

Digital Game Based Learning (A Literature Review)

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Abstract

Game Base Learning (GBL) has gained a lot of attention in the field of Instructional Design and Technology (IDT). The increased adoption levels in institutions and complex organizations have led to the growth of studies around the area with the goal of assessing their effectiveness in the learning process. This descriptive paper conducts an analysis of GBL as a learning process and the issues involving the IDT. The information is gathered from secondary sources where a systematic review of previous literature is conducted, was used to provide general knowledge about GBL. Particularly, the main issues addressed by this descriptive paper include overview of GBL, brief history of the concept, benefits, drawbacks, and successes addressed by current studies. Overall, GBL has become a significant area of interest in IDT in the world today. Most educational institutions and corporations are adopting this concept in their learning process due to its numerous benefits. Some of the benefits include development of cognitive skills, motivation during learning process and helping learners to gracefully accept failures. The findings indicate that most users and implementers of GBL decide to focus on the benefits in spite of various criticisms. Also, experts continue to support the concept as an alternative learning approach to the traditional methods of teaching.

Keywords: Technology, Game Based Learning, Digital Game in Education, Instructional Technology.

1. Introduction

In the past few years, Game Based Learning (GBL) has gained attention and is becoming increasingly incorporated in Instructional Design and Technology (IDT) in both educational institutions and large organizations. Usually, games are considered fun and people use them to relax and enjoy themselves. However, in this context, GBL has been adopted as an instructional design as it has been acknowledged to promote motivation, concentration, and learning process (von Gillern & Alaswad, 2016). Learning engagement is considered as a combination of various factors where the learners remain focused throughout the exercise. Notably, engaged learners will always focus on mastering newly acquired ideas, a concept that results to better information processing mechanisms that eventually lead to enhanced attitude towards the learning process. Remarkably, digital games are commonly used in learning environments due to the notion that they act as primers for deep engagement into the learning process and setting an environment for real live problem solving (Ke et al., 2016). Currently, most scholars are putting emphasizing on GBL with the argument that the strategy helps learners gain cognitive needs and also ensure motivation in learn by applying exciting approaches (von Gillern & Alaswad, 2016). Due to increased popularity in GBL, studies indicate that there is an increase in the number of research to assess the effectiveness of the approach as an instructional design (Vusić & Geček, 2018). Essentially, technology has become a crucial aspect of human life; thus, it is essential to demonstrate how GBL can utilize computer games and incorporate them in the learning systems to enhance learning outcomes.

In spite the increased attention on GBL, there are no conclusive findings on the effectiveness of use of technology in this approach. According to Vusić & Geček (2018), lack of focus and rigorousness in the current studies raises the question of reliability and validity of methods used. However, the approach is still being used by many companies which has been made even more widespread due to rapid development in internet technology and multimedia. Both companies and corporations have developed and adopted GBL due to the financial incentives that it brings to the institutions. However, since it is a new approach the methods has been classified as complex as users have to understand the design and bulk information in the games which could be confusing to responds making most instructors to stay away from it (Vusić & Geček, 2018). Therefore, it is crucial for institutions that want to adopt it to understand its impacts both negative and positive so that they can make informed decisions.

1.1. Objective of Research

- 1- Overviewing and history from a year 2015 to 2018 of the use of digital games GBL enhancing to education.
- 2- Presentation of previous literature on the benefits of using digital games GBL in the field of education such as cognitive development, motivation, and graceful failure.
- 3- Overviewing of the literature review on the failure and success of using digital games GBL in the educational process.

1.2. Significance of Research

This scientific paper summarizes the concepts The concept of benefit from using GBL digital games in education, as they develop cognitive skills and solve problems through play, playing game is considered one of the motivations for learning, and graceful failure through the enjoyment of playing and trying in education procces without risks is considered as motivation to learn through trying. Additionally, show the challenges that educational institutions or educators may face when they decide to use digital games in the educational process by presenting previous literature on the problems and successes of using GBL digital games. The concept of benefit from using GBL digital games in education, as they develop cognitive skills and solve problems through play, playing game is considered one of the motivations for learning, and graceful failure through the enjoyment of playing and trying in education procces without risks is considered as motivation for leaners to learn through trying. Ultimately, this descriptive paper can be a reference for educators with some basic points that indeed the use of GBL digital games in the field of education.

1.3. Methodology

The descriptive approach was used in this scientific paper and the studies were covered in literature review from a year 2015 to 2018, and the number of studies covered in the review reached around 10 studeies.

2. Literature Review

2.1. Overview of GBL

GBL is a concept adopted to enhance learning among students and adult learners in the society. According to Hamari et, al. (2016), this approach has become an important concept, especially in the current society where learners are becoming increasingly disengaged in learning. Consequently, experts decided to design an exciting instructional design which would motivate learners and capture their attention, which is using games for learning purpose.

The game is meant to help the learners solve complex problems using ideas learned from the game (Hamari et al., 2016). Therefore, the definition of GBL is derived from its purpose, where Pass et. al. (2016), defines it as a type of game which has defined or predetermined learning outcome. When technology is incorporated in GBL, Arnab, et al. (2015), describes it as use of ICT to simulate virtual where players participate in the game by living in compelling adventures where they acquire, practice and verify knowledge gained as part of learning. Simply put, this definition describes GBL as an approach where players gain knowledge they can transfer in their real life, while participating in an entertaining game.

2.2. Brief History of GBL

Game based learning is not as new as it is believed to be and it has been existed for centuries. According to Wilkinson (2016), GBL, which he refers to as Serious Games (SGs), has been there since of Plato, the great philosopher who existed centuries ago. According to Plato's philosophies, some behaviors that are exhibited in children serious games can be reinforced in adult behaviors to influence their learning (Cózar-Gutiérrez & Sáez-López, 2016). Further, Wilkinson continues to argue that the current GBL being adopted to is a concept adopted from 19th century where constructive games were developed to enhance children learning. The philosophy behind GBL is that since games are work for children, they can be used for learning purpose and not just entertainment and this has been adopted in adult learning as well. These arguments by Wilkinson are supported by similar views in a study by Plass, Homer, & Kinzer (2015), who argue that the use of games in the educational and development context is not a new concept and it has been in existence for several years. The only new development is use of technology which has been influenced by increased acceptance of digital games which have been mainstreamed as a form of entertainment prompting developers to incorporate GBL in computer games (Plass, Homer, & Kinzer, 2015). In other words, this concept has been existed for ages and it has only been advanced to incorporate new technology.

2.3. Benefits of GBL

Cognitive development. One of the benefits of the game is that it helps in cognitive development. This is one of the most strong arguments about GBL as studies indicate that while learners are participating in the game, they engage in activities that help them in construction of mental model (Hamari et al., 2016). When playing the game, players have to select what is presented to them and then organize them to arrive at the appropriate solution to the problem.

The organizing part engages both visual and verbal skills which requires a lot of memory as they have to integrate the skills with prior knowledge. Studies indicate that psychologists have acknowledged the cognitive development of GBL, especially among children as play is an integral part of child's growth as it helps their cognitive development since it enhances their symbolic recognition and social aspects of life (Plass et al., 2015). On the other hand, numerous studies have been dedicated on games that are merely played for entertainment purposes. The investigations indicate that playing is an exercise that is emotional and physical and the involvement in the game can be reflected in the players' emotions. Therefore, engagement emerges from the level of involvement and connection to the set of features in the game (Abdul Jabbar & Felicia, 2015). Thus, it can be deducted that integration of games into the curriculum will increase the engagement level of learners, leading to improved performance. In the current generation where almost every child is playing video, GBL is therefore crucial in developing their cognitive skills.

Graceful Failure. Another strong argument that supports digital GBL is that it allows graceful failure. Sometimes in learning, failure inevitable and learners have to gracefully accepted it so that they can assess their approach and identify a process that they did not do correctly. Since games are not considered that serious because they are supposed to be fun, players are not significantly affected by failure. Like any other games, GBL are developed in form of a challenge and failure is by expected hence learners acknowledge it and gracefully accept it (Wilkinson, 2016). This argument is based on the lowered consequences of failure where players are given an opportunity to correct their mistake which is an essential learning process.

2.4. Problems in GBL Concept

In spite of several GBL having existed for several years, lack of consistency on the best methods to be used remains a problem. According to Vusić & Geček (2018), all proposed methods in previous studies have flaws as they lack rigourousness and focus which raises questions about their reliability. For an concept like this that has proven to be of financial benefit to both corporations and education institution, question about validity of design and implementation remains a critical issue as it could be costly to the users. The lack of consistency in studies on the best methods of implemeting the concept has led to conflicting findings among users as it depends on the methods or criteria for inclusion and exclusion adopted by the users (Plass et al., 2015; Arnab et al., 2015). Plass et al incinuates that the source of this problem is

because GBL was influenced by authors which means the idea did not come from educational experts who could design a standard approach. Arnab, et al. (2015), also argues that there is still a huge gap on methodologies and tools in design, assessment and analysis in GBL, which significantly contributes to inconsistent outcomes. The findings are also supported by Wilkinson (2016), who indicate that most GBL approaches do not adopt key learning theories which is caused by methodological inadequacy which make it difficult to conduct evaluations and give conclusive outcomes in this IDT. This problem creates a barrier in translating the importance and effectiveness of adopting and implementing GBL as an instructional design in many institutions.

Another challenger for GBL concept is transfer of learning as the users are expected to replicate what they have learned in the game into real life experience and solve existing problems. According to Arnab, et al. (2015), transfer of learning has proven to be a serious issue since learners are expected to remain engaged in the entertainment part of the game and acquire knowledge. Sometimes the gamers get swept away by the entertainment part such that they forget the real agenda, which is learning. Similarly, Plass et al. (2015), indicates that one of the main challenges of GBL is that there are several factors that create a barrier to transfer of learning, and this could include lack of seriousness among the players as they might take the game to be a mode of entertainment and forget about the learning part. For the transfer of learning to happen the game has to have similar context with the problem it is expected to solve and also insist on the consciousness and application of the knowledge (Plass et al., 2015). Consequently, the designers and developers need to have adequate knowledge and clear purpose for developing the game to suit user's context.

2.5. Success of GBL

In spite of various drawbacks and criticism of the IDT, GBL is still adopted by many educational institutions and corporate as an effective learning approach. Arnab et al. (2015), acknowledge that different digital GBL features contribute to effective learning outcomes based on several studies which suggest psychological mechanisms of the games in enhancing the learning process. According to Hooshyar et al. (2016), the motivation part of GBL contributes to a game-based formative assessment which effectively improves learning process. Further, Hooshyar recommends that GBL should be adopted in learning institutions as a transformation to traditional learning process as they provide high level of motivation that is not provided through passive learning.

In other words, GBL is becoming successful attracting attention and gaining acceptance in the society today.

3. Conclusion

Overall, GBL has become a significant area of interest in IDT in the world today. Most educational institutions and corporations are adopting this concept in their learning process due to its numerous benefits. GBL Digital games can achieve effective enhancement in the learning process by presenting previous literature in the section of successes of GBL achieved to promote the educational process, as it has recently been the focus of attention of the educators.

Additionally, GBL is the use of predetermined learning outcomes in both digital and non-digital games to improve the efficacy of the learning process. Some of the benefits include development of cognitive skills, motivation during learning process and helping learners to gracefully accept failures. There has, however, criticism where studies indicate that lack of standard designs and methods affect the effectiveness and raise questions of validity of GBL methods. In spite of these criticisms, researchers and psychologists still recommend the use of GBL and most institutions have been adopting the design.

4. References

- Abdul Jabbar, A. I., & Felicia, P. (2015). Gameplay engagement and learning in game-based learning: A systematic review. *Review of Educational Research*, 85(4), 740-779.
- Arnab, S., Lim, T., Carvalho, M. B., Bellotti, F., Freitas, S. D., Louchart, S., et al. (2015). Mapping learning and game mechanics for serious games analysis. *British Journal of Educational Technology*, 46(2), 391-411.
- Cózar-Gutiérrez, R., & Sáez-López, J. M. (2016). Game-based learning and gamification in initial teacher training in the social sciences: An experiment with MinecraftEdu. *International Journal of Educational Technology in Higher Education*, 13(1), 17-41.
- Hamari, J., Shernoff, D. J., Rowe, E., Coller, B., Asbell-Clarke, J., & Edwards, T. (2016). Challenging games help students learn: An empirical study on engagement, flow, and immersion in game-based learning. *Computers in Human Behavior*, 54, 170-179.
- Hooshyar, D., Ahmad, B., R., Yousefi, M., Fathi, M., Horng, S. J., et al. (2016). Applying an online game-based formative assessment in a flowchart-based intelligent tutoring system for improving problem-solving skills. *Computers & Education*, 94, 18-36.

- Ke, F., Xie, K., & Xie, Y. (2016). Game-based learning engagement: A theory-and data-driven exploration. *British Journal of Educational Technology*, 47(6), 1183-1201.
- Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of game-based learning. *Educational Psychologist*, 50(4), 258-283.
- Von Gillern, S., & Alaswad, Z. (2016). Games and game-based learning in instructional design. *International Journal of Technologies in Learning*, 23(4), 1-7.
- Vusić, D. B., & Geček, R. (2018). Instructional design in game-based learning and applications used in educational systems. *Technic Journal*, 12(1), 11-17.
- Wilkinson, P. (2016). A brief history of serious games. *Entertainment computing and serious games*, 17-41.

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