

Games-Based Learning in Business Management Programmes: A Reflective Analysis of Students' Experience

Nurun Nahar¹ and Thomas Storey²

¹Greater Manchester Business School, University of Bolton, Lancashire, UK

²Faculty of Engineering and Creative Technologies, University of Bolton, Lancashire, UK

n.nahar@bolton.ac.uk

Abstract: Games-based learning constitutes integrating games into learning experiences to create effective learning environments by applying some common characteristics which improve intrinsic and extrinsic motivation. Using an exploratory study design and reflexive thematic analysis, this paper shares insights from a research study conducted between September 2021-April 2023, to co-evaluate the effectiveness of a co-created games-based learning application, for formative assessment of learning on a business undergraduate programme. Potential benefits of games-based learning in higher education institutions (HEI) include introduction of a structured rewards system and goals in a fun and focused way into learning that can act as a powerful motivator to enhance engagement and promote participative interaction. It offers an alternative opportunity to HEIs to redefine learner experience by re-evaluating contemporary pedagogies. Findings from this study indicate, application of games-based learning as a pedagogical intervention, can improve learning experience of students on business management programmes by allowing students to take ownership of learning. The co-created application piloted in this study, helped students to recall contents learned and track their performance through instant feedback received upon completion of a game. It also supported students in identifying weaknesses in their grasp of knowledge related to particular topics within a module and motivated them to work on areas of improvements. A key challenge identified by the students was expectation of a variety of games within GBL approaches to keep intrinsically motivated to use such applications for learning.

Keywords: Games-based learning, Gamification, Active learning, Gamified learning, Formative assessment

1. Introduction

The notion of Games-Based Learning (GBL) as an instructive approach is gaining traction in Higher Education as an 'enabler' of increased engagement and motivation through integration of gaming into learning experiences. GBL can be used to create effective learning environments by incorporating gaming characteristics that include making decisions and solving problems in increasingly difficult circumstances in complex environments. The availability of digital tools and portable devices in recent years have proliferated the use of digital gaming as a mobile and social activity (Advance-HE, 2020). With blended learning becoming more prevalent, digital GBL is being seen by some researchers as a post-pandemic solution for higher education (Froehling, 2023). Digital games can be played remotely, making them accessible to students regardless of their location and can be played asynchronously, allowing students to learn at their own pace (Jackson, 2021). Application of GBL in business management education and its evaluation is not uncommon. However, there is relatively little scholarly attention paid to the involvement of higher education students in the testing and evaluation process of GBL applications designed and developed to support learning in business management programmes.

In this case study, the researchers aim to explore the concept of GBL from a gamification perspective using a co-created GBL application. Using a reflexive thematic analysis approach, the main objectives of this study are to explore students' overall experience of GBL in business management programmes and understand its effectiveness for formative assessment of learning by involving students in the evaluation process.

2. Context and Background

In general terms, GBL can be defined as 'learning that is facilitated by game' (Whitton, 2012). Also known as educational or serious games, GBL has gained significant attention as an innovative approach to engage and educate students in higher education. It is an active form of learning involving a variety of learning events such as instruction, assessment and feedback in addition to motivational events such as rewards and challenges (Braad et al., 2020). GBL is implemented in educational settings in various formats either by embedding learning contents seamlessly into the game itself in serious games or through use of gamified digital assessment tools that integrate gamification elements such as points, leadership board into quizzes and similar activities for practical pedagogical outcomes (Sad and Ozer, 2019). In the context of business management education, GBL refers to the use of games as a teaching method to support learning outcomes using a specific typology of serious games that combine simulations and games to support management and entrepreneurial training (Nonino, 2013). If applied as serious games, GBL incorporates principles of active and collaborative learning, intrinsic motivation, reflection and immediate feedback which collectively enables students to apply

knowledge and skills in relevant contexts while offering the opportunity to foster their metacognitive skills by assessing their own performance (Arnab et al., 2014).

Research into GBL have found benefits of applying this approach for learning in various contexts. For example, mobile learning games (MLG) has been found to be as effective as traditional textbook learning at transferring factual knowledge. The Entertainment Software Association (ESA) (2019) reported GBL for assessments (GBLA) to be a strong way of measuring implicit learning. A study by Lai et al. (2012) found that game-based cooperative learning can produce a better result by improving both students' learning and motivation (Vandercruysse, Vandewaetere and Clarebout, 2012) while supporting repetition, recognition and recalling of knowledge including collaborative learning approaches (Jisc, 2016). Additionally, a meta-analysis study by Karakoç et al. (2022), reported on wide-ranging effects of GBL on student achievement. Firstly, it promotes active learning by encouraging students to participate actively in the learning process, rather than passively receiving information. Secondly, games can provide a safe and controlled environment for students to experiment and make mistakes, facilitating deeper learning and understanding of complex concepts. Additionally, games-based learning can offer immediate feedback, personalized learning experiences, and opportunities for collaborative and competitive interactions among students, fostering a sense of achievement and social learning. Key benefits of GBL, include increased motivation, improved knowledge acquisition, enhanced problem-solving skills, and higher engagement levels among students. GBL has the potential to foster active and experiential learning experiences, enabling students to explore complex concepts in a simulated and interactive environment (Connolly et al., 2012).

2.1 Use of GBL for Formative Assessment of Learning

While there is a substantive body of literature that supports the educational benefits of GBL, limited work investigates the validity and generalizability of such systems for assessments. In discussing about Games-based assessments (GBA), Kim et al. (2022) argued that the use of digital games can be a powerful context to support student and assess student learning. GBL will be effective if it assesses learners while playing the game by providing detailed insights on the learning process, tracking motivational, emotional and metacognitive features to understand behaviour and final outcome, and immediate feedback based on embedded assessment to identify the areas of difficulties for learners to play the game (Ifenthaler et al., 2012). Research shows that bringing game-based assessments into classrooms can improve students' learning abilities by supporting the development of cognitive (e.g., memorisation, reasoning), Practical (e.g., time management, data handling), Motivational (e.g., confidence, immediate feedback) and social (e.g., collaboration and communication) skills (Ifenthaler et al., 2012; Vlachopoulos and Makri, 2017). It promotes learning that is fun while providing educators with real-time feedback to adjust lesson plans accordingly (Lin, 2019).

Although games can provide engaging and interactive experiences, there is a risk of superficial integration or misalignment with the curriculum. It is crucial to critically evaluate its implementation to ensure that game content is well-integrated with the curriculum, aligning with learning objectives, and promoting deep meaningful learning experiences. For instance, Squire (2011) highlights the importance of aligning game mechanics, narrative, and content with the desired learning outcomes. Simply adding game elements without clear connections to the course content may result in a lack of coherence and reduced effectiveness.

Another critical aspect of games-based learning in higher education is the assessment of student learning within game environments. Traditional assessment methods may not effectively capture the knowledge and skills gained through game-based learning experiences. Therefore, it becomes essential to develop appropriate assessment strategies that align with the nature of games and the desired learning outcomes. De Freitas and Oliver (2006) emphasize the need to go beyond traditional testing methods and explore alternative assessment approaches that capture the multifaceted learning experiences offered by games. These can include performance-based assessments, reflective journals, portfolios, or in-game assessments that measure the application of knowledge and skills within the game context. By utilizing a diverse range of assessment methods, educators can evaluate students' learning in a more comprehensive and authentic manner using a GBL approach (Petri and Von Wangenheim, 2016; Gris and Bengtson, 2021).

2.2 Involving Students in the Evaluation of GBL for Formative Assessments

There is currently a lack of literature where evidences of engaging students can be found during the process of product and service development, in this case a digital GBL application. The researchers applied the theory of co-creation (Dacre, Gkogkidis and Jenkins, 2018) to co-evaluate a pilot digital GBL application for joint value creation by improving the outcome of the design process. Nahar & Cross (2020) defined co-creation in the

context of involving students as partners in the creation of e-learning materials as a facilitator of digital literacy skills development in students and staff. The concept of co-creation with students stemmed from Healey et al.'s, (2014) student-staff partnership model, which explored this notion from the perspectives of engaging students in subject based research and enquiry, learning, design and development, curriculum design and pedagogic consultancy to enhance learning and teaching and student engagement. Involving students in the evaluation of the impact of games-based learning offers several benefits. Student involvement in the evaluation process can enhance their engagement and ownership of their learning experiences. When students actively participate in evaluating games-based learning, they become more invested in the assessment process and take greater responsibility for their own learning (Witton et al., 2020). By reflecting on their experiences, students can provide valuable insights into the strengths and weaknesses of games-based learning approaches.

Including students in the evaluation of games-based learning can provide unique insights into its effectiveness, engagement, and relevance. Students' perspectives can contribute to a more comprehensive understanding of the impact of games-based learning by offering qualitative data on their perceptions, challenges, and suggestions for improvement (Sicilia, 2015). Their perspectives can help identify aspects of the learning experience that may have been overlooked and shed light on the contextual factors that influence the effectiveness of games-based learning interventions providing opportunities for refinement, clarification, or additional support (Connolly et al., 2012). However, it is important to consider that student involvement in evaluation might not be feasible in all contexts. Students may feel the use of games for serious study as inappropriate or frivolous. Their perspectives are subjective and may not always align with educational objectives or long-term learning outcomes. Additionally limited time or resources, large class sizes, cultural barriers, accessibility or logistical challenges could hinder the choices around using games within curriculum (Jisc, 2016). Factors like these could affect the extent of student involvement in evaluation processes.

3. Methodology

A qualitative study design using exploratory method was applied in this research to explore undergraduate business students' experience of using a gamified approach to formative assessment of learning. Exploratory research is a recognised methodological approach in business research. It allows for an open-ended and flexible approach, enabling researchers to delve into new areas and gain a comprehensive understanding of the subject matter (Babbie, 2016). In the context of co-evaluating a digital games-based learning application, this approach can help identify and explore various aspects, including usability, engagement, learning outcomes, and student perspectives to enhance the validity and relevance of the evaluation results to ensure that the application aligns with the expectations and requirements of the target audience. Saunders et al. (2012) acknowledges that while exploratory method may not always yield definitive evidence, it still contributes to enhancing our understanding of a problem. Use of this method has been seen in previous research studies in the context of applying online gamification as an approach for positive enhancements in student engagement (Ding et al., 2018). Given the nature of this study, this method seemed to be an appropriate choice since it was important to consult learners during the evaluation process of a co-designed digital GBL application intended to be used as a gamified formative assessment tool.

3.1 Digital GBL Used and the Process of Application

The digital tool co-evaluated in this study is known as Ed Owl, a web-based learning application. Co-designed and developed between September 2021 and January 2022; Ed Owl was piloted on two final year undergraduate business management modules with finance specialism over a period of 8 months across two academic years. The purpose of the pilot was to introduce Ed Owl to the learners as a gamified formative assessment tool and use it synchronously or asynchronously to support learners in assessing their knowledge and grasp of topics following a lesson. 3 types of games: Quiz, Hangman and Match the definition were programmed in Ed Owl. Elements of gamification such as challenge and rewards were added to these games in the form of time restriction, points and badges. Students would log in to their Ed Owl account either at the beginning of a lesson or during a lesson to engage in playing Quiz or Hangman games to recap on topics or assess their level of understanding following the delivery of a topic. The contents of the games were aligned to their module learning outcomes and linked to summative coursework.

1.2 Data Collection and Analysis

Towards the end of the pilot phase, students from two taught modules on the undergraduate business management finance pathway programme, were invited to participate in a focus group. The focus group

consisted of open-ended questions to gather qualitative data around their perceptions of GBL as a learning approach, their experience of using Ed Owl as a facilitator GBL and formative assessment of learning on business programmes. A total of $n = 14$ students participated in two focus groups at two points in time between May 2022- April 2023. Findings were analysed using reflexive thematic analysis (RTA) technique. Byrne (2021) explained Braun and Clarke's (2012) approach of RTA as *"an easily accessible and theoretically flexible interpretative approach to qualitative data analysis that facilitates the identification and analysis of patterns or themes in a given data set."* Using this technique, recurring patterns from participants' responses from the focus group have been arranged into three broad themes to constitute 'domain summaries' capturing participants thoughts in relation to a particular data collection question (Braun et al. 2019, p. 5 as cited in Byrne, 2021) as key discussion points residing within the data in a positivistic sense.

4. Findings and Discussion

4.1 Makes Learning fun, Social and Interactive

"Good thing about Ed Owl is it is fun to learn" – Participant 4.

A key observation noticed from engagement with the GBL approach was the almost 'sudden transformation' of otherwise a low-key classroom environment into a fun and socially interactive atmosphere which resonates with some existing research findings about use of games for promoting a fun learning environment (Lin, 2019). Some of the students who were quiet by nature, were seen to exchange dialogues in an enthusiastic manner as participating in the games evoked a 'competitive' vibe among the students.

"It is an interactive and fun application especially by learning through games" – Participant 2.

The challenges embedded within the games in addition to the points scoring system enabled with each gaming activity, may have induced this change in the students' behaviour and approach to formative assessment activities attempted. As students received immediate feedback following a game completion, it appeared 'intrinsic motivation' (Vandercruysse, Vandewaetere and Clarebout, 2012) to do better or out perform a fellow classmate encouraged students to attempt some assessment activities more than once in order to get a better score and self-validate comprehension of a certain topic being assessed has taken place. This observation reiterates GBL can foster opportunities for collaborative and competitive interactions among students, fostering a sense of achievement and social learning. The interactive nature of the GBL application increased students' motivation to learn which paved way for higher engagement levels among students (Connolly et al., 2012).

4.2 Enables to Recall and Retain Content

The students who participated in this evaluation had selected finance pathway in their final year business management undergraduate programme. There is a common fallacy among the students that the topics learned on this pathway are 'complex by nature' due to the context in which they are taught. Due to the diverse nature of the student population who join business management programmes at undergraduate level, not all students choosing finance pathway may have prior subject knowledge of some key concepts that are relevant to this pathway. As such there is a general apprehension in relation to some core concepts taught such as double entry book keeping, consolidation of financial statements, audit, risk assessment and control among others. The introduction of GBL approach has enabled the students in their opinion to "learn and remember things". The ability to get an answer 'right' and 'review' it through live feedback in the application has helped students to 'remember things' learnt.

"It is easy to understand topic that relates to the module through games, absolutely interesting!" – Participant 3.

Student found their learning process to be more active (Karakoç et al., 2022) when using GBL approach. The opportunity to experiment and make mistakes in a safe and controlled gamified environment such as Ed Owl in this instance, collectively enabled students to apply knowledge and skills in relevant contexts to assess their implicit learning. It offered them the opportunity to foster their metacognitive skills by assessing their own performance (Arnab et al., 2014). Student found GBL approach supported them to reflect through immediate feedback generation thus facilitating deeper learning and understanding of complex concepts.

"It is good as it be always related to the topic we are studying" – Participant 6.

What we learn in class we can put it in work and practice it on the web-based gaming application' – Participant 9.

Another important finding from the investigation, was the ability of GBL to foster improved knowledge acquisition and problem-solving skills among learners. As students could access Ed owl's digital games-based learning platform from any electronic device with internet connection, it allowed them to log in to the application and use it for asynchronously assessment of learning. The repetition feature within this application enabled students to develop their meta-cognitive skills in their abilities to recognise and recall (Jisc, 2016) knowledge to support meaningful contextualised assessment of learning (Ifenthaler et al., 2012; Vlachopoulos and Makri, 2017).

4.3 Increased Familiarity Leading to an Expectation for Variety

Frequent engagement with Ed Owl in their curricula meant that students became accustomed to the dynamic and diverse experiences offered by digital games.

"Need to give new games to keep learners entertained and as a mobile application feature" – Participant 4.

Incorporating a variety of GBL experiences (Petri and Von Wangenheim, 2016; Gris and Bengtson, 2021), can maintain interest and prevent monotony among learners with different game mechanics, challenges, and contents. However, meeting the expectation for variety can also pose challenges for educators and game developers. Creating a diverse range of GBL experiences requires significant resources, time, and expertise. Developing high-quality educational games with varied content and mechanics demands careful planning, content creation, and iterative design processes. Furthermore, ensuring that the games align with specific learning objectives adds another layer of complexity. The expectation for variety in digital games can create a potential risk of superficial or superficially diverse learning experiences. Adding variety without adequately addressing the core educational content and objectives can lead to a situation where learners are exposed to a variety of gamified learning experiences, but the depth of their understanding and retention of the educational content is compromised.

It is important to acknowledge that student perspectives are subjective and may not always align with educational objectives or long-term learning outcomes. Students' immediate enjoyment or perceived ease of use may influence their evaluation, which might not necessarily reflect the educational effectiveness of GBL. Therefore, a balance must be struck between valuing student perspectives and considering other objective measures of learning outcomes.

5. Conclusion

Findings from this study reaffirms, GBL can be an alternative effective approach for formative assessment of learning if applied in the context of business management programmes. The integration of student's reflections on their experience of using digital games for learning adds further value to the findings since students are the direct beneficiaries of any pedagogical interventions. This study has attempted to illuminate the importance of involving students in the evaluation process of digital GBL applications for learning during the design and development stage not only to allow ownership of learning but also to ensure joint value creation in the design process of such applications. Educators interested in applying GBL within a formative assessment of learning context should consider possible factors that affect how certain populations of students enjoy educational games, so it does not marginalize specific student populations and hinder their learning experience and academic outcomes. To strike a balance, educators and game developers need to consider the learning objectives and content as primary factors when designing game-based learning experiences. A thoughtful approach that combines diverse gameplay elements with solid pedagogical principles is necessary. Iterative design processes, user feedback, and research can help ensure that the variety in game-based learning experiences aligns with the intended learning outcomes.

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