All Work and no Play Makes Jack a Dull Boy

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Abstract

“Tell me, and I'll forget. Show me, and I may remember. Involve me, and I'll understand.” [1]

This is exactly what game-based learning does. It involves, motivates, and challenges. It has the capability of making even dull and serious trainings interactive and fun.

In spite of the initial hiccups from education systems and administrators, eLearning spread its wings over a period of time. However, notwithstanding its various advantages over traditional classroom learning, the truth is that passive eLearning is mostly boring with weak interactivity levels and often results in high drop-out rates. The industry tried to revamp the whole learning experience by introducing game-based learning. Again, the initial reaction of education systems has not been so welcoming so far. Games have other challenges to meet before they can be adapted open handedly and open mindedly. But the fact of the day is that game-based learning is here to stay and is "'the' medium of learning" for today’s generation.

This session looks at the challenges and key advantages of game-based learning and examines how simulation and game-based learning can be used to provide an effective, engaging, and enriching eLearning experience to students from diverse portfolios and different learning styles.

Keywords

eLearning, game-based learning, simulation, digital game-based learning, GBL, DGBL, serious games, digital natives, features of an engaging game, role play, roleplaying, categorization of games, embedded, collaborative, simulation based, immersive, challenges with games

[1] Confucius

Introduction

eLearning is not a new technology. In fact, the roots of eLearning were developed just about the same time when a computer was developed. However, eLearning became popular in early 90s and since then there has been a vast increase in training demands.

Why eLearning?

Unlike traditional learning means, eLearning involves high development costs but low delivery costs. Organizations save 50% to 70% of their overall training cost by implementing eLearning.[2]

Some of the benefits of eLearning over traditional learning methods include:

Is self-paced, self-directed, and personalized to accommodate different learning styles
eLearning can be easily adapted to a user's learning style so you can learn at your own pace and at your own time. Moreover, you can skip the topics you already know and concentrate on new topics that serve your needs and interest.

Increases retention
eLearning increases retention and understanding of a subject matter. It uses varied media like audio, video, simulation, graphics, and exercises that help reinforce learning. If you do not understand or remember a concept, you can revisit the content at your convenience for recall and review.

Uses a variety of delivery methods
eLearning can be delivered using different methods like CBTs, WBTS, ILTs, and virtual classrooms.

Is designed around the learner
eLearning is student centered. It is developed after extensive research of market and audience and is designed to suit your preferences and needs.

Provides updated information
eLearning content is regularly updated to provide up-to-date information. New content is frequently added and outdated information is removed.

Eliminates geographical barriers and is accessible to a geographically dispersed audience
Due to wide accessibility, eLearning opens up broader education options.

[2] Source: Training Magazine

Provides on-demand and just-in time access and education
With eLearning, learning can happen when needed.

Provides anytime learning and is accessible 24 hours a day, 7 days a week. You're not bound by time. Courses are available 24x7.

Reduces or eliminates travel time and cost.
Online learning does not require physical attendance. So it reduces travel time, eliminates cost of hiring trainers and consultants, and the expenses involved in providing facilities and taking people away from their jobs for the training.

Can be deployed quickly
Time required to roll out a new online training program is relatively less than traditional courseware development.

Challenges with eLearning

In spite of its various advantages, eLearning received a setback during the year 2000. There were high expectations from eLearning that it failed to meet. Companies and institutes started having second thoughts about its usefulness. However, eLearning did not disappear from the scene. Companies just started looking at new ways to improve the effectiveness of eLearning and reduce the cost at the same time.

Some of the challenges faced by eLearning include:

Boring content and design
People hate training, not just eLearning – but any kind of training. They need reasons for learning - why they need to learn and what personal motives will it fulfill? Typical eLearning courses include text-heavy content. The "interactivity" is mostly in the form of some multimedia elements, Flash animations, next click instructions, hyperlinks, or drag and drop questions.

High dropout rates
According to a study, companies end up forcing their workers to join courses. Only 32% of the workforce joins voluntarily. The study also indicates that 50% to 80% of users, who join an eLearning course, do not complete it. [3]

Lack of detailed instructional design and design elements
Most of the times, instructional design does not cater the audience profile. Courses have video and next click instructions in the name of interactivity. There is no method of evaluation and a system of revising the instructional design for improvements. With the popularity of rapid-eLearning, companies feel that all it takes to develop eLearning is to take a series of PowerPoint slides and add in couple of MMCs, and you have created a course with a single button click!

Not Suitable for today's generation
eLearning is not meant for today's generation of hyperactive, technology savvy learners who learn and interpret things differently and have shorter attention spans. Our young generation is used to faster speeds and multitasking, and spends their time playing Wii or computer games. In one of his articles, Marc Prensky [4] refers to them as "digital natives". If we want to develop effective technology-based learning for these digital natives, we need to find ways to retain their attention and interest.

[3] Source: Forrester Group

[4] Marc Prensky is a speaker, writer, consultant, and game designer in the critical areas of education and learning. He is the author of *Digital Game-Based Learning* and *Don't Bother Me, Mom, I'm Learning*. He invented and popularized the term digital native and digital immigrant.

The Solution?

One solution to convert 'eBoring' content into 'eInteresting' content is to add 'games' and 'simulations'.

Let's look at these terms and see how they differ from each other.

Game
A structured activity in which two or more participants compete within constraints of rules to achieve an objective. One of these participants can be a computer. [5]

An activity engaged in for diversion or amusement. [6]

A game doesn't necessarily model a real-world application. A game is an enjoyable voluntary activity separate from the real world. Games must involve high level of interactivity to appeal to users.

Simulation
An operational model, using selected components, of a real or hypothetical process, mechanism or system. [7]

Unlike games, simulations represent real-world systems and are created to engage learners into activities that are too expensive or difficult to perform in real life. A simulation needs to have elements like rules, fun, play, a goal, and competition to be categorized as a game.

> *You can have a game that's not a simulation and a simulation that's not a game, but when you get one that does both, it's a real kick-ass situation.*
> *-Elliot Masie* [8]

[5] Thomas Keiser and John Seeler, 1987
[6] Merriam-Webster's Online Dictionary
[7] Thomas Keiser and John Seeler, 1987
[8] Cited by Prensky in his paper "Simulations: Are They games?" in the book Digital Game-Based Learning (2001). Elliot Masie is a well recognized analyst and researcher on the critical aspects of workforce learning, business collaboration, and emerging technologies. He is the editor of Learning Trends.

Digital Game-based Learning

In addition to simulation and games, there is game-based learning (GBL) or digital game-based learning (DGBL). [9]

DGBL combines games, simulation, and education content to make learning more effective. Also referred to as serious games, DGBL is used in fields such as medicine, surgical training, aviation training, and legal education. Organizations prefer DGBL to provide a safe environment to people to learn new skills in an engaging and memorable way. Learners not also experience new challenges but also have more control over their progress. The best part of learning via DGBL is that learners don't even realize they have learned something but when a real-life situation arises, they are prepared to handle it.

[9] The book "Digital Game-Based Learning" by Marc Presnsky was the first major publication to define the term.

Challenges with Games

It is paradoxical that many educators and parents still differentiate between a time for learning and a time for play without seeing the vital connection between them.
- *Leo Buscaglia*

Anyone who makes a distinction between games and learning doesn't know the first thing about either.
- *Marshall McLuhan*

Games themselves face several challenges. The truth is that games are not often encouraged even though they have been a part of everyone's growing up. People tend to think of games as frivolous and associate them with kids and play.

Let's look at some of the challenges encountered by games.

- Most of the managers may not want their employees to "play" at work even if it is a part of some learning content.
- Development of games and simulations involves high effort and development costs.
- The game or simulation often becomes boring after you have attempted it a couple of times.
- It is very difficult to design a game that aligns with the objectives and the learning content.
- Most computers in the offices are not capable of handling multimedia content.
- The games or simulations may require installation of specific software. However, the strict security standards and firewalls in companies prevent users to install the required software or change their computer settings.

Games and Simulations are Here to Stay…

In spite of the resistance from some sectors, games and simulations are here to stay. Anything fun is not necessarily frivolous. In fact, people learn and remember more when they are relaxed. There are companies that use game/simulation based courses for soft skills, business and policy, social cause (such as sexual harassment), product, medical, aviation, and legal training.

Games are not just for kids. Everyone needs to relax once in a while. According to a study, average gamer is 33 years old and almost 35% of gamers have an income of $50k to $100K. [10]

When designed strategically with a right balance of, and appropriate learning content, games are much more engaging and have defined learning outcomes. Boeing claims that pilots who received both cockpit and simulation training were better than the ones who just had cockpit training. Many Universities are also looking into using games and simulations in their courseware. 93% of the organizations using game-based learning have rated this approach better than other forms of learning. Moreover, 76% of the organizations have reported a positive ROI. [11]

As far as the cost is concerned, the use of templates, authoring tools, and content reusability has significantly reduced the development costs of games.

[10] Source: ESA (Entertainment Software Association)
[11] Survey by eLearning Guild (2008)

Why Games and Simulations?

Games such as 'Lingo' are not just played for fun but also teach you new words. Quiz games can help promote education. Games like 'Catch 21' increase your analytical and reasoning power.

There are studies that indicate that games have a calming effect on autism affected kids. Research also indicates that adolescents with attention deficit disorder may experience improvements in learning and social skills with educational games. [12]

Some of the areas where simulations and games can be successfully used include:

- Training on software
- Training on soft skills
- Simulating physical systems, such as pieces of a machinery or equipment or setting up a network
- Simulating concepts, for example, how heart functions or circulatory system works
- Virtual learning, for example, flight simulation or office or factory operations
- Role plays
- Business skills
- Problem solving based on a scenario
- Troubleshooting and diagnostics
- Procedural walkthroughs

Let's look at some of the benefits of using games and simulations in eLearning:

- Promote learner participation and involvement.
- Increase competition and collaboration.
- Provide longer spans, improved attentiveness and positive feelings.
- Increase retention and reinforce learning – People tend to relax when games are introduced in a learning session. They are excited, learn to compete, and are more likely to remember the activity and the learning that came with it.
- Provide a challenge to learners.
- Engage and motivate learners to gain the knowledge to complete the game successfully
- Adapt to suit different competence levels. Games are designed to automatically track user's progress and allow them to move to a new level after successful completion of the current level.
- Allow for repetition so that learners can retain the knowledge.
- Promote learning by guiding users through real-life situations.
- Allow for the spontaneous formation of social networks.

[12] Mark Griffiths in his publication "The Educational Benefits of Videogames". Griffiths is the Professor of Gambling Studies in the Psychology Division, Nottingham Trent University.

Features of an Engaging Game

Games are fun, no doubt. But what makes them most enjoyable?

The key factor that makes game-based learning fun and enjoyable is motivation. Lack of interest in a topic leads to lack of attention. A person needs to be motivated enough to stay focused and learn. It is important to develop and sustain motivation throughout the course. This can be done by bringing in several elements like challenge, fantasy, competition, interaction, feedback, and reflection.

Let's look at some of the elements that make game-based learning engaging and motivating.

Challenge and goals
Games provide challenge and often involve problem solving. Some games also involve teamwork. The challenge must be built to match users' skill levels in order for the game to be engaging. This is done by defining clear, short-term goals or learning objectives that match the skill level of the learner and satisfy the context. Each challenge must satisfy a learning objective. For example, connecting various computers and printers in a network can be a challenge and can be made a part of the bigger game. In addition to a goal, each game must have clearly defined rules and outcomes. For example, if the learner connects one component incorrectly in the network, the network will explode.

Flexibility and interactivity
A game typically provides several different ways to accomplish each goal that makes the game interesting. Studies indicate that users learn only 5% of the information through passively listening to a lecture. Games provide interactivity that actively involves users in the subject matter thereby increasing their retention level.

Fantasy
Games often have a fantasy element to invoke the interest of learners. This is normally done through narrative or storyline. A good and effective storyline builds up users' curiosity and helps them remember the learning objectives. For example, soft skill courses typically provide a business challenge and make the user a part of the story. Interactive dialogs and role play are used to involve the user in the courseware.

Closeness to real life situations
Games relate to real life situations to engage and motivate users. For example, humor and suspense makes a game real. When you are able to relate to different characters in a storyline and can understand the problems they are facing, you feel motivated to solve them. It also helps you retain information better.

Feedback provided in a non threatening environment
Games provide explicit and relevant feedback to inform learners of the results of their actions. It feels good to have someone congratulate or correct you. This is primarily so because this makes learners more comfortable with the topics as there is no need to fear failure. Learners are free to explore why an option is correct or incorrect. For example, if a learner clicks an incorrect menu item in a simulation, there can be a feedback stating that the option exists in a different menu. Or, if the learner loses a contract because they selected an incorrect option, an appropriate feedback is provided as to why this happened. This helps learners analyze the results of their action and assess how a different approach would have prevented this outcome.

Rewards
One important feature of games is that they provide immediate rewards. For example, on the successful completion of an exercise, you move to the next lesson; or on the completion of a puzzle, you are provided with a new puzzle.

> *That's what learning is, after all; not whether we lose the game, but how we lose it and how we've changed because of it and what we take away from it that we never had before, to apply to other games. Losing in a curious way, is winning.*
>
> - *Richard Bach in his book 'The Bridge Across Forever'*

Categorization of Games

There are different classifications of games provided by different experts even though these classifications are somewhat similar. The most popular of these classifications is the one given by Marc Prensky.

Marc Prensky classifies games into eight categories: *Action, Adventure, Fighting, Puzzle, Roleplaying, Simulation, Sports, and Strategy*. These different categories can also overlap. For example, an action-based game can also be adventurous and may include fighting.

The different categories of games can be embedded, collaborative, simulation based, or immersive.

Embedded games are used to learn facts. Examples include matching or sequencing games or puzzles.

Collaborative games provide a real-time environment for learners to test their knowledge by competing online.

Simulation based games provide simulated real-world situations to impart learning using avatars, scoring, storyline, and competition. These games are most suitable for problem solving objectives.

Immersive games employ a 3-D environment that uses various strategies to present problem solving scenarios, such as Second Life where 3D graphics are used to provide a virtual world and a virtual presence to its Residents.

Steps to Create Game-Based Learning

> *I never teach my students anything. I simply create an environment in which they can learn.*
> *- Albert Einstein*

For games to be effective and engaging, it is important that they are carefully planned, designed, and integrated in the learning content. It is also important to consider the level of difficulty of attempting a game or a simulation. An engaging simulation based courseware must have some of the important elements of games, such as fun, motivation, rules, a goal, and competition.

For example, in a selling skills course that we did, a salesman walks into his client's office and you (the client) have a simulated conversation with the customer based on a "tree" structure with different branched choices. Each branch takes you to a different conversation path.

Let's look at some of the important steps that will help you develop an engaging game or simulation.

1. Define objectives
You should focus on what you want the users to learn from a simulation or a game. If you introduce a simulation for the sake of interactivity and with no define goals, it is of no use and does not do any value add.

2. Develop a story and realistic setting
Develop a logical storyline by using dialogs or visuals. You should also use a realistic scenario to show examples to which users can relate to. For example, selling is an art. If you use simulations depicting an office room and buyer-seller dialogs and situations, the subject matter will become clearer. This also helps users build on previous knowledge and experience.

3. Decide on a type of game
Decide what kind of game will appropriately justify the learning content - dialogs, puzzle, trivia, word game, board game, or a race.

4. Define different levels of challenges for an objective
It is recommended to have different levels of challenges for an objective. For example, for a trivia game, you can have questions with different levels of complexity. For other type of games, you can have some other means to measure that the task or the game has been successfully completed. You should ensure that the challenge is increased gradually / incrementally. For example, you should start with a basic-level problem or activity and once the task is accomplished, present the user with a higher level of challenge.

5. Provide user guidance
Your simulation can use controls or mouse clicks. To help users play the game, you should provide them with written instructions or a guided tutorial.

6. Include feedback and rewards
Motivate the users to continue with the next level by providing timely feedback and rewards. Rewards can include promoting them to the next level.

7. Provide multiple chances
If a learner fails to complete a task, the learner must be provided sufficient number of attempts to retry. You may decide to provide a guided simulation after a certain number of unsuccessful attempts.

8. Provide a logical end to the story/simulation
The story/simulation should end with a logical solution or a problem statement that the user needs to solve.

Conclusion

Games might not be so frequently used today but we are fast progressing towards the day when most organizations will start using them to “edutain” users. Organizations are realizing the opportunities that game-based learning presents and are more open to experiment with them to train their workforce. Cost and time do not pose a serious barrier anymore. The wide variety of templates and authoring tools have made it possible to effectively design interactive games faster and cost efficiently. Coupled with this is the realization that today’s learners are changing. They think and react differently and “boredom” is not a word in their dictionary. What they want from learning is fun, involvement, and challenge. eLearning is about to change for the best and reach a status where work and play will happen simultaneously to present a most enriching experience that will entice, enthrall, and involve our new generation of Jacks’ and Jills’.

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