THE IMPACTS OF KAHOOT! ON STUDENTS' GRAMMAR LEARNING AT THAI NGUYEN UNIVERSITY OF AGRICULTURE AND FORESTRY

Pham Thi Thu Trang[*], **Bui Thi Kieu Giang**
TNU - University of Agriculture and Forestry

ARTICLE INFO		ABSTRACT
		This study examined the impact of the digital game Kahoot! on enhancing grammar acquisition among first-year students at Thai
		Nguyen University of Agriculture and Forestry. A quasi-experimental
		study was conducted involving two groups of students. The experimental group received instruction through Kahoot!, while the control group was taught using the traditional method. Pre-tests, post-

tests, and a questionnaire were utilized to assess the students' improvement in grammar learning and their attitudes toward gamification in language learning. The analysis of the data was conducted using the Statistical Package for the Social Sciences (SPSS 20). The findings of the study revealed a significant effect of employing Kahoot! on learners' grammar performance as well as their positive attitude toward using digital games for language learning. Additionally, the study also recommended implications for schools, teachers, and students using gamification to teach and learn English. Furthermore, suggestions for future research were provided.

ẢNH HƯỞNG CỦA ỨNG DỤNG KAHOOT! TỚI KHẢ NĂNG HỌC NGỮ PHÁP TIẾNG ANH CỦA SINH VIÊN TRƯỜNG ĐẠI HỌC NÔNG LÂM – ĐẠI HỌC THÁI NGUYÊN

Phạm Thị Thu Trang[*], **Bùi Thị Kiều Giang**
Trường Đại học Nông Lâm - ĐH Thái Nguyên

THÔNG TIN BÀI BÁO		TÓM TẮT
		Nghiên cứu này điều tra tác động của ứng dụng Kahoot! trong việc nâng
		cao việc học ngữ pháp cho sinh viên năm nhất tại Trường Đại học Nông Lâm – Đai học Thái Nguyên. Nghiên cứu bán thực nghiệm đã được tiến
		hành với hai nhóm sinh viên. Nhóm thí nghiệm được hướng dẫn học ngữ pháp thông qua trò chơi số Kahoot!, trong khi nhóm đối chứng được giảng dạy bằng phương pháp truyền thống. Các bài kiểm tra trước,

kiểm tra sau và bảng câu hỏi được sử dụng để đánh giá sự tiến bộ của học sinh trong việc học ngữ pháp cũng như thái độ của họ đối với việc sử dụng trò chơi số để học ngôn ngữ. Việc phân tích dữ liệu được thực hiện bằng phần mềm SPSS 20. Những kết quả của nghiên cứu cho thấy tác động đáng kể của việc sử dụng Kahoot! đối với việc học ngữ pháp của sinh viên cũng như thái độ tích cực của họ đối với việc sử dụng trò chơi số để học ngôn ngữ. Ngoài ra, nghiên cứu cũng đưa ra những gợi ý cho các trường học, giáo viên và học sinh khi sử dụng trò chơi số để dạy và học tiếng Anh, và một số đề xuất cho nghiên cứu trong tương lai.

[*] Corresponding author. *Email: phamthithutrangnn@tuaf.edu.vn*

1. Introduction

Grammar has been crucial in acquiring proficiency in the English language. Grammar serves as the structural basis that categorizes words, word groups, and rules for creating accurate and understandable sentences. English learners in Vietnamese schools face difficulties in learning English grammar. They struggle with the correct application of grammar rules and often make errors in their writing and speaking due to the influence of their mother tongue and a lack of practice [1]. They often commit several errors in various elements of English grammar, including tenses, copula "be," adverb placements, and adjective phrases [2]. Additionally, Vietnamese and English exhibit significant differences in their grammatical properties [3]. Vietnamese grammar emphasizes word order and using function words over bound morphemes [4]. This might significantly challenge Vietnamese learners aiming to excel in English grammar. Enhancing the quality of education by utilizing modern teaching methods to actively engage students in the learning process is essential for improving grammar instruction and boosting academic performance [5].

Gamification has been increasingly utilized in different educational contexts for teaching and learning English due to its significant advantages. The purpose is to inspire learners and improve their motivation and engagement in the learning process [6] - [11]. Furthermore, research has shown that gamified learning can positively impact vocabulary and grammar acquisition [12] - [15]. English as a Second Language (ESL) students often favor gamified learning for its ability to enhance motivation and improve understanding of English grammar principles [16]. Therefore, gamification is perceived as a tool that supports and encourages student learning.

As technology becomes more prevalent in education, web-based games like Kahoot! have become a necessary tool. It is a game-based application commonly utilized in educational settings. The application is designed to create a game-based student response system that transforms the conventional classroom into a game show format [17]. The application is compatible with multiple platforms, including personal computers and mobile devices. Educators can create questions or polls on Kahoot! for students to answer at the same time using their chosen device. Educators can choose and modify predetermined quizzes to align with specific personal learning goals. Kahoot! offers various features that are universally regarded as easy to use.

The use of Kahoot! has been found to have significant effects on English grammar competence. Studies have shown that Kahoot! can be an effective tool for developing grammatical competence in students studying foreign languages and cultures [18]. It has been found to improve students' grammar achievement and have a positive impact on their motivation [10], [19]. Kahoot! has been found to be an effective medium for teaching grammar exercises, leading to improved grammar scores [20]. Additionally, the use of Kahoot! in the classroom has been found to enhance students' learning and improve their performance in English grammar, particularly in terms of memory retention [21]. Overall, the research suggests that Kahoot! can be a valuable tool for enhancing English grammar competence in students.

In Vietnam, research has shown that learners who are proficient in using gamified learning tools and have a good attitude toward them are more prepared to participate in online gamified platforms [22], [23]. Some research has shown that the use of Kahoot! impacts students' grammar performance in higher education. The current study intends to assess the appropriateness of using Kahoot! to strengthen and solidify grammar learning in undergraduate students at Thai Nguyen University of Agriculture and Forestry (TUAF). The study aims to address the following research questions:
- To what extent can Kahoot! improve students' grammar learning?
- What are the students' attitudes toward the use of Kahoot! in grammar learning?

2. Methodology

2.1. Research approach

The population of this study was 78 students in two English classrooms at TUAF. The study employed a quasi-experimental method using a pre-test and post-test to evaluate the improvement

of students' grammar performance, along with a questionnaire to investigate students' learning motivations for using the gamification approach in their respective grammar classes. This assessment aimed to conduct a thorough examination of how effectively this approach is used in grammar classrooms, leveraging its advantages and confronting its limitations to successfully achieve the objectives associated with this method. The researchers commenced this study in September 2023 and continued until December 2023. During this timeframe, data collection was carried out through the distribution of a pre-test, post-test, and questionnaire. The responses obtained from the pre-test, post-test, and questionnaires were then computed, analyzed, and organized according to the specific subjects covered.

2.2. The population and samples

The population consisted of 554 students (across 10 sections) who registered for ENG01 (3 credits) in the first semester of the academic year 2023-2024 at TUAF. Two sections of students were sampled using cluster sampling due to their pre-existing grouping within sections. The sample included a total of 78 individuals, comprising 32 males and 46 females. An experimental group consisting of 40 students was selected, while a control group of 38 students was chosen. These students were first-year students majoring in Pet and Veterinary Medicine, aged between 18 and 20. Both groups were required to attend three hours per week for 15 weeks.

2.3. Data collection instruments

2.3.1. Pre-test and Post-test

In this study, a quasi-experimental method was utilized. Two groups were created: treatment and control groups. Each group was given a 40-question achievement test as both a pre-test and post-test, and the results were used to collect quantitative data for this study. The achievement test questions were selected from a pool of questions with high levels of validity, reliability, and distinctiveness. The achievement tests used in the study were developed by [24]. Statistical data on each item provide information regarding the achievement test items used as the pre-test and post-test. Each group used a copy of the English textbook "Speakout" (pre-intermediate level) [25]. Target grammar was taught to the experimental group via Kahoot!, while the control group received conventional classroom teaching techniques over fifteen weeks.

2.3.2. Questionnaire

The second tool was a questionnaire that explored students' perspectives on gamification. After the intervention, only students in the experimental group were required to fill out this questionnaire. The questionnaire consisted of seven items derived from Wichadee and Pattanapichet [10]. Learners provided feedback for each item by choosing one of five levels of agreement ranging from "mostly agree" to "mostly disagree." A pilot test of the initial version of the questionnaire was conducted before actual implementation. Forty students from the identical pilot group filled out this survey. The students' feedback allowed the researcher to modify the language to ensure that the questions were clear and could prompt the necessary information.

3. Results and discussions

3.1. Pre-test and Post-test results

3.1.1. Results of the pre- and post-test of the control group

A paired-sample t-test was performed to assess the impact of traditional teaching methods on learners' grammar achievement. According to the descriptive statistics in Table 1, there was an improvement in test scores between the beginning (M = 4.13, SD = 0.94) and the end of the course (M = 4.91, SD = 0.67). Additionally, the results of the paired-sample t-test in Table 2 show that there was a significant difference between pre-test and post-test grammar scores (t[37]= -11.49, p =

0.000 < 0.05). It can be inferred that the grammar knowledge of students in the control group showed significant improvement following their participation in a 15-week course.

Table 1. *The paired samples statistics of the pre-and post-test of the control group*

		Mean	N	Std. Deviation	Std. Error Mean
Control group	Pre-test	4.13	38	0.94	0.15
	Post-test	4.91	38	0.67	0.10

Table 2. *The results of the paired sample t-test between the pre-and post-test of the control group*

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Control group	Pre-test – Post-test	-0.78	0.41	0.06	-0.92	-0.64	-11.49	37	0.000

3.1.2. Results of the pre- and post-test of the treatment group

Test scores of learners were compared pre and post-treatment of Kahoot!. In Table 3 on average, learners performed worse before (M = 4.23, SD = 0.98) than after the intervention (M = 6.02, SD = 0.76). The enhancement, with a mean difference of 1.79 and a 95% confidence interval of [-1.93, -1.65], showed a significant difference, t (39) = 26.11, p = 0.000 (Table 4). After 15 weeks of treatment, learners' grammar knowledge showed significant improvement.

Table 3. *Descriptive statistics of the pre- and post-test of the treatment group*

		Mean	N	Std. Deviation	Std. Error Mean
Treatment group	Pre-test	4.23	40	0.98	0.15
	Post-test	6.02	40	0.76	0.12

Table 4. *The results of the paired sample t-test between the pre- and post-test of the treatment group*

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Treatment group Pre-test – Post-test	-1.79	0.43	0.06	-1.93	-1.65	-26.11	39	0.000

3.1.3. Results from the pre-test between the control and treatment group

Table 5 and Table 6 show that there was no significant difference in grammar competence between the control and experimental groups, t (76) = -0.45, p = 0.65, even though the treatment group (M = 4.23, SD = 0.98) scored higher on average than the control group (M = 4.13, SD = 0.94). The result showed that learners in both the control and experimental groups had equivalent levels of grammar knowledge before the intervention.

Table 5. *The results from the pre-test between the control and treatment group*

Group	N	Mean	Std. Deviation	Std. Error Mean
Control group	38	4.13	0.94	0.15
Treatment group	40	4.23	0.98	0.15

Table 6. *The results of the independent samples pre-grammar test*

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	MD	SED	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	0.05	0.80	-0.45	76	0.65	-0.099	0.21	-0.53	0.33
Equal variances not assumed			-0.45	75.99	0.64	-0.099	0.21	-0.53	0.33

3.1.4. Results from the post-test between the control and treatment group

The data from Table 7 and Table 8 indicate that 40 participants who underwent the intervention demonstrated a significantly higher mean score (M = 6.02, SD = 0.76) compared to that of the students in the control group (M = 4.91, SD = 0.67). Therefore, there was a significant difference in scores for the experimental group and control group at the post-test stage with t (76) = -6.75, p = 0.00.

Table 7. *The results from the post-test between the control and treatment group*

Group	N	Mean	Std. Deviation	Std. Error Mean
Control group	38	4.91	0.67	0.11
Treatment group	40	6.02	0.76	0.12

Table 8. *The results of the independent samples post-grammar test*

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	MD	SED	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	0.62	0.43	-6.75	76	0.000	-1.11	0.16	-1.43	-0.78
Equal variances not assumed			-6.77	75.54	0.000	-1.11	0.16	-1.43	-0.78

The outcome above indicates that engaging with Kahoot! after 15 weeks led to a great improvement in learners' understanding of grammar compared to conventional learning methods. The findings suggest that both the experimental and control groups showed improvement in grammar proficiency after 15 weeks of studying the basic grammar course. However, individuals in the treatment group, who received the intervention, achieved higher average scores on a grammar test compared to those in the control group. Therefore, gamified learning resulted in greater academic success.

The students in the experimental group likely had a chance to review their learning through competition, as stated by Kim [26]. They enjoyed playing Kahoot! games while also acquiring knowledge. Furthermore, Kahoot! facilitated increased engagement in the learning process, enabling instructors to easily monitor student participation in the activities. This outcome aligns with Goehle's study [27], which suggested that digital games not only foster a positive learning atmosphere but also enhance engagement. The competitive aspect of the games motivates learners to participate, increasing their enthusiasm and engagement in the learning process [19], [28], [29]. Increased participation in the games resulted in a greater acquisition of knowledge, leading to superior results compared to individuals in the control group. This discovery can be utilized to bolster the assertion that Kahoot! can enhance learning and foster language development in an enjoyable educational setting.

This aligns with prior research that has shown the beneficial effects of utilizing Kahoot! in enhancing students' understanding of grammar, as demonstrated by [9], [10], [11], [17], [30]. Various factors may account for the greater improvement observed in learners from the experimental group. Learners play an active role in their learning process, and actively participating in language games helps them understand the importance of practicing grammar forms [5]. Furthermore, incorporating game elements like feedback, points, a leaderboard, and visually appealing features can enhance the appeal of assignments to students. Subsequently, they would allocate additional time to engaging with those exercises. In addition, dynamic and appealing visual elements can enhance the significance and enjoyment of the learning process [31]. Kahoot! offers additional features like meme feedback, music, vibrant backgrounds, and a clear display to enhance the learning experience for students during assignments. Consequently, they would allocate additional time to engaging with those exercises. Repeatedly taking quizzes can enhance learners' comprehension of grammar concepts.

3.2. Questionnaire

The experimental group of students showed a high level of acceptance towards the gamification technique, with an average mean of 4.12 as indicated in Table 9. The students, in general, embraced the gamification technique and conveyed favorable opinions about it. Students appeared to prefer Kahoot! as an educational resource. Item 1 had the highest mean (Mean = 4.32), and item 2 had the second highest mean (Mean = 4.25). Item 4 came third with a 4.23 mean score. Item 5 had the lowest mean score (Mean = 3.84). It was at a moderate level.

Table 9. *Students' attitudes towards the gamification technique*

Statements	Mean	SD
1. This technique made the course more fun.	4.32	0.58
2. I like competition in this technique.	4.25	0.67
3. This technique increased engagement with the class.	3.93	0.69
4. This technique increased my interest in the lessons.	4.23	0.56
5. This technique enabled me to learn better.	3.84	0.55
6. This technique is suitable for the language class.	4.18	0.56
7. I want this technique to be used in other courses.	4.06	0.50
Average	**4.12**	**0.35**

The study showed that students had a favorable perception of incorporating digital games in language learning. Three reasons can elucidate this outcome. Firstly, students are familiar with utilizing a range of technologies in their daily routines. A mobile phone is the optimal device for playing games in class due to its widespread availability among all students. Secondly, Kahoot! enables users to compete with their friends using the mobile application. They were more attentive in class because they had to apply their knowledge in the competition. This curiosity resulted in enhanced academic achievement, as demonstrated in prior research by Hidi & Renninger [32] and Oblinger [33]. Finally, the elements of Kahoot! games are appropriate for educational use. Kahoot!'s features, such as the screen and music, are carefully crafted to captivate players, while the quizzes are tailored to their skill level. This discovery aligns with Kiili's study [34], which suggests that engaging students in activities that are appropriately challenging in relation to their skills can increase their interest and improve their learning outcomes. Studying in an enjoyable manner can foster a positive environment. Students strongly concurred that gamified learning enhanced the course's enjoyment. Kahoot! is an effective digital game for enhancing students' engagement in language learning and making the learning process more enjoyable.

4. Conclusion

Grammar is universally recognized as the cornerstone of communication, regardless of the language used. It is essential for developing all four language skills in English. Using Kahoot! can effectively enhance learners' engagement in learning activities and grammar proficiency. The results of this study suggest that using Kahoot! can improve EFL students' performance on grammar tests and foster a positive attitude among students.

This study expands on previous findings regarding the influence of utilizing Kahoot! on first-year students and the range of grammar topics covered in the curriculum. These results should be taken into account when seeking to enhance learners' knowledge in teaching grammar for English learners and other subjects for students in various majors. Policymakers are responsible for promoting the implementation of Kahoot! to improve students' engagement in learning activities. The purpose of gamification is to modify learning-related behavior or attitudes that may impact learning outcomes. Educators are advised that gamification, specifically Kahoot!, serves as a tool to enhance instructional content. Educators must choose suitable instructional materials to effectively communicate the desired knowledge to their students initially.

While gamification is a valuable method for teaching English, there are numerous unresolved questions. Initially, it is important to determine the threshold at which students will lose interest

in Kahoot! games. Additionally, future research could compare different free digital games to assess their impact on language proficiency, aiding in the selection of appropriate games for upcoming educational programs. It is possible to investigate whether the quantity of games affects their learning performance. It is crucial to determine which game best aligns with the study's content. In future studies, a larger sample size of students should be included to collect more comprehensive data and statistics, as this study has limitations. Subsequently, the feedback can provide a clearer insight into students' perceptions and the impact of the gamification technique on them. Additionally, interviews should be utilized as research tools to enhance the comprehensiveness of the studies.

REFERENCES

[1] N. T. V. Nguyen, T. V. Doan, T. H. N. Nguyen, T. T. T. Nguyen, N. L. Tang, and T. N. T. Nguyen, "An investigation into the common errors of word form used in writing of the freshmen: a case study," *European Journal of Education Studies*, vol. 9, no. 2, pp. 62-74, 2022.

[2] V. D. Dao, "Some Vietnamese students' problems with English grammar: A preliminary study," *Hawaii Pacific University TESOL Working Paper Series,* vol. 6, no. 2, pp. 37-56, 2008.

[3] G. M. Tang, "Cross-linguistic analysis of Vietnamese and English with implications for Vietnamese language acquisition and maintenance in the United States," *Journal of Southeast Asian American Education & Advancement*, vol. *2*, no. 1, pp. 1-33, 2007.

[4] D. H. Nguyen, *Vietnamese*. John Benjamins Publishing Company, 1997, doi: 10.1075/loall.9.

[5] J. Thirusanku and M. M. Yunus, "Status of English in Malaysia," *Asian Social Science,* vol. 10, no. 14, pp. 254-260, 2014, doi: 10.5539/ass.v10n14p254.

[6] P. Ardi and E. Rianita, "Leveraging gamification into EFL grammar class to boost student engagement," *Teaching English with Technology*, vol. 22, no. 2, pp. 90-114, 2022.

[7] F. Szabó and M. Kopinska, "Gamification in foreign language teaching: A conceptual introduction," *Hungarian Educational Research Journal*, vol. 13, no. 3, pp. 418-428, 2023.

[8] L. Huseinović, "The effects of gamification on student motivation and achievement in learning English as a foreign language in higher education," *MAP Education and Humanities*, vol. 4, pp. 10-36, 2024.

[9] M. Z. M. Husin and R. A. Azmuddin, "Learner Engagement in Using Kahoot! Within a University English Proficiency Course," *Educational Process: International Journal*, vol. 11, no. 2, pp. 167-180, 2022.

[10] S. Wichadee and F. Pattanapichet, "Enhancement of performance and motivation through application of digital games in an English language class," *Teaching English with Technology*, vol. 18, no. 1, pp. 77-92, 2018.

[11] E. Zarzycka-Piskorz, "Kahoot! it or not? Can games be motivating in learning grammar?" *Teaching English with Technology*, vol. 16, no. 3, pp. 17-36, 2016.

[12] L. Castillo-Cuesta, "Using digital games for enhancing EFL grammar and vocabulary in higher education," *International Journal of Emerging Technologies in Learning (iJET)*, vol. 15, no. 20, pp. 116-129, 2020.

[13] M. Dindar, L. Ren, and H. Järvenoja, "An experimental study on the effects of gamified cooperation and competition on English vocabulary learning," *British Journal of Educational Technology*, vol. 52, no. 1, pp. 142-159, 2021.

[14] H. Hashim, R. M. Rafiq, and M. Md Yunus, "Improving ESL learners' grammar with gamified-learning," *Arab World English Journal (AWEJ) Special Issue on CALL*, vol. 5, pp. 41-50, 2019, doi: 10.24093/awej/call5.4.

[15] M. Purgina, M. Mozgovoy, and J. Blake, "WordBricks: Mobile technology and visual grammar formalism for gamification of natural language grammar acquisition," *Journal of Educational Computing Research*, vol. 58, no. 1, pp. 126-159, 2020.

[16] M. Rafiqah, K. Rafid, H. Hashim, M. Yunus, and F. Nor Pazilah, "Gamified-learning to teach ESL grammar: Students' perspective," *Journal of Social Sciences and Humanities*, vol. 4, no. 18, pp. 181-186, 2019.

[17] G. M. Boden and L. Hart, "Kahoot - Game Based Student Response System," *Compass: Journal of Learning and Teaching,* vol. 11, no. 1, pp. 1-4, 2018, doi: 10.21100/compass.v11i1.668.

[18] M. H. Hamdani and D. Novita, "The Effect of Using Kahoot Application To Teach Grammar Eighth Grade Students in Junior High School," *Indonesian Journal of Cultural and Community Development*, vol. 9, 2021, Art. no. 10-21070.

[19] L. Hakulinen, T. Auvinen, and A. Korhonen, "The effect of achievement badges on students' behavior: An empirical study in a university-level computer science course," *International Journal of Emerging Technologies in Learning*, vol. 10, no. 1, pp. 18-28, 2015.

[20] B. Khalilian, H. Hosseini, and Z. Ghabanchi, "On the effect of employing the online Kahoot game-based app on Iranian EFL learners' structural ability and their motivation," *Journal of Language Teaching and Learning*, vol. 11, no. 2, pp. 42-60, 2021.

[21] M. Md Yunus and M. A. B. Azman, "Memory Stay Or Stray?: Irregular Verbs Learning Using Kahoot!" *Arab World English Journal (AWEJ) Special Issue on CALL*, vol. 5, pp. 206-219, 2019.

[22] L. T. Le, "A real game-changer in an ESL classroom? Boosting Vietnamese learner engagement with gamification," *Computer-Assisted Language Learning Electronic Journal*, vol. 21, no. 3, pp. 198-212, 2021.

[23] A. T. Pham, "University students' attitudes towards the application of Quizizz in learning English as a foreign language," *International Journal of Emerging Technologies in Learning*, vol. 17, no. 19, pp. 278-290, 2022, doi: 10.3991/ijet.v17i19.32235.

[24] E. Boyd , M. Stephens , C. Barraclough , S. Gaynor, and M. Roderick, *Activate! B1 Grammar and Vocabullary*. London: Pearson ELT Platforma, 2010.

[25] A. S. Clare and J. J. Wilson, *Pre-intermediate students' book*. London: Pearson Longman, 2011.

[26] B. Kim, "Designing gamification in the right way," *Library Technology Reports*, vol. 51, no. 2, pp. 29-35, 2015.

[27] G. Goehle, "Gamification and web-based homework," *PRIMUS: Problems, Resources, and Issues in Mathematics Undergraduate Studies*, vol. 23, no. 3, pp. 234-246, 2013.

[28] J. J. Lee and J. Hammer, "Gamification in education: what, how, why bother? Definitions and uses," *Exchange Organizational Behavior Teaching Journal*, vol. 15, no. 2, pp. 1-5, 2011.

[29] C. I. Muntean, "Raising engagement in e-learning through gamification," *Proceedings the 6th International Conference on Virtual Learning ICVL*, 2011, pp. 323-329.

[30] G. Koç and S. S. Sütçü, "The Impact of Gamification on Secondary School Students' Grammar Proficiency," *Educational Policy Analysis and Strategic Research*, vol. 18, no. 1, pp. 31-49, 2023.

[31] D. M. Brinton, "The use of media in language teaching," *Teaching English as a second or foreign language,* 3 ed., Boston, 2001, pp. 459-474.

[32] S. Hidi and A. Renninger, "The four-phase model of interest development," *Educational Psychologist*, vol. 41, no. 2, pp. 111-127, 2006.

[33] D. Oblinger, "The next generation of educational engagement," *Journal of Interactive Media in Education*, vol. 8, pp. 1-18, 2004.

[34] K. Kiili, "Digital game-based learning: Towards an experiential gaming model," *The Internet and Higher Education,* vol. 8, pp. 13-24, 2005.