

Learning by Gaming: Investigating the Effectiveness of Kahoot! on Young ESL Learners' Language Performance

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Abstract

Educators turn to game-based language education to offer immersive and interactive learning experiences that foster language acquisition. This fun and engaging mode of learning is resultant of the rapid growth of technology and the rising popularity of internet-based games. The present study investigated the effectiveness of gamification of Kahoot! to enhance grammar acquisition of young ESL learners. In a pre-experimental quantitative research setting, a purposive sample of 68 sixth-grade ESL learners is utilized, employing research instruments like pre-tests, post-tests, and questionnaires to evaluate the efficacy of gamified learning for grammar acquisition. The SPSS analysis suggests a statistically significant improvement in students' post-test scores in grammar, affirming Kahoot!'s positive impact on student motivation and engagement. This study strongly highlights gamification as a powerful strategy in enhancing language acquisition and nurturing a positive learning experience.

Keywords: gamification, Kahoot!, student motivation, learning environment, student engagement

1. Introduction

1.1 Introducing the Problem

Recent events, such as the global Covid-19 pandemic and technological advancements have led to the creation of a blended learning environment that integrates e-learning into traditional learning. Since several higher education institutions and schools were unable to participate in face-to-face instruction due to regional or global issues, few of these institutions turned to the blended learning model. A variety of learning management systems supported the learning process. Such an integration of technology helps Generation Z students to adapt to using technology for educational purposes (Hernandez-de-Menendez et al., 2020).

Relatively, a decline in using ICT (Information and Communication Technology) in teaching is perceptible when schools started functioning traditionally after the pandemic. The shift engendered new challenges in teaching English, particularly in creating an engaging and motivating classroom environment. Teacher-centred methods, time consumed in long and monotonous lecturing, and absence of technology are a few factors hindering the teaching-learning process. A need for conscious effort from educators emerged to offer an organized online learning environment that makes use of a variety of collaborative technological tools to encourage engagement, personalization, and inclusiveness (Bageshwar & Zafar, 2022; Jeyaraj, 2019).

1.2 Importance of the Problem

“Over the years, research on grammar instruction, both within English as a second language (ESL) and English as a foreign language (EFL) contexts, has criticized the decontextualized nature of grammar instruction and L2 teaching and learning” (Mansouri & Jami, 2022; Larsen-Freeman, 2015). The field of research has always flourished in developing successful grammar teaching methods for school students. However, young learners often consider grammar classes uninteresting compared to other topics and subjects. A few possible reasons are the complexity of concepts, lack of engaging teaching materials, and lack of practice and motivation (Mazlan et al., 2023). While teaching grammar involves its own set of challenges, teaching prepositions in particular can be very demanding, despite considering that they are often thought of as a basic grammatical topic.

Prepositions frequently convey abstract relationships between concepts or objects which can be difficult for young learners to understand. Several prepositions can indicate different meanings depending on the context. Discovering a one-to-one translation of some prepositions in the student's original language can be challenging because they lack direct analogues. Hence, limited translations is another main factor that makes prepositions a complex component (Abdullah et al., 2018). This may result in the misunderstanding and improper usage of prepositions. Correct usage of prepositions therefore requires frequent practice. Learners may find difficulty in internalizing prepositions if they fail to receive enough exposure to English language or opportunities to practice using them in context. Furthermore, in the absence of visual cues for prepositions like "under," "behind," or "between" that frequently suggest spatial relationships, young learners may struggle to comprehend these ideas. Therefore, visual assistance or relevant examples from everyday life too becomes integral to learning

prepositions (Annapurani & Rajappan, 2023).

A number of studies done in other countries also highlight the challenges associated with preposition acquisition. Kim (2001) explored English preposition errors among Malay students, identifying prevalent mistakes in place, time, and direction concepts. The study emphasized the crucial role of teaching methods in enhancing preposition learning. Additionally, Setyaningrum & Fatmawaty (2020) conducted a study to observe types of prepositional errors among Indonesian students. The researchers explored the four types of errors in writing preposition; omissions, additions, misformation, and misordering, and discovered that misformation constituted 44.93% of prepositional errors. Therefore, creating a supportive learning environment and boosting learners' confidence through effective teaching methods is imperative.

Despite several studies on recognizing the challenges in teaching and learning prepositions, and the distinctive attempts in proposing an appropriate teaching strategy, unfortunately, very few teacher researchers were successful in creating a supportive learning environment for young ESL learners. To address this gap, this quantitative study investigated the effect of kahoot! on young ESL learners in context with preposition acquisition. The study aims to contribute to the literature on teaching and learning prepositions by providing insights into the potential of gamification as teaching strategy to positively influence student engagement and student motivation along with improved performance in preposition acquisition.

2. Review of Literature

2.1 Gamification

The term 'gamification' refers to "an interactive process in which the application of game mechanics and elements is in a non-gaming environment" (Plass et al., 2015). To make language learning more interesting, dynamic, and entertaining for students, gamification involves integrating game aspects, mechanics, and concepts into language classes. Gamification can help students acquire grammar, vocabulary, listening comprehension, speaking, and writing, among other language skills.

Several research studies confirm the power of gamification in creating a positive learning environment. Gamification is effective with meaningful interactions through its features such as leader boards, badges, points, rankings, music, etc. The features offer a chance to win or earn something which results in increasing intrinsic motivation (Ali & Abdalgane, 2022). The presentation of complex concepts to learners in a gaming atmosphere eases the content interaction among students and provides a positive classroom space (Rojabi et al., 2022). Including gamification through computer technology results in a "better mastering of language, simultaneously allowing to tackle other educational tasks; to accelerate the process of assimilation of theoretical material, to increase the volume of completed tasks, the cognitive activity of students and to develop their creativity" (Drugov et al., 2022). Beyond doubt, games contribute majorly to the process of language learning as gamification simultaneously aids practice in the target language simultaneously allowing students to have fun. The most welcoming feature of instructional games is their flexibility across different levels of learners. (Ahmed et al., 2022)

2.2 Student Engagement and Motivation

Student engagement is defined as "the student's psychological investment in and effort directed toward learning, understanding, or mastering the knowledge, skills, or crafts that academic work is intended to promote" (Newmann, Wehlage, & Lamborn, 1992). Motivation in learning is defined by Gardner as "the learner's desires, attitudes, and efforts put forth to learn the target language" (as cited by Knell & Chi, 2012). The positive impact of gaming features on student behaviour is unimaginable. The games primarily influence learner behaviour via increasing motivation and reducing anxiety (Ali & Abdalgane, 2022). The features of gaming apps or websites, such as leader boards, points, rankings, music, etc., also have a positive connection with student engagement and motivation level during learning (Drugov et al., 2022). According to Azman & Yunus, (2019), gamification can be a useful tool since it encourages high motivation and engagement while also focusing on young learners' attention. At the same time, multiplayer games motivate students to cooperate, communicate, and plan their actions in order to achieve a common objective. By encouraging teamwork, boosting communication and social skills, and fostering pleasant connections among learners, the cooperative aspect of gamified learning can have an impact on learner behaviour (Xu et al., 2019).

2.3 Theoretical Framework

The paper bases itself on the theoretical framework of Social Constructivism. The idea of Social Constructivism is that "the source of learning and development is found in social interaction rather than solely in the mind of an individual" (Swain et al., 2012). According to Akpan et al., (2020), the theory places less emphasis on memorization of existing concepts and definitions and promotes students to construct their own definitions, meanings, and understandings based on their own inquiry. It supports teaching-learning process by providing opportunities for students to collaborate with their teachers and classmates in generating knowledge and understanding. Social Constructivist theorists acknowledge the significance of learner involvement and learning through social interactions. Learning through games frequently combines concepts like problem-solving, critical thinking, decision-making, and teamwork (Sibirian & Mahmud, 2022). Social constructivism and gamification are related because they both place a strong emphasis on active and interactive learning. Hence, theory of social constructivism supports gamification as it involves collaborative and contextualized learning, constructing meaning, along with motivation and engagement (Vasalou et al., 2017).

2.4 Kahoot!

Kahoot! is a digital learning platform based on games (Ali & Abdalgane, 2022). Due to its incredible game features, Kahoot! is growing

popular all over the world. In addition to providing a pleasing display of questions, it also stimulates learning with games and competition (Azman & Yunus, 2019). Kahoot!'s gamification of language learning benefits the teaching-learning process in “presenting new material and boosting more interactive and enjoyable learning that motivates students to participate and understand the content better”(Rojabi et al., 2022). Learners may obtain deeper comprehension through the inclusion of Kahoot! when imparting language skills (Rojabi et al., 2022; Lofti & Pratolo, 2021; Ahmed et al., 2022). However, a few minor issues that learners encounter in a game-based language learning environment that interfere with their engagement and motivation are: an unstable internet connection, lack of devices and a lack of discussion space for both students and teachers. (Bikova et al., 2023)

2.5 Research Questions

- RQ1. Is there any significant difference in young ESL learners’ test score in prepositions after Kahoot!’s intervention?
- RQ2. How does Kahoot! impact young ESL learners’ motivation in learning prepositions?
- RQ3. How does Kahoot! impact young ESL learners’ engagement in learning prepositions?

3. Method

3.1 Participants Characteristics

68 sixth-grade students from two higher secondary schools situated in Chennai, India, served as the study's sample through purposive sampling. All of the participants were between the ages of 10 and 12; 37% of them were females and 63% of them were males. 82% of the participants had the state language Tamil as their L1 and 18% were from different language backgrounds. All the participants have been learning English as a second language for more than seven years.

Table 1. Participants Characteristics

	Female	Male	L1 State Language	L1 Other Languages
School A	5	25	22	8
School B	20	18	35	3
Total (68)	25	43	57	11

3.2 Research Design

This quantitative study employed a pre-experimental design with the one-group pre-test post-test design. “A one-group pre-test post-test design includes a pre-test measure followed by a treatment and a post-test for a single group” (Creswell & Creswell, 2021).

Group A O1 ----- X-----O2 (Campbell & Stanley, 1963)

- X - Intervention
- O - Pre-test & Post-test measurements.

3.3 Data Collection Instruments

3.3.1 Pre-test and Post-test Questionnaires

Pre-test and Post-test questionnaires served as the research instrument to collect data and analyse in regard to the first research question. Three subject experts from three different institutions approved the research instrument through a one-on-one discussion. The criteria for the approval of the research instrument were appropriateness of content and learner-level competency. This ensures that the study can produce accurate results and is not based on assumptions. Both pre-test and post-test were designed with 25 items, split into two sections. The first section with the heading, ‘Choose the most appropriate prepositions’ comprised of fifteen multiple choice questions followed by the second section ‘Fill in the blanks with the most appropriate preposition’ with ten questions. Every correct answer fetched one point and every wrong answer received zero points. The maximum score for the test was 25 points and the time duration was 20 minutes.

3.3.2 Student Motivation and Student Engagement Scale

Questionnaires on student motivation and student engagement were adapted from Elthahir et al., (2021) & Rojabi et al., (2022). The measuring tools have already proven to be reliable and valid. The questionnaire has 14 items in total and each dimension (motivation & engagement) has 7 items with five-point Likert scale options. The allotment of points for the responses in categories “Strongly Agree”, “Agree”, “Neutral”, “Strongly Disagree”, “Disagree” is 5, 4, 3, 2, and 1 respectively.

3.4 Data Collection Procedure

The researcher conducted a pre-test and collected the data for assessing the entry knowledge level of students in the usage of prepositions. As the learners used this gaming app for the first time, an introductory demonstration was given followed by the necessary instruction on the conduct of the study and the distribution of printed copies of pre-test questions to students. When the researchers first created Kahoots, the majority of the testing contained visual cues. In the sessions that followed, the visual cues were eliminated to encourage the students to reflect on and respond to the questions. The participants who were in teams of four or five for the first week were in pairs for the subsequent week. Students attended Kahoot! sessions on alternate days throughout the intervention for three-weeks. Every week, the researchers modified the presenting style and managed the content. The participants participated in lively discussions both during the lecture and after the gaming session. Once everyone felt comfortable with the subject and the tool, the researchers began conducting

Kahoot! sessions in which each participant played the game on their own. This improved the game experience of every individual and positively impacted their understanding of prepositions. The surveys recorded student motivation and engagement after the post-test. The inventories received modifications in line with the participants' level of language competence. The researchers also provided simple explanations for every item, and upon request, they provided explanations in L1.

3.5 Data Analysis Methods

IBM SPSS Statistics 25 software was used to perform data analysis. Paired sample t-test was done to analyse pre-test post-test data. Data collected through questionnaires were analyzed using descriptive statistics.

4. Results and Discussion

Table 2. Paired Sample t-test

	N	Mean	Std. Deviation	Std. Error Mean	t	Sig. (2 tailed)
Pretest	68	10.68	4.090	0.496	- 14.473	0.000
Posttest	68	16.38	3.860	0.468		

RQ1: Is there any significant difference in young ESL learners' exam score in prepositions after Kahoot!'s intervention?

Table 2 displays the comparison of pre-treatment scores and post-treatment scores of prepositions. The paired sample t-test revealed a significant difference between the students' pre-test and post-test scores, with the intervention of Kahoot!, with t-value = -14.473. Results from paired sample t-test also show a substantial change in the mean scores between the pre-test (mean = 10.68, std. Deviation = 4.090) and the post-test (mean = 16.38, std. Deviation = 3.860) The difference in mean scores highlights the improvement with Kahoot! intervention. As the value of sig (2 tailed) paired sample t-test is 0.000, and is less than 0.05, it records a statistically significant difference in student performance. Hence, the results from the paired sample t-test strongly proved that Kahoot! reinforced the learning of prepositions among young ESL learners.

Table 3. Descriptive Statistics of Student Motivation

S.No.	Items	Mean	Order	Standard Deviation
1.	I like to continue the game till the end.	4.94	1	0.29
2.	I love participating in this language learning game	4.85	2	0.69
3.	I look forward to attending the English classes due to Kahoot! session	4.78	3	0.78
4.	I make an effort in winning the game by choosing the right answer	4.71	4	0.64
5.	I have a strong desire to learn English through games	4.68	5	0.74
6.	Comments on my learning in Kahoot! encourages me to learn.	4.57	6	0.99
7.	The topic may not be interesting, but the game makes my learning interesting.	4.50	7	0.97

RQ2: How does Kahoot! impact young ESL learners' motivation in learning prepositions?

Table 3 displays the descriptive statistics of seven items of student motivation. The items were ranked based on their mean value. Item 1 (I like to continue the game till the end) was ranked first in order with the mean score (4.94 ± 0.29), followed by item 2 (I love participating in this language learning game) with the 2nd highest mean score (4.85 ± 0.69). Item 7 (The topic may not be interesting, but the game makes my learning interesting) was ranked the lowest with mean score (4.50 ± 0.97). This indicates the effect of Kahoot! in motivating students to learn prepositions, which they initially considered to be an uninteresting topic. These responses highlight students' positive attitude towards Kahoot! app and language learning. The overall mean value of 7 items from the student motivation scale is 4.71 ± 0.72. The motivation to perform well in the game pushed them to listen to the lectures with better enthusiasm and encouragement. Items 3, 4, 5 and 6 also received high mean values. Hence, the overall responses emphasize Kahoot!'s positive impact on student motivation. Item 5 with mean value 4.68 directly represents the positive impact of gamification on student motivation in learning the target language. Gamification as a teaching strategy holds the power to motivate learners to make an effort in winning and also to learn the content with accuracy (item 4). Item 7 proves that most of the participants did not find prepositions to be interesting, however, kahoot! directly influenced their learning in a positive way and indirectly contributed to learning prepositions.

Table 4. Descriptive Statistics of Student Engagement

S.No.	Items	Mean	Order	Standard Deviation
1.	The Kahoot! game in learning is exciting for me	4.79	3	0.44
2.	I feel happy to take the test through Kahoot! till the end.	4.87	2	0.38
3.	While learning through gamification, I ignore distraction.	4.46	6	0.74
4.	I could focus my entire attention throughout the game.	4.88	1	0.40
5.	I am sure about the content of the topic.	4.68	4	0.53
6.	I gain confidence in writing the test well.	4.63	5	0.73
7.	I use the game to learn this second language as my teacher wants me to use it.	3.34	7	1.59

RQ3: How does Kahoot! impact young ESL learners' engagement in learning prepositions?

Table 4 displays the descriptive statistics of seven items of student engagement scale. The overall mean value of 7 items from the student engagement scale is 4.52 ± 0.68. Item 4 (I could focus my entire attention throughout the game.) was ranked first in order with the mean

score (4.88 ± 0.40). Followed by item 2 (I feel happy to take the test through Kahoot! till the end.) with the 2nd highest mean score (4.87 ± 0.38). Item 7 (I use the game to learn this second language as my teacher wants me to use it.) was ranked the lowest with mean score (3.34 ± 1.59). This indicates that pressure was absent from the teachers' side with regard to taking the test and the students themselves showed interest in the Kahoot! app. Gaming features like immediate feedback, badges etc., play a vital role in sustaining students' attention through the game (item 4). The responses mark that even when students lacked personal interest, they were happy and excited to participate as a team, along with their friends (item 2). The competitive effect and friendly interactions led to consistency in engagement.

The researchers of this study observed that the participants initially showed considerably less interest in lectures than in playing Kahoot!. From entering the game code and then deciding on a nickname for the team, Kahoot! played a major role in student bonding. Gradually the learners understood the competitiveness of the game and worked to play better as a team. This sense of team spirit encouraged interest in learning the material and applying it in the game. This also demonstrates that Kahoot! provided adequate motivation for students to actively participate and engage in the classroom. Kahoot!, a gaming platform is designed with useful features that impressively help passive learners' language learning. A few students needed extra time to fully understand the concept and do well in the game. To address this problem, the researchers extended the time frame for displaying the questions. In addition to this function, Kahoot!'s gaming elements are flexible.

The platform also offers multiple formats in presenting the questions. This enables teachers to design the ideal gaming atmosphere and give students a comfortable learning environment. It allows the student to read all of the provided options and select appropriate preposition. At the same time, all of the students are able to concentrate on giving timely responses without any stress or pressure. Every question's instant feedback contributes to enhancing concentration. This aids students in expanding on what they already know and becoming aware of other prepositions. In comparison to traditional teaching methods, Kahoot! serves as a teaching strategy that gives students greater exposure to the topic matter. Prepositions can only be taught to a certain extent in a lecture because this mode of teaching, overwhelms young learners causing them to lose interest. However, Kahoot! is able to sustain the focus of young students and provide them with better exposure without making learning material boring or overloaded. Preposition acquisition, a fundamental aspect of language proficiency, holds particular significance in linguistic development. Gamification, as explored in this study, emerges as a dynamic tool for augmenting preposition learning. By integrating game elements into educational strategies, learners engage with prepositions in context, fostering a more immersive and memorable learning experience. The interactive nature of gamification not only captures learners' attention but also provides repeated exposure to prepositions, reinforcing understanding and retention. Furthermore, the positive reinforcement inherent in gaming environments can enhance motivation and sustain learners' interest in mastering prepositions. This synergy between gamification and preposition acquisition presents a promising avenue for optimizing language education and deserves careful consideration in pedagogical approaches.

The outcomes of this study coincide with numerous studies that have revealed favourable observations on gamification and language teaching (Ariati & Iswahyuni, 2023; Pham, 2023; Tamayo et al., 2023; Firdaus et al., 2022; Siburian & Mahmud, 2022). The results of this investigation concur with the previous investigations that supported the positive effect of Kahoot! gamification on learner behaviour and learning outcome (Sinnivasagam & Hua, 2023; Ali & Abdalgane, 2022; Lofti & Pratolo, 2021; Kaur & Nadarajan, 2020; Azman & Yunus, 2019).

Similar findings of Kaur & Nadarajan (2020) study, who utilized questionnaire to collect teachers' and students' perceptions on Kahoot! supports the present study. Several teachers accepted Kahoot! as an effective platform in the area of language teaching. Their results closely aligns with the present study as almost all the students supported Kahoot! for making them actively engaged in learning. Further, the study of Azman & Yunus,(2019) that employed Kahoot! to teach irregular verbs to 35 year 3 learners, emphasized gamification's strong positive influence on memory retention.

When Firdaus et al., (2022) studied Kahoot!'s effect as an assessment tool along with other gamification platforms, their study reported Kahoot!'s positive effect on student motivation and also identified problems like students' academic dishonesty and teacher's poor computer skills. However the present study has no space for academic dishonesty because of restrictions on students to be only on the game screen till the end. As discussed earlier, unstable internet connection and inadequate devices prevented students from getting the best experience out of Kahoot!. These observations align with those of the research study by Bikova et al., (2023) as well.

This study has addressed most of the challenges in teaching prepositions, mentioned in the introductory part. Inclusion of visual cues in Kahoot! helped the researchers to teach prepositions that convey abstract relationships and lacked one-to-one translations. Correct usage of prepositions demands frequent practice, therefore the Kahoot! sessions took place without any breaks until the learners were confident about using them. As the researcher mentioned earlier, Kahoot! also offers a better exposure without causing a loss of motivation and engagement among learners. Consequently, gamification with social constructivism's backing provides the ideal setting and a fun grammar-learning experience for young ESL learners.

5. Conclusion

Considering the results of the current study, drawing the conclusion that using Kahoot! to teach prepositions can enhance the quality of learning outcomes for young ESL students is reasonable. This research study has several implications. Since Kahoot!'s adaptability creates a space for learning, practicing, and testing any concept, the study's findings inspire teachers of a wide range of subject areas to include games in their classrooms irrespective of the levels of the learners. Second, the statistical data clearly showed the effect of

gamification on learner behaviour (motivation and engagement), making this investigation a significant contribution to the field of teaching English as a second language. In this way, the employed strategy succeeded in dealing with one of the main issues that language teachers encounter in their attempt to teach grammar to young ESL learners.

The limitations regarding this study include the choice of grammatical item in the study which is exclusively preposition teaching. It is possible to conduct further studies to see how Kahoot! enhances learning of other grammatical concepts and language skills. Since the study only included sixth graders from two private schools, public and aided schools also require several such studies with various levels. Third, while the study has opted out learners with disabilities, further research studies can employ Kahoot! for teaching English to young ESL students with disabilities.

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N. Akshaya has conceptualised, collected resources, analysed, and written the original draft. B. Sivakami is the corresponding author and supervisor. She edited, reviewed, and developed the final draft. All authors read and approved the final manuscript.

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