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From Concept to Classroom: Gamifying lesson design in Open and Distance Learning

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Abstract

The unprecedented impact of the COVID-19 pandemic has prompted research into students' attitudes, experiences, and challenges within the realm of open and distance learning (ODL). A significant body of literature has underscored the critical issues of student engagement and motivation, highlighting them as key factors influencing learning outcomes. Gamification—the application of game-like elements into non-game contexts—has emerged as an innovative pedagogical strategy aimed at enhancing student engagement, motivation, and overall learning experiences. Recent literature suggests that when gamification is thoughtfully designed and carefully incorporated into the lesson design, it has the potential to improve learning. The present study explores the integration of gamification within the lesson design, demonstrating how various game elements were strategically embedded to enhance student engagement and motivation. This research was conducted with a cohort of thirty students enrolled in a gamified Software Engineering course at the Open University of Mauritius. Upon completion of the course, fifteen students participated in a structured focus group discussion to share their perspectives and reflections on their gamified learning experience. The participants generally expressed enthusiasm and enjoyment for all the gamified activities. Furthermore, students highlighted the positive impact of gamification on fostering a strong sense of community, teamwork, and collaborative learning. Notably, the findings revealed diverse reactions to specific game elements, particularly the leaderboard, which elicited mixed responses in terms of motivation and competition. Overall, the study contributes valuable insights on gamification in ODL for educators seeking to design and implement gamified learning courses.

Keywords: attitudes, engagement, gamification, learning experience, motivation

1. Introduction

With the increasing shift towards hybrid and fully online learning, digital platforms have become integral to university education. Despite the widespread adoption of these technologies, student engagement in online learning environments continues to be a persistent challenge. Empirical evidence suggests that engagement levels are often lower in virtual settings, which negatively impacts both motivation and academic performance (Guo et al., 2023). In response to these challenges, educators and researchers are exploring innovative pedagogical strategies to foster deeper engagement and more meaningful learning experiences. Among these, gamification—the integration of game design elements into non-game contexts—has emerged as a promising solution to enhance student motivation and engagement in educational contexts. Studies show that when game mechanics are properly integrated, students have greater engagement, improved learning, and increased motivation (Khaldi *et al*., 2023; Han & Chen, 2024). Berdousis (2024) identifies gamification as an innovative teaching tool with the potential to enhance higher education learning experiences, particularly for ODL learners. However, there remains a critical need to investigate which gamification techniques are most effective, how they influence student outcomes, and how they can be implemented optimally in higher education contexts (D'Mello et al., 2023).

This study contributes to the growing body of literature by adopting an application-oriented approach to illustrate how various game elements can be systematically embedded throughout course design to improve the overall quality of the learning experience.

This study addresses the following research question:

How can game elements be designed and applied to optimise the student learning experience in open and distance learning environments?

2. Theoretical Background

The ODL mode has become increasingly popular in response to the rising need for lifelong learning and upskilling as a driver for individual and career advancement. But with all its advantages, ODL is plagued by challenges in maintaining key determinants of academic achievement, particularly students' motivation and engagement (Klock *et al*., 2023). The self-study aspect of ODL, coupled with the absence of face-to-face interactions, can lead to feelings of isolation and disengagement on the students' part (Zainuddin *et al*., 2023). These are issues that have prompted teachers and academics to look for new methods of enhanced student participation and sustaining motivation in the ODL environment.

Gamification has emerged as a prominent pedagogical strategy aimed at enhancing learner engagement, motivation, and academic performance across various educational contexts. Central to gamification are core mechanics—fundamental game elements such as points, badges, leaderboards, narratives, avatars, and progress indicators—that structure learner interaction and foster engaging user experiences (Christopoulos & Mystakidis, 2023; Khaldi et al., 2023). These mechanics serve distinct motivational functions, with some promoting competition and achievement, and others supporting cooperation, exploration, or narrative

immersion (Li et al., 2024a; Krath et al., 2021). A systematic review conducted by Zainuddin *et al.* (2023) explored the use of gamification in higher education and concluded that collective game elements such as points, badges, leaderboards, levels, feedback, and challenges proved effective in eliciting students' motivation and engagement.

However, the literature also reveals critical limitations in the way gamification is often implemented. A common challenge lies in the fragmented and ad hoc application of isolated game elements without sufficient alignment to pedagogical goals, learner characteristics, or course design (Khaldi et al., 2023; Na & Han, 2023). For instance, leaderboards may foster motivation in competitive learners but may discourage others if not carefully designed to support competence and inclusion (Li et al., 2024a; Na & Han, 2023). Kode (2025) highlighted several challenges such as insufficent focus on accessiblity and equity and excessive reliance on extrinsic rewards. This lack of strategic alignment has led to concerns regarding the long-term effectiveness and scalability of gamified interventions.

To address these concerns, recent research advocates for a more systematic and theory-informed approach to gamification design—one that includes clear criteria for the selection, categorization, and evaluation of game mechanics (Christopoulos & Mystakidis, 2023; Toda et al., 2020). Such frameworks enable the mapping of mechanics to specific learning outcomes, thereby improving replicability and instructional coherence. For example, collection-based mechanics such as digital badges can reinforce goal-setting and progress, while social mechanics like collaboration tasks can promote relatedness and engagement in group learning (Li et al., 2024b; van Gaalen et al., 2021).

2 Methods

The implementation of the online gamified course took place over one academic semester, from August to December 2024. To investigate the influence of embedded game elements on students' learning experiences, a qualitative research design was employed, utilising focus group discussions conducted at the end of the course. The study focused on the BSc (Hons) Computer Science programme, with the course Software Engineering selected through purposive convenience sampling, based on the instructor's willingness to facilitate the research. Of the 30 students who completed the course, 15 voluntarily participated in the focus group sessions. These discussions were audio-recorded with participants' consent and subsequently transcribed verbatim for analysis. A thematic analysis was conducted following Braun and Clarke's (2022) methodology, which led to the identification of several key themes relating to students' perceptions, motivation, engagement, and learning outcomes in the gamified environment.

2.1 Gamifying the course

To guide the integration of gamification within an ODL environment, a modified version of the D6 gamification design framework originally developed by Werbach and Hunter (2012) was employed. The D6 model comprises six sequential stages: **Define business**

objectives, **Delineate target behaviours**, **Describe the players**, **Devise activity loops**, **Don't forget the fun**, and **Deploy appropriate tools**. Although initially conceptualised for business contexts, this framework offers a structured, iterative, and goal-oriented approach that aligns well with educational design when appropriately adapted. Its flexibility supports systematic translation of pedagogical aims into engaging learner experiences, particularly in technology-mediated learning environments (Werbach & Hunter, 2012).

In adapting the D6 methodology for the higher education context, the framework was recalibrated to align gamification strategies with course learning outcomes, desired learner behaviours, and the intrinsic and extrinsic motivational profiles of the target student cohort. Particular emphasis was placed on ensuring pedagogical coherence, such that game elements were not implemented arbitrarily but served as intentional tools for reinforcing cognitive and behavioural engagement.

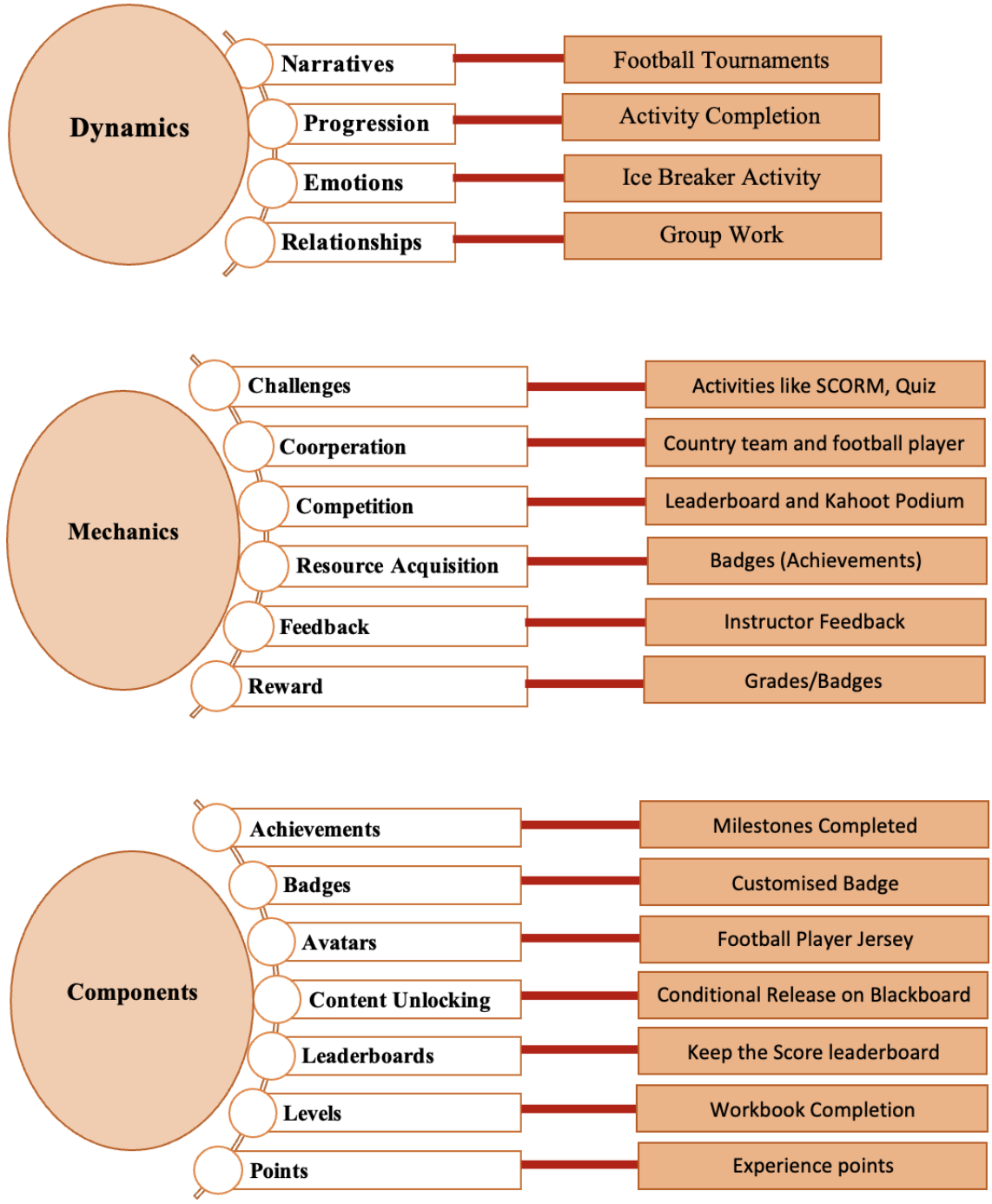
The implementation took place within the OU Learn Blackboard platform, the institutional learning management system (LMS) used by the Open University of Mauritius**.** Blackboard's modular structure and built-in support for interactive content (e.g., quizzes, badges, leaderboards, discussion forums) provided a conducive infrastructure for embedding gamified learning elements. The selected course for this gamification intervention was Software Engineering, a compulsory second-year module within the Bachelor of Science (Honours) in Computer Science programme. Delivered over a 15-week semester from August to December 2024**,** the module covered foundational topics including the software development life cycle (SDLC), software process models**,** and key practices in software testing and quality assurance.

Before gamifying the course, the Bartle player type survey (Bartle, 1996) was distributed. The findings from the Bartle Player Type questionnaire provided critical insights into the learner profiles within the BSc (Hons) Computer Science cohort. The predominance of **Explorers** (37.29%) and **Achievers** (27.12%) suggests that students are primarily driven by intrinsic motivations such as curiosity, the pursuit of knowledge, and the desire for competence and recognition. In response to these learner characteristics, the design of the gamified online course was informed by elements that align with these dominant player types.

As such, for **Explorers**, the course incorporated opportunities for discovery and independent problem-solving through interactive content and exploratory challenges. These elements aimed to stimulate curiosity and foster a sense of adventure. For **Achievers**, the course integrated mechanisms that reward performance and progress, including badges and progress tracking scoreboards. These features were intended to support goal-oriented learners by providing clear indicators of success and milestones to strive toward. Although **Socializers** and **Killers** represented smaller proportions of the learner population, the course also included collaborative features such as group activities with feedback to accommodate social interaction, as well as competitive elements such as timed quizzes or challenges to engage competitive learners. This balanced approach ensured that the gamification strategy was inclusive and responsive to a diversity of motivational profiles, while remaining focused on the needs of the majority. Hence, the activities were designed to cater for all four types of

players. Figure 1 illustrates how the game elements were mapped into the lesson design of the course.

Figure 1: Mapping of game elements in the lesson design



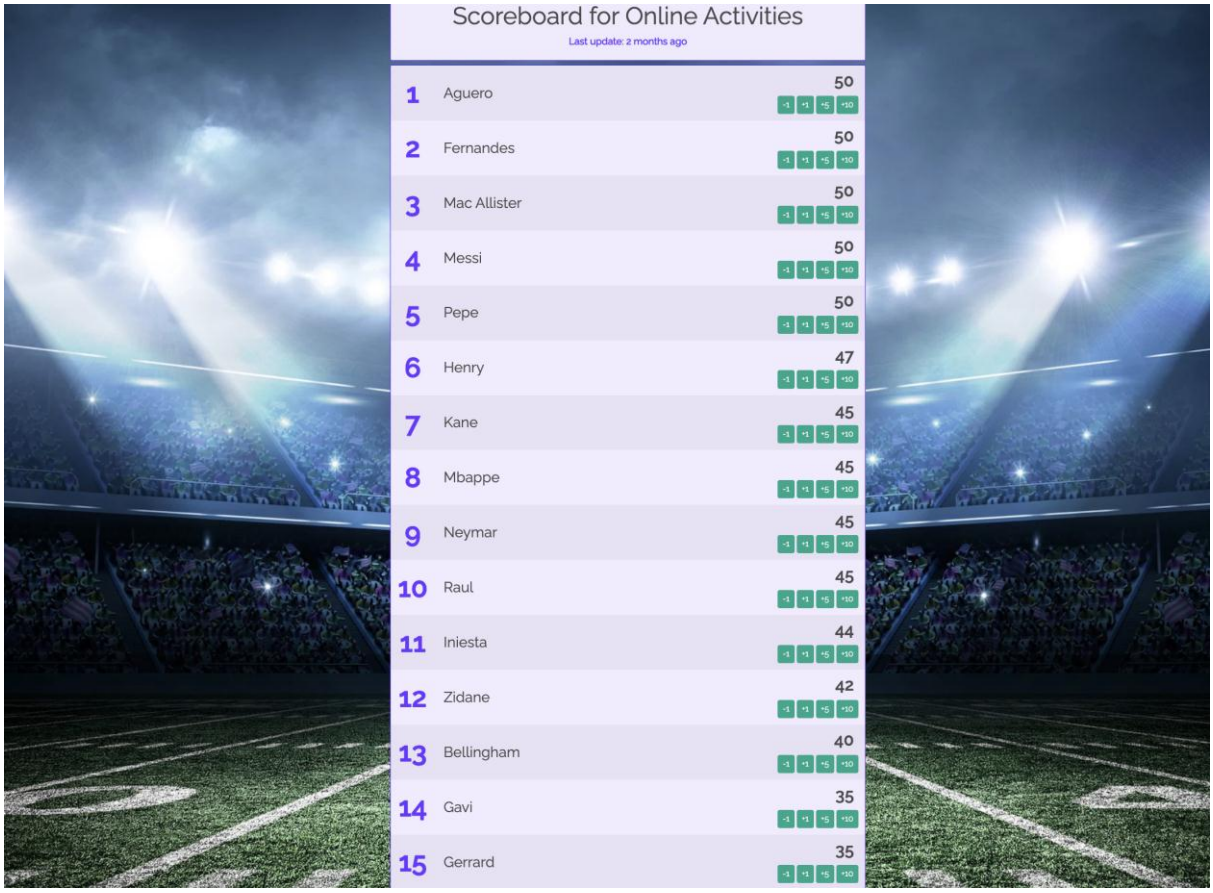
2.2 Game elements applied in the lesson design

2.2.1 Points, Badges and Leaderboard

Students were awarded experience points (XP) as a form of extrinsic motivation and reward for the successful completion of a range of learning activities, including synchronous online exercises, quizzes, and participation in discussion forums. These experience points functioned as a quantifiable metric to track student progress, engagement, and performance throughout the course. The cumulative experience points earned by each student were visually represented through a dynamic scoreboard, which ranked participants based on their total XP.

To implement the leaderboard functionality, the third-party tool *Keepthescore* was employed. This web-based application allowed for the real-time updating of scores and the creation of a visually appealing and interactive scoreboard. As illustrated in Figure 2, the leaderboard was integrated into the course to provide feedback on the student's standing relative to their classmates.

Figure 2: Scoreboard



The initial challenge within the gamified course was intentionally designed as an ungraded activity, serving as an introductory phase to allow students to familiarise themselves with the gamified learning environment, including its rules, mechanics, and expectations. This

approach aimed to reduce cognitive load and anxiety typically associated with unfamiliar learning formats, thereby promoting early engagement and a smoother transition into the gamified structure. By offering a risk-free opportunity to explore the course's features, students could build confidence and develop a clearer understanding of how to interact with the various gamified components.

As the course progressed, the complexity and cognitive demands of the challenges increased incrementally, in alignment with the principles of scaffolding and mastery learning. Each challenge was strategically designed to build upon previously acquired knowledge and skills, thereby encouraging deeper learning and sustained engagement. Students earned experience points upon the successful completion of these activities, which served both as a measure of individual progress and as a motivational incentive.

In addition to experience points, a tiered badge system was implemented to recognise and reward student achievements at different performance thresholds. Upon the completion of specific levels or milestones, learners were awarded digital badges corresponding to the total XP accumulated. A cumulative score of 30 XP qualified the student for a Bronze Badge, 40 XP for a Silver Badge, and 50 XP for a Gold Badge. As illustrated in Figure 3, these badges were customised to reflect the course's thematic elements and visually distinguished in terms of design and colour scheme to signify varying levels of accomplishment.

Figure 3: Badges example

At the end of the course, based on the experience points, there are three overall badges that were awarded namely Champion Trophy for the best team, Overall Best player (Golden Ball) and Top player of the tournament (Golden Boots).

2.2.2 Narrative, Progression, Emotions and Relationships

A narrative element was strategically embedded within the gamified course design to foster a more engaging, immersive, and contextually meaningful learning experience. The chosen narrative theme centred around the Football World Cup 2024. This theme served as the backdrop for the course, framing learning activities as components of an unfolding adventure within the world of the football tournament.

The narrative was adventure-focused, with the primary objective of capturing students' attention from the outset and sustaining their interest throughout the course. By introducing a storyline that learners could relate to and interact with, the narrative aimed to cultivate a

sense of purpose and progression. Within this narrative framework, the instructor assumed the role of "The Referee"—the central character responsible for guiding learners through the various stages of the course. This personification of the instructor not only strengthened the narrative coherence but also reinforced the instructor's presence in the online environment.

To support the narrative and facilitate student understanding of the gamified mechanics, a "documental dictionary" was developed. The documental dictionary outlined key terminology drawn from the football domain and contextualising it within the course structure. As shown in Figure 4, the documental dictionary provided clear information regarding the scoring system, the activities, and the expectations for each level of the gamified experience.

Figure 4: Documental Dictionary

2.2.3 Collaboration, Challenges and Quizzes

In this study, face-to-face and online sessions were structured around collaborative group activities designed to foster problem-solving and knowledge-sharing among students. Each group was assigned a specific task to complete and present during these sessions. To create an engaging and thematic learning environment, students were divided into six groups, each named after a country that participated in the Football World Cup 2024: Spain, Portugal, Argentina, Brazil, England, and France. These group assignments are illustrated in Figure 5.

For individual activities, students selected a football player as their avatar, which served as their representation in online activities. This avatar served as a digital representation of the learner during tasks such as synchronous online activities, quizzes, discussion forums, and interactive challenges.

Figure 5: Group teams and players

TEAM SPAIN

	Footballer	Attributes	Student name
PLAYER 1	Morata	Inspirational	
PLAYER 2	Yamal	Fast dribbler	
PLAYER 3	Raul	Jumping reach	
PLAYER 4	Gavi	Resillient	
PLAYER 5	Iniesta	Communicator	

TEAM PORTUGAL

	Footballer	Attributes	Student name
PLAYER 1	Ronaldo	Flair	
PLAYER 2	Fernandes	Long passing range ability	
PLAYER 3	Figo	Accurate shots	
PLAYER 4	Pepe	Leadership skills	
PLAYER 5	Dias	Heading ability	

TEAM ARGENTINA

	Footballer	Attributes	Student name
PLAYER 1	Lionel Messi	Versatility	
PLAYER 2	Garnacho	Fast dribbler	
PLAYER 3	Dybala	Teamwork	
PLAYER 4	Aguero	Top finishing skills	
PLAYER 5	Mac Allister	Accurate passing	

TEAM BRAZIL

	Footballer	Attributes	Student name
PLAYER 1	Neymar	Flair	
PLAYER 2	Vinicus Junior	Speed and agility	
PLAYER 3	Casemiro	Accurate passing	
PLAYER 4	Roberto Carlos	Long shots	
PLAYER 5	Ronaldinho	Ball mastery and control	

TEAM ENGLAND

	Footballer	Attributes	Student name
PLAYER 1	Bellingham	High composure	
PLAYER 2	Gerrard	Powerful shots	
PLAYER 3	Beckham	Long free kick taker	
PLAYER 4	Kane	Top finishing skills	
PLAYER 5	Foden	Finnese shots	

TEAM FRANCE

	Footballer	Attributes	Student name
PLAYER 1	Mbappe	Fast dribbler	
PLAYER 2	Henry	High stamina	
PLAYER 3	Zidane	Tactical	
PLAYER 4	Pogba	Long passing range ability	
PLAYER 5	Benzema	Top finishing skills	

During the online sessions, interactive formative assessments were integrated using the Kahoot platform, which facilitated real-time engagement through gamified quizzes. These activities were strategically placed at the end of each session to serve multiple pedagogical purposes: to reinforce key concepts introduced during the lesson, to assess students' comprehension of the material, to stimulate active participation, and to provide immediate feedback that could inform both students and instructors about learning progress.

Each Kahoot activity consisted of a variety of question formats designed to accommodate different cognitive levels and sustain learner interest. These included multiple-choice questions, true-or-false statements, and timed challenges. An illustrative example of a Kahoot activity is presented in Figure 6. To further enhance the gamified experience, a leaderboard feature—referred to as the Kahoot podium—was employed at the conclusion of each quiz. As shown in Figure 7, the podium displayed the top-performing students based on their speed and accuracy in responding to the quiz questions.

Figure 6: Kahoot quiz example

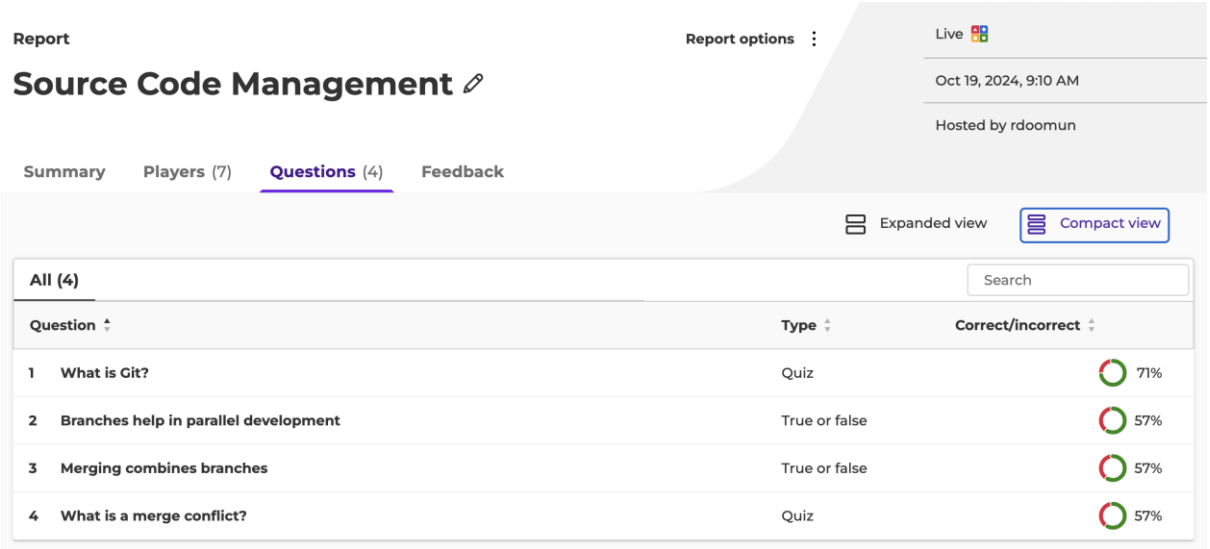
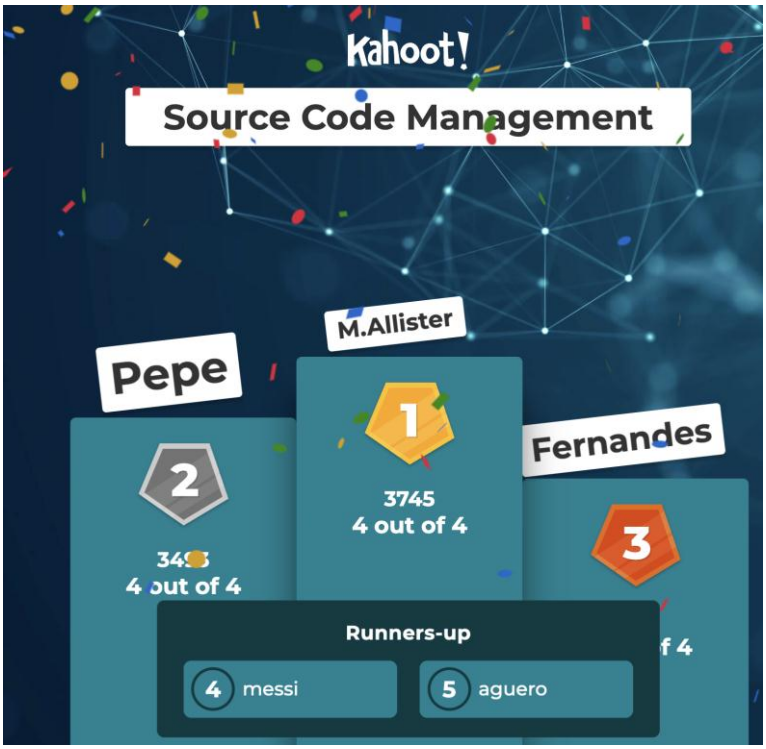


Figure 7: Kahoot podium example



To encourage student engagement and task completion, the Referee regularly sent reminder emails accompanied by interactive and adventurous missions. These missions were designed as engaging prompts to stimulate curiosity and motivate students to participate actively in their learning activities. Additionally, the missions were strategically crafted to align with the course content, ensuring that students remained immersed in the learning process while enjoying a gamified experience.

3 Summary of Findings and Discussion

The findings revealed that the integration of interactive quizzes, particularly through platforms like Kahoot, was consistently highlighted as a driver of active learning. Students reported that the quizzes promoted sustained attention and enhanced content retention. End-of-unit quizzes further enabled students to gauge their learning progress, reinforcing self-assessment and reflection. These findings align with research suggesting that interactive quizzing supports metacognitive development and fosters deeper learning (Li et al., 2024a). The leaderboard, however, elicited divergent reactions. Competitive students perceived the leaderboard as a motivational catalyst, whereas non-competitive learners expressed feelings of demotivation or disengagement. These findings support recent scholarship urging the contextualised implementation of game mechanics based on learner profiles (Na & Han, 2023; Klock et al., 2023). The use of badges was perceived positively by participants, not merely as extrinsic motivators but as meaningful indicators of personal achievement and skill

mastery. Badges provided a visible and motivational symbol of progress, reinforcing the 'feel-good' effect of accomplishment. These findings resonate with literature highlighting the dual role of badges as motivational tools and reflective instruments in supporting learner autonomy and self-regulation (Li et al., 2024b; Khaldi et al., 2023). The choice of a sports-themed narrative appealed to a subset of students, others found such themes irrelevant or uninspiring. This heterogeneity underscores the need for adaptable and student-centered narratives that resonate with learners' interests, values, and motivational profiles. Consistent with Krath et al. (2021), the findings affirm the importance of narrative congruence in enhancing emotional engagement and meaning-making within gamified learning experiences. Students responded favourably to gamified tasks with varying degrees of complexity. However, uniform difficulty levels posed risks of disengagement—either due to boredom or overwhelm. This underscores the necessity of incorporating dynamic difficulty adjustment (DDA) and scaffolding techniques to tailor learning experiences to individual competence levels. By doing so, students are provided with achievable challenges that promote flow states and sustained motivation (Guo et al., 2023; D'Mello et al., 2023). Collaboration emerged as a pivotal mechanism for enhancing student engagement and fostering inclusivity. Gamified group tasks enabled learners from diverse backgrounds to collectively problem-solve, thereby reinforcing teamwork and peer-to-peer support. These findings align with Martin and Bolliger (2018), who argue for cooperative over competitive structures in digital learning environments to cultivate equity, cohesion, and a sense of belonging.

4 Limitations

This study offers meaningful insights into how game elements can be integrated into an open and distance learning (ODL) course. However, there are a few limitations to consider. Firstly, the participant sample was drawn from a single course within a specific undergraduate programme, thereby potentially limiting the generalisability of the findings to other disciplines, institutions, or learning contexts. Nevertheless, the findings may hold transferability to comparable educational settings, depending on institutional characteristics and pedagogical alignment. Secondly, the study was conducted over the duration of a single academic semester. Future studies over extended periods and across diverse contexts could help to provide a more comprehensive understanding of the sustained impact and broader applicability of gamification in open and distance learning environments.

5 Conclusion

This study examined the integration of gamification into an online course within an open and distance learning (ODL) context, revealing both its pedagogical potential and design considerations. Findings indicate that when carefully aligned with instructional goals, gamified elements—such as interactive quizzes, badges, adaptive challenges, and narrative themes—can significantly enhance student engagement, motivation, and self-regulated learning. However, the effectiveness of these elements varies based on individual learner profiles, preferences, and the broader learning environment.

Crucially, the study underscores the need for a structured, student-centred approach to gamification design—one that accommodates diverse motivational drivers, fosters inclusivity, and integrates formative assessment and feedback loops. Allowing flexibility in engagement with competitive elements like leaderboards and promoting collaboration over rivalry were found to be essential for cultivating a supportive and equitable online learning experience.

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