

Game Based Learning for University Students

Lobna Abdulsalam Mohammed

Abstract

The aim of this paper is to review the available literature on the recent trends and advancements in game based learning, focusing on university students. In order to do this, open source articles from Google Scholar were used. An attempt was made to select recent studies spanning the past decade so as to analyse the trends in how the attitude towards game based learning has evolved as well as the advancements in the quality of the games used for educational purposes. Using a set of criteria, approximately 400 papers were initially considered and then a smaller number were explored in detail. The research found that there are many benefits to using a game based learning approach in the education sector. Some of these include cognitive and behavioural development while also teaching skills that can be applied to the real world. Such an approach utilises features that include promoting engagement with the content and games, enhancing motivation and problem-solving skills. Therefore, this approach is a more holistic approach than conventional models of teaching and learning at every level of education. However, this approach is not devoid of its challenges, key among which include teacher training, financial barriers and developing good quality games.

Keywords: Game based, learning, higher education, university

Introduction

With technology and digital tools becoming an integral part of everyone's daily lives, these tools are being used in increasingly novel ways. Technology has also changed the way we learn and interact with learning material, especially in the context of COVID and an increase in remote learning. Hence, education has undergone and witnessed significant changes with the introduction of digital tools and technology (Tang, Hanneghan & El Rhalibi, 2009). In the field of education, the use of digital tools and novel ways of teaching has ushered in changes in the attitude, creativity and motivation of students. Although the use of computer games to aid in teaching and learning is not new, there have been significant improvements in recent years that have allowed these games to be adapted to the varying needs and learning level of students of different abilities. This is applicable for self-learners as well. Students now have a plethora of tools available at their disposal to assist in their learning process. In addition to this, game based learning has been applauded for its ability to teach students important skills such as cooperation, problem-solving, creativity, critical thinking and communication (Liu, Shaikh & Gazizova, 2020). Game based learning, therefore, may be understood as 'the use of video games and elements related to game reality, content, subject and images in the educational process' (Liu, Shaikh & Gazizova, 2020:54). Over the years, this has become an important tool in teaching, which is used in different ways 'by more than 89% of children and adolescents, in the UK' (Liu, Shaikh & Gazizova, 2020:54). Game based learning includes the use of 'web based games, virtual reality games, simulation games, online games and multi-user virtual environments games' (Akour, Alsghaier and Aldiabat, 2020:150). Research suggests that game based learning is highly beneficial and effective not only for younger students but also in higher levels of learning, such as for university students.

Despite the many advantages of game based learning, however, there are some challenges as well. The most important, perhaps, relates to the training of teachers who must incorporate novel ways of teaching students in the classroom. Akour, Alsghaier and Aldiabat (2020) add that with game based learning, there is also a challenge for teachers to draw the linkages between what students learn from games and what they learn in class. The second pertains to the quality of the games - ensuring that the games are challenging for the students and impart some learning as opposed to poor quality games. The high cost of developing these games and the financial barrier in investing in new technology is another challenge that needs to be explored. Lastly, access to infrastructure to use these games and make them accessible to developing countries is also a concern.

This paper will discuss game based learning for university students, the benefits, challenges as well as the advances that have been made in recent years.

Methodology

In order to find relevant research studies specific terms were used in Google Scholar. These were the following

- Game based learning
- Game based + education
- Game based + higher education
- Game based + university

For each individual search term, 100 results were considered, totalling 400 results. These papers were then examined. An attempt was made to select recent studies spanning the past decade so as to analyse the trends in game based learning, focusing on university students. The research found that there are many different types of games that can be incorporated in the learning process. These include web based games, virtual reality games, simulation games and online games. There are many benefits to using a game based learning approach. Adopting such an approach has been found to facilitate cognitive and behavioural development while also inculcating values and teaching skills that can be applied to the real world. With features such as promoting engagement with the content and games, enhancing motivation and problem-solving skills, this approach is more holistic than conventional models of teaching and learning. Research also suggests that these attributes are beneficial in learning at all stages and not only at primary levels of education. The review below will discuss these in detail while also highlighting the challenges posed by adopting such an approach to learning.

Results

In recent years, the field of education has undergone many changes. The use and incorporation of technology has led to new tools that enhance the learning experience for students. Game based learning is one such example and refers to an innovative learning approach that combines the use of interactive software and applications with educational outcomes (Tang, Hanneghan & El Rhalibi, 2009). Some examples of using this approach in learning include 'learning support, teaching enhancement, assessment and evaluation of learners' (Tang, Hanneghan & El Rhalibi, 2009:3). Game based learning has the potential to present learning material in interesting, creative and innovative ways such as through narratives, challenges and puzzles, thereby making

learning more engaging and reflective. Through this approach, the pace of learning can also be modified so as to suit the level and speed of the learner, while at the same time reaching a wider audience since it can be utilised online.

Tang, Hanneghan and El Rhalibi (2009) elaborate on the general learning model, which was developed by Buckley and Anderson. They contend that this model allows for understanding the way the learning process takes place through games and is experienced by the players.

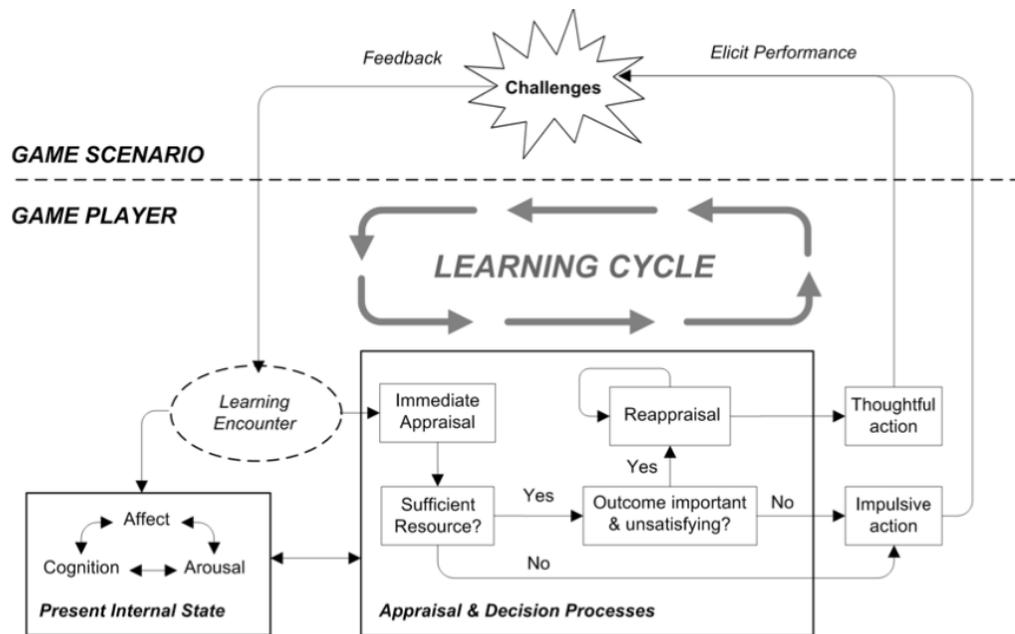


Figure 1: General Learning Model (Tang, Hanneghan and El Rhalibi, 2009:8)

The figure above highlights how such a learning approach promotes understanding the context and environmental factors as well as short term goals and determining the actions to meet them. Hence, game based learning teaches real-life skills to students that are essential outside of the learning context as well.

Plass, Homer and Kinzer (2015) trace the foundations of game based learning and state that the importance of games in the learning process has long been emphasised and researched by psychologists. This research, however, has mostly been in the field of cognitive development of children and how they learn through play. Some of the elements of play that have been found to aid in the learning process have been identified as player engagement, the ability of games to motivate players, as well the feature of games to be adapted to the pace of learners, thereby making them personalised. The influence of games in promoting cognitive and behavioural development, therefore, cannot be ignored and must be examined further. Based on their research, they present a model of game based learning which incorporates the features they have found work best.

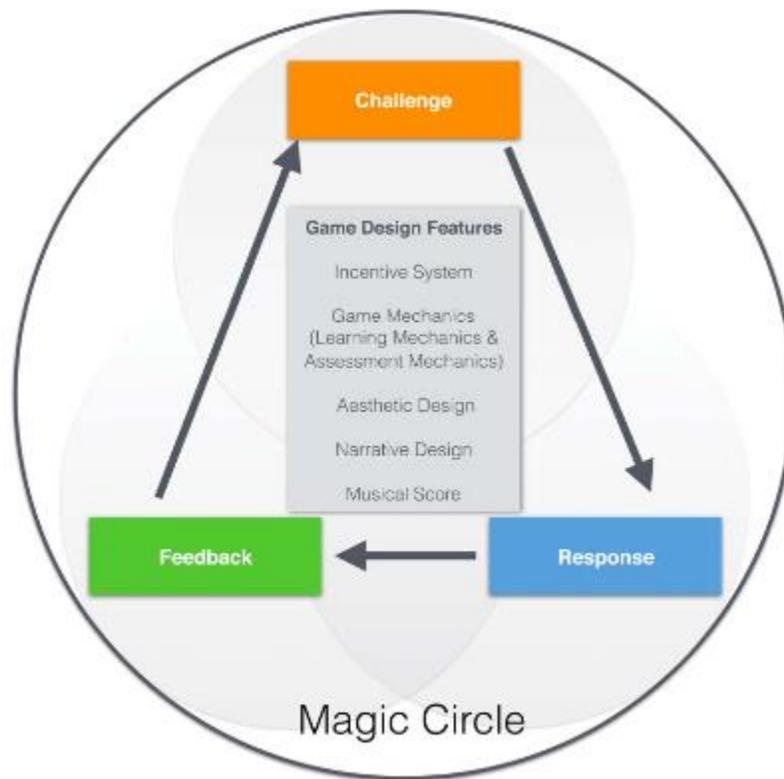


Figure 2: A Model of Game Based Learning (Plass, Homer & Kinzer, 2015:262)

As is evident from the figure above, there are a number of features that are essential to ensuring the success of adopting a game based approach. As was discussed earlier, the design features, as well as the quality of the game, play a crucial role in this approach. They also add to the advantages of using such an approach and contend that game based learning is a more holistic and integrated approach that allows for preparing learners for future challenges, teaches them new skills and knowledge while also helping them practice skills that they already possess and have learned. Based on their research, they developed a framework that allows for an elaboration of the integrated learning that is facilitated by game based learning. In this context, therefore, they state that game based learning has the following elements and attributes.

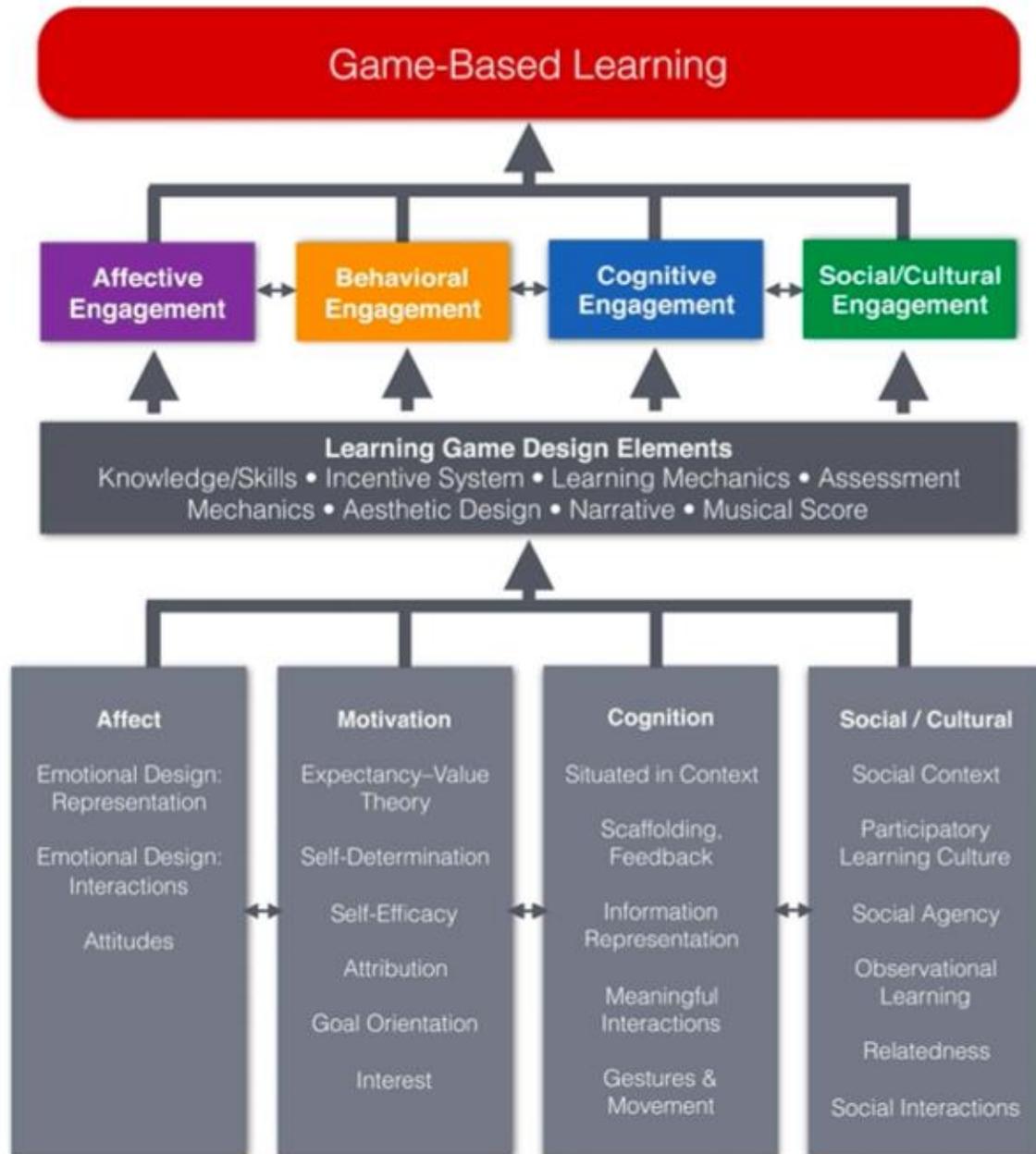


Figure 3: A design Framework for Game Based Learning (Plass, Homer & Kinzer, 2015:263)

Research conducted by Akour, Alsghaier and Aldiabat (2020) highlights how adopting a game based learning approach can improve self-learning in students. They demonstrate the value of creativity and innovation in keeping students motivated throughout the learning process and the new tools available to students and teachers through ‘smart education technologies’ (Akour, Alsghaier & Aldiabat, 2020:148). They add that ‘skills of comprehension and competence’ vastly improve with the adoption of game based learning (Akour, Alsghaier & Aldiabat, 2020:148). This is important because both these skills are crucial factors for determining motivation and achievement in learners. The researchers suggest that since students, especially at the university level, utilise technology and their mobile devices for communication and

information, the use of these devices for learning through interactive means and games should be encouraged. In addition to this, they address the issue of teacher training with regard to incorporating a game based learning approach in higher education and state that through collaboration and competition, teachers can organise games tournaments in order to foster team building in students.

Kirstavridou, et al. (2020) give the example of Ionian University and other universities in Greece, which have incorporated game based learning in some of their masters and bachelors programmes. Ionian University, along with Texas University, 'provides open tools for the construction and the usage of such digital games in higher education in Greece' (Kirstavridou, et al., 2020:91). They also observed an increase in the interest in better understanding game based learning by students. This was observed by way of bachelor's theses attempting to study the approach better and the perceptions of other students towards the adoption of such an approach in learning. Kirstavridou, et al. (2020) also take the example of Kahoot, which is a game based learning platform. They found that the platform is available in multiple languages, making it easy to use by students across the world. Their research also stressed the value of adopting a game based learning approach in the context of COVID and increased remote learning. Therefore, given the rise in online learning, there is potential to expand game based learning to other subjects and develop high-quality games.

Discussion

The paper thus far has sought to examine game based learning, what it includes and its benefits for learners of every stage. This section will now elaborate on students' perception of this game based learning as well as the challenges posed by adopting this approach.

Research by Camilleri and Camilleri (2017) highlights the ease with which students can incorporate game based learning owing to their existing access to digital and mobile devices. Their research, which included interviews with college students in Malta, also found that through the incorporation of game based learning methods, there is an increase in students' critical thinking and problem-solving skills. In addition to this, interpersonal skills also improved with the adoption of this approach. However, they also highlight that there is still a gap in fully evaluating what games can be the most effective, and hence there is scope for further research in this area to aid in improving our understanding.

Liu, Shaikh and Gazizova (2020) add that despite the many benefits of using game based learning for university students, there are several challenges to fully implementing this approach in the education sector. They state that although game based learning has shown better results than conventional teaching methods, this is only based on recent research since this approach has only recently been implemented. Hence, there is a need for research that will assess the long term impact of utilising game based approaches in learning. In addition to this, Tang, Hanneghan and El Rhalibi (2009) argue that there is a need to address the technical requirements for effectively incorporating game based learning within education, especially in universities. They state that teacher training is crucial in this respect. Teachers would require rigorous training in order for them to become comfortable with the new learning material and style. Additionally, such an approach could prove to be costly, thereby highlighting potential financial barriers to the widespread adoption of game based learning. Designing effective games with rich, engaging and challenging content is another concern that has already been highlighted above. This would require significant investments as well as the recognition of this approach as a valuable one.

Camilleri and Camilleri (2017) also comment that while game based learning in university students should be encouraged, factors such as learning conditions, infrastructure availability and individual learner characteristics will play a role in determining the success of incorporating this approach. Training teachers and understanding the costs and the benefits of implementing and adopting games in learning is also crucial. Lastly, they stress the need for further research in different contexts so as to effectively inform policymaking and establish the legitimacy of using game based learning.

Conclusion

This paper has sought to highlight the nature of game based learning for university students, its benefits as well as the challenges it poses. After reviewing what game based learning is, the paper examined the various advantages and benefits of adopting and utilising such an approach. It was argued that this is a more holistic and well-integrated approach as opposed to conventional learning approaches. Some of the advantages include teaching students skills that extend beyond the classroom, such as problem-solving skills, critical thinking and team-building. In addition to this, there is also scope for formal as well as non-formal training and skilling for learners. This is because game based learning provides learning and content in ways that are engaging and innovative, thereby boosting creativity and motivation among students.

Despite the many benefits of game based learning, however, the challenges were also discussed. The key challenges in this context include the need for generating awareness about the benefits of adopting this approach, teacher training to aid in the integration of in-class conventional teaching and game based learning. In addition to this, concerns of high costs and the need for infrastructure development were also discussed, along with the value of creating high-quality games.

Tang, Hanneghan and El Rhalibi (2009) highlight that there has been a significant increase in the interest in using game based learning. This is not only from students but also from educational institutions such as universities, policymakers and from students themselves. Hence, it is important to conduct further research on the benefits and implications of wider implementation and utilisation of game based learning.

References

- Akour, M., Alsghaier, H. and Aldiabat, S. (2020) 'Game-based learning approach to improve self-learning motivated students', *Int. J. Technology Enhanced Learning*, Vol. 12, No. 2, pp.146–160.
- Camilleri, M.A. & Camilleri, A. (2017). The Students' Perceptions of Digital Game-Based Learning. In Pivec, M. (Ed.) *11th European Conference on Games Based Learning* (October). Proceedings. H JOANNEUM University of Applied Science, Graz, Austria.
- Fatta, H., Maksom, Z. and Zakaria, M., (2019). Game-based Learning and Gamification: Searching for Definitions. *International journal of simulation: systems, science & technology*.
- Kirstavridou, D., Kousaris, K., Zafeiriou, C., and Tzafilkou, K. (2020). Types of Game-Based Learning in Education: A brief state of the art and the implementation in Greece. *The European Educational Researcher*, 3(2), 87-100. DOI: 10.31757/euer.324

- Liu, Z., Shaikh, Z. and Gazizova, F., (2020). Using the Concept of Game-Based Learning in Education. *International Journal of Emerging Technologies in Learning (iJET)*, 15(14), p.53.
- Plass, J., Homer, B. and Kinzer, C., (2015). Foundations of Game-Based Learning. *Educational Psychologist*, 50(4), pp.258-283.
- Tang, S., Hanneghan, M. and El Rhalibi, A., (2009). Introduction to Games-Based Learning. In: T. Connolly, M. Stansfield and L. Boyle, ed., *Games-Based Learning Advancements for Multi-Sensory Human Computer Interfaces: Techniques and Effective Practices*. Information Science Reference -, pp.1-17.