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The influence of Kahoot-based TBLT in improving the critical reading skills in higher education

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Abstract: This study aimed to assess the effectiveness of Task-based language Teaching (TBLT) approach through Kahoot in improving EFL students' critical reading skills. The study used a quasi-experimental method with a pre-experiment design involving a pre and post-test for one group. The research was conducted with 70 students (15 males and 65 females) from the Department of English Education at a Private University in Indonesia. The Kahoot-based TBLT approach was used to assess students' critical reading skills. The data were analyzed utilizing paired t-tests and N-gain to determine the effectiveness. The result showed a significant improvement in critical reading skills from the pre-test to the post-test after using the Kahoot-based TBLT model. the findings indicate that the Kahoot-based TBLT model is a successful approach in improving students' critical reading skills. Therefore, it can be concluded that Kahoot-based TBLT is effective in improving EFL students' critical skill. Future research recommends the usage of Kahoot-based TBLT by educators to increase academic success in English language learning for higher education students.

Keywords: *Higher education, Kahoot, critical reading, Task-based teaching.*

1. Introduction

The 21st century demands high-quality, globally competitive human resources [1]–[3]. A characteristic of high-quality human resources in the 21st century is the ability to manage, use, and develop thinking skills. Critical thinking is one of the skills demanded in the 21st century [4]–[6]. Critical thinking is an essential skill that helps students evaluate the evidence, assumptions, logic, and language that form the foundation of other people's ideas. Using a systematic process, students can develop the ability to analyze and understand various perspectives and arguments, enabling them to make informed decisions and form their opinions based on sound reasoning [7], [8]. Critical thinking skills more specifically direct individuals to have the ability to solve problems logically and accurately. This is in line with Aranguiz's [9], that critical thinking is a reasoning and reflective activity that emphasizes decision-making based on what should be believed and done. Critical thinking is important for students to develop because it helps them analyze and evaluate information [10], [11]. This can encourage problem-solving, which can be beneficial in many areas of life.

In language learning, critical thinking skills can be integrated into essential reading [12]. Critical reading is crucial for higher education students as it allows them to critically evaluate and analyze information, arguments, and sources [13]. Several studies have shown the importance of critical reading for English as a Foreign Language (EFL) students in higher education. A study conducted by Chen [14] states that critical reading skills are important for EFL students in higher education as they can help improve their language proficiency and academic success. This study also highlighted the need for EFL teachers to incorporate critical reading activities and tasks in their lessons to help students develop these skills.

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One effort to improve students' critical reading ability was to integrate the TBLT model into the learning process [15], [16]. TBLT is claimed to be a suitable learning model for English language learning in higher education [17], [18]. In many countries, particularly in China, the TBLT model is widely implemented in English language learning [19], [20]. Some schools in Asia have policies to encourage teachers and institutions to use TBLT in their curricula [21], [22]. Specifically, Nunan [22] emphasized the significance of Task-Based Language Teaching (TBLT) based on curriculum and syllabus guidelines in Asia-Pacific countries such as Japan, Vietnam, China, Korea, and Malaysia. For example, China's Ministry of Education issued a guidance document called Guidelines on College English Teaching (CET), which mandates the adoption of a task-based teaching approach in some Chinese universities. This approach prioritizes activities that simulate real-life situations, providing students with opportunities to apply and practice their language skills in a meaningful context. By incorporating TBLT into language teaching practices, educators can enhance students' communication abilities, promote creativity, and develop critical thinking skills [23].

Task-Based Language Teaching can be integrated with technology through educational games [24]–[26]. One educational game that can be used to support collaborative and discovery learning is Kahoot [27], [28]. Kahoot is a free game-based learning platform that can be played by all students in the class [29]. Kahoot can improve student engagement and learning through quiz-based learning [30], particularly in English language learning [31]. Kahoot provides a conversational platform, allowing users to create questionnaires, and make online quizzes to enhance student participation in learning [32], [33]. The educational game Kahoot can be played synchronously during live class and asynchronously as an assignment.

The use of technology in language education has rapidly evolved in recent years [34], and an innovative approach is the integration of TBLT with interactive learning tools such as Kahoot [35]. Historically, Kahoot is the result of the Quiz Lecture project that began at the Norwegian University of Science and Technology in 2006 [36]. Ebadi et al. [29] reported that Kahoot effectively improves students' understanding and conceptual learning and positively affects their confidence. Wang and Tahir [37] further reported that students who used Kahoot learned more and were more motivated than students who took paper-based quizzes. Similarly, Chaiyo and Nokham [38] found that Kahoot supports learning and improves student concentration, engagement, and motivation. Likewise, Licorish et al. [39] showed that most students believed that learning using Kahoot was more effective and enjoyable than traditional methods. In other words, game-based learning such as Kahoot, is an effective learning tool because it uses a graphical and audio user interface that attracts students' attention and participation [40].

Referring to the explanation, no research has investigated the impact of Kahoot on the critical reading abilities of university students in English language teaching. Because Kahoot is a relatively new web-based digital learning game, empirical studies on student perceptions of its use in the classroom are still limited. To address this gap, the present study surveyed university students who used Kahoot for English language learning, specifically focusing on critical reading skills. The survey analyzed student perceptions based on various factors, such as gender, college, and academic year. This study aims to assess the students' effectiveness of critical reading skills through Kahoot-based TBLT.

2. Materials and Methods

2.1. Research Sesign

This study was conducted during the academic year 2022/2023, specifically in January-February 2023. It utilized a quasi-experimental method with a one-group pretest-posttest design, meaning that there was no control group. The main objective of this research was to assess the effect of the Kahoot-based Task-Based Language Teaching (TBLT) model in improving students' critical reading skills in English language teaching. All participants were given a pre-test to assess their critical reading skills, then given the treatment in the form of Kahoot-based TBLT

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three times in four weeks (12 sessions). Afterward, a post-test was conducted to determine their critical reading skills.

2.2. Participants

This study used convenience sampling as the sampling technique, which involved selecting participants based on their availability and accessibility at a suitable place and time. The study included 70 participants (15 males and 55 females) between the ages of 17-19 years, all of whom were students in the English Education Department at a private university in Indonesia. They have programmed reading I subject as the compulsory course in their first year. The course was instructed by a male lecturer with over ten years of teaching experience who held an M.Ed degree in English Language Education from a local university.

2.3. Data Collection Instrument

The text used in this study was news text, and the adapted instrument was derived from Elhfni et al. [41] and Suell et al. [42], as presented in Table 1. The subscale indicators were developed using operational definitions based on Bloom's Taxonomy. As such, the assessment instrument considers the critical reading ability of college students through the statement points. The developed instrument included 23 items, which could be completed within 40 minutes.

Table 1.
Critical reading assessment instrument.

Subscales	Indicators of critical reading	Aspects observed
Analyzing skill	• Discrimination • Bias detection • Source validation	• Skill to distinguish between fact and opinion
Evaluating skill	• Validity and relevance assessment • Comparative verification • Critical conclusion making	• Skill to identify bias in the text.
Synthesis skill	• Integration • Reflection • Creativity	• Skill to determine the validity of the text

Table 1 shows the instrument validated to assess students' critical reading abilities through SPSS 20. The research results indicate that 20 items are within the valid criteria, as is shown in Table 2.

Table 2.
Validity of the critical reading instrument.

Item	Pearson correlation	Sig. (2-tailed)	Category
1	0.681	0.001	Valid
2	0.746	0.001	Valid
3	0.551	0.003	Valid
4	0.876	0.001	Valid
5	0.516	0.002	Valid
6	0.653	0.001	Valid
7	0.544	0.002	Valid
8	0.521	0.002	Valid
9	0.683	0.001	Valid

10	0.746	0.001	Valid
11	0.552	0.003	Valid
12	0.652	0.001	Valid
13	0.865	0.001	Valid
14	0.483	0.002	Valid
15	0.563	0.000	Valid
16	0.551	0.002	Valid
17	0.563	0.001	Valid
18	0.566	0.002	Valid
19	0.553	0.004	Valid
20	0.541	0.002	Valid
21	0.552	0.001	Valid
22	0.583	0.000	Valid
23	0.621	0.000	Valid

Table 2 shows that the critical reading test used in the study had a Cronbach's alpha coefficient of 0.80 indicating valid criteria. Table 3 provides Instrument Reliability for Critical Reading.

Table 3.
Instrument reliability for critical reading.

Cronbach's alpha	N of items	Remark
0.80	23	The instrument used is reliable for critical reading

2.4. Procedure

The treatment was conducted for eight meetings (8 x 100 minutes = 800 minutes), consisting of two meetings for pre-test and post-test and six meetings for learning news through critical reading using Task-Based Learning based on Kahoot. The implementation of Kahoot-based TBLT followed these steps as the following:

1. Set learning objectives: Determine the objectives of the lesson, such as improving students' critical reading skills and comprehension of English texts.
2. Plan tasks: Develop engaging critical reading tasks for students, such as analyzing scientific or opinion texts related to their studies.
3. Teach language prerequisites: Identify and teach the language skills necessary for reading texts, such as vocabulary and text structures, and introduce critical reading theories.
4. Implement tasks: Assign critical reading tasks to students and provide opportunities for them to complete, collaborate, and discuss. Students can also present their analysis results.
5. Please provide feedback on how students performed in the critical reading tasks and help them improve their necessary reading abilities.
6. Evaluate: Assess the results of integrated Kahoot tasks and students' critical reading abilities to ensure they meet the learning objectives. Here's an example of an evaluation integrated with Kahoot.

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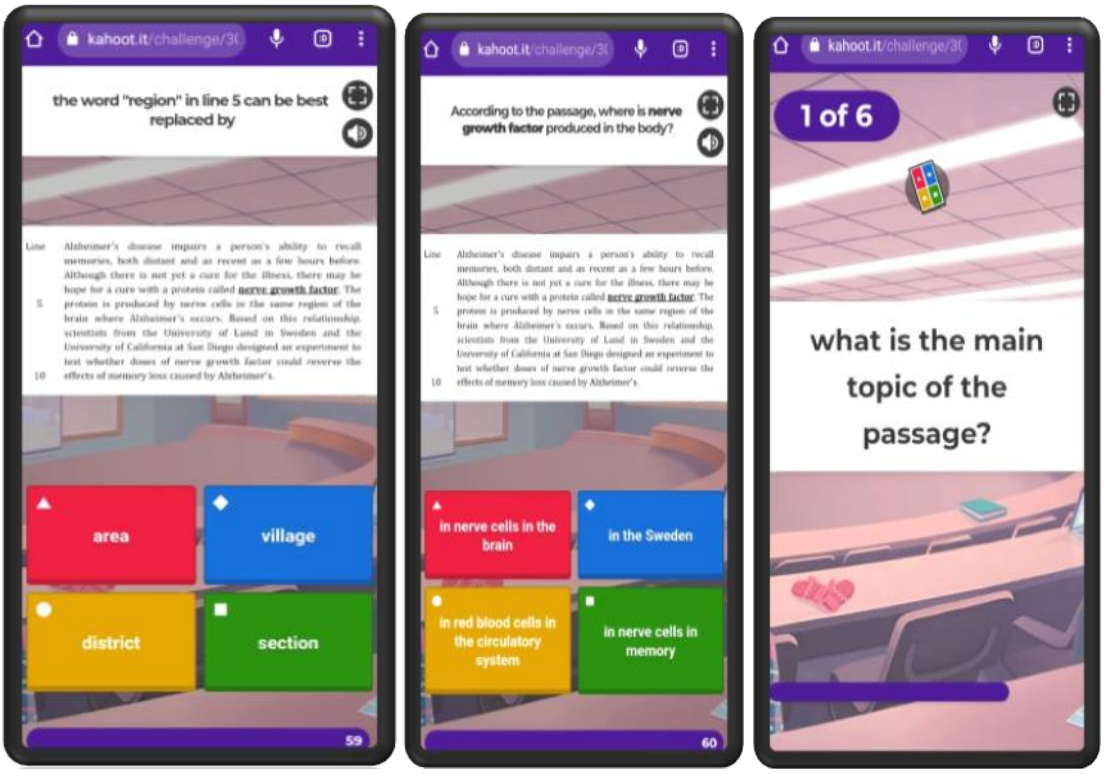

Figure 1.
The screenshot of Kahoot. it is on critical reading.

Figure 1 shows questions on critical reading that students have done using their smartphones. Here students were given 60 seconds to complete each question. Thus, they focused on strategies for answering the critical reading questions. The firs screenshots asks for a synonym for "region" to test vocabulary and contextual understanding; the second queries the location of nerve growth factor production in the body to assess comprehension of specific details; and the third focuses on identifying the main topic of the passage to gauge students' grasp of the overall message, reinforcing essential skills in critical reading.

2.5. Data Analysis

The data were analyzed using prerequisite tests, namely the normality test to determine whether the distribution of the data to be analyzed was normally distributed and the homogeneity test to test the equality of the population variances that were normally distributed. Based on the analysis results using the Kolmogorov-Smirnov Test, the significant value ($p = 0.099$) > 0.05, meaning that the data were normally distributed, while the homogeneity test used the Levene test with a significant value (hal = 0.328) > 0.05 meaning that the data are homogeneous. There was a difference in the mean score from the pre-test to the post-test using a paired t-test, while the N-gain test measured how much the critical reading score increased before and after the intervention (Table 4). The calculation results obtained the value of <g>, which is then interpreted into three categories, namely <g>:.

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Table 4.
Gain value classification.

Average gain	Criteria
$0.00 < g \leq 0.30$	Low
$0.30 < g \leq 0.70$	Medium
$0.70 < g \leq 1.00$	High

3. Result and Discussion

In this section, results of the paired t-test analysis conducted to compare the pre-test and post-test scores are presented to highlight the difference between the two sets of scores. The findings indicate a statistically significant difference between the two scores, supporting the post-test scores ($t = 14.149$; $p = 0.000$). The detailed Paired t-test results for critical reading ability are presented in Table 5."

Table 5.
Paired t-test results for critical reading ability.

Scale		Mean	SD	T calc.	Prob.
Analyzing skill	Pretest	27.84	3.029	14.380	0.000
	Posttest	33.53	1.491		
Evaluating skill	Pretest	28.79	3.288	12.771	0.000
	Posttest	33.76	1.388		
Synthesis skill	Pretest	28.84	2.942	12.299	0.000
	Posttest	33.53	1.491		
All subscales	Pretest	85.47	8.646	14.149	0.000
	Posttest	100.81	4.112		

Table 5 shows that the Kahoot-based TBLT model significantly improves students' critical reading skills in English language learning at the university level. Students can think more critically through the Kahoot-based TBLT model. The students' self-learning motivation is directly enhanced because the TBLT model includes steps to be taken during the classroom learning process. The learning evaluation has stimulated students' enthusiasm due to the attractive Kahoot interface.

Table 5 shows the results that demonstrate that the Kahoot-based TBLT model significantly improves students' critical reading skills in English language learning at higher education levels. Specifically, the model can improve students' critical thinking skills, self-learning motivation, and enthusiasm for the learning process because the TBLT model includes steps to be taken during the classroom learning process. In contrast, Chen & Cheng [43] and Nguyen [44] reported less success with traditional classroom-based teaching methods. Kahoot platform provides an interactive and stimulating learning environment, which has been shown to enhance students' motivation and engagement with the material. Thus, the Kahoot-based TBLT model may represent a promising approach to improving students' English language skills.

In TBLT-based Kahoot learning, teachers provide various learning materials and assign tasks to students to encourage interaction and collaboration in the learning process [45]. In addition, providing activities to students can increase their interest and interaction both inside and outside the classroom [46], [47]. Research shows that using TBLT in the learning process can also increase student engagement in active learning [48]–[50]. Previous research showed that using the TBLT model could enhance students' creativity in learning Stoichiometry [51]. Furthermore, physics learning using TBLT could also improve students' creativity skills and critical thinking at the Science College in Malaysia [52]. Moreover, students' creativity skills can also be obtained through a blended learning approach using TBLT. Additionally, Yustina et al. [53] also stated that the critical thinking

skills of pre-service teachers can be enhanced using this method.

The results aligned with previous research conducted by Kassymova [54], technology-based learning provides students with opportunities to solve problems independently or in groups. Additionally, Wang [36], technology could enhance student motivation by providing engaging learning experiences that lead to improved learning outcomes. However, when choosing technology for game-based learning materials, instructors must consider that the digital game must be aligned with the learning material and objectives [55]. Kahoot allows users to choose from various alternatives to achieve specific learning objectives, making it a useful learning tool. Kolb [56] stated that constructivist learning theory and sociocultural cognitive development theory emphasize individual and situational experiences in learning. In addition, Figley et al. [55] and Hu et al. [57], digital game technology allows teachers to track student progress over time due to the long-term connections and gameplay. Therefore, digital games should be aligned with the content and learning objectives to be effective at the university level.

3.1. Improving Critical Reading Towards the Ability to Analyze

To evaluate the improvement in students' critical reading skills in each subscale, a paired t-test and N-gain score analysis were performed. The specific results of this analysis are presented in Tables 6 and 8. These tables show detailed information on the improvements observed in each subscale of critical reading to assess the effectiveness of the Kahoot-based TBLT model in improving students' skills in specific areas such as vocabulary, comprehension, and inference. The use of statistical tests such as the paired t-test and N-gain score analysis provides an objective method for evaluating the effectiveness of educational interventions to draw reliable conclusions about the effect of the Kahoot-based TBLT model on students' critical reading abilities.

Table 6.
Critical reading on the ability to analyze.

Analyzing skills	Paired differences		T calc.	df	P	G
	Mean	SD				
Discrimination	1.914	1.412	11.346	69	0.000	0.68
Bias detection	1.986	1.450	11.461	69	0.000	0.75
Source validation	1.786	1.392	10.730	69	0.000	0.66
All subscales	5.686	3.308	14.380	69	0.000	0.70

Note: Remarks: T = T calculated, dF = Degree of Freedom, P = Probability, and G = gain

Table 6 shows that the ability to analyze from the discrimination indicator is at an N-gain score of 0.68, the bias detection indicator at an N-gain score of 0.75, and the source validation indicator at an N-gain score of 0.66, all falling in the moderate category. The research results indicate that students' analytical skills in critical reading have improved after being taught using Kahoot-based TBLT. According to Riyanti et al. [58], analytical skills in critical reading fall into category C4 in Bloom's Taxonomy. Furthermore, according to Park [59], the ability to analyze reading content is critical and aligns with the cognitive domain. Aligning Nychkalo's [60] research suggested that the steps included in the TBLT model could enhance students' analytical abilities.

3.2. Improving Critical Reading on the Ability to Evaluate

Table 7 shows that the ability to evaluate from the validity and relevance assessment indicator is at an N-gain score of 0.72, while the comparative verification indicator is at an N-gain score of 0.66. The critical conclusion-making indicator is at an N-gain score of 0.68, falling into the moderate category. The study's results suggested that the ability to evaluate critical reading can be enhanced using TBLT based on Kahoot.

Table 7 shows detailed data on the N-gain scores for each critical reading indicator used in our

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study. Specifically, the results show that the evaluation skill from the validity and relevance assessment indicator improved significantly, with an N-gain score of 0.38. Similarly, the comparative verification indicator also demonstrated significant improvement, with an N-gain score of 0.40. The critical conclusion-making indicator showed the most improvement, with an N-gain score of 0.50 in the moderate category. The results showed that Kahoot-based TBLT had the potential to significantly improve students' critical reading, which could have important implications for their academic and professional success.

Table 7.
Critical reading on evaluating skill.

Evaluating skill	Paired differences		T	df	P	G
	Mean	SD				
Validity and relevance assessment	1.743	1.270	11.478	69	0.000	0.72
Comparative verification	1.786	1.392	10.730	69	0.000	0.66
Critical conclusion making	1.443	1.421	8.497	69	0.000	0.68
All subscales	4.971	3.257	12.771	69	0.000	0.69

Table 7 shows evaluation skill in critical reading refers to a student's comprehension level in assessing the accuracy and truthfulness of acquired information [61]. A study conducted by Sole & Anggraini [62], students' critical reading is categorized in higher-level thinking ability in Bloom's Taxonomy. Students are prompted to evaluate information, whether it's relevant or irrelevant concerning their understanding of the reading material. Throughout this process, students repeatedly assess whether the text aligns with their comprehension. Additionally, evaluating critical reading skills is linked to a student's ability to analyze errors in language elements [63].

In the learning process, Kahoot-based TBLT plays a significant role as a model that teachers must follow during instruction. One of the roles teachers must fulfill in implementing TBLT in the classroom is skill to investigate, select, and create tasks that cater to the needs and interests of students in learning English [64]. Another advantage of Kahoot during evaluation in the TBLT model is training students to assess their abilities through tests on their mobile phones [65]. The engaging and interactive nature of the Kahoot-based TBLT model made it desirable for teaching critical reading skills. The use of Kahoot's platform allowed for a more dynamic and fun learning experience, which could improve students' motivation and engagement in the learning process. Additionally, using Kahoot-based TBLT can transform the less dominant role of teachers in the learning process into a more interactive one. Another benefit of Kahoot-based TBLT is that it can accommodate various students' learning speeds [66]. Students with a higher learning speed will complete Kahoot quizzes more quickly or understand the content more easily.

3.3. Improving Critical Reading Skills in Synthesis Ability

Table 8 shows that Kahoot-based TBLT effectively improves critical reading skills and synthesis ability. Specifically, the synthesis ability aspect in the integration indicators scored an N-gain of 0.63, while the reflection and creativity indicators scored N-gains of 0.72 and 0.61, respectively. All these scores fall into the moderate category, indicating that the TBLT model significantly impacts students' critical reading synthesis ability. The ability to synthesize information is crucial for success in many fields, as it requires bringing together diverse pieces of information to form a coherent whole. The TBLT model based on Kahoot provides students with a framework for developing this skill, emphasizing the importance of collaboration and critical thinking in the learning process.

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Table 8.
Critical reading on synthesis skill.

Synthesis skill	Paired differences		T	df	P	G
	Mean	SD				
Integration	1.514	1.530	8.282	69	0.000	0.63
Reflection	1.757	1.268	11.598	69	0.000	0.72
Creativity	1.414	1.479	7.999	69	0.000	0.61
All subscales	4.686	3.188	12.299	69	0.000	0.65

Table 8 shows the ability to synthesize critical reading by combining information and ideas from various sources to create a new picture or concept [67], [68]. In critical reading, synthesis helps individuals integrate various views and arguments presented in the text to construct a more comprehensive and holistic interpretation or understanding [69]. Synthesis enables individuals to make connections between ideas [70], identify reading patterns [71], and make useful generalizations to comprehend the meaning of the text more deeply and thoroughly [72].

Consistent with the findings of Hasan [73] and Calvert et al. [74], TBLT can improve student learning outcomes and motivation in higher education. TBLT can improve students' conceptual understanding and literacy [75], [76] and their critical and creative thinking skills [14], [77]. Similarly, Kahoot-based TBLT can improve visual-spatial intelligence, communication, and high-level thinking skills [78], [79]. These results added to the growing body of research on the benefits of integrating technology-enhanced learning models that emphasize fun and interactive effects during the learning process. These findings strongly showed Kahoot-based TBLT in the teaching and learning process at the English education department. In short, the use of technology-enhanced learning models in the classroom, as detailed in this study, has inspired students' knowledge about meaningful learning experiences.

4. Conclusion

Based on the results of the study, it can be concluded that Kahoot-based Task-Based Language Teaching (TBLT) significantly improved students' critical reading abilities in the areas of analysis, evaluation, and synthesis in the moderate category. The study found that using Kahoot for Task-Based Language Teaching (TBLT) effectively improves students' critical reading abilities in English. This approach allows students to answer questions about the text they are reading, enhancing their comprehension. Moreover, Kahoot's game-based format facilitates group discussion and enables students to evaluate their own and their peers' understanding of the text. Moreover, Kahoot allows teachers to monitor student learning outcomes and adapt their teaching approach based on student's needs, thereby ensuring that they acquire the correct understanding and build their critical reading abilities. The Kahoot-based TBLT model represents a fun and effective way for students to learn critical reading. However, it is worth noting that the limitation of this study lies in the relatively recent introduction of Kahoot-based TBLT as a means of developing critical reading skills among higher education students. Therefore, practitioners should prepare engaging learning scenarios that incorporate Kahoot-based TBLT to maximize the learning process and make it more enjoyable for students. To obtain more significant results on the use of Kahoot-based TBLT to improve critical thinking, future researchers should conduct similar studies in other fields of study.

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