SENNDIKA: Prosiding Seminar Nasional Pendidikan
Vol. 2, No. 2, Desember 2025, hlm. 61-70
e-ISSN: 3089-5014

Exploring Kahoot as Gamification Tool for Teaching Reading Comprehension in the Framework of the Technological Pedagogical and Content Knowledge (A Descriptive Qualitative at Privat Senior High Schools in Karawang)

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Abstract
This study explores the use of Kahoot! as a gamification tool in teaching reading comprehension within the Technological Pedagogical and Content Knowledge (TPACK) framework at private senior high schools in Karawang. The research was motivated by students' low motivation, difficulty in understanding English texts, and limited technology integration in classrooms. Using a descriptive qualitative approach, data were collected through teacher and student interviews, classroom observations, and document analysis. The findings show that Kahoot! enhances student engagement and motivation while encouraging teachers to integrate content, pedagogy, and technology knowledge synergistically. Structured use of Kahoot! in reading lessons facilitates interactive and enjoyable comprehension practice. Nevertheless, challenges such as unstable internet connections and limited device access persist. The study highlights the importance of continuous teacher training in designing TPACK-based instruction with gamified approaches to foster more contextual and effective learning experiences.
Keywords: *Kahoot; Reading Comprehension; TPACK*

Abstrak
Penelitian ini mengeksplorasi penggunaan Kahoot! sebagai alat gamifikasi dalam pembelajaran pemahaman membaca berdasarkan kerangka Technological Pedagogical and Content Knowledge (TPACK) di SMA swasta Karawang. Penelitian ini dilatarbelakangi oleh rendahnya motivasi siswa, kesulitan memahami teks berbahasa Inggris, serta terbatasnya integrasi teknologi dalam pembelajaran. Dengan pendekatan deskriptif kualitatif, data dikumpulkan melalui wawancara guru dan siswa, observasi kelas, dan analisis dokumen. Hasil penelitian menunjukkan bahwa Kahoot! meningkatkan keterlibatan dan motivasi siswa sekaligus mendorong guru untuk mengintegrasikan pengetahuan konten, pedagogi, dan teknologi secara sinergis. Penggunaan Kahoot! yang terstruktur dalam pembelajaran membaca memfasilitasi latihan pemahaman teks secara lebih interaktif dan menyenangkan. Namun demikian, tantangan seperti koneksi internet yang tidak stabil dan keterbatasan perangkat masih menjadi hambatan. Penelitian ini menekankan pentingnya pelatihan berkelanjutan bagi guru dalam merancang pembelajaran berbasis TPACK dengan pendekatan gamifikasi agar lebih kontekstual dan efektif.
Kata kunci: Kahoot; Pemahaman Membaca; TPACK

INTRODUCTION

Reading comprehension is a fundamental skill in language learning, particularly in the context of learning English as a foreign language (EFL). However, many students encounter significant challenges in mastering this skill, including limited vocabulary, lack of extensive reading practice, and difficulty analyzing different text types (Purnama, 2023). These issues often result in low motivation and disengagement, especially in traditional classroom settings where teaching methods may not fully captivate students' interests. To address this, educators have turned to the integration of technology, specifically game-based learning and gamification, as a means of revitalizing classroom engagement and promoting active learning (Nugroho et al., 2021; Rahmaniati, 2024).

Gamification defined as the use of game elements in non-game contexts has become increasingly popular in education, offering students not only enjoyment but also a more interactive and competitive learning environment. Among various gamified platforms, Kahoot! has gained global popularity as an engaging, student-response system that allows teachers to create quizzes and learning games that enhance classroom interaction (Wang & Tahir, 2020). Several studies have shown Kahoot!'s potential in improving motivation, vocabulary acquisition, and reading comprehension (Sezen & Hüseyin, 2021; Safitri, 2021; Licorish & Lotter, 2022). Yet, despite these promising findings, challenges such as limited device access, unstable internet connectivity, and repetitive use without variation remain obstacles in its effective implementation.

Moreover, the effective integration of tools like Kahoot! requires educators to possess more than just content and pedagogical knowledge it demands a sound understanding of Technological Pedagogical and Content Knowledge (TPACK). While the TPACK framework has been widely explored globally, especially among pre- and in-service teachers (Schmid et al., 2020), studies focusing on the implementation of TPACK in the Indonesian high school context, particularly in reading comprehension instruction, are still limited. This gap becomes more critical when considering Generation Z learners, whose learning preferences are closely tied to technology and interactivity (Putri, 2021; Rusmiyanto et al., 2023).

This study addresses the identified gap by exploring the integration of Kahoot! in teaching reading comprehension through the lens of the TPACK framework. Specifically, the research focuses on English teachers and students at State Senior High Schools in Karawang. The research aims to answer three core questions: (1) How do teachers prepare and utilize Kahoot! as a gamification tool within the TPACK framework? (2) What challenges and supporting factors do they face? (3) How does the use of Kahoot! affect students' reading comprehension?

The findings of this research are significant for several reasons. Theoretically, they contribute to the growing body of literature on gamification and TPACK in EFL contexts. Practically, they provide insights for educators and policymakers on how digital tools like Kahoot! can be effectively used to foster reading comprehension, particularly in Indonesian senior high schools. Moreover, the study offers recommendations for improving instructional practices and overcoming implementation barriers.

The scope of this study is limited to English reading comprehension in eleventh-grade classes at selected State Senior High Schools in Karawang. It focuses on the pedagogical strategies of teachers, the technological aspects of using Kahoot!, and students' learning experiences and outcomes. Limitations of the study include potential variability in internet access, device availability, and the generalizability of findings beyond the specific context. Nonetheless, this research offers a comprehensive exploration of how gamification, mediated through the TPACK framework, can transform reading instruction in EFL classrooms.

METHOD

This study applied a descriptive qualitative approach to explore the integration of Kahoot! as a gamification tool in teaching reading comprehension within the Technological Pedagogical and Content Knowledge (TPACK) framework. The qualitative method was chosen to gain an in-depth and contextual understanding of teacher preparation and practice, student engagement, and the challenges and support factors involved in using Kahoot! in the classroom. In line with Creswell (2014) and Yin (2011), this approach allows the researcher to collect non-numerical data directly from natural settings, presenting it in rich, descriptive narratives.

The research was conducted in two private senior high schools located in Karawang, West Java, namely SMA BM (S1) and SMA BU (S2). These schools were purposefully selected because they both implement the Kurikulum Merdeka and are designated as Sekolah Penggerak, making them relevant for investigating how innovation and technology are embedded in teaching. Additionally, their affiliation with Islamic boarding schools introduces unique institutional policies, such as the prohibition of student smartphone use, which affects how digital tools like Kahoot! are utilized.

The participants consisted of four English teachers and four eleventh-grade students. The teachers held at least a bachelor's degree in English Education and had a minimum of one year of teaching experience, as well as practical experience using Kahoot! in their instructional practices. The students, selected from different Grade XI classes, had participated in English reading comprehension lessons that utilized Kahoot!. Participants were chosen using purposive sampling to ensure their experiences were directly relevant to the research objectives.

The data collection followed four major stages. First, a preliminary study was conducted through literature reviews, informal discussions, and curriculum analysis to formulate the research focus. Second, classroom observations were carried out to gather firsthand data on how Kahoot! was implemented in reading classes, including teacher strategies, student interactions, and challenges encountered. Third, structured interviews were conducted with teachers and students to gain deeper insights into their experiences, perspectives, and perceptions regarding the use of Kahoot. Fourth, the researcher conducted data analysis, synthesizing findings through thematic coding and interpretation.

Three main instruments were used: observation sheets, interview protocols, and document review checklists. The observation sheet was developed based on 13

indicators grounded in the TPACK framework and reading comprehension principles, including teachers' use of Kahoot! features, instructional strategies, content alignment, and student engagement. The structured interview guide was designed to explore each component of TPACK as applied in classroom practice and included questions for both teachers and students regarding the impact of Kahoot! on reading comprehension. The documentation checklist was used to analyze lesson plans, teaching materials, and reading assessments that reflected the integration of technology in instruction.

The data were collected over a span of three months (March–May 2025). Classroom observations took place during regular lessons, while interviews were conducted both in person (for students) and via WhatsApp (for teachers) to accommodate participant availability. Supplementary documents such as RPPs (lesson plans), reading tests, screenshots of Kahoot! quizzes, and teaching videos were also collected and analyzed to strengthen the study's validity through triangulation.

Data were analyzed using the interactive model of Miles, Huberman, and Saldana (2014), which includes three key components: data condensation, data display, and conclusion drawing/verification. During data condensation, relevant information from transcripts, field notes, and documents was coded and categorized based on emerging themes such as teacher preparation, student motivation, and technological integration. The condensed data were then displayed in narrative form to allow for clear interpretation. Finally, conclusions were drawn through iterative analysis and verified by cross-checking data from multiple sources.

To ensure the validity and trustworthiness of the findings, the study employed Lincoln and Guba's (1985) criteria, including credibility, transferability, dependability, and confirmability. Credibility was maintained through triangulation, member checking, and prolonged engagement in the field. Transferability was addressed by providing thick descriptions of the context, participants, and instructional setting. Dependability was ensured through detailed documentation of procedures, while confirmability was achieved through reflective journaling and transparent data analysis.

RESULTS AND DISCUSSION

A. Integration of Kahoot within the TPACK Framework

1. Technological Knowledge (TK)

The findings reveal that teachers demonstrated a wide range of familiarity with Kahoot features, from basic multiple-choice quizzes to advanced tools such as type-answer, puzzle, and audio integration. Teacher T1, for example, employed type-answer and audio features to check deeper comprehension, while T2 and T4 utilized timers and visual aids to promote reading fluency. By contrast, T3 preferred the basic quiz mode, reflecting a more simplified but still effective use of the platform. Observation results (see Table 1) indicate that 83.3% of the teachers aligned their use of Kahoot features with pedagogical goals, demonstrating that technology was not merely operated but adapted to classroom contexts.

This result supports Mishra and Koehler's (2006) concept of technological knowledge, where teachers are not only capable of using technological tools but also able to integrate them flexibly to optimize learning. Previous studies by Wang and Tahir (2020) also confirm that the interactive features of Kahoot enhance student engagement when applied intentionally. In this study, teachers showed growing technological fluency, though the depth of utilization varied, reflecting both opportunities and constraints in real classroom settings.

Tabel 1 Observation Result on TK Component

Item	Description	Yes (%)	Teachers
2	Teacher utilizes Kahoot features (quiz, timer, leaderboard)	83.3%	T1, T2, T3, T4
7	Kahoot features align with pedagogy	83.3%	T1, T2, T3, T4
10	TPACK components integrated harmoniously	83.3%	T1, T2, T3, T4

2. Pedagogical Knowledge (PK)

Pedagogical strategies were consistently integrated with the use of Kahoot. Teachers employed classroom management techniques such as assigning roles, sharing devices among students, and allowing reflective pauses after certain quiz rounds. For example, T1 set clear classroom rules, while T3 included pauses for feedback and reflection, and T4 emphasized participatory monitoring during games. The observation data (Table 2) show that 100% of teachers successfully aligned their reading strategies to student levels and maintained engagement throughout the lessons.

These findings highlight the significance of Shulman's (1987) pedagogical knowledge framework, which underscores the teacher's ability to design and manage learning activities meaningfully. In this context, Kahoot was not used solely as an entertainment tool but was embedded in structured pedagogy that supported reading comprehension. This aligns with Safitri's (2021) findings that Kahoot can foster interactive learning when combined with strong pedagogical design.

Tabel 2 Observation Result on PK Component

Item	Description	Yes (%)	Teachers
3	Reading strategies aligned to student level	100%	All
4	Teacher maintains classroom engagement	100%	All

3. Content Knowledge (CK)

Teachers demonstrated careful adaptation of content to ensure that quiz items reflected reading comprehension objectives. T1 and T4 designed questions that required both literal understanding and inferential thinking, while T2 adjusted

question difficulty depending on the text's topic and complexity. Observation confirmed that in 83.3% of the sessions, quiz content matched the intended reading goals (Table 3).

This reflects the central role of content knowledge (CK) in ensuring that gamification activities serve instructional purposes. Rather than treating Kahoot as a stand-alone activity, teachers integrated it with the targeted skills of reading comprehension, such as identifying main ideas, making inferences, and understanding vocabulary in context. These findings reinforce Brown's (2020) argument that content relevance is essential in reading instruction and affirm Nuttall's emphasis on matching text difficulty with learners' proficiency levels.

Tabel 3 Observation Result on CK Component

Item	Description	Yes (%)	Teachers
6	Texts align with student levels	83.3%	T1, T2, T4
8	Quiz content matches reading goals	83.3%	T1, T2, T3, T4

B. Challenges and Supporting Factors

1. Supporting Factors

The effective use of Kahoot was facilitated by several supporting elements. Teachers' classroom management strategies, such as setting rules and roles, device-sharing practices, and adaptive pacing, contributed to a smooth integration of Kahoot into lessons. Students reported increased motivation when exposed to features like leaderboards and instant feedback, which transformed reading practice into a competitive yet enjoyable activity. These supporting factors enabled teachers to harmonize the elements of TPACK in real classroom practice.

This finding is consistent with Deterding et al. (2011), who emphasize the motivational value of gamification in educational contexts. Similarly, Licorish and Lötter (2022) found that the leaderboard and feedback elements in Kahoot significantly enhanced classroom dynamics and student engagement.

2. Implementation Challenges

Despite these strengths, teachers faced several challenges in implementing Kahoot. Time constraints often forced them to shorten activities, limiting the depth of discussions. Some teachers admitted to underutilizing advanced features of Kahoot, sticking mainly to basic quiz modes. Moreover, lesson plans sometimes lacked explicit integration of Kahoot activities, which reduced their pedagogical alignment. Technical issues such as unstable internet connections and limited access to devices also hindered implementation.

These challenges mirror those found in Safitri (2021), who identified similar technical and time-related obstacles. Additionally, research by Yu (2021) highlights the risk of student disengagement when gamified tools are used repetitively without variation. In this study, while teachers demonstrated competence in applying TPACK, institutional and temporal barriers limited the full potential of Kahoot integration.

Tabel 4 observation Summary on TPACK Alignment

Item	Description	Yes (%)	Sessions
10	TPACK integration visible	83.3%	5 of 6
8	Quiz aligns with objectives	83.3%	5 of 6

C. Impact of Kahoot on Students' Reading Comprehension

1. Cognitive Impact

The use of Kahoot supported students' practice of essential reading strategies such as skimming, scanning, identifying main ideas, and making inferences. Observations showed that students achieved higher accuracy rates in their answers and demonstrated stronger recall during post-quiz discussions. Teachers also reported improved reading fluency when students practiced comprehension under timed conditions.

These findings align with Aprilia et al. (2023), who found that Kahoot improved students' comprehension of narrative texts, and with Sezen and Hüseyin (2021), who observed that gamification enhanced students' understanding of text structures.

2. Affective-Motivational Impact

Students expressed higher enthusiasm for reading lessons conducted with Kahoot. Teachers noted that even quiet students actively participated when the activity took the form of a game. One student commented that using Kahoot made reading "feel less stressful and more fun," reflecting a positive shift in affective engagement.
This aligns with Wang and Tahir (2020), who argue that Kahoot fosters motivation by combining competition with learning, and supports Purnama et al. (2023), who found that students perceived Kahoot as a motivating factor in reading comprehension.

3. Metacognitive Impact

The instant feedback feature of Kahoot allowed students to reflect on their mistakes and engage in self-correction. Teachers observed that students became more aware of their comprehension processes and more willing to reflect on why certain answers were incorrect. This metacognitive element is crucial for developing independent reading skills.

These results resonate with Cartwright (2023), who highlights the role of metacognitive strategies in improving reading comprehension outcomes. Kahoot provided a practical platform for such reflection, embedding metacognitive practice in real-time.

4. Knowledge Retention

Another notable effect was the improvement of knowledge retention. Teachers reported that students were able to recall vocabulary and text structures in subsequent lessons, suggesting that Kahoot supported long-term memory. This echoes Setiawan (2020) and Marsa et al. (2021), who found that gamification-based instruction improved both short- and long-term learning retention among students.

Tabel 5 Observation Result on Student Outcomes

Item	Description	Yes (%)	Teachers
11	Strong comprehension shown	83.3%	T1, T2, T4
12	Students engaged and motivated	83.3%	T1, T2, T3, T4
13	Kahoot effective for assessment	83.3%	T1, T2, T3, T4

The results confirm and extend the literature on TPACK and gamification (Mishra & Koehler, 2006; Deterding et al., 2011), showing that Kahoot, when strategically implemented, enhances engagement and comprehension. This study adds depth by illustrating how TPACK operates under real-world constraints, emphasizing the need for supportive infrastructure and teacher training. The findings validate that technology alone is insufficient; it is the thoughtful pedagogical application that transforms it into a meaningful learning tool.

D. Synthesis with Literature and Contribution of Study

The overall findings of this study confirm and extend previous literature on TPACK and gamification. Consistent with Mishra and Koehler's (2006) framework, teachers demonstrated that meaningful technology integration requires not only technical skills but also pedagogical alignment and content adaptation. Kahoot proved effective in enhancing student engagement and comprehension, echoing global findings (Wang & Tahir, 2020; Deterding et al., 2011), while adding new insights from the Indonesian senior high school context.

The contribution of this study lies in illustrating how TPACK operates under real-world constraints, particularly in private boarding schools where smartphone use is restricted, internet access is uneven, and lesson time is limited. Despite these challenges, teachers were able to strategically adapt Kahoot to foster reading comprehension. This suggests that gamification tools, when implemented intentionally within the TPACK framework, can transform traditional reading lessons into interactive, reflective, and skill-oriented learning experiences.

CONCLUSIONS

This study investigated the integration of Kahoot as a gamification tool in teaching reading comprehension within the TPACK framework at State Senior High Schools in Karawang. The findings reveal that English teachers were able to strategically blend technological, pedagogical, and content knowledge to enhance reading instruction through Kahoot. Teachers utilized Kahoot's interactive features not merely for engagement, but to reinforce reading sub-skills, such as identifying main ideas, making inferences, and improving vocabulary acquisition. Most demonstrated an intentional and adaptive use of the platform that aligned with

instructional goals, although variations in depth and planning were evident across sessions.

The study also identified both supporting factors and challenges in implementing Kahoot. Successful integration was facilitated by strong classroom management, content-adaptive question design, and the strategic use of feedback. Conversely, time constraints, limited use of advanced features, and inconsistencies in lesson planning limited the full potential of TPACK-aligned integration.

From the students' perspective, Kahoot contributed to multidimensional learning outcomes. Cognitively, it supported the practice of essential reading strategies. Affectively, it fostered motivation, attention, and active participation. Metacognitively, the platform's instant feedback enabled self-assessment and reflection, encouraging deeper comprehension and learning autonomy.

Despite its contributions, the study is limited by its qualitative scope and localized context. The findings may not be generalizable across different educational settings. Future research is encouraged to expand the study with quantitative, longitudinal, or comparative designs, explore other digital tools beyond Kahoot, and investigate teacher development in integrating gamified instruction in diverse contexts.

In summary, this study underscores the potential of integrating gamified tools like Kahoot within the TPACK framework to create a more engaging, reflective, and skill-oriented approach to reading instruction. When implemented intentionally, such tools can transform traditional reading lessons into interactive experiences that promote both comprehension and student agency.

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