

## Game Based Learning (GBL)

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**Abstract**—GBL refers to the amalgamation of games or gaming procedure into educational experiences. This theme has gained significant footing in excess of the past decade as games have established to be efficient learning tools, and useful in cognitive development and the promotion of soft skills among learners, such as collaboration, communication, problem-solving, and critical thinking. The forms of games grow up progressively more different and some of the most commonly used for educational purposes include alternate reality games (ARG), massively multiplayer online games (MMO), and global social awareness games. The majority games that are presently used for learning across a broad series of disciplines share related qualities: they are goal-oriented; have sturdy social mechanisms; and replicate some sort of real world experience that natives find related to their lives. As game-based learning garners more attention, developers are responding with games explicitly designed to hold up immersive, empirical learning.

**Index Terms**—e-Learning, video games, teaching methods, students.

### I.INTRODUCTION

“Videogames are Not the Solution to Educational Problems”, the main idea of this article is that we need to change our teaching methods to enhance the skills that future citizens will need in a digital society. Children and young people are introduced to the virtual world via videogames, and the way in which they interact with technology may be changing ways of learning and the production of knowledge. Game-based learning is one of the education’s current “hot buttons.” Blogs, articles and advice in the education press, webinars and workshops on the topic abound.

According to research by the Entertainment Software Association, nearly 50% of all American homes have a video game comforts, and more Americans than ever are playing video games on smartphones, tablets and handheld devices. In addition, the 2012 Edition of the Essential Facts about the Computer and Video Game Industry Report, 30% of gamers are playing games on their smartphones - a 20% increase over 2011, and 25% play on wireless devices – up 13% from 2011. This pre-existing acquaintance with game-related engagements, and interactions and socializations, especially within MMOs (massively multiplayer online games), aligns with practical learning models. This makes game-based

education a regular learning method for current and upcoming students, and often educators that are accustomed with gaming.

#### **Ten causes why GBL works in education:**

1. Familiarity
2. Engagement
3. Mingled learning has a real place
4. A cost effective option
5. Content galore!
6. on a mission!
7. Flexibility
8. Stay ahead
9. 21st century workplace skills
10. The students love it.

Games and game-based approaches are able to stimulate resources for experiential learning and critical inquiry. According to Kurt Squire, games are able to do this because they offer players "designed experiences" which let students "learn through a grammar of doing and being" (Squire, 2006). Epistemic games in detail embody this philosophy to create learning environments that model professional experiences and provide students with opportunities for authentic learning.

Teachers have always used games in their classrooms—as rewards, to encourage students to practice skills, to help children acquire social skills like taking turns just because they’re fun. Now games have gone digital and advocates want to see gaming go mainstream. It only makes sense for today’s digital native students.

The game based learning creates enthusiasm in learners and simulates their brain to gather more information from the content. There are some situations where traditional e-Learning courses cannot impart the intended knowledge to the learner. The solution to such a situation is using GBL.

Educational games are the games that are designed to teach people about certain subjects, expand concepts, reinforce development, understand an historical event or culture, or assist them in learning a skill as they play. Game types include board, card, and video games. We don't need much time in the classroom to learn how to think and perform in the face of real-world challenges. We need effective, interactive experiences that motivate and actively engage us in the learning process. This is where GBL comes into picture.

## II.SCOPE

Today, game-based learning is accessible in many different industries, for four reasons:

- The success of game- and simulation-based learning in the aviation, military and healthcare industries provides a powerful proof-of-concept, and an endorsement of learning effectively.
- Advances in raw processing power with an attendant decrease in cost have brought game-based learning within reach.
- The development of stable, flexible game engines and toolkits are driving down the cost of development and reducing the need for 100% custom, from scratch to application development.
- A growing crop of designers and developers literate in the medium of games have amassed a critical level of knowledge regarding what works and what doesn't.

## III.APPLICATIONS

Till date, GBL (Game based learning) has been used in a wide range of disciplinary contexts (e.g. surgical training, medicine, legal education, science education). But it is fair to say that the uptake of simulation and game-based approaches have tended to

take deepest root in training and vocational areas. This is due to the experiential and problem-based learning approaches that have been prime pedagogic drivers – as well as due to the financial investment (and the requirement of high student numbers) needed to set up systems and adequate support.

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## IV.ADVANTAGES

**Motivation** is a key aspect of effective learning, but that motivation needs to be sustained through feedback responses, reflection and active involvement in order for designed learning to take place.

**Learning through intense enjoyment and "fun"**, several authors suggest that games can be a vehicle for engaging students in a "flow". Flow is a state of consciousness during which an individual is in control of his actions and is completely absorbed in the task at hand.

**Experiential learning** is a very old and influential one in education, dating back to the seminal work of John Dewey. Many claim that gaming provides a cost effective alternative to learning by doing in real settings.

**Integrating a range of tools** together has been a key challenge for e-learning today as often tools that have potential use for education are not always easily integrated into institutional systems.

**Communication and collaboration** is an important issue in online games and is seen as one of the strengths of this approach. We wanted to find out how much students communicated and cooperated with each other.

**Transparency of the Simulation** Relationship to the Real World: As described above, it sometimes is an open question whether educational simulation games should represent the world "as it is" or should emphasize some aspects to reach an educational goal.

#### V.DISADVANTAGES

**Large budgets** needed for effective use of GBL, and in particular simulations, are less of a driving force today with the emergence of easily accessible software applications.

**Content of the game** must determine whether the content of the game is appropriate for specific age groups and whether the games are suitable for the standards-based accountability movement and also take into account how the game's features might affect students cognitively and physiologically.

**Technical support and licensing costs:** Institutions have to bear the cost for licensing and technical support and sometimes it can be out of reach for smaller institutions.

#### VI.IMPLEMENTATION

Game-based learning, if used effectively and in a coherent and relevant way, can support both the option of more choice for how the learner can learn (experientially), as well as offering the potential for personalizing the learning experience. In addition it offers a way of integrating a range of different learning tools (e.g. social software) into a more coherent view of learning from the learner's perspective.

But this does rely upon two factors: **Readiness** of the learner or learner group to adapt to a new learning tool. **Correct level** of institutional support (e.g. technical support, continuing professional development, allocation of staff time and resources, curriculum development). **The following are some of the examples Under construction**



Fig: 6.1 Image of 3D canvas

Game based learning developed a healthy and safety training game for use in the Construction Industry. This is a first person 3D environment that allows people to identify healthy and safety risks and best practice in an evolving construction site.



Fig: 6.2 Image of chicken game

This emphasis on experiential experience for learners rather than simply learning the material and passing the test.

**The chicken game**

Game based learning worked with the Halifax Comedy Festival to create a game that brought awareness of the event and delivered information about venues and events in the festival. We deliberately chose a slightly quirky old school feel to the game to match the event.

	Traditional Training (lectures, online tutorials)	Hands-on Training	Game-based Learning
Cost-effective	Yes	No	Yes
Low physical risk/liability	Yes	No	Yes
Standardized assessments allowing student-to-student comparisons	Yes	No	Yes
Highly engaging	No	Yes	Yes
Learning pace tailored to individual student	No	Yes	Yes
Immediate feedback in response to student mistakes	No	Yes	Yes
Student can easily transfer learning to real-world environment	No	Yes	Yes
Learner is actively engaged	No	Yes	Yes

Table: 6.1 Difference of traditional learning and game based learning

VII.DESCRPTION:

- Game-based learning’ broadly refers to the use of video games to support teaching and learning. Although it is a relatively established notion, it is hard to define precisely. We have arrived at a conclusion of definition by extracting the key principles and mechanisms involved.
- ‘Gamification’ is a much newer concept than game-based learning. It is about using ‘elements’ derived from video-game design, which are then deployed in a variety of contexts, rather than using individual video games.
- ‘Gameplay’ is the treatment of topics and ideas as rules, actions, decisions and consequences, rather than as content to be communicated or assimilated.

According to the landmark study by Bassok, Reimann and Glaser, learning by practice is the most effective way to increase learning retention, especially for skills-based training and problem-solving.

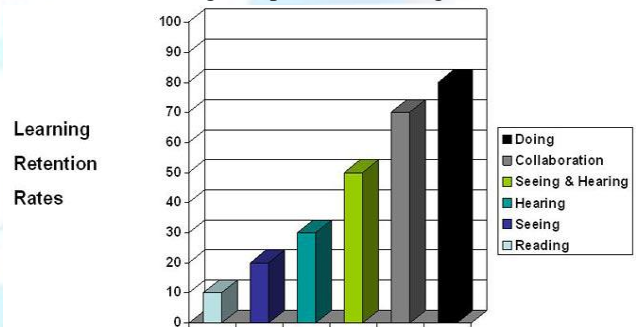


Fig 7.1 Learning preservation chart

Despite the research, the traditional teaching model does not employ for this ‘learning by doing’ strategy. Instead, most often corporate training departments and academia use the ‘expert-based teaching model’ in which students watch passively as content is presented. After this learning experience, students demonstrate their competency by completing some form of educational assessment.

In this traditional model, the student does not search and retrieve this content until after the learning experience – when they’ve entered the ‘real world.’

The major problem with this traditional model is that students do not have the opportunity to apply the learning and rehearse and hence they fail. When the learning environment is unable to provide this practice, students will not achieve mastery until it is too late!

**Traditional Learning Model**

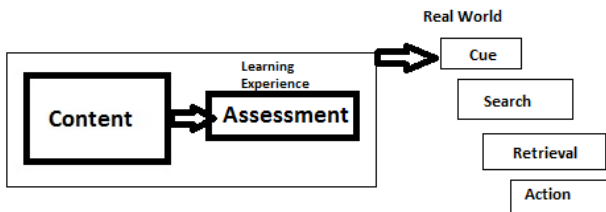


Fig 7.2 Traditional Learning Model

**Game-based Learning Model**

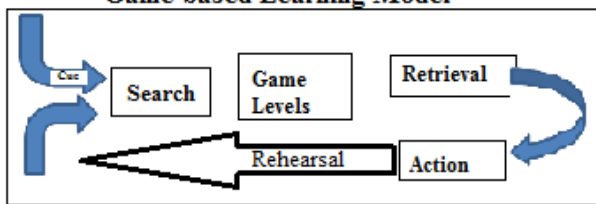


Fig: 7.3 Game-based Learning Model

The GBL model revolves around rehearsal. This ‘learning by doing’ style has been proven to promote mastery. Students access the content in order to complete the ‘level’ or the challenge. When they fail, gaming promotes rehearsal, encouraging the students to retry until they successfully complete the level.

This model can also provide simulated real-world ‘cues,’ so that students become aware of stimuli that trigger their need to employ a ‘search’ and ‘retrieval’ process, applying their knowledge to overcome the challenge. While not every learning objective requires rehearsal, game-based learning will increase the amount of interactivity and increase student retention.

**VIII. FUTURE SCOPE**

It is important that we develop a more analytic approach that considers how the different elements that operate within video games impact in an educational setting.

• Opening up the ‘black box’ of video games would enable us to focus on specific principles or mechanisms. This finer grained approach could unlock a more rewarding research agenda.

*Three research challenges have been identified:*

1. Working towards a consensus about the relationship between academic achievement and game-based learning. Efforts are needed to articulate clear relations between game elements and a range of outcomes, from a broad level (e.g. platform on which the game runs, single player, multiplayer, and so forth), gradually narrowing down to specific gameplay mechanics.
2. Unpacking further the relationship between gaming and academic achievement in the context of educational assessment. Games seem to allow more powerful and ‘always-on’ forms of assessment in which all actions, interactions, successes and failures can be constantly tracked and logged. This raises a number of empirical and ethical issues.
3. Developing research into the potential of video games that accounts for the realities of schools. In particular, more research is needed into the social, cultural and economic factors that influence attitudes towards the use of game-based learning in our increasingly diverse and multicultural schools.

**IX. CONCLUSION**

Serious – or educational – games are opening up new potential for learning in formal situations and in innovative ways. The emergence of GBL is offering the learning and teaching communities new opportunities to reach and motivate hard-to engage learner groups, support differentiated and personalized learning, addresses vocational and training-based course materials and provides new tools for teaching basic and key skills, science and math’s education.

Clearly, GBL has been effective in these situations and offers a wide diversity of approaches and tools for tutors to make use of it in their practice. But GBL also offers the learner a chance to become more central in their own learning through generating their own

content, learning collaboratively in teams and becoming more engaged in the processes of learning.

#### X. REFERENCES

- [1] [www.brain-trainer.com](http://www.brain-trainer.com)
- [2] [www.gamelearning.net](http://www.gamelearning.net)
- [3] <http://nwn.bioware.com>
- [4] [www.sp.tamucc.edu/pulse/](http://www.sp.tamucc.edu/pulse/)
- [5] <http://secondlife.com>
- [6] [www.bbc.co.uk/skillswise](http://www.bbc.co.uk/skillswise)
- [7] [http://en.wikipedia.org/wiki/Educational\\_game](http://en.wikipedia.org/wiki/Educational_game)  
<http://www.newmedia.org/game-based-learning--what-it-is-why-it-works-and-where-its-going.html>
- [8] <http://www.gc-solutions.net/elearning-services/game-based-learning/>  
<http://www.learnnc.org/lp/pages/4970>  
<http://www.pil-network.com/HotTopics/gamesbasedlearning/benefits>
- [9] <http://www.galanoe.eu/index.php/home/574-the-use-of-game-based-learning-gbl-in-moocs>
- <http://www.gblearning.com/examples.html>
- [10] <http://epiclearninggroup.com/us/content/games-based-learning/>
- [11] <http://www.playtoteach.com/research.htm>
- [12] <http://www.weareteachers.com/community/blogs/weareteachersblog/blog-wat/2012/11/26/debating-game-based-learning>
- [13] <http://www.educationscotland.gov.uk/usingglowandict/gamesbasedlearning/about/aboutgamebasedlearning.asp>
- [14] <http://icst.org/game-based-learning/>
- [15] <http://www.wlv.ac.uk/PDF/sed-cedare-royle-gamingsummary.pdf>
- [16] <http://www.connectededucation.com/2012/02/ten-reasons-why-game-based-learning-works-in-education/>
- [17] [http://www.theesa.com/facts/pdfs/ESA\\_EF\\_2012.pdf](http://www.theesa.com/facts/pdfs/ESA_EF_2012.pdf)