

Quantitative Analysis of Game Elements for Game-Based Learning In Grammar Instruction in Secondary Education

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Abstract

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Game-based learning brings new experiences for the educational environment. The trend of using the gamification approach is increasingly in demand at all levels of education, especially for secondary education. This study aims to identify the most relevant gamification elements in secondary education through This qualitative study aimed to identify the most relevant gamification elements for grammar instruction in secondary education. Data were gathered through a Focus Group Discussion (FGD) with eight English teachers, selected based on age and technological experience. The FGD was conducted online via WhatsApp and lasted 1.5 hours. Teachers discussed their awareness and perceptions of game-based learning and evaluated nine gamification elements. The analysis showed that 62.5% of participants were already using gamification in grammar lessons, and 75% believed it was important for student engagement. The most preferred elements were interactive mini-games (30%), point systems (25%), daily challenges (20%), badges (15%), and leaderboards (10%). The study concludes that gamification is a promising strategy to improve grammar learning in secondary classrooms. The results of this study can be used as the basis for further researcher in relation to developing a prototype of a game-based learning system in secondary education with a focus on interaction, rewarding, problem solving, and challenges.

Kata Kunci:

*Pembelajaran Digital,
Inovasi Pendidikan,
Gamifikasi, Desain
Game*

Abstrak

Pembelajaran berbasis permainan (game-based learning) membawa pengalaman baru dalam lingkungan pendidikan. Tren penggunaan pendekatan gamifikasi semakin diminati di semua jenjang pendidikan, terutama di pendidikan menengah. Studi ini bertujuan untuk mengidentifikasi elemen-elemen gamifikasi yang paling relevan untuk pembelajaran tata bahasa (grammar) di tingkat pendidikan menengah. Penelitian kualitatif ini mengumpulkan data melalui diskusi kelompok terfokus

(FGD) dengan delapan guru Bahasa Inggris yang dipilih berdasarkan usia dan pengalaman dalam penggunaan teknologi. FGD dilakukan secara daring melalui WhatsApp dan berlangsung selama 1,5 jam. Para guru mendiskusikan kesadaran dan persepsi mereka terhadap pembelajaran berbasis permainan, serta mengevaluasi sembilan elemen gamifikasi. Hasil analisis menunjukkan bahwa 62,5% peserta sudah menggunakan gamifikasi dalam pembelajaran grammar, dan 75% percaya bahwa gamifikasi penting untuk meningkatkan keterlibatan siswa. Elemen yang paling disukai adalah permainan mini interaktif (30%), sistem poin (25%), tantangan harian (20%), lencana atau badge (15%), dan papan peringkat atau leaderboard (10%). Studi ini menyimpulkan bahwa gamifikasi merupakan strategi yang menjanjikan untuk meningkatkan pembelajaran grammar di kelas-kelas tingkat menengah. Hasil penelitian ini dapat dijadikan dasar bagi peneliti selanjutnya dalam mengembangkan prototipe sistem pembelajaran berbasis permainan di pendidikan menengah, dengan fokus pada interaksi, penghargaan, pemecahan masalah, dan tantangan.

INTRODUCTION

Education is one of the most vital forms of investment in building individual potential and the progress of society (Rochmawan, 2023). Its function is not only to transfer knowledge and skills from generation to generation, but also plays a major role in developing cognitive, emotional, and social aspects as a whole (Hapsari et al., 2023). More than just preparing for the world of work, education also plays an important role in shaping character and fostering critical thinking skills needed in everyday life and professional careers (Hemania et al., 2023).

English plays a crucial role in education as the most widely used global language (Rahayu & Fujiati, 2018). This language learning not only focuses on grammar and vocabulary, but also includes the development of key skills such as speaking, listening, reading, and writing, as well as an understanding of the culture associated with the use of the language (Ismiati et al., 2020). Good English language skills are an important factor in being able to communicate effectively internationally and in a professional work environment (Rofiq & Hakim, 2022).

Therefore, the next generation is expected to be able to master this language optimally as an important provision in achieving success in the future.

However, to optimally achieve such mastery, engaging and adaptive learning approaches are indispensable. One innovative strategy that is increasingly being applied in English language learning is gamification, which is the application of game elements in the learning process (Kusumarini et al., 2025; Sari & Nurani, 2021). Gamification can increase student motivation, engagement and learning experience in a fun, interactive and challenging way (Sari & Nurani, 2021). By utilizing technology and educational game design, gamification opens up great opportunities to make English learning more effective and meaningful (Saleme et al., 2020).

Gamification is an innovative approach that integrates game elements into non-game applications or activities, with the aim of engaging, involving, and motivating children (Jacob et al., 2022). The trend of gamification is becoming increasingly popular and has been implemented across various industries, including the field of education (Kao, 2020). The main purpose of using gamification in education is generally to provide stimuli in the form of motivation and student engagement (Ismiati et al., 2020). This increase in motivation and engagement can enhance the effectiveness of the teaching and learning process. The application of the gamification concept in a learning context is not merely about adding game elements to educational applications, but must also take into account several important aspects to achieve the right goals: 1) understanding the target users, 2) determining game features, and 3) selecting appropriate game elements (Saleme et al., 2020). In other words, for the successful implementation of gamification in the teaching and learning process, it is essential to understand students' perspectives on the matter (Azza et al., 2023; Öztürk et al., 2025)).

Several previous studies have proven that the use of gamified media such as Kahoot, Baamboozle, and other interactive games can increase student motivation and learning outcomes in English language learning at the secondary education level. However, most of these studies focus more on the results of applying certain media without explaining in detail the specific gamification elements used and how

these elements were selected or designed according to the needs of secondary school students. Furthermore, there has been little research exploring the views of English teachers as key practitioners in learning about which gamification elements are most relevant and effective in teaching aspects of grammar, particularly in the context of fun and meaningful learning. Therefore, this study aims to address this gap by delving deeper into the implementation of planned gamification at the secondary education level, from the perspective of English teachers, and providing recommendations on appropriate gamification design elements for grammar instruction.

Previous studies have demonstrated that the use of gamified media such as Kahoot, Baamboozle, and other interactive games can enhance student motivation and learning outcomes in English language learning at the secondary education level (Modjanggo & Manggeni, 2022; Murti et al., 2023; Mustafa, 2022; Silaban et al., 2023). However, most of these studies have focused on the outcomes of implementing specific media without detailing the specific gamification elements used or how these elements were selected or designed to meet the needs of secondary school students. In addition, there has been little research exploring the views of English teachers as key practitioners in learning about which gamification elements are most relevant and effective in teaching aspects of grammar, particularly in the context of enjoyable and meaningful learning. Therefore, this study aims to address this gap by delving deeper into the implementation of planned gamification at the secondary education level, from the perspective of English teachers, and providing recommendations on appropriate gamification design elements for grammar instruction.

The purpose of this study is to conduct a qualitative analysis of game elements used in game-based learning for teaching grammar in secondary education.

METHOD

The aim of this study is to identify the most relevant gamification elements in a digital learning environment for early childhood. In addition, the study seeks to explore the perceptions and experiences of secondary English teachers regarding the use of game-based learning in grammar classrooms. Lastly, it intends to provide practical recommendations for the development of a game-based learning system that enhances student engagement by incorporating key elements such as interaction, rewards, problem-solving, and challenges. The data collection was based on input from teachers. This is because it is difficult to collect and evaluate gamification elements through interviews with secondary students. Therefore, the data collection process was conducted through a Focus Group Discussion (FGD) involving eight Secondary education teachers and all the participants are female who is selected through a screening process. The selection process considered two aspects of diversity: 1) level of technological experience, and 2) age. The demographic details of the participants are presented in Table 1.

Table 1. Demographics of FGD Participants

Teacher	Gender	Age	Teaching Experience	Technology Experience
1	Female	40-54 years old	>10 years	Medium
2	Female	20-30 years old	1-6 years	Medium
3	Female	17-24 years old	1-5 years	High
4	Female	41-56 years old	>10 years	Low
5	Female	20-30 years old	>10 years	Medium
6	Female	20-30 years old	10 years	Medium
7	Female	20-30 years old	10 years	High
8	Female	20-30 years old	>10 years	Low

The FGD activity was conducted on 29 April, 2025, through an online meeting (WhatsApp group) with a duration of an hour and half. The first step in the FGD was to understand the teachers' awareness and preferences regarding game-based learning in secondary education. The researcher explored participants' awareness and preferences through a structured questionnaire was used during the FGD to guide the discussion. It included questions about the teachers' familiarity with gamification, the perceived importance of using game-based elements in

grammar instruction, and their willingness to implement such methods in the classroom. Their responses were presented in percentage tables and supported by qualitative comments. This combination of a guided questionnaire and open discussion allowed the researcher to gather both measurable data and deeper insights into the participants' understanding and preferences regarding game-based learning. Next, the FGD process also focused on identifying gamification elements. The researcher identified the relevant gamification elements through a structured questionnaire distributed via Google Form. The questionnaire was designed to present a list of commonly used gamification elements, such as points and rewards, badges, leaderboards, challenges, leveling, progress indicators, avatars, and virtual currency. Participantseight secondary English teachers were asked to rank these elements based on their perceived relevance and usefulness in grammar instruction. The Google Form included a percentage-based ranking feature that allowed teachers to assign importance to each element. The collected data were then analyzed to determine which elements were most preferred. This ranking method helped the researcher clearly identify the gamification elements that teachers considered most effective for use in secondary grammar learning. In this study, the analysis of gamification elements was based on eight popular gamification elements for children: points and rewards, leaderboards, badges, challenges, leveling, progress indicators, avatars, and virtual currency (Mohamad et al., 2017).

In addition, participants were also given the opportunity to suggest other gamification elements not previously mentioned in teaching grammar. Moreover, participants were also invited to share their suggestions through interviews conducted during the Focus Group Discussion (FGD). These interviews allowed teachers to express their opinions more freely and provide deeper insights based on their teaching experiences. Through open-ended questions, participants gave valuable recommendations on how gamification could be effectively implemented in grammar instruction. Some suggested incorporating mini-games to spark curiosity, while others emphasized the importance of rewards and challenges to maintain student motivation. These qualitative inputs were analyzed thematically

to complement the quantitative data, offering a well-rounded understanding of the most suitable gamification elements for secondary education.

The data analysis in this study combined both quantitative and qualitative approaches. Quantitative data from the Google Form questionnaire were analyzed using percentage rankings to identify the most preferred gamification elements among participants. These rankings helped the researcher determine the priority and relevance of each element based on teachers' evaluations. Meanwhile, qualitative data collected from interviews and open-ended responses during the Focus Group Discussion (FGD) were analyzed thematically. The researcher categorized participants' comments based on recurring themes, such as motivation, student engagement, problem-solving, and learning effectiveness. By combining numerical data with in-depth insights, the researcher was able to draw meaningful conclusions about teachers' perceptions and preferences regarding gamification in grammar instruction for secondary education.

FINDINGS AND DISCUSSION

Awareness and Preference

The following subsection discusses the teachers' justification and comments regarding the participants' awareness and preferences toward games-based learning in early secondary education.

a. Awareness Toward Gamification in Learning Grammar

The comparison of participants' awareness levels regarding ICT-based games in early childhood education can be seen in Table 2.

Table 2. Awareness Level Towards Games Usage in Classroom

Awareness Level	Awareness	Amount	%
0	Just heard the gamification term for the first time	1	12,5 %
1	I have heard but never using gamification in learning grammar	2	25 %
2	I have heard and used gamification in learning grammar	5	62,5 %

Table 2 shows that teachers' awareness of gamification in secondary education is relatively high, the percentage of 62,5% is a prove that teacher having a good level of awareness about gamification in teaching grammar, while 25 % shows that the teacher in secondary education have a medium level of awareness towards gamification, and the lowest point of percentage explains that 12,5 % teacher has low awarnes towards the usage of gamification in teaching grammar.

b. The Needs of Games in Learning Grammar

The comparison of participants' perceptions regarding the need for gamification in the teaching and learning grammar process at the secondary education level can be seen in Table 3.

Table 3. The Perception of Gamification in Teaching and Learning Grammar

Needs	Amount	%
Very Important	2	25 %
Important	4	50 %
Doubt	2	25 %
Not Important	0	0 %
Very Not Important	0	0 %

Table 3 shows that 75% of participants expressed a need for gammification in the teaching and learning grammar at the secondary education level, while 25% were uncertain. Comments supporting the need for gamification in secondary education level included statements such as: 'Because today's demands require the introduction of digital support to junior high school through games,' 'To make learning more engaging,' 'To facilitate students's understanding, as they are more interested in gadgets than manual tools,' and 'Because children nowadays are already familiar with the concept of games in apps.' Meanwhile, a hesitant comment stated: 'They may be needed, but they also may not be, depending on the purpose and implementation.

c. The Preference of Games Usage in Grammar Class

The comparison of participants' preferences for implementing ICT-based games in the teaching and learning process at the early childhood education level can be seen in Table 4.

Table 4. The Preference level of Games Usage in Grammar Class

Needs	Amount	%
Very Possible	2	25 %
Possible	5	62,5 %
Doubt	1	12,5 %
Impossible	0	0 %
Very Impossible	0	0 %

Table 4 shows that 87.5% of participants considered it possible to implement gamification in their teaching and learning grammar process, while 12.5% expressed hesitation towards the gamification implementation.

d. Types of Gamification's Elements for Secondary Education

The comparison of Gamification's elements types that suitable for secondary education level can be seen in picture 1. The figure shows that the most suitable types of element for secondary students are: Interactive mini game (30 %), level point (25 %), daily challenges (20 %), badge (15 %), and leaderboard (10 %).

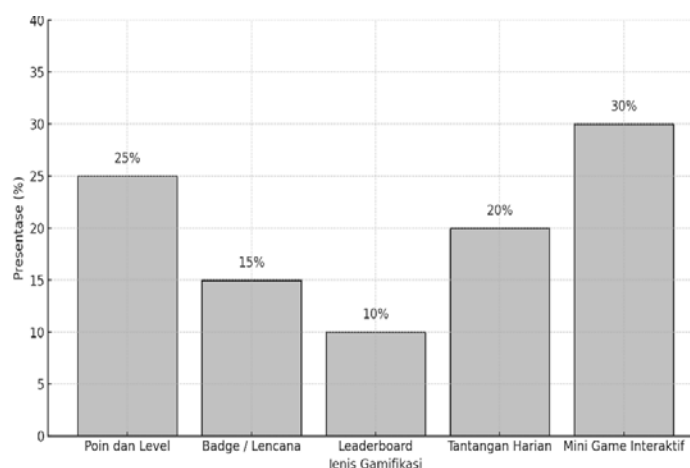


Figure 1. Types of Gamification's Elements for Secondary Education

The Use Gamification Elements

In the following subsection, the discussion focuses on teachers' justifications and comments regarding gamification elements

a. Interactive Mini Game Elements

This element was explained to participants as an indicator to explain the material through mini games. The average importance rating for the progress indicator element in the context of gamification for secondary student was 30 % (on a scale of 1–100). This indicates that teachers consider the progress indicator element necessary to be implemented in learning process. Comments regarding the use of this element included the idea of control, for example: 'So that children can better control and monitor the game's progress.' Others saw it as a source of curiosity, such as: 'It makes children curious about the game and also the material.'

b. Point and Levels Elements

This element was explained to participants as the presence of rewards and prizes that children can receive after completing a game. The average importance rating of the points and rewards element in the context of gamification for secondary student was 25% (on a scale of 1–100). This indicates that teachers consider the points and rewards element necessary in English class which is elaborated with gamification. Comments regarding the use of points and rewards in this context included their appeal, such as: 'To make children more interested,' 'To make children more curious and engaged in what they're doing,' and 'Because giving appreciation for the process they go through is important to foster enthusiasm.' Others viewed it as a form of motivation, for example: 'To motivate children,' and 'Because rewards aim to create a sense of pride in children.'

c. Daily Challenges Elements

This element was explained to participants as a challenge present within the game. The average importance rating of the challenge element in the context of gamification for secondary student was 20 % (on a scale of 1–100). This indicates that teachers consider the challenge element necessary in learning process, especially in teaching grammar material. Comments regarding the use of challenges in this context included problem-solving benefits, such as: 'To help children learn to solve problems they encounter,' 'So

that children are able to make efforts and carefully solve the problems they face,' and 'To train children to try to solve problems on their own. Others viewed it as stimulating curiosity, for example: 'It makes children more driven by their curiosity.

d. Badge Elements

This element was explained to participants as an accessory in the form of badges/medals to represent a player's achievement. The average importance level of the badge element in the context of ICT-based games for early childhood is 70.00% (on a scale of 1–100). This indicates that teachers consider the badge element to be necessary in ICT-based games for young children. Meanwhile, comments regarding the use of badges in ICT-based games for early childhood include boosting confidence, such as: “Teaching children to be more confident” and “Children will feel more confident after completing the game.” In addition, some also view it as a source of pride, for example: “Children will feel proud after completing the game.”

e. Leaderboard Elements

This element was explained to participants as information used to determine ranking position compared to other players. The average importance level of the leaderboard element in the context of ICT-based games for early childhood is 68.75% (on a scale of 1–100). This indicates that teachers consider the leaderboard element necessary in ICT-based games for young children. Meanwhile, comments regarding the use of the leaderboard element in ICT-based games for early childhood include it being a measure of achievement, such as: “To help children measure their abilities in achieving goals during gameplay,” and “To determine the extent of children's understanding of the learning content through the game.” In addition, some also see it as a motivator, for example: “To encourage children to be enthusiastic.”

Discussion

This sub-section discusses the findings of teachers' perceptions of ICT-based games in early childhood education and includes recommendations on how gamification elements can be applied in learning activities for young children. The results of the conducted Focus Group Discussion (FGD) revealed that participants were hearing about ICT-based games for early childhood education for the first time. This presents a valuable opportunity for developers to create games focused on early childhood education, while also posing a challenge due to the low level of awareness among educators regarding the use of ICT-based games (Aditya et al., 2021). However, when discussing the need for ICT-based games in the teaching and learning process, most participants agreed that such tools are necessary. Considering that children today frequently play games on electronic devices and are already familiar with ICT-based games, the need for educational games that support learning processes is evident and highly feasible for implementation.

The analysis concludes that the most suitable ICT-based games for supporting early childhood education are puzzle, adventure, and role-playing games. Puzzle games guide players through a series of tests, requiring them to use problem-solving and other skills taught in the game to navigate various puzzle-based environments (Manokaran et al., 2023). Adventure games also positively contribute to early childhood education by incorporating skills, challenges, and fun, all of which impact children's endurance and engagement (Kolar & Čater, 2018). Role-playing games allow young children to explore scenarios involving moral dilemmas and relate these experiences to real life, helping them gain greater confidence and openness in expressing their understanding of moral choices, while also increasing classroom engagement (Hafis et al., 2020).

In addition, the findings also highlight the gamification elements needed to support early childhood education based on priority. Ranked in order of importance: points and rewards, challenges, badges, progress markers, leveling, leaderboard, avatars, virtual currency, and surprises. These elements serve as a guide for game developers to design educational games tailored to young learners. By including these elements, it is hoped that the games will be well-received by both the children

and their supporting environments such as parents and teachers. When these elements are properly integrated into games, children are expected to enjoy playing while learning and to develop a better understanding after gameplay (Rahayu & Fujiati, 2018)

CONCLUSION

This study aims to understand early childhood education (ECE) teachers' perceptions of the usefulness of ICT-based games and gamification elements in enhancing children's learning experiences in ECE settings. The analysis results show that teachers' perceptions of the gamification approach are positive. Although most participants had never heard the term before, they expressed that early childhood education would benefit from such a gamified approach, and they intend to use it in their classroom teaching in the future. Teachers also believe that gamification elements such as points and rewards, leaderboards, badges, challenges, leveling, progress markers, avatars, and virtual currency are useful in supporting gamified learning systems in early childhood environments. Overall, young children appear to enjoy the following aspects of gamified learning systems: interaction, rewards, problem-solving, and challenges. This suggests that the gamification approach is highly suitable for early childhood learning, particularly in developing children's cognitive abilities and character. Given that data collection in this study did not explore preferences for gamification elements based on different child types, future research could analyze the use of each element based on player types. Additionally, due to the difficulty of conducting investigations directly with children aged 4–6, this study's data collection was limited to the perceptions of ECE teachers. Future investigations may be able to explore children's perspectives through practical examples involving the implementation of one or more gamification elements.

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