# Designing GBL for Higher Education: Pitfalls & Recommendations

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**Abstract**: Game-Based Learning (GBL) has gained significant attention in recent years as an effective educational approach to enhance student engagement and learning outcomes in higher education. This conference paper aims to emphasise the significance of GBL in higher education and presents a comprehensive review of a case study involving the application of GBL in a linguistics course. The study explores the impact of games on student learning, motivation, and engagement with the course content.By integrating gaming principles and mechanics into the curriculum, students are encouraged to actively participate, explore concepts, and apply their knowledge in a dynamic and stimulating environment. The study examines data gathered from student surveys and structured interviews to evaluate the effectiveness of GBL in fostering student engagement and knowledge acquisition. Furthermore, this paper provides a valuable set of recommendations and strategies for educators and administrators interested in implementing GBL in higher education settings. It explores the potential benefits of GBL, including increased motivation, improved critical thinking skills, and enhanced problem-solving abilities. Additionally, it highlights the importance of aligning game design with specific learning objectives and ensuring the integration of assessment mechanisms to gauge student progress effectively. Moreover, this paper discusses potential pitfalls and challenges that may arise during the implementation of GBL in higher education. It addresses issues such as technology requirements, accessibility considerations, and the need for appropriate training and support for instructors. By acknowledging these challenges and offering potential solutions, this research aims to guide educators and administrators in overcoming obstacles and optimising the implementation of GBL in higher education courses.

**Keywords:** GBL, Higher Education, Engagement, Recommendations, Strategies

## 1. Introduction

Game-Based Learning (GBL) has gained significant attention in recent years as an effective educational approach to enhance student engagement and learning outcomes in higher education. In general, games, especially well-designed ones, focus on a type of learning that involves problem-solving and active participation (Gee, 2007). This approach encourages players to take an active role in finding solutions to the given problems. Complex games with challenging problems often necessitate the formation of support groups and specialised communities that offer assistance in finding specific solutions. Even experienced gamers usually rely on these communities to enhance their understanding of the game and improve their abilities to overcome the game's challenges (McGonigal, 2011). Research has shown that GBL can also promote valuable skills such as critical thinking, problem-solving, initiative, communication, and sometimes even subject-specific knowledge (De Freitas, 2018; Gee, 2013; Höyng, 2022; Marklund & Taylor, 2016; McGonigal, 2011). GBL can ignite learners' curiosity and inspire them to delve deeper into a subject beyond the traditional motivation of passing exams. James Paul Gee, in his essay "Good Video Games and Good Learning" (2007), elaborates on this concept and presents 16 principles that emphasise the elements of video games that can be harnessed for active, experiential, and problem-based learning. These principles include player interaction, challenging tasks and problems, player agency, and maintaining a flow that balances frustration and boredom, enticing players to continue playing.

In Higher Education (HE) settings, the ability of learners to engage actively in their own learning process is a desired and supported skill. GBL aligns with this objective and can also target cognitive skills such as critical reasoning, logical thinking, and independent knowledge building. Implementing GBL in HE also benefits educators and instructors. Having motivated and engaged students not only enhances the teaching and learning process but also fosters an environment conducive to experimentation and creativity (Pavaloiu et al., 2016; Xinogalos & Eleftheriadis, 2023). While GBL is typically discussed from the learner's perspective, for educators, having a motivated and engaged classroom that actively participates in discussions and contributes to the learning process is a valuable advantage.

One significant challenge faced by academics and lecturers in HE is the lack of adequate support to incorporate games as supplementary resources in their teaching. In personal interviews with academics regarding game-based learning, although they acknowledge its potential to enhance motivation and engagement, a common question arises: where do we begin? This question is often followed by inquiries such as selecting suitable games, integrating games into classes, and assessing student learning outcomes. These thought-provoking questions are addressed in the initial study discussed in this paper. The primary objective of this paper is to offer a set of guidelines and recommendations for academics and lecturers in HE who aspire to integrate game-based learning

into their teaching courses. The research question driving this paper is: What strategies should be employed to navigate challenges and avoid pitfalls when implementing GBL in higher education teaching and learning?

The remainder of this paper is organised as follows: it starts with a background section emphasising the significance of GBL in HE for both students and staff. It then proceeds with a literature review, exploring the principles and practices of designing effective game-based learning experiences. Subsequently, a detailed examination of a specific case study that attempts to integrate games into higher education learning practices is presented. This is followed by a discussion of key considerations, addressing the requirements of GBL, and outlining the challenges and pitfalls that should be avoided when designing for this form of learning. Finally, this paper concludes by providing a list of recommendations and strategies specifically tailored to academics and educators who are interested in adopting GBL at their institution. These insights aim to support the successful implementation of game-based learning and enrich teaching and learning experiences in higher education.

## 2. Background & Review of Literature

Games can be categorised as a form of media. Most often games are associated with and as a source of entertainment. Games are also very diverse in nature. Various genres of games appeal to a wide variety of audiences irrespective of gender, race, age or culture (De Freitas, 2018; De Freitas & Griffiths, 2008). There are games that possess great complexity, as well as games that are quite simple in their logic and game rules. The beauty of games in general lies in the ability to create an engaging environment that offers a balanced flow between boredom and frustration in an attempt to solve the game's quest (Gee, 2013). However there is a distinct difference between games that have been designed and created for entertainment purposes and those that have been specifically designed as media for training and learning. Researchers are also quite divided on the role of games for learning. Whereas some researchers present studies on the design of games that teach specific content, there are others who subscribe to the school of thought that view off-the-shelf games as the basis for the transfer of skills and competences to go beyond the acquisition of content information (Steinkuehler et al., 2012; Squire, 2011).

However when considering GBL, whether these are specifically designed or off-the-shelf, we must set aside our preconceptions and regard games as any other medium that contributes to the learning process. Just as we approach books, films, YouTube videos, Instagram reels, and academic papers as sources of knowledge, we can also explore games that have the potential to enhance, enrich, support, and stimulate learning, as well as instilling in learners a desire to learn more and in more depth.

Utilising a GBL approach in HE offers numerous advantages. Apart from employing a cutting-edge teaching method that enhances skills associated with modern literacies, a game-based approach primarily focuses on fostering critical thinking and problem-solving abilities through an active methodology framework. Research in GBL has been going on for decades and a number of results have shown that there have been a number of successful initiatives in higher education (Marklund & Taylor, 2016). A few recent publications explore the notion of using games as mediators to improve the perception of higher education students of the various subjects such as accounting (Sugahara & Cilloni, 2021), project management (Jääskä & Aaltonen, 2022) and others (Höyng, 2022; Stiller & Schworm, 2019; Xinogalos, & Eleftheriadis, 2023). Results from these studies indicate that whilst GBL may not be directly responsible for improved performances or perceptions related to the subject it may indeed be responsible for a deeper engagement with the content following an increased curiosity in getting to know more about the subject itself. However it has to be said that each GBL experience is quite unique in its application at the classroom level, and it is dependent on a number of variables. These include learners' attitudes towards games, the subject/skill that is targeted through the game, the environment/context in which games are played and the lecturers/teachers/academics' confidence in games and playing. Although in theory, GBL can be applied across a wide range of subjects and disciplines, at Higher Education level, where more depth in the skills and knowledge is expected, not all games can target the learners' and educators' needs equally. Specific subjects/fields of study may require specifically designed games to reach the scope of the content. The following is a summary of some of the benefits that using games in HE might offer to both learners and indirectly also to academics or educators.

1. Enhanced student engagement and motivation; research has indicated on numerous occasions that GBL leads to enhanced student engagement and motivation provided that the game which is made use of is tailored to the needs of the player at the time that is needed, in order to provide the player with some form of meaning in context (Sugahara & Cilloni, 2021). When a learner becomes engaged in the learning process it is expected that s/he would move beyond learning facts or information towards constructing knowledge that is needed for an improved performance.

2. Development of critical thinking and problem-solving skills; well-designed games often contain problems which the player needs to solve before advancing to a higher level (Tay et al., 2022). Problem solving requires lateral thinking and critical thinking skills which are considered as some of the more generic cognitive skills that are not directly subject content related. Research has also shown that these skills are important for the 21st century literacies that characterise technology driven societies (Squire, 2011).
3. Increased collaboration and social interaction; through multiplayer and online networks, players most often make use of communities having diverse skills, to hone in on their experiences, and help them overcome game challenges and solve problems to master their level of the game (McGonigal, 2011).
4. Personalised learning experiences; games offer personalised experiences of the learning process, depending on the level of ability of the player, as well as his/her scope in playing the game (Troussas et al., 2020). AI provides ways of adapting game difficulty based on the player's progress and performance. This means that the game difficulty level is adjusted gradually to enhance the player's experience rather than make it frustratingly difficult.

GBL for HE offers enough flexibility to educators and academics in the field, to include a diverse range of game genres, each offering possible unique educational benefits. Simulation games, such as medical or business simulations, allow students to apply theoretical knowledge to real-world scenarios. This also allows for a more empathic approach to skill building. Puzzle games promote critical thinking and problem-solving skills, while role-playing games encourage empathy, teamwork, and decision-making in complex situations. Strategy games foster strategic planning and resource management, while trivia and quiz games reinforce content retention. Adventure games can immerse learners in historical or cultural contexts, enhancing their understanding of the subject matter or the context in which the content is placed. Narrative-based games combine storytelling with interactive gameplay, enabling students to explore complex concepts within a compelling narrative framework. By immersing learners in rich, branching narratives, such as historical reenactments or futuristic scenarios, narrative-based games enhance critical thinking, decision-making, and problem-solving skills. Moreover, they promote emotional engagement and empathy, as students connect with characters and make choices that impact the story's outcome.

## 3. Case Study

In this case study, we examine the results of an exploratory study conducted by the University of Malta, which aimed to gain insights into GBL and its effectiveness in engaging language and linguistics students with academic topics. The study involved two surveys, with the first survey focusing on identifying student preferences regarding games in learning environments. Based on the findings, a narrative text-based game was chosen to be developed, aiming to engage participants in discovering more about the language-driven profession. Moreover the scope of such a game, included fostering skills that lead to critical thinking, decision-making and problem-solving. The second survey evaluated the game's impact on a select group of language and linguistics students.

### 3.1 Objective

The primary objective of this case study was to determine the effectiveness of a narrative text-based game in engaging language and linguistics students with the academic subject matter, and to assess whether such games could foster further interest and knowledge in the field.

### 3.2 Methodology

A first exploratory survey involved 215 respondents, and aimed to determine the needs and preferences of language and linguistics students regarding games in learning environments. The survey results indicated that while games might not be a top priority for all participants, those who enjoyed playing games preferred simple, short games with engaging narratives that could also facilitate learning.

Based on the findings from the first survey, a narrative text-based game was developed. The game's objective was to lead participants into a mission of discovering the language-driven profession, targeting students' interests in engaging narratives while incorporating educational elements.

A second specifically designed survey to gain insights into the perceived effectiveness of games in learning involved 25 language and linguistics students who voluntarily participated in the narrative-based text game. The survey aimed to gain insights into the game's impact on participants' interest in the subject matter and their perception of the game's effectiveness as a learning tool. Together with the survey, interviews with participants revealed further insights into the perception of the effectiveness of games for learning at higher education level. Results from the interviews were coded using thematic analysis.

The pre and post- game survey, together with the focus group interviews used a triangulation method of research that could provide the basis of the recommendations for the uptake of games at a higher education level.

### 3.3 Results:

The initial survey results suggested that language and linguistics students preferred games that were simple, short, and had an engaging narrative. They were more inclined towards games that could promote learning, rather than those that involved complexity or physical action.

In the Game Evaluation Survey, almost all participants (96%) expressed enjoyment in the narrative of the game. However, some participants (44%) expressed a desire for more complexity in the questions and missions. Despite this, 60% of respondents reported that the game made them think further about aspects of the language specialist profession. Furthermore, an equal proportion (60%) mentioned that playing the game motivated them to explore the subject in more depth.

The results of both surveys indicate that narrative text-based games can be effective in engaging language and linguistics students with academic topics. Although a subset of participants desired more complexity in the game mechanics, the majority reported increased interest and curiosity in the language-driven profession after playing the game.

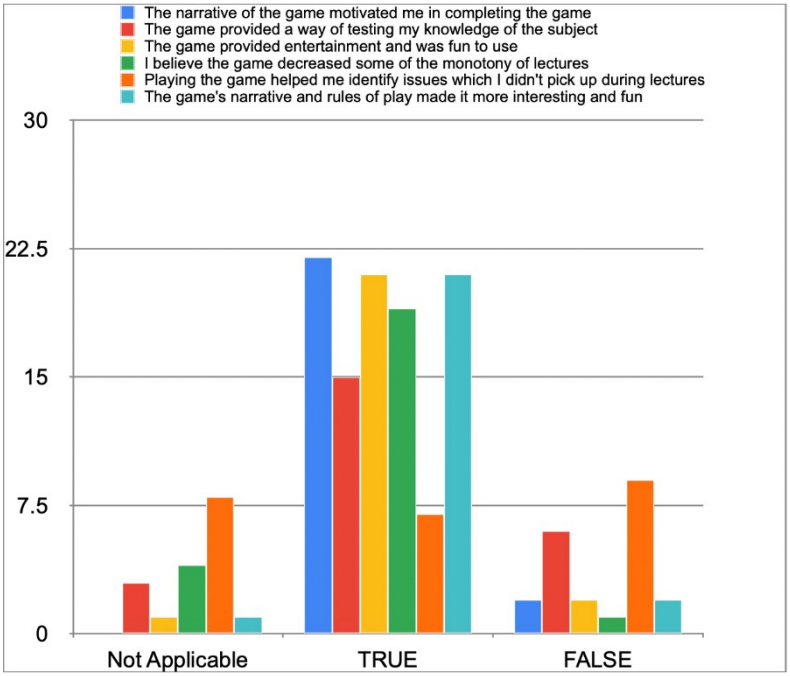


**Figure 1: Frequency Distribution of the Participants' self reported game engagement (n=24)**

The results from the surveys gave an indication that narrative text-based games have the potential to engage language and linguistics students and foster further interest in the subject matter. While some participants desired more complexity in the game, the majority still acknowledged the game's ability to inspire them to explore the language specialist profession in more depth.

In addition to the administered surveys, structured interviews were conducted among the study's participants, with the primary objective of soliciting comprehensive feedback pertaining to the integration of gamified elements in higher education pedagogy. All interview sessions were meticulously transcribed, and the ensuing qualitative analysis revealed the emergence of two overarching thematic categories. The first of these themes, denoted as "Theme 1: Game Play," exhibited a multifaceted spectrum of sub-themes. These sub-themes encompassed the classification of game genres, the exploration of competitive dynamics, the examination of conflict resolution strategies, and the nuanced dynamics surrounding collaborative teamwork within the context of educational gaming experiences. Meanwhile, "Theme 2: Assessment" served as the second salient thematic category, wherein participants deliberated extensively on matters encompassing skill identification processes and the assessment of academic achievements within the gamified learning environment.

The results from this case study highlight the value of well-designed narrative games as a complementary tool in academic settings, encouraging learners to engage with subject matter beyond the traditional classroom approach. Further research and refinement of such games could pave the way for more effective GBL experiences in the future.

## 4. Reflection & Discussion

The study underscores the importance of strategic planning and design when integrating game-driven pedagogy for successful teaching and learning experiences using games. The following are a list of reflection points arising from the literature and from the initial exploratory research in the case study.

1. Clear Learning Objectives: The development of a game should be guided by well-defined learning objectives. These objectives should align with the subject/skill being taught and facilitate specific, grounded learning outcomes. By brainstorming ideas related to the subject matter, educators can map out learning objectives that resonate with students' critical skills and content knowledge. This process ensures that the game's pedagogical design aligns with the desired educational outcomes.
2. Incorporating Relevant Curriculum Content: While games offer unique learning opportunities, not all subject curriculum needs to be addressed within the game. Identifying key aspects of the curriculum content, along with additional skills for deeper engagement, can enrich the gaming experience. By prioritising relevant content and skills, educators can map them into measurable objectives, enhancing the game's educational value.
3. Aligning Game Mechanics with Learning Outcomes: Game mechanics, including rules, challenges, and objectives, play a crucial role in shaping gameplay. To maximise the educational impact of a game, educators must ensure that the gameplay objectives align with the identified curriculum content and learning outcomes. While a perfect match may not always be possible, mapping gameplay objectives to relevant curriculum content can enhance the game's educational effectiveness.
4. Providing Meaningful Feedback and Assessment: One of the challenges in using games for educational purposes is evaluating students' learning progress. Incorporating various forms of feedback and in-game assessments can be highly effective in promoting continuous learning. This approach encourages students to improve their skills and knowledge by overcoming challenges within the game. Additionally, alternative assessment methods, such as engaging students in discussions and open-ended questions, foster reflective learning and critical thinking throughout the GBL experience.

### 4.1 Challenges & Pitfalls:

GBL is not without its challenges and pitfalls. A number of academics and educators often express difficulty and reticence to integrating games into higher education learning. Most often such reticence may be associated to resistance to change, however at times this is also reflected to limitations of technology infrastructure and resources available as well as lack of knowledge of games and gaming. The following is a list that emerges from the case study above and which includes a number of challenges which academics and educators describe as potentially limiting to taking up GBL at higher education level.

1. Time and Resource Constraints: Managing time and accessing sufficient game resources can be challenging. To overcome this, faculty should allocate support staff to educators and academics involved in GBL. These experts can ensure access to necessary infrastructure, pedagogical materials, curriculum integration, and assessment strategies, facilitating successful implementation.
2. Assessment and Grading in GBL: Traditional assessment methods may not align with GBL's experiential nature. Utilising in-game outcomes, such as scores and experience points, provides valuable feedback and encourages reflective discussions on learning outcomes within the study unit.
3. Overcoming Resistance to Change: Introducing innovative pedagogical practices like GBL may face resistance from the teaching and learning community. Overcoming this resistance involves taking small, guided steps, showcasing successful GBL examples, and offering support and training to educators through faculty support staff and pedagogical experts.
4. Ethical Considerations and Student Well-being: Designing, creating, or using games for learning requires careful consideration of ethical aspects. Key considerations include obtaining informed consent, ensuring accessibility and inclusivity, protecting student data, promoting fairness and psychological well-being, respecting intellectual property and copyright, and emphasising ethical game design and academic integrity. Adhering to these principles ensures a positive and inclusive GBL environment for students.

## 5. Recommendations & Strategies:

The proposed strategies aim to contribute to the existing body of knowledge in GBL and suggest potential areas for the future development of innovative pedagogies in higher education.

1. Institutional Support and Policy Development:

- Full institutional support is crucial for successful GBL implementation in higher education.
- Dedicate pedagogical support staff to assist academics in selecting appropriate games, ensuring technological infrastructure, and promoting ethical practices.
- Collaborate with game designers, academic experts, and technologists to develop games that align with teaching and learning objectives.

2. Collaboration between Faculty and Game Developers:

- In-house game development requires interdisciplinary collaboration to enhance user experience through AI, psychology, sociology, and game design.
- Involve industry partners when institutions lack game development centres to provide technical expertise and aesthetic design.

3. Continuous Evaluation and Improvement:

- GBL should be viewed as a dynamic educational resource adaptable to various contexts and purposes.
- Employ diverse assessment procedures to gather qualitative feedback, leading to enhanced game mechanics and an improved learning environment.

4. Sustainability and Scalability:

- Consider the long-term sustainability of GBL resources, accounting for staff time, development costs, and maintenance.
- Implement management plans to address server maintenance, continuous feedback, updated guidelines, and ethical academic use of games.
- Explore acceptance and adoption models to build confidence in using games across different fields of study and settings.

## 6. Conclusion

In conclusion, this paper aims to propagate the notion of the significance of GBL in HE, presenting valuable recommendations and strategies for a successful implementation. Institutional support, interdisciplinary collaboration, and continuous evaluation play a crucial role in enhancing GBL's impact on student engagement. These practical recommendations can be used to foster an innovative and dynamic learning environment that empowers both educators and students to thrive in the digital age. More research insights are needed to create sustainable, inclusive, and immersive learning experiences that will shape the future of education. As GBL continues to evolve, further research and refinement of game-based approaches hold promise for enhancing learner engagement and academic success.

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