that piques your interest, but doesn't let you *learn* or *research* more about the topics shown
- **Sonic Schoolhouse**
A school house full of unclear options, terrible graphics, and an unpleasant soundtrack

That Dragon, Cancer proves that games don't have to be "fun" to be engaging, thought-provoking, and valuable.



WHAT MAKES A GAME GOOD OR BAD?



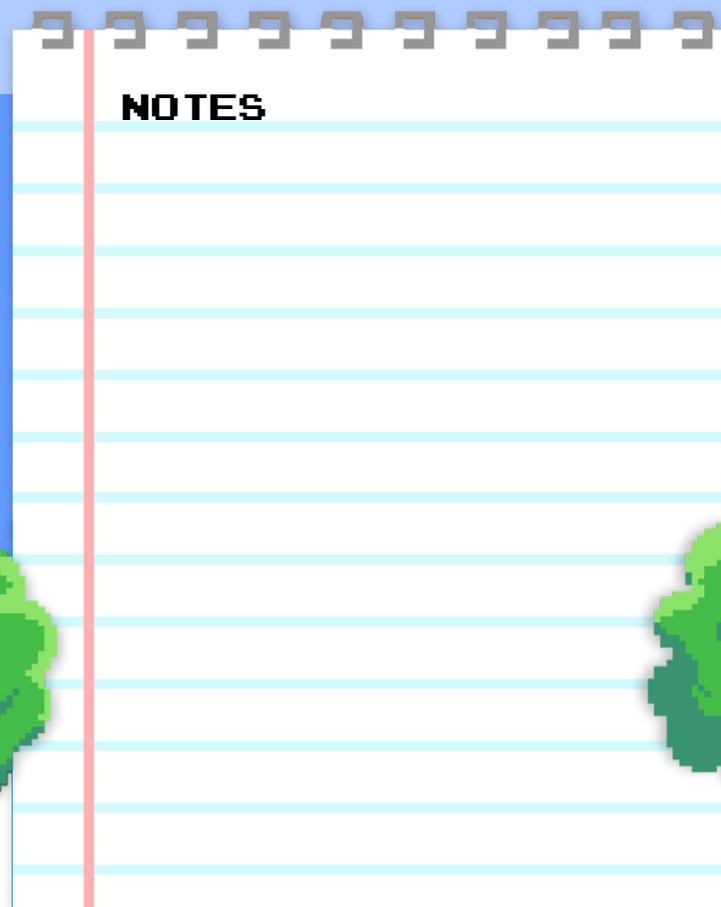
Why are some games good, but others are terrible? What factors contribute to a game being useful, engaging, and educational? Key factors that contribute to a game's success include:

- **Motivation** - they provide gamers with a *reason* to play
- **Environment** - the setting, story, and sounds either contribute to the game or, at the very least, are not distracting
- **Difficulty** - the game is neither too easy nor too challenging for the intended audience
- **Controls** - the way(s) in which the player

interacts with the game is intuitive or easy to learn

- **Educational** - the game meets its intended content goals
- **Memorable** - the overall experience is memorable and enjoyable

Games that are classified as “bad” usually lack any sort of “hook” to engage players or don’t provide enough motivation to play. Some “bad” games suffer from poor controls, a distracting environment, unclear goals, or lack the necessary content focus to make them worthwhile in the training room.



THE TOP 5 REASONS “EDUTAINMENT” FAILS

If it's so easy to identify the characteristics of a “good” or “bad” game, why do commercial games marketed toward education so often fail? There are really five main reasons:

- 1. Too focused on content goals.** Games made by educators or SMEs focus too heavily on content and not enough on the “game.”
- 2. Too focused on entertainment.** Educational materials made by gamers are often not valuable for training purposes.
- 3. Wrong content goals.** It can be difficult to find off-the-shelf games on the topics L&D professionals need the most.
- 4. Too much competition.** There are a lot of “educational” apps or platforms and it can be difficult to find valuable ones. No one has time to review them all.
- 5. The education market is small.** When compared to commercial video games, the market for high-quality educational or training games is very small and rarely profitable.



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EVALUATING GAMES FOR USE IN TRAINING

Looking at off-the-shelf games for training? Use the rubric below to evaluate their use for training. Games that score less than 25 points have significant flaws and may waste valuable training and learner time.

	1	2	3	4
Connection to educational goals	The game is generic or completely unrelated to any training goals.	The game is loosely connected to the content presented in the training.	The topic and story are clearly related to the training content and aligns somewhat with institutional goals.	The game directly aligns with training and institutional goals and learners will receive desired content from playing the game.
Player feedback	Player performance is not measured or score/feedback is not given.	The player receives a final score when the game is complete.	The player receives some form of feedback during and after the game.	The player receives continuous feedback to show consequences of choices/actions.
Differentiated instruction	The game is the same for all players.	There are two levels of play: "easy" and "hard."	There are multiple difficulty settings to cater the game to different skill levels.	There are multiple ways to customize the experience in order to address individual learner skill and knowledge levels.
Controls and interface	The controls are awkward or the interface is unintuitive.	The controls and interface can be customized somewhat.	The controls could be a little better and the interface is fine once you're used to it.	The controls are natural and the interface is intuitive and unobtrusive.
Instruction and navigation	There are no clear instructions and it's easy to become frustrated with the interface.	There are some instructions, but it's still possible to get "lost" when trying to figure out what to do.	The instructions could be a little more clear, but they give players a sense of how to play the game.	The instructions and game play are completely clear, even for a novice player.
Sound, colors, and environment	The sounds, music, and colors are distracting. Sounds cannot be muted or are necessary for play.	The colors are distracting; the sound can be muted so it doesn't distract from game play.	There are some distracting elements, but the overall environment does not detract from game play.	The sounds, music, and color scheme fit well with the content and contribute to (or do not distract from) the game.
Section 508 Compliance/Accessibility	There are no tools for making the game accessible or adjusting the font size, contrast, volume, etc.	The game includes both narration/voice-over and on-screen text at all times. There are no other accessibility features.	There are screen-reader and voice-over options, but no other accessibility considerations.	The game allows users to adjust font size and contrast, and is fully compliant with Section 508. The game runs on a variety of platforms and interfaces.
Engagement and motivation	The game contains little to attract some learners or certain types of game-players	The game will likely engage some players, but not others.	Most of the learners will be engaged by what this game has to offer.	The game has a clear "hook" for players of all types and is likely to engage or motivate all learners.



Use this worksheet to plan gaming experiences for your training.

GAMIFYING YOUR CONTENT



Training Area: _____

Learning or Development Goal: _____

Describe the Players/Audience:

Skill level: _____ What motivates them? _____

What content do they already know? _____

Describe the Game:

Single-player

Small-groups/Pairs

Large group

e-learning

board game

simulation

other: _____

What's the basic premise? _____

How will the game drive the learning/exploration of content? _____

What materials are needed? _____

What are the rules? How will players interact? _____

Identify Concerns:

Where will players struggle? _____

What is my contingency plan if the game isn't engaging? _____





VIRTUAL REALITY

You've probably hear that one of the hottest trends in education lately is the use of virtual reality, but what is it? How does it work? **Virtual reality** is a computer generated simulation that can be used to create a realistic or life-like experience. VR is at one end of a spectrum of immersive experiences with AR, or augmented reality, at the other.

AR uses the camera on a tablet, computer, or smartphone to add elements to a real-life scene, essentially creating a "window" into a world that has been augmented visually. VR, on the other hand, typically uses a headset or head-mounted display with a small screen in front of the eyes to give the wearer the feeling of actually being *in* a virtual environment.

High-quality virtual-reality hardware includes headsets that connect to computers, utilizing desktop graphics hardware to power the screen in the headset. **Oculus Rift** and **HTC VIVE** are two commercially available headsets of this type. Low-end VR setups utilize a smartphone as the screen, inserting it into an otherwise empty headset. **Google Cardboard** headsets such as these are an inexpensive solution for many schools.

So how is VR used in education? The possibilities are endless. One of the most common applications is the virtual "field trip." Learners can wear a VR headset and visit places difficult or impossible to visit, such as Mars or the bottom of the ocean. VR is being used in job-training simulations as well, giving users an opportunity to practice a procedure and develop muscle memory in a safe environment without wasting materials or risking injury.



PEOPLE TO FOLLOW...

@**benz145** - Benjamin Lang,
Executive Editor of
RoadToVR.com

@**RoblemVR** - Rob Crasco,
thought leader & futurist

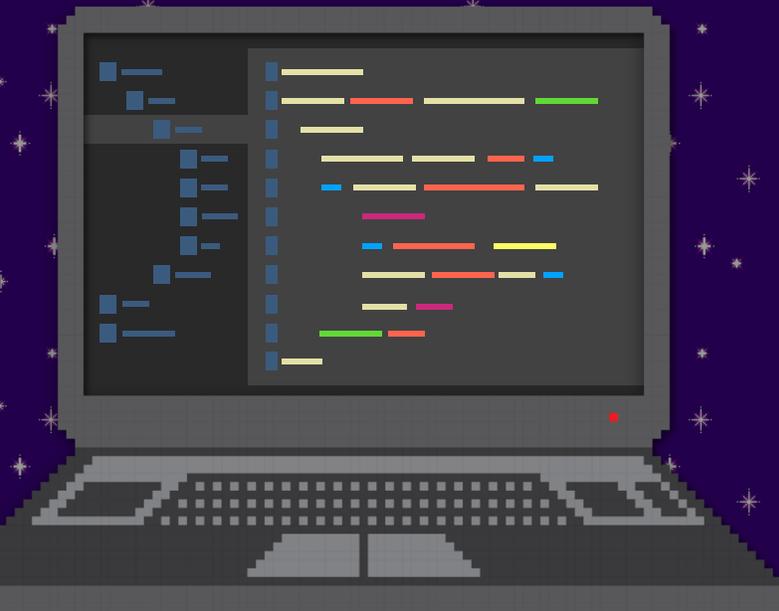
@**ID_R_McGregor** - Robert
McGregor, VR blogger

@**GoogleARVR** - official Google
AR & VR, vr.google.com

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TRAINING CREATIVITY



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Businesses are increasingly looking to L&D professionals to help train employees in areas of creativity and critical thinking. Games can help in this area as well. Some games involve world-building or require the player to find supplies to craft tools, make food, and build shelter in order to survive.

Another type of “game” that helps to build creativity and critical-thinking skills: coding. Apple’s **Swift Playgrounds** turns learning the Swift programming language into a game that increases in difficulty as learners develop programming skills. Taking the programming into the physical world, **Sphero** allows learners to see their programs executed by rolling robots in real time as they learn Swift, Javascript, or Sphero’s drag-and-drop programming interface.

Nintendo Labo combines video games and creativity by having learners build cardboard creations and use the unique hardware of the Nintendo Switch to interact with them. The Labo “Garage” provides a programming interface that combines coding with a makerspace, giving learners to build, code, and play with their own cardboard creations.

Why learn coding at work? Because creativity in the workplace has many benefits:

- **Opportunities to fail.** Learners can take risks and recognize that failure is not the end, but an opportunity for a new beginning.
- **Divergent thinking.** Finding unique solutions to unforeseen problems is a key skill in any business environment.
- **Higher productivity and morale.** Valuing creativity gives workers the opportunity to find new and better ways to complete the same tasks.

E-LEARNING TOOLS



What tools are available for developing online games and e-learning experiences?

- **Microsoft PowerPoint/Apple Keynote** - presentation software already on your computer can be used for text-based simulations, animations, and even *Jeopardy!*
- **Articulate Storyline** - e-learning software that uses slides, scenes, and stories to create branching presentations and trainings
- **Adobe Captivate** - e-learning software that can create pages, simulations, videos, presentations, and assessments
- **Trivantis Lectora** - create trainings, lessons, assessments, animations, mobile apps and more with this e-learning suite
- **Tumult Hype** - this HTML5 editor lets you quickly assemble animations, build web pages, and create mobile-friendly e-learning experiences

For more resources and tools,
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Sean Hickey
@mshEducation

Cara North
@caranorth11



Greg Nagy
@gnagy5

