

## **UTILIZING KAHOOT! AS A DIGITAL LEARNING INNOVATION TO SUPPORT SUSTAINABLE EDUCATION IN THE GLOBAL ECONOMY ERA**

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### **ABSTRACT**

This study aims to conduct a systematic review and thematic analysis of existing research on the use of Kahoot! as a digital learning innovation, and to explore its contribution to sustainable education within the context of the global digital economy. The study employs a Systematic Literature Review (SLR) combined with thematic analysis to synthesize findings from relevant studies collected through Google Scholar and Scopus using the keywords between 2020 and 2025. Following a rigorous inclusion and exclusion process, ten articles were selected for analysis. Analysis data included authors, publication years, key findings, and implications of Kahoot! in education. The thematic analysis revealed four key themes: (1) Kahoot! as a digital learning innovation, emphasizing its interactive and engaging learning design; (2) Kahoot! on learning quality, highlighting its role in improving students' motivation, participation, and understanding; (3) Challenges and implementation of Kahoot, identifying technical barriers and teachers' readiness; and (4) Kahoot! in continuing education, revealing its potential to promote lifelong learning in the digital era. The study concludes that Kahoot! functions not only as a technological tool but as a pedagogical innovation that enhances the quality and sustainability of education. It is recommended that educators strengthen their digital competence to maximize the benefits of Kahoot! in diverse learning environments.

**Key words:** Kahoot; Digital learning; Sustainability Education

### **INTRODUCTION**

Current technological advances have improved various systems and work methods, making them more effective. The Indonesian Ministry of Education and Culture has utilized technology as a learning tool (Febriani Chandra et al., 2023). Technology plays an important role in overcoming various learning problems (Cahyadi, 2019), so proper integration is a key requirement for educational success. In this case, teachers have a strategic role in helping students achieve academic success (Khotimah et al., 2023). However, the reality in the field shows that the learning process is still largely teacher-centered with one-way communication, causing students to become passive, bored, and less motivated to learn (Wardana & Sagoro, 2019). This conventional learning model, which lacks interactivity, often leads to a decline in students' interest and motivation to learn.

In facing a global economy that demands efficiency, creativity, and technology-based competencies, education needs to transform to become more innovative, interactive, and sustainable. Digital learning innovation is one of the important strategies in efforts to improve the quality of education and its relevance to the needs of the times. Education in the digital era is no longer just about transferring knowledge, but also about shaping learners who are critical, collaborative, and adaptive to global changes (International Commission on the Futures of Education, 2021). This concept is in line with the principles of Education for Sustainable Development (ESD), which emphasizes the importance of the interconnection between education, technology, and sustainable development.

One form of digital learning innovation that is widely used today is Kahoot!, a game-based learning platform designed to increase student participation and motivation to learn. This application enables fun interactions between teachers and students through interactive quizzes, healthy competitions, and challenge-based learning. Research shows that using Kahoot can increase student motivation and engagement in the learning process because it provides an interactive, collaborative learning experience and fosters a positive competitive spirit (Hartanti, 2019). Thus, Kahoot can be part of digital learning innovation that supports the realization of sustainable education amid evolving global challenges.

The use of Kahoot! as a digital learning innovation aligns with Self-Determination Theory (SDT) by Deci & Ryan (1985), which highlights intrinsic and extrinsic motivation in learning. Kahoot! supports students' needs for autonomy, competence, and relatedness allowing choice, providing instant feedback, and fostering social interaction. By fulfilling these needs, Kahoot! enhances sustainable learning motivation and contributes to global education goals that emphasize independent, collaborative, and lifelong learning in the global economy era.

In sustainable education, using Kahoot! not only boosts learning motivation but also enhances digital literacy, a key competency in the global economy era. Its integration fosters critical, reflective, and adaptive

thinking (Lestari & Masitah, 2022), making Kahoot! a digital innovation that promotes participation, creativity, and collaboration in sustainable learning.

Based on the above description, the main issues that are the focus of this study are: How has Kahoot! been utilized as a digital learning innovation in various educational environments, and in what ways does Kahoot! contribute to sustainable education in the era of the global digital economy. This research is important to provide a conceptual contribution to the development of a digital learning model that is not only effective in improving student motivation and learning outcomes, but also relevant to the objectives of Sustainable Development Goal (SDG 4): Quality Education.

## METHOD

This study employs a Systematic Literature Review (SLR) approach combined with thematic analysis to synthesize and interpret findings from existing studies related to the use of Kahoot! in education. Relevant literature was collected from academic databases such as Google Scholar and Scopus. These databases were selected because they provide extensive coverage of peer-reviewed journals and conference proceedings in education and digital innovation.

The literature search was conducted using a combination of keywords to ensure comprehensive coverage, and to search for this data using the Publish or Perish tool. The main keywords used were “Kahoot!” “digital learning”, and “education sustainability”. The search was limited to publications from 2020 to 2025, reflecting recent developments in digital learning innovation and its relevance to sustainable education.

### 1. Inclusion and Exclusion Criteria

To ensure that only relevant and high-quality studies were included in the review, specific inclusion and exclusion criteria were established.

**Table 1. Inclusion and Exclusion Criteria**

Inclusion	Exclusion
Discussing the use of Kahoot! Context of digital learning	Do not discuss the use of kahoot context digital learning
Publication from 2020 – 2025	Publication before 2020
Open access	No open access
Scientific articles	Non-scientific articles

### 2. Article Selection Process

The article selection was conducted systematically through three stages: identification, screening, and final inclusion. A total of fifty articles were initially collected from Scopus and Google Scholar using keywords related to *Kahoot!*, digital learning and sustainable economy. After removing duplicates and irrelevant studies, seventeen articles remained for further review and reference. Based on the inclusion and exclusion criteria, ten relevant articles were finally selected and used for data extraction and thematic analysis.

### 3. Data Analysis

Data extraction was carried out systematically to collect essential information from each selected study. The extracted data included authors and year of publication, key findings, and implications related to the use of *Kahoot!* in education.

The extracted information was analyzed using thematic analysis by (Braun & Clarke, 2006). The analysis began with initial coding of significant statements and findings, followed by grouping codes into descriptive themes, such as, classroom engagement, learning outcomes, and his involvement with continuing education in the era of the global economy. Subsequently, these descriptive themes were synthesized into analytical themes. The thematic synthesis results are presented in Table 2 and elaborated further in the Results and Discussion section.

## RESULTS AND DISCUSSION

The following subsection presents the results of the literature review process. A synthesis of ten selected studies is provided to highlight current trends and patterns in the use of Kahoot! for promoting sustainable educational and engaging digital learning. After applying the inclusion and exclusion criteria, a total of ten studies were retained for detailed review. Each study was examined to extract essential information such as the author(s), publication year, research objectives, methodology, key findings, and educational implications. In general, the ten articles focus on the use of digital learning media and platforms, especially quiz and game-based applications, to improve the effectiveness and engagement of students in various educational contexts.

Based on the review of the ten articles, a number of patterns were identified that formed the basis for thematic analysis. These patterns were then grouped into several main themes that describe the direction and trends

of previous research related to the use of digital learning media. Details of the themes and sub-themes formed from this analysis are presented in Table 2 below.

**Table 2. Thematic Synthesis Results**

No	Theme	Author, Year of Research	Description
1	Kahoot as a digital learning innovation	(Özdemir, 2025), (Wang & Tahir, 2020), (Febriani Chandra et al., 2023), (Kehumasan et al., 2020)	Kahoot is an innovative GBL medium used for learning and assessment. Kahoot! was developed methodically using the R&D model (ADDIE, 4D).
2	Kahoot on learning quality	(Rayan & Watted, 2024), (Maraza-Quispe et al., 2024), (Irwan, 2019)	Consistently improves academic achievement, knowledge retention, motivation, and student engagement. Effective as a formative assessment tool and provides valuable instant feedback.
3	Challenges and implementation of Kahoot	(Ingriyani et al., 2020), (Suharsono, 2020)	Implementation requires teacher assistance for effective integration. There are findings that training participants (millennials) prefer Quizizz because of its technical ease of use on personal devices.
4	Kahoot in Continuing Education	(Wirani et al., 2021)	It is an adaptive solution that is relevant to digitalization (Era 4.0). Students expressed their intention to continue using Kahoot because they consider it useful and enjoyable in the context of modern learning and distance learning.

Based on the results of a thematic synthesis of a number of studies that have been analyzed, several main themes were found that describe the use of Kahoot! in the context of education. These themes reflect the researchers' diverse perspectives on the role, benefits, and challenges of implementing Kahoot! as a technology-based learning medium.

### **1. Utilizing Kahoot! as a Digital Learning Innovation in Education**

Thematic analysis of the reviewed literature identified four key themes regarding the utilization of Kahoot! in education. The first theme, Kahoot! as a digital learning innovation, emphasizes its role as an innovative game-based learning (GBL) platform used for both instruction and assessment. Studies by (Özdemir, 2025), (Wang & Tahir, 2020), (Febriani Chandra et al., 2023), (Kehumasan et al., 2020) describe Kahoot! as a product of structured instructional design models such as ADDIE and 4D. Its systematic development supports effective learning experiences by combining entertainment and education, helping students stay engaged while achieving learning objectives.

The second theme, Kahoot! on learning quality, highlights its consistent positive effects on students' academic outcomes. Research by (Rayan & Watted, 2024), (Maraza-Quispe et al., 2024), (Irwan, 2019) reveals that Kahoot! enhances knowledge retention, motivation, and engagement. It also serves as an effective formative assessment tool that provides real-time feedback, allowing teachers to monitor learning progress and adapt instructional strategies accordingly.

The third theme, Challenges and implementation of Kahoot!, discusses the difficulties teachers face in effectively integrating Kahoot! into classroom practice. Ingriyani et al. (2020) and Suharsono (2020), found that technical skills and teacher readiness remain key obstacles. Moreover, some learners particularly millennials show a preference for alternative platforms such as Quizizz due to its user-friendly interface and personal device accessibility. This suggests that the success of Kahoot! implementation relies heavily on digital literacy and pedagogical adaptation by educators.

The fourth theme, Kahoot! in continuing education, reflects its applicability beyond formal school contexts. According to (Wirani et al., 2021), Kahoot! supports lifelong learning by aligning with the needs of Education 4.0. Students express positive intentions to continue using the platform because it is practical, enjoyable, and beneficial for distance or blended learning. This indicates that Kahoot! has the potential to foster sustainable learning practices in both formal and non-formal education environments.

### **2. Kahoot!'s Contribution to Sustainable Education in the Era of the Global Digital Economy**

More than just a game-based learning tool, Kahoot! also makes a significant contribution to strengthening sustainable education amid the development of the global digital economy. Through the integration of technology that supports distance learning, active student engagement, and improved digital literacy, Kahoot! helps create an educational ecosystem that is inclusive and adaptive to global change.

The utilization of Kahoot! in education not only enhances learning quality but also contributes significantly to achieving sustainable education in the global digital economy era. The thematic synthesis reveals that Kahoot! functions as a digital learning tool that fosters digital literacy, motivation, and active engagement in learning processes (Özdemir, 2025; Wang & Tahir, 2020; Febriani Chandra et al., 2023).

Through its interactive and game-based nature, Kahoot! promotes meaningful and enjoyable learning experiences, encouraging critical thinking, collaboration, and lifelong learning attitudes among students (Rayan & Watted, 2024 and Maraza-Quispe et al., 2024) Such engagement aligns with the core values of sustainable education, which emphasize inclusive, participatory, and future-oriented learning environments.

Moreover, Kahoot! supports the realization of the Sustainable Development Goals (SDGs), particularly Goal 4: Quality Education, by providing an accessible and adaptive digital learning medium that fits both distance and blended learning contexts (Wirani et al., 2021). In the context of a globally competitive economy, the mastery of educational technologies such as Kahoot! strengthens human resource competitiveness through enhanced digital competence and adaptability.

However, as noted by Inggriyani et al. (2020) and Suharsono (2020), the successful implementation of Kahoot! depends on teachers' readiness in both pedagogical and technical aspects. Continuous professional development is therefore essential to ensure that the integration of digital tools like Kahoot! produces sustainable impacts within educational systems

The use of Kahoot! supports Sustainable Development Goal (SDG) 4, which is to ensure inclusive and quality education and promote lifelong learning opportunities for all. By providing a fun and accessible learning environment, Kahoot! plays a role in reducing the digital divide and encouraging the active participation of students from various backgrounds. This is particularly relevant in the context of a global economy that demands adaptability, creativity, and critical thinking skills as key assets for human competitiveness.

Overall, the findings of this study show that Kahoot! not only functions as an engaging digital tool, but also contributes to the creation of sustainable and inclusive education in the era of the global economy. In the context of economic globalization, a country's ability to adapt to changes in technology and information is highly dependent on the quality of its human resources. Through the use of Kahoot!, the learning process becomes more interactive, collaborative, and technology-based hallmarks of 21st-century education oriented toward the development of global competencies.

## CONCLUSION

This study concludes that Kahoot! is a digital learning innovation that supports sustainable education in the era of the global economy. Based on the results of a thematic review, Kahoot! has been proven to increase student motivation, engagement, and learning outcomes, while also playing a role in building an inclusive and collaborative learning environment. Kahoot! is in line with SDG 4 (quality education) because it encourages digital literacy and sustainable learning. However, its success is highly dependent on educators' readiness to integrate technology effectively. Thus, Kahoot! can be a strategic tool to strengthen the transfer of knowledge and skills. For further research, it is recommended that a broader empirical study be conducted using an experimental and longitudinal approach to measure the long-term impact of Kahoot! on learning performance and educational sustainability in various learning contexts.

## ACKNOWLEDGMENTS

The author would like to express sincere gratitude to the Department of Economic Education, Faculty of Economics and Business Education, Universitas Pendidikan Indonesia, for the financial and academic support in participating and presenting this paper at ICEBEF 2025. Appreciation is also extended to colleagues and mentors who provided valuable insights and constructive feedback during the research and manuscript preparation process.

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