

Gamification-Driven Approaches to Strengthening Engagement in Hybrid-Flexible Learning

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Abstract— Information technology for learning during the Covid-19 pandemic, such as learning management systems (LMS) remained essential even after face-to-face sessions were resumed in schools and campuses. Its existence has even become the new normal because it complements the more controlled and well-planned method of providing learning materials, collecting assignments, and assigning grades. Every semester, students can access and analyze their course records through the LMS, both in class and online. The hybrid-flexible learning approach is comfortable and suitable for the post-Covid-19 pandemic situation. However, due to differences in learning standards and motivation prior to and following the Covid-19 pandemic, lecturers should create strategies to promote their students' learning motivation in interesting ways, such as through learning gamification. This research uses Moodle LMS to investigate the implementation of gamification strategies for hybrid-flexible learning, as well as the results of Forum Group Discussions with the international class students.

Keywords— gamification, hybrid-flexible, learning management system, moodle

I. INTRODUCTION

The concept of gamification of learning has been around for a long time, even before information technology. If gamification was formerly applied via traditional means such as additional points, candies, souvenirs, or specific titles with good meaning [1], now everything has become unlimited, more documented, and non-physical or virtual due to the existence of information technology [2].

This is the difference between game-based learning and gamification [3]. The user's activity in game-based learning is to play in order to meet predetermined learning objectives. In contrast, gamification involves having users accomplish educational tasks while adding game elements such as extra credit, badges, unique titles, or rankings when they succeed.

Game-based learning aims to ensure that users can easily capture learning content, because the learning content is embedded in the game [4], [5]. On the other hand, gamification aims to improve excitement and motivation during the learning process [6]. Users in gamification are still learning, but they receive incentives when the process goes well.

The fundamental distinction is that game-based learning employs game software, whereas gamification in learning employs learning management software [7]. LMS users do not need to have game-playing skills or to learn the powers of each character. All activities are centered on the learning process [8].

Despite their differences, game-based learning and gamification of learning share features such as scenarios (gameplay), instructions (rules), appreciation (awards), elements of competitiveness (ranking), and enjoyment (fun) as the game's foundation [9].

Based on these differences, gamification strategies can be employed in the classroom learning process, especially in the LMS for the Hybrid-Flexible (HyFlex) learning approach [10], [11], which blends face-to-face classroom learning and online learning in a flexible manner. Students can choose to attend classes in person or online. However, the ability to move between the two modes as

necessary or preferred. This strategy may be appropriate following the Covid-19 epidemic, as LMS is still used in face-to-face classes [12], [13].

However, strategies are needed to ensure that gamification not only works well at the beginning but does not get monotonous after a few meetings. It is essential to incorporate variations in rewards, levels, special titles, badges, opportunities for reward exchange, and a storyline that connects tasks from one session to the next. Furthermore, combining gamification plugins into the LMS is necessary to ensure that gamification in HyFlex education remains interesting and effective over time.

II. GAMIFICATION ELEMENTS

Gamification elements are developed from game components, despite their use in non-game contexts. These elements, like those found in games, such as gameplay, challenges, progress tracking, awards, levels, badges, and leaderboards, may encourage sustained participation and drive students to achieve their objectives.

A. GAMEPLAY

Gameplay refers to the interactions and experiences that players have with the game environment [14]. In the context of education, gameplay involves designing engaging and interactive activities that mimic game-like scenarios. These activities can include simulations, role-playing, and problem-solving tasks that make learning more immersive and enjoyable. Effective gameplay design ensures that students remain actively engaged and motivated throughout the learning process.

B. CHALLENGES

Challenges are tasks or activities that demand both effort and expertise to complete [15]. Challenges in gamified learning environments are used to encourage critical thinking and problem-solving skills. These can include downloading course materials, taking attendance, participating in forums, submitting assignments, and navigating

complex scenarios. The key to successful challenges lies in balancing difficulty, ensuring that tasks are neither too easy nor too difficult, thereby keeping students in a state of flow where they remain fully absorbed and focused.

C. PROGRESS

Progress tracking allows students to see how far they have come and what they have achieved [16], [17]. This can be accomplished via visual indicators such as progress bars, checklists, or milestone markers. Educators can help students stay motivated and feel accomplished by updating them on their progress on a frequent basis. Progress indicators can also help students create goals and manage their learning journey more efficiently.

D. AWARDS

Awards are incentives given to recognize and reward students' achievements and efforts [18]. These can include virtual trophies, certificates, or tangible prizes. Awards serve as extrinsic motivators, encouraging students to complete tasks and strive for excellence. When used correctly, prizes can enhance self-esteem and promote positive behaviors, resulting in a more motivated and engaged learning environment.

E. LEVELS

Levels represent stages of progression within the gamified system [19]. As students accumulate points or complete challenges, they advance to higher levels. Each level can unlock new content, privileges, or more difficult tasks, providing a clear pathway for advancement. Levels help to create a sense of achievement and progression, encouraging students to continue their efforts and aim for higher accomplishments.

F. BADGES

Badges are digital representations of achievements that students earn for completing specific tasks or reaching certain milestones [20]. They serve as symbols of success and recognition, often displayed on

student profiles or portfolios. Badges can represent a wide range of accomplishments, from mastering a skill to exhibiting exemplary behavior. They help to make learning goals tangible and provide a visual representation of a student's progress and capabilities.

G. LEADERBOARDS

Leaderboards display student rankings based on performance, providing a competitive environment that can boost motivation and engagement [21], [22]. Leaderboards motivate students to work hard for higher rankings by highlighting the top performers. However, it is critical to integrate leaderboards in a way that encourages healthy competition and promotes a collaborative learning environment. They should be intended to honor individual accomplishments while encouraging group success.

Incorporating these elements of gamification into educational settings can significantly enhance the learning experience. Educators can use gameplay, challenges, progress monitoring, awards, levels, badges, and leaderboards to create a dynamic and engaging environment that promotes active engagement and continual growth. Gamification, when properly implemented, has the potential to make traditional learning processes more engaging, effective, and pleasurable for students.

III. GAMIFICATION STRATEGIES

To ensure that learning gamification may begin and continue to be successful, the following six strategies must be established. Learning gamification frequently focuses solely on prizes or levels, despite the fact that all of these concepts must be incorporated in order for learning gamification to be effective. These strategies foster a dynamic and enjoyable learning environment, encouraging students to actively participate and achieve learning goals.

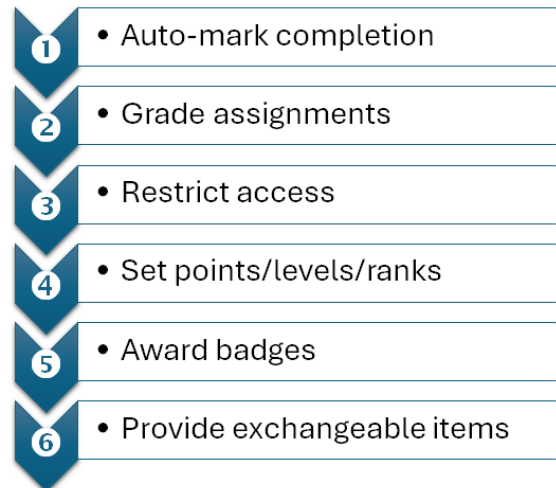


Figure 1. Six Learning Gamification Strategies

A. AUTO-MARK COMPLETION

The first strategy in learning gamification is to keep track of and record each task that is finished by setting the Activity Completion. Educators must automatically mark activities upon completion to ensure accurate monitoring of work progress. This involves configuring the LMS to track each student's advancement through various tasks and assignments, providing both educators and students with real-time insights into learning progress [23]. By enabling completion tracking, educators can identify areas where students may be struggling and provide timely interventions, while students can visually see their accomplishments and areas needing improvement.

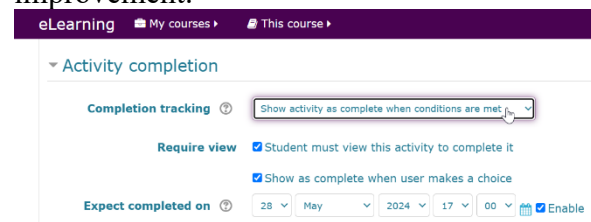


Figure 2. Activity Completion

This transparency not only keeps students accountable but also fosters a sense of achievement as they navigate through the gamified learning environment. Accurate completion tracking is thus a foundational element in implementing effective gamification, ensuring that the system's motivational and educational benefits are fully realized.

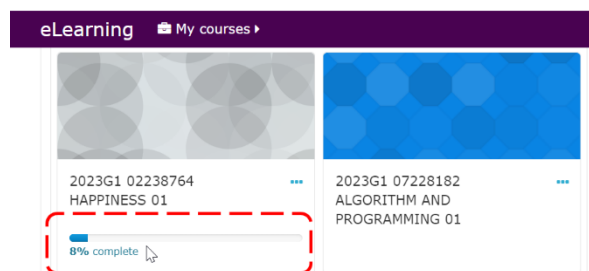


Figure 3. Progress: Percentage of Completion

B. GRADES LEARNING TASKS

The second strategy is to assign a grade for each and every learning task. Grading each activity in a gamified learning environment involves assigning specific point values or grades to various tasks and assignments [24]. This approach provides clear and quantifiable goals for students, helping them understand the relative importance and weight of each activity. By breaking down the overall course grade into smaller, manageable components, students can focus on incremental achievements. This method not only makes the assessment process transparent but also motivates students to consistently engage with the coursework, knowing that each activity contributes to their final grade.

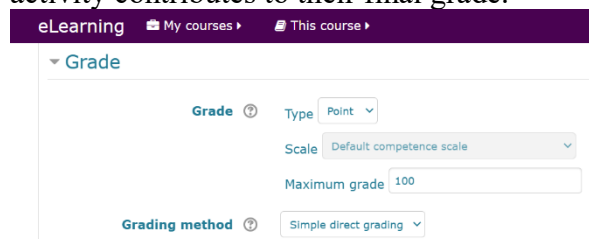


Figure 4. Grade

C. REQUIRED ACTIVITIES

The third strategy is to establish requirements between activities in order for them to be sustainable. Setting the required activities in the restrict access settings ensures that students complete prerequisite tasks before advancing to more complex ones [23], [25]. This strategy is essential in maintaining a structured learning progression and ensuring foundational knowledge is acquired before moving forward. Educators can guide students through a well-organized learning route by requiring them to complete a quiz or get a specified score before proceeding to the next section of content. This strategy also prevents students from skipping essential

materials, thus promoting a deeper understanding and mastery of the subject matter.

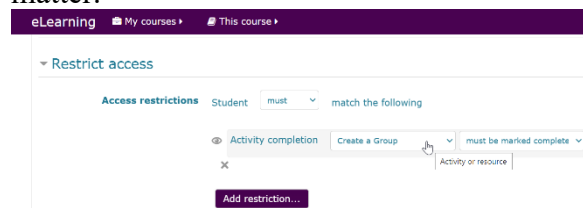


Figure 5. Restrict Access based on activity completion

D. SET POINTS, LEVEL AND RANKS

The fourth strategy involves the use of points, levels, and ranks by using Level-Up! plugin. These elements are key components of gamification strategies [8]. Points are awarded for completing tasks, participating in discussions, and achieving milestones. Accumulating points allows students to level up, unlocking new content, privileges, or more challenging activities. Ranks can be introduced to create a competitive edge, where students see their standing relative to their peers. This tiered system of points, levels, and ranks provides continuous feedback and incentives for students to progress, fostering a sense of achievement and encouraging sustained engagement.

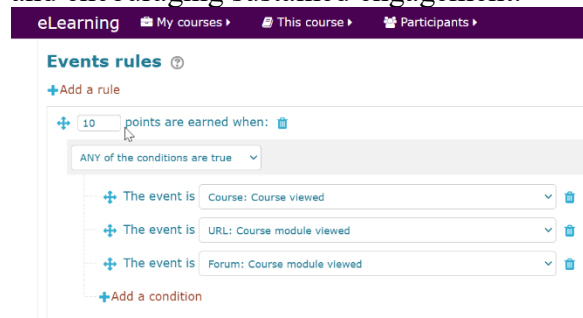


Figure 6. Level-Up! Point Setting

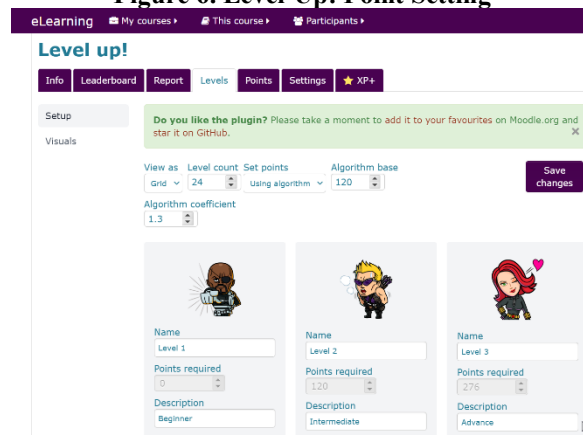


Figure 7. Level-Up! Level Setting

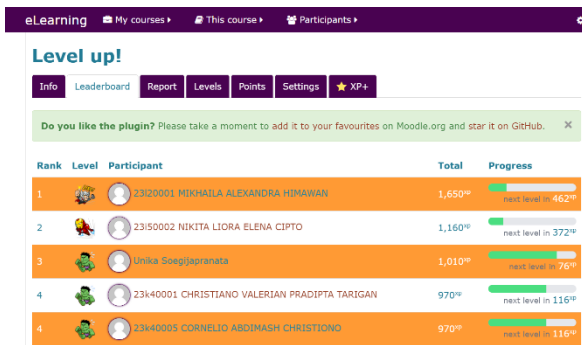


Figure 8. Level-Up! Ranks

E. AWARD BADGES

The fifth strategy is the use of badges as a reward for each activity that has been successfully completed [26]. Badges are awarded for successfully completing activities as a form of recognition and motivation. Badges can represent a variety of accomplishments, including mastery of a skill, active participation, and good behavior. These digital tokens of achievement can be posted on student profiles to provide a visual depiction of their development and talents. Badges not only recognize individual achievements, but they also motivate students to participate in a variety of activities, resulting in a well-rounded educational experience.

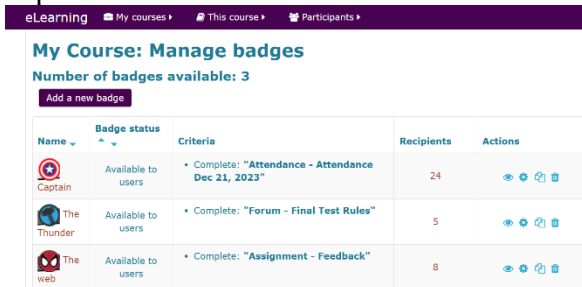


Figure 9. Manage Badges

F. EXCHANGEABLE ITEMS

The sixth strategy emphasizes item usage and the ability to be traded. The concept of items and exchanges can be implemented using the Stash plug-in [27], which introduces a layer of interactivity and choice in the learning process. Students can earn virtual items through participation and achievements, which can then be exchanged for rewards, privileges, or additional resources. This approach allows for personalization and strategy, as students

decide how to utilize their earned items best. Stash adds an element of game-like economy, where students can plan and manage their resources, fostering a sense of ownership and engagement with the learning material.

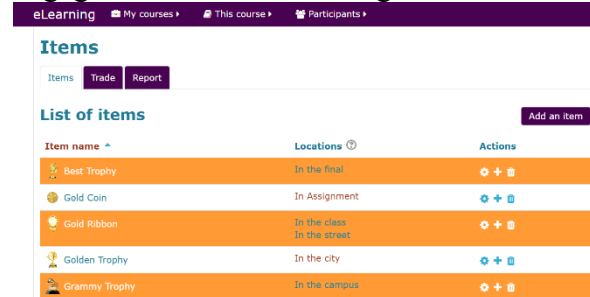


Figure 10. Items and Locations

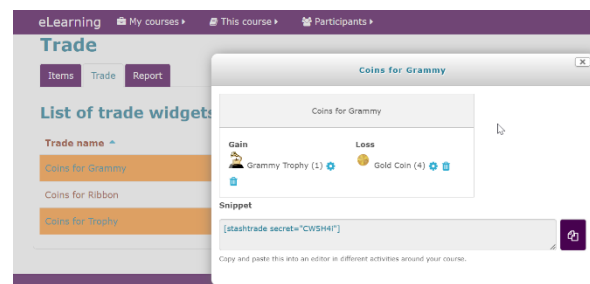


Figure 11. Trade Items Settings

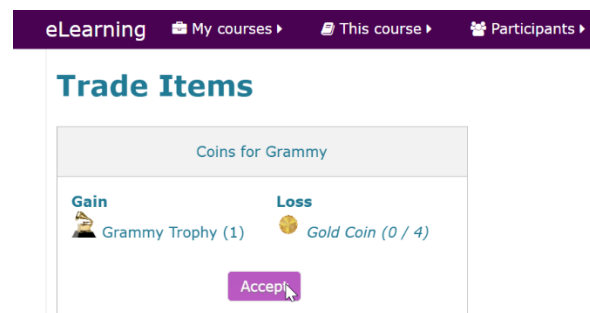


Figure 12. Execution of item exchange

These strategies make learning gamification more interactive, rewarding, and engaging, promoting active participation and sustained motivation among students. Gamification, when carefully developed and implemented in an interesting story, has the potential to convert traditional educational environments into dynamic and enjoyable learning experiences, leading to better student outcomes and deeper engagement with the learning topic.

IV. IMPLEMENTATION

The implementation of gamification, utilizing the six strategies discussed earlier, was carried out in two groups: an international

class that had never experienced gamified learning before and a regular class that had been using gamified learning for several semesters. Both groups were provided with an explanation of the scenarios, rules of the game, or gameplay within the learning process. The basic rule established was that each completed activity would impact the overall progress percentage of a course. For instance, if there are five activities, each activity would contribute 20% to the course completion.

Furthermore, each activity could unlock access to other activities. For example, a user who has downloaded the learning material for a particular session would then be able to participate in a quiz. Once the quiz is completed and graded, the learning materials for the next meeting will be made available for download. This pattern continues until the final meeting. Additionally, each activity is assigned a value that influences the user's level and special designation at each level. Each level features separate characteristics and titles, encouraging users to continuously improve their scores and levels. The progression between levels can be managed using specific algorithms, and this functionality is supported by the Level Up! plugin in Moodle. To prevent repetitive activities, Level Up! must be configured to limit the maximum number of activities within a specific time frame and the number of similar activities occurring simultaneously.

For certain activities considered important and special, such as active participation in discussions, badges representing active communication can be awarded. Similarly, when students are eligible to take exams, a bravery badge can be given to enhance motivation and confidence. For activities involving feedback and suggestions, which typically see lower participation, an honesty badge can be introduced to encourage greater involvement. The management of badges is facilitated by Moodle's basic features.

Finally, surprises in the form of game items, which are virtually unlimited, can be added to specific activities. This not only helps to maintain enthusiasm and stamina in accessing

the course but also motivates students to revisit learning activities that contain items within the course. Once items are collected, students can exchange them for more appealing and luxurious items. This approach ensures sustained engagement and continuous interaction with the learning materials. This need can be met using the Stash plugin in Moodle.

V. FEEDBACK

Feedback from the deployment of learning gamification has been divided into two groups: first-time users in the international class and experienced users in the regular class. The feedback from first-time users emphasized their initial excitement and increased engagement with the gamified learning activities. In contrast, experienced users demonstrated sustained motivation and deeper integration of gamification elements into their learning routines, reflecting more consistent and effective engagement over time.

A. FIRST-TIME USERS' GROUP

Feedback from several students in the international class who encountered gamification for the first time demonstrates that the implementation of gamification in educational contexts has mostly positive effects on engagement, motivation, and overall enjoyment. Many students, like Nikita and Christiano, express that gamified elements such as points, badges, and competitive environments make learning more fun and stimulating. They appreciate the competitive and interactive aspects, which not only make the learning process enjoyable but also foster a sense of achievement and motivation to excel. This sentiment is echoed by others like Cornelio and Mikhaila, who emphasize that gamification makes classes more engaging and can transform a mundane educational experience into an exciting one.

However, the responses also highlight that the effectiveness of gamification can vary among individuals. While some, like Aubrey and Karen, acknowledge the motivational benefits and the drive towards completion,

they also point out potential downsides, such as the risk of tasks becoming repetitive, or the temporary nature of the happiness derived from gamified elements. Kezia and Luigi emphasize the importance of incorporating a variety of game elements to maintain interest and engagement, suggesting that personalization and diverse challenges can enhance the effectiveness of gamification strategies.

B. EXPERIENCED USERS' GROUP

For students in the regular class who get used to gamified learning, a notable observation is that the most active participants tend to be gamers or those who prefer to play games. This shift in engagement, while not a conventional measure of academic achievement, serves as a significant indicator of the success of gamification. The introduction of game-like elements into the learning environment has evidently resonated with these students, transforming their previously passive attitudes into highly active participation.

Moreover, students who were previously inactive have shown remarkable changes, becoming some of the most engaged individuals in the class. This increased activity is a positive result of gamification, demonstrating its ability to energize and motivate students. However, while more involvement is beneficial, it is also critical to ensure that these students not only participate but also understand and master the course material. Continuous encouragement and planned instructional support are necessary to balance active participation with a deep understanding of the subject matter.

V. CONCLUSION

The integration of gamification strategies into HyFlex learning in both groups has been effective in enhancing student engagement, motivation, and academic performance. Points, levels, and badges create a dynamic and interactive learning environment, continuously motivating students to participate and excel. Structured progression through restricted access activities ensures

that students build a solid understanding of fundamental concepts before progressing to more advanced content, leading to better overall comprehension and retention. Additionally, the incorporation of items and exchanges adds personalization and strategic engagement, making learning more enjoyable and rewarding.

However, even though learning gamification is generally well-received and has proven to boost engagement and satisfaction in educational contexts, its success depends on thoughtful implementation and the inclusion of diverse, dynamic elements to cater to different preferences and learning styles. To ensure that gamified activities match educational goals, it is critical to combine enjoyment and competition with careful evaluation and accurate measurement of the students' understanding of the course material.

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