Gamification of Virtual Language Learning: A Case Study with Thai Undergraduate Students

Veronica Aguilos, Colin Gallagher, and Kevin Fuchs

***Abstract*—Gamification of learning in higher education has been used as an educational tool to motivate and engage students. Despite its positive impacts demonstrated in the existing body of knowledge, some adversaries are concerned with the decline of learners' intrinsic motivation and becoming independent of extrinsic rewards. This research aims to design a user-centered and meaningful gamification framework for students who are explicitly learning English as a second language to resolve these adversaries. The empirical data for this study was collected through a focus group discussion. It was conducted to obtain students' learning factors that would contribute to user-centered learning. Based on the focus group outcome, a gamification course using a learning management system with embedded gamification features will be best suited for these specific students. The affordances used in this study are rewards, levels, badges, and points. The practical implications of this study are to gain a more in-depth understanding of the students' motivations in language learning, which is crucial in creating a meaningful user-centered game design.**

***Index Terms*—Language learning, gamification, hospitality education, student engagement.**

I. Introduction

Gamification is defined as applying game design principles in non-gaming contexts [1], [2]. It aims to stimulate human motivation and performance [3] and the most common application of this concept is in formal education [4], [5]. The learning outcomes of gamification are mostly positive in terms of increased motivation and engagement; this is according to the systematic literature review of empirical studies on gamification efficacy [4]. However, despite the positive results, there are a few adverse outcomes relating to gamification. A gamified product or service with a rewards feature may harm intrinsic motivation, not enhance it [6]. In addition, it can reduce the internal motivation that the user has to take part in the activity, as it replaces internal motivation with external motivation [7].

The success of gamification is defined as applying game design principles in non-gaming contexts [1], [2]. It aims to stimulate human motivation and performance [3] and the most common application of this concept is in formal education [4], [5]. The learning outcomes of gamification are mostly positive in terms of increased motivation and engagement; this is according to the systematic literature review of empirical studies on gamification efficacy [4]. However, despite the positive results, there are a few adverse outcomes relating to gamification. A gamified product or service with a rewards feature may harm intrinsic motivation, not enhance it [6]. In addition, it can reduce the internal motivation that the user has to take part in the activity, as it replaces internal motivation with external motivation [7]. Gamifications' success greatly relies on the context in which it is being implemented and its users [4].

According to Chen *et al.* [8], there are only a few qualitative gamification studies, indicating that current studies in gamification give more attention to data usage and interfering with user behavior, rather than paying enough attention to the actual players' experiences. Thus, qualitative data was collected through a focus group discussion to understand students' learning factors and perceptions in a gamified learning environment. This study aims to design a language learning course based on the students' learning factors to make it user-centric, then choose game elements that would intrinsically motivate students in learning a second language. Moreover, it is the objective of the study to design meaningful conceptual learning gamification to encourage students to learn a second language.

II. Literature Review

A. Gamification of Learning

Gamification is the application of game design principles in non-gaming contexts [1], [2]. It aims to foster human motivation and performance regarding a given activity [3]. According to Hamari *et al*. [4], gamification provides positive effects towards achieving the course learning outcomes more effectively. However, the results are much dependent on the implementation of gamification and the users using it. Gamification of learning was the most common context for implementations [4]. It is not surprising that gamification is applied within education and learning since retaining engagement and motivation among students is a constant and continual challenge. Based on Subhash and Cudney's [9] study, articles related to gamification in education from a systematic search of databases, gamification learning outcomes are mostly positive, for example, in terms of increased motivation and engagement in the learning tasks and enjoyment of such tasks.

Despite the positive learning outcomes, their studies suggested that there are some pitfalls in gamification. Based on research conducted by Dom ńguez *et al.* [10], despite the students' better scores in practical assignments and an overall

Manuscript received March 11, 2022; revised April 10, 2022. The Faculty of Hospitality and Tourism, Prince of Songkla University, supported this research project under the Research Grant FHT6300001.

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doi: 10.18178/ijiet.2022.12.10.1726

score, the same set of students performed poorly on written assignments and participated less in activities. The same study also suggested that the cognitive impact of gamification on students was not very significant. A gamified product or service with a rewards feature may harm intrinsic motivation, not enhance it [6].

B. Game Elements or Affordances Applied in Learning

Game elements or affordances are the game design principles that are applied in the non-gaming context. According to the systematic review on gamification of learning [9], points, badges, and leaderboards are the most frequently used gamification elements. These elements can be seen in different forms; for example, points can be in the form of a bonus, something earned, or experience points, while badges can be in the form of trophies and rewards. According to the same systematic review, the most significant benefits of gamification in higher education is improved student attitude, engagement, and performance. Engagement, motivation, and enjoyment among students are widely cited as benefits of gamification of learning. Tables A1-A2 (in the Appendix) show an overview of game elements and benefits according to some recent studies on gamification.

According to Hamari *et al.* [4], people interact with gamified systems differently for many different reasons, resulting in variations in the experiences created by these affordances. For example, a study conducted by Jia *et al*. [11] claimed that individual personalities have different perceived preferences on motivational affordances: the results showed that extroverts tended to be motivated by points, levels, and leaderboards, while people with high levels of imagination and openness were less likely to be motivated by avatars. Research undertaken by Xu *et al*. [12] observed that bashful or distracted students were most likely to be engaged in a gamified class compared to active students. In short, a similar outcome is not guaranteed for all students participating in a gamified learning environment.

Based on these studies, gamification of learning has positive outcomes such as increased motivation, engagement, and enjoyment [4], [9]. However, some gamification elements can decrease intrinsic motivation [6], [7], [13] which is the only consistent predictor of academic achievement across different school contexts and cultures [14]. With the lack of motivation and desire to reach their overall potential to learn a second language, learners show minimal effort in developing second language skills. These drawbacks favorably impact second language learning, wherein we want students to learn, practice, and retain second language skills individually.

According to a study conducted by Geelan et al. [15], the learning style of individual students also plays a positive role in maintaining continued engagement. To apply gamification in language learning, we focus on the appropriate game elements and affordances according to our target players. We cannot simply use all these elements because previous studies claim effective gamification have different types of users with different characteristics. The effectiveness of gamification varies depending on the players' characteristics [11], [12].

C. Gamification in Learning Management Systems (Moodle)

Many institutions are using LMS to support the quality of education. It is not just a communication channel between teachers and students, but can also be used as a gamification tool. Moodle, for example, is the top open-source tool for Learning Management Systems, according to Pappas [16]. Moodle has been used in a few research studies to implement game elements in the gamification of learning [17], [18]. Game elements such as points, badges, and leaderboards were the most commonly used elements [17].

III. Methodology

This research project was designed to identify and understand meaningful and effective gamification techniques. The first step is to understand students' learning factors to gain insight into what motivates them and to understand their intrinsic motivators. As suggested in the case study by Geelan *et al*. [15], improving the understanding of learning preferences could maximize the educational benefits of the learning experience through gamification. From a gaming perspective, this process is a way to understand the students or the players. The gamified language learning design, or the game, will depend on the players' learning factors. In this way, the game will be more meaningful to the players.

A. Sample and Setting

A focus group is a small, structured group with selected participants usually led by a moderator. It aims to gather multiple views and attitudes and often requires complex negotiation of the ongoing interaction process among participants [19]. In this study, the focus group will be able to understand students' learning factors and motivation in learning English as a second language. It is a way to gather first-hand information from the participants or potential players. The data was collected from 27 undergraduate students that were enrolled as full-time degree students at the time of sampling. The participants studied for a business major at a large government-run university in southern Thailand. Moreover, the participating students were enrolled in a compulsory ESL course that is part of their degree curriculum.

B. Procedure and Data Collection

The empirical data for this study was collected through one focus group discussion. The discussion was conducted during the students' regular classroom time and lasted approximately 45 minutes. The focus group discussion was guided by open-ended semi-structured questions that aim to investigate the students' experiences in ESL learning. During the focus group, a moderator facilitated the discussion and encouraged involvement from all the participants. Furthermore, a research assistant was present to take notes and record audio. At the end of the discussion, a questionnaire was distributed to gather socio-demographic information about the participants.

C. Data Analysis

After the data collection, the recordings were transcribed

before undertaking the analysis. The core findings for each question were noted and reviewed. The main recurring ideas were critically analyzed to identify themes as presented in the following sections of this paper. The second step was to gather and understand the game design elements or affordances that can be implemented in designing gamification in language learning. This process aimed to classify which affordances would be motivators for our players. During this process, the focus group results were analyzed and some students' learning factors were matched to the affordances. This step was to eliminate unnecessary affordances and choose appropriate affordances that could be used motivate the students.

After gathering information on the players' learning factors and classifying the appropriate affordances, the formulation of the game took place and all affordances listed as motivators were applied. For this research, a learning management system (LMS), specifically Moodle, created a gamified language learning activity suitable for the players. Moodle offers multiple features convenient to apply gamification in the learning experience. Frequently used affordances such as points, badges, and leaderboards [9] can be applied on Moodle.

IV. Results

Students from this faculty learn the English language mainly from the subject and course offerings from their secondary schools and the university. They mentioned a few hours of self-study and a limited number enrolled in private language schools. Hollywood films, English TV shows, and TED talks were mentioned as their secondary sources of learning English. A few students said that some language learning mobile applications and websites were also used in learning English. Students have been studying the English language for 16-20 years. When they were asked what motivated them to study English, 70% responded by saying to graduate and please their parents. Students from this university are not eligible to graduate if their TOEIC score is below 630 points. 25% of students will settle on getting 630 points to graduate, while the remainder aimed to obtain a higher score higher than 630.

When it comes to language learning methods and techniques, the students mentioned that classroom composition and size could influence their motivation. Students prefer to be in a group with the same level of English skills as their own. A group with varied levels causes embarrassment to some students, either feeling that others look at them as superior or fear of making mistakes. Group and class sizes also matters; students prefer a relatively smaller group, around 5-20 students per class when it comes to language learning. They prefer to obtain more constructive and hands-on feedback from their teachers. Students mentioned that negative feedback is only acceptable if it is given from someone with authority and expertise and is delivered in a non-embarrassing way.

Students had consensus answers regarding recognizing their English assessment accomplishments or group competition. While being recognized can boost motivation, they mentioned that announcing TOEIC accomplishments on social media, such as Facebook, is not encouraging but rather embarrassing. In addition, individual competitive behavior, such as getting a reward for getting the highest mark, was not perceived as an encouraging or motivating factor. 81% of the students say that they do not want to compete with others and 96% say they would rather compete with their old selves, aiming for self-improvement and checking their learning progress.

When it came to the effectiveness of teaching methods and classroom tools, interactive media or whiteboards such as SMART Technologies were the most effective, as well as real-life simulation or role-playing. 78% mentioned that interactive classrooms with supplementary mobile applications or software were effective means by which to study and, at the same time, helped them engage with, attend, and participate in class. 93% said role-playing or real-life simulations allowed them to practice their English skills. They believed that practical application was better than having academic tasks such as grammar lessons, seat works, and quizzes. Other means such as mobile learning apps, quizzes on LMS (56%), and video tutorials (70%) were also considered useful learning tools. 93% of students mentioned fun classroom games like Kahoot!, a game-based learning platform; they said that it is engaging and exciting while they are playing. Still, it did not have a long-term effect on learning.

TABLE I: Affordances That can Be a Motivator or not a Motivator for the Players

Affordances	Motivator	Not a Motivator
Earning Points	Points that can be converted to grades	Points that cannot be converted to anything
Badges/Medals	Something to show off to their parents	If it is announced in any form of social media
Levels	For self-improvement	Public announcement or leaderboard
Rewards	Money and grades (to graduate)	-
Competition	Competition with themselves	Competition against others

The second step is to gather and understand the game design elements or affordances that can be implemented in designing gamification in learning and education. Game elements are used to increase the learners' motivation. Table I shows the summary of the affordances that can be a motivator or a demotivator for the players.

Referring to the information gathered from the focus group, the following game design elements will be used in this research: rewards, levels, badges, and points. Competition with oneself can be incorporated with the level and badge affordances. These game design elements were indirectly included in the focus group discussion and were concluded as motivators for our respondents, Thai undergraduate hospitality management students.

V. Discussion

Before applying the affordances in a language learning activity in Moodle, adequate planning and development should be taken into consideration. The badge is the most common game element used in Moodle [17]. To incorporate points and levels, a plugin is needed to showcase these

affordances. The Level Up! plugin for Moodle can present students with their current levels based on points they earned, praise their progress once they move on to the next level and unlock content that requires a certain level to access it, and other customizations to make it more engaging and exciting [20].

The Level up! plugin will play a big part in designing a gamified Moodle course. One of its features is to automatically attribute points to students for their actions. It can also report the students' levels to the students and the teacher. As part of the planning and development, the teacher will set certain points for specific actions in the system and achieve the next levels.

Activities set up in Moodle can be in the form of a lesson, forum, or quiz. Teachers can allocate points for participation in lessons, answering and contributing to forums, and achieving specific scores in quizzes. Points can also be rewarded for simple tasks such as reading in advance, asking questions, or referencing an external resource. This way, students can be more engaged in lessons and more motivated to learn, knowing their simple actions can be rewarded. Using points as a game element can increase the engagement and motivation of students in comparison to traditional methods [2], [12], [17], [21]-[25].

For the levels, the teacher can set up the first few levels to be easily achieved; thus, students will be engaged and motivated upon seeing their levels improve. The points needed for leveling up should gradually increase to challenge students to perform better and encourage them to undertake more tasks to earn points. Previous studies on gamification and game-based learning mentioned that this game element could motivate students [2], improve students' performance [26], and increase engagement [21], [27].

Badges should be meaningful to players, something that is not earned too quickly [28]. To do so, badges should be designed to be awarded after the accomplishment of certain cumulative tasks, such as completing a lesson and receiving a high score for the lessons quiz, or it can be about perseverance by taking practice tests or lessons every day for 30 consecutive days or more. The awarding of badges can be set up automatically by the system by establishing certain criteria to be accomplished within a given timeframe. It can also be granted by the teacher if necessary. Badges can also have an equivalent point to be earned at the same time as the badge is acquired so that students can level up as well. Badges can motivate, engage, and improve students' attitudes and performances in learning [17], [22], [24]-[26], [29]-[31].

Rewards can boost engagement [21], improve learning outcomes [32], and increase motivation, confidence, and academic effort [31]. When it comes to rewards, teachers can reward students with badges for particular excellence achieved throughout the course. This can be in the form of badges or points. Other means of rewards can be in the form of virtual money, which can be used to unlock specific tasks or in exchange for skipping a day for review. The rewards given in this game design should not be too attractive for the students, as this can result in them depending on external rewards [13], [33]. However, all these are extrinsic rewards that may motivate students in a short period.

This gamified language learning course's overall design was based on the students' input from the focus group. The plan is to boost self-development and let students see their progress over time. It encourages students to compete with their old selves and challenge themselves to perform better. Based on the previous gamification of learning research [34] studies, each affordance and its implementation mentioned were all aiming toward a more meaningful learning gamification design for students to be more engaged and intrinsically motivated to learn a second language. Similarly, a study conducted by Fuchs [35] revealed that gamification had a positive impact on the students learning progress. However, if the game elements are not carefully planned and executed, it will negatively impact the students' motivation throughout the entire course [35], [36].

VI. Conclusion

Gamification can be a powerful tool to enrich the students' learning experience and foster their learning process. However, the study also revealed that gamification approaches have the potential to decrease intrinsic motivation without considering the players' needs and goals. Therefore, if not carefully planned and implemented, it will lead to ineffective learning gamification. The combination of user-centered game design elements into a non-game context can lead to meaningful gamification. User-centered meaningful gamification will result in longer-term and deeper engagement between users, non-game activities, and supporting organizations. This study has given much consideration to the highlighted shortcomings of earlier studies in reducing the inefficient gamification elements. Understanding the students' motivations in language learning was crucial to creating a meaningful user-centered game design. It is a necessary step to assess the game elements that are used in gamified learning through the learners' experience. These elements include points, badges, and leaderboard activities. When it comes to designing gamified learning, the main objective in applying the game elements is to boost self-improvement and progression in learning a language, which is considered an intrinsic motivation for students.

Acknowledgements

The completion of this research could not have been accomplished without the help and guidance of our colleagues from the Faculty of Hospitality and Tourism, Prince of Songkla University in Phuket. We would also like to thank the group of anonymous students who participated in the focus group discussion.

Disclaimer

Any opinions, recommendations, and conclusions expressed in this paper are solely the intellectual result of the author and do not reflect the viewpoint of the Faculty or University.

APPENDIX

A. Supplementary Material

TABLE A1: GAME ELEMENTS (POINTS AND BADGES) AND THEIR PERCEIVED BENEFITS

Affordances	Benefits
Points	Motivation, interest, and knowledge [2]
	Engagement and enjoyment [12]
	Motivate to participate and engage in learning [17]
	Engagement and retention [21]
	Engagement, more effort, and higher quality work [22]
	Motivation, engagement, enjoyment, and perceived learning [23]
	Performance, engagement, and attendance [24]
	Motivation and performance [25]
	Improved student performance [26]
	Improved attitude and learning outcomes [29]
	Improved student performance [30]
	Increased competition [33]
Badges	Psychological satisfaction [3]
	Motivate to participate and engage in learning [17]
	Engagement, more effort, and higher quality work [22]
	Performance, engagement, and attendance [24]
	Motivation and performance [25]
	Improved student performance [26]
	Improved attitude and learning outcomes [29]
	Improved student performance [30]
	Engagement, performance, confidence, motivation, and academic effort [31]

TABLE A2: GAME ELEMENTS (LEADERBOARD, LEVELS, REWARDS, FEEDBACK, TEAMWORK AND ROLE PLAY) AND THEIR PERCEIVED BENEFITS

Leaderboard	Psychological satisfaction [3]
	Motivate to participate and engage in learning [17]
	Engagement and retention [21]
	Engagement, more effort, and higher quality work [22]
	Performance, engagement, and attendance [24]
	Improved attitude and learning outcomes [29]
	Improved student performance [30]
	Engagement, performance, confidence, motivation, and academic effort [31]
	Enjoyment, motivation, engagement, and perceived learning [34]
Levels	Motivation, interest, and knowledge [2]
	Engagement and retention [21]
	Engagement [27]
Rewards	Engagement and retention [21]
	Engagement, performance, confidence, motivation, and academic effort [31]
	Improved learning outcomes [32]
Feedback	Motivation, engagement, enjoyment, and perceived learning [23]
	Motivation, confidence, engagement, and attention [36]
Teamwork	Motivation, interest, and knowledge [2]
	Psychological satisfaction [3]
	Improved attitude and learning outcomes [29]
Role Play	Motivation, engagement, enjoyment, and perceived learning [23]

CONFLICT OF INTEREST

The authors declare that the study was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

AUTHOR CONTRIBUTIONS

The authors confirm sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation. All authors contributed equally to this work.

REFERENCES

[1] S. Deterding, D. Dixon, R. Khaled, and L. Nacke, "From game design elements to gamefulness," in *Proc. the 15th International Academic MindTrek Conference on Envisioning Future Media Environments — MindTrek '11*, 2011, pp. 9–15.

[2] A. Manzano-León, P. Camacho-Lazarraga, M. A. Guerrero, L. Guerrero-Puerta, J. M. Aguilar-Parra, R. Trigueros, and A. Alias, "Between level up and game over: A systematic literature review of gamification in education," *Sustainability*, vol. 13, no. 4, p. 2247, 2021.

[3] M. Sailer, J. U. Hense, S. K. Mayr, and H. Mandl, "How gamification motivates: An experimental study of the effects of specific game design elements on psychological need satisfaction," *Computers in Human Behavior*, vol. 69, 371–380, 2017.

[4] J. Hamari, J. Koivisto, and H. Sarsa, "Does gamification work? — A literature review of empirical studies on gamification," in *Proc. 47th Hawaii International Conference on System Sciences*, Hawaii, USA, January 6-9, 2014.

[5] F. Almeida and J. Simoes, "The role of serious games, gamification and Industry 4.0 tools in the Education 4.0 paradigm," *Contemporary Educational Technology*, vol. 10, no. 2, pp. 120-136, 2019.

[6] C. Dahlstrøm, *Impacts of Gamification on Intrinsic Motivation*, 2017.

[7] S. Nicholson, "A user-centered theoretical framework for meaningful gamification," in *GLS 8.0*, C. Martin, A. Ochsner, and K. Squire, Eds., MADISON, WI: ETC Press, pp. 223–229, 2012.

[8] Y. Chen, T. Burton, M. Vorvoreanu, and D. M. Whittinghill, "Cogent: A case study of meaningful gamification in education with virtual currency," *International Journal of Emerging Technologies in Learning (IJET)*, vol. 10, no. 1, p. 39, 2015.

[9] S. Subhash and E. A. Cudney, "Gamified learning in higher education: A systematic review of the literature," *Computers in Human Behavior*, vol. 87, pp. 192–206, 2018.

[10] A. Domínguez, J. Saenz-de-Navarrete, L. de-Marcos, L. Fernández-Sanz, C. Pagés, and J.-J. Martínez-Herráiz, "Gamifying learning experiences: Practical implications and outcomes," *Computers & Education*, vol. 63, pp. 380–392, 2013.

[11] Y. Jia, B. Xu, Y. Karanam, and S. Voida, "Personality-targeted gamification," in *Proc. the 2016 CHI Conference on Human Factors in Computing Systems*, 2016, pp. 2001–2013.

[12] H. Xu, D. Song, and P. Ju, "Engaged cohorts: Can gamification engage all college students in class?" *EURASIA Journal of Mathematics, Science and Technology Education*, vol. 13, no. 7, pp. 3723–3734, 2017.

[13] E. L. Deci, R. Koestner, and R. M. Ryan, "Extrinsic rewards and intrinsic motivation in education: Reconsidered Once again," *Review of Educational Research*, vol. 71, no. 1, pp. 1–27, 2001.

[14] G. Taylor, T. Jungert, G. A. Mageau, K. Schattke, H. Dedic, S. Rosenfield, and R. Koestner, "A self-determination theory approach to predicting school achievement over time: The unique role of intrinsic motivation," *Contemporary Educational Psychology*, vol. 39, no. 4, pp. 342–358, 2014.

[15] G. Ben and K. Salas, I. Lewis *et al.*, "Improving learning experiences through gamification: A case study," *Australian Educational Computing*, vol. 30, 2015.

[16] C. Pappas. (November 26, 2020). *The Best Learning Management Systems (2020 Update)*. [Online]. Available: https://elearningindustry.com/the-best-learning-management-systems-top-list

[17] C. Poondej and T. Lerdpornkulrat, "The development of gamified learning activities to increase student engagement in learning," *Australian Educational Computing*, vol. 31, no. 2, 2016.

[18] O. Sitra, V. Katsigiannakis, C. Karagiannidis, and S. Mavropoulou, "The effect of badges on the engagement of students with special educational needs: A case study," *Education and Information Technologies*, vol. 22, no. 6, pp. 3037–3046, 2017.

[19] L. Litosseliti, *Using Focus Groups in Research*, London, England: Bloomsbury Academic, 2003.

[20] Level up! Gamification for Moodle. [Online]. Available: https://levelup.plus/

[21] M.-S. Kuo and T.-Y. Chuang, "How gamification motivates visits and engagement for online academic dissemination — An empirical study," *Computers in Human Behavior*, vol. 55, pp. 16–27, 2016.

[22] K. F. Hew, B. Huang, K. W. S. Chu, and D. K. W. Chiu, "Engaging Asian students through game mechanics: Findings from two experiment studies," *Computers & Education*, pp. 92–93, 2016.

[23] J. A. Stansbury and D. R. Earnest, "Meaningful gamification in an industrial/organizational psychology course," *Teaching of Psychology*, vol. 44, no. 1, pp. 38–45, 2016.

[24] J. Dias, "Teaching operations research to undergraduate management students: The role of gamification," *The International Journal of Management Education*, vol. 15, no. 1, pp. 98–111, 2017.

[25] J. R. Chapman and P. J. Rich, "Does educational gamification improve students' motivation? If so, which game elements work best?" *Journal of Education for Business*, vol. 93, no. 7, 315-322, 2018.

[26] P. Denny, F. McDonald, R. Empson, P. Kelly, and A. Petersen, "Empirical support for a causal relationship between gamification and learning outcomes," in *Proc. the 2018 CHI Conference on Human Factors in Computing Systems*, pp. 1-13, April 2018.

[27] D. Giannetto, J. T. Chao, and A. Fontana, "Gamification in a social learning environment," *Issues in Informing Science and Information Technology*, vol. 10, pp. 195–207, 2013.

[28] Technology Advice. (2014). *Gamification Examples: Badges*. [Online]. Available: https://www.youtube.com/watch?v=4-s1qoADXok

[29] I. Yildirim, "The effects of gamification-based teaching practices on student achievement and students' attitudes toward lessons," *The Internet and Higher Education*, vol. 33, pp. 86–92, 2017.

[30] L. De-Marcos, A. García-Cabot, and E. García-López, "Towards the social gamification of e-learning: A practical experiment," *International Journal of Engineering Education*, vol. 33, no. 1, pp. 66–73, 2017.

[31] Ü. Çakıroğlu, B. Başıbüyük, M. Güler, M. Atabay, and B. Y. Memiş, "Gamifying an ICT course: Influences on engagement and academic performance," *Computers in Human Behavior*, vol. 69, pp. 98–107, 2017.

[32] S. Bai, K. F. Hew, and B. Huang, "Does gamification improve student learning outcome? Evidence from a meta-analysis and synthesis of qualitative data in educational contexts," *Educational Research Review*, vol. 30, p. 100322, 2020.

[33] J. Sánchez-Martín, F. Cañada-Cañada, and M. A. Dávila-Acedo, "Just a game? Gamifying a general science class at university," *Thinking Skills and Creativity*, vol. 26, pp. 51–59, 2017.

[34] M. Ortiz-Rojas, K. Chiluiza, and M. Valcke, "Gamification through leaderboards: An empirical study in engineering education," *Computer Applications in Engineering Education*, vol. 27, no. 4, pp. 777-788, 2019.

[35] K. Fuchs, "Bringing Kahoot! Into the classroom: The perceived usefulness and perceived engagement of gamified learning in higher education," *International Journal of Information and Education Technology*.

[36] C. M. Barrio, M. Munoz-Organero, and J. Sanchez Soriano, "Can gamification improve the benefits of student response systems in learning? An experimental study," *IEEE Transactions on Emerging Topics in Computing*, vol. 4, no. 3, pp. 429–438, 2016.

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