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ENHANCING READING INSTRUCTION THROUGH GAMIFICATION: A SYSTEMATIC REVIEW OF THEORETICAL MODELS, IMPLEMENTATION STRATEGIES, AND MEASURABLE OUTCOMES (2020-2024)

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ABSTRACT

Aim/Purpose	The purpose of this systematic literature review is to explore the use of gamification in reading instruction between 2020 and 2024, focusing on the main theories and models, implementation strategies in various educational settings, measurable effects on student engagement and comprehension, and future directions for research.
Background	Reading instruction faces persistent challenges, including declining student engagement, varied reading comprehension levels, and a lack of motivation among learners. Traditional methods often fail to captivate students, resulting in suboptimal literacy outcomes. In response to these challenges, educators and researchers are increasingly turning to gamification as a promising approach to reinvigorate reading instruction. Gamification, which incorporates game design elements into non-game contexts, has the potential to enhance student motivation, engagement, and comprehension.
Methodology	In order to guarantee precision and reliability, this systematic literature review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. This review focuses on studies published in the Web of Science, Scopus, and ScienceDirect databases from 2020 to 2024.

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	and applied inclusion criteria to select 15 peer-reviewed studies from 421 retrieved, focusing on gamification in reading instruction.
Contribution	This paper addresses a gap in the existing literature on gamified reading instruction by examining the theoretical foundation, different implementation strategies, and measurable effects of gamification in reading instruction across various educational settings and age groups. Additionally, it offers recommendations and guidance for future research in the field of gamified reading instruction. This study also offers a systematic approach for educators to implement gamified reading instruction.
Findings	This review examined a total of 15 papers, encompassing various educational settings and age ranges. The investigations were conducted in multiple countries, including China, Indonesia, and Spain, demonstrating a worldwide interest in gamified reading education. Self-determination theory (SDT) is significant in the domain of gamified reading teaching. Primary school extensively incorporates gamified reading instruction, emphasizing the use of badges, leaderboards, narrative contexts, and avatars to foster captivating and individualized learning experiences. Multiple studies consistently demonstrate that the integration of game aspects into reading teaching leads to improvements in reading speed, reading accuracy, reading immersion, interactivity, and frequency.
Recommendations for Practitioners	Educators are encouraged to integrate gamification elements tailored to different educational stages, such as badges and narrative contexts in primary education and collaborative challenges in higher education, to enhance student engagement and comprehension.
Recommendations for Researchers	Researchers should focus on conducting longitudinal studies to assess the long-term effects of gamification and work on integrating varied theoretical frameworks to provide a more consistent foundation for future research.
Impact on Society	This paper proposes that implementing gamification in reading instruction has the potential to positively influence reading comprehension and student motivation, ultimately leading to improved educational results on a larger scale.
Future Research	Future research should explore the long-term effects of gamification on reading instruction, address the identified limitations of current studies, and investigate its effectiveness across different cultural and educational contexts.
Keywords	gamification, gamified learning, reading instruction, reading comprehension, reading engagement

INTRODUCTION

Gamification is a concept that has gained a lot of attention in the field of education and refers to the integration of game design elements into non-game scenarios to enhance user engagement and motivation (Landers, 2014). Gamification is often confused with serious games and game-based learning. Serious games are games that are not purely for entertainment but are designed to achieve a primary purpose, such as education, training, health, or social change and are intended to convey learning material or achieve specific results while also maintaining the appeal of a game. Game-based learning is an educational method that uses games to aid learning. It involves the use of specific games designed to teach specific skills or knowledge, often with explicit educational outcomes in mind. Game-based learning can be seen as a sub-category of serious games, focusing on education (Becker, 2021; Deterding et al., 2011; Krath et al., 2021). In education, gamification can be translated into “gamified

learning,” where game mechanics such as points, badges, leaderboards, and challenges are embedded in learning activities to create a more interactive and motivating experience for students (Landers et al., 2017; Nair & Mathew, 2022).

Gamified learning utilizes intrinsic and extrinsic motivation in games to create a more engaging and effective educational environment. Its main goal is to transform traditional learning activities into more engaging activities that increase student engagement and interest (Zainuddin et al., 2020). According to Jaramillo-Mediavilla et al. (2024), the use of gamification in education can increase motivation, enhance learning enjoyment, and improve learning outcomes.

Research has shown that gamified learning is particularly beneficial for improving students’ motivation and performance in various subjects (Bai et al., 2020). For example, in mathematics education, gamification elements such as interactive quizzes and leaderboards have been shown to significantly increase student engagement and performance. A study by Luo et al. (2023) found that gamified math exercises increased student motivation and learning outcomes compared to traditional teaching methods. By incorporating game elements, educators aim to create a more immersive and enjoyable learning experience that encourages students to develop a more positive attitude toward learning.

However, the potential benefits of gamification are not limited to mathematics or other subjects; they extend to reading instruction, an area that presents unique and critical challenges. Despite the critical importance of reading as a foundational skill, educators across the globe continue to face significant challenges in effectively teaching reading. Many students struggle with reading comprehension and lack interest and motivation in reading (Efriza et al., 2023). These challenges are exacerbated by differing learning needs, varying literacy levels, and the increasing prevalence of digital distractions. Traditional methods of teaching reading often fail to engage students, leading to inattention and academic underachievement (OECD, 2019).

The use of gamification in reading instruction shows great potential in addressing these challenges. Recent studies have shown that gamified reading programs can increase student engagement and motivation by making reading activities more fun and interactive (García-López et al., 2023). For example, a study by Tsai et al. (2020) found that gamification elements such as rewards and progress tracking significantly increased students’ reading time and comprehension. Gamification strategies can address long-standing issues such as student inattention and lack of motivation, making reading activities more engaging and interactive (García-López et al., 2023).

However, the use of gamification in reading instruction is still in its infancy. While there have been successful case studies and pilot programs, they have not yet been widely implemented and rigorously evaluated (Siregar et al., 2023). Many educational institutions are on the fence about gamification because of concerns about its long-term effects and the resources required for implementation (Polat, 2023).

Current research on gamification in reading instruction has some limitations. Many studies focus on short-term outcomes and lack longitudinal data assessing the ongoing effects of gamification on reading skills (Sailer & Homner, 2020). In addition, few studies have explored the differential impact of various gamification elements (e.g., points, badges, leaderboards) on different student populations and learning contexts (Alomari et al., 2019; Huang et al., 2020). Furthermore, most of the existing studies are limited to small samples and specific educational settings, reducing the generalizability of the findings (Luo et al., 2023; Sanabria Huertas, 2021; Waluyo et al., 2023). Additionally, the existing systematic reviews on gamification are mainly focused on the application of gamification in different educational contexts, and there is no systematic review on gamification in the field of reading (Behl et al., 2022; Cavus et al., 2023; Dehghanzadeh et al., 2024).

RESEARCH QUESTIONS

This systematic literature review aims to fill the aforementioned gaps by comprehensively analyzing existing research on gamification in reading instruction. By synthesizing the results of previous studies, it aims to identify effective gamification strategies, understand their impact on students' reading motivation and reading comprehension, and emphasize the implementation of best practices. In addition, this paper aims to reveal the theoretical underpinnings of gamified learning in reading instruction and provide practical recommendations for educators and policymakers. Therefore, the research questions for this systematic review are:

- RQ1:** What are the main theories/models/frameworks for applying gamification in reading instruction?
- RQ2:** How is gamification implemented in reading instruction in different educational backgrounds?
- RQ3:** What are the measurable effects of gamification on student reading engagement and comprehension?
- RQ4:** What future directions and recommendations do researchers offer for effectively integrating gamification into reading instruction?

Research Question 1 aimed to uncover the theories, models, or frameworks that support gamification in reading education. By identifying these theories, models, or frameworks, this review can provide a solid foundation for understanding why and how gamification works in this context. Research Question 2 focuses on the practical application of gamification. It seeks to explore a variety of approaches and strategies for incorporating gamification elements into reading programs, taking into account factors such as age groups (e.g., elementary, middle, and high school) and educational settings (e.g., classrooms, online learning platforms). Research Question 3 investigated the outcomes of gamified reading instruction. It aims to gather evidence on how gamification affects students' reading engagement and comprehension of reading materials and critically assess its effectiveness. Research Question 4 looks to the future and aims to synthesize suggestions from the literature on improving and optimizing gamified reading instruction. It also attempts to identify gaps in current research for future research to address.

METHODOLOGY

This study used a systematic literature review method. Systematic reviews synthesize the state of knowledge in a field and thereby identify future research priorities; they address questions that cannot be answered by individual studies; they identify problems in primary research that should be corrected in future studies; and they generate or assess theories about how or why a phenomenon occurs. Systematic reviews can, therefore, provide different types of knowledge for different review users (e.g., patients, healthcare providers, researchers, and policymakers).

This systematic literature review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. PRISMA 2020 is based on and updated from PRISMA 2009, which was developed to help systematic review authors transparently report the reasons for the review, the work done by the authors, and their findings. Due to advances in systematic review methods and terminology, the PRISMA 2020 statement replaces the 2009 statement. It includes new reporting guidelines that reflect advances in the methods for identifying, selecting, assessing, and synthesizing studies. This approach ensures the reliability and validity of the research results through a rigorous and transparent process of identifying, selecting, and analyzing relevant studies (Page, McKenzie, et al., 2021; Page, Moher, et al., 2021).

IDENTIFICATION OF STUDIES

Table 1 lists the inclusion and exclusion criteria for articles to be screened in the systematic literature review on gamification in reading instruction.

Table 1. Inclusion and exclusion criteria for screening articles

Criteria	Inclusion	Exclusion
Publication year	Studies published after 2020	Studies published before 2020
Study design	Empirical studies, meta-analyses, and case studies	Editorials, commentaries, and opinion pieces
Focus	Studies focusing on gamification in reading instruction	Studies not specifically addressing gamification in reading instruction
Population	Studies involving participants of all age groups	Studies not involving human participants
Outcome measures	Studies with clear outcome measures related to reading engagement and comprehension	Studies without clear or relevant outcome measures
Language	Studies published in English	Studies not published in English
Accessibility	Studies that are peer-reviewed and accessible	Studies that are not peer-reviewed or inaccessible

These criteria are designed to ensure that the systematic literature review includes the most relevant and high-quality studies that contribute to answering the research questions. The focus on empirical studies and exclusion of non-research articles aligns with scientific standards and helps maintain the rigor of the review process. The inclusion of studies across all age groups allows for a comprehensive understanding of gamification's impact on reading instruction. The requirement for clear outcome measures ensures that the review can assess the effectiveness of gamification strategies.

INFORMATION SOURCES

For this systematic literature review, the following databases will be utilized to search for relevant literature:

1. *Web of Science (WoS)*: Another comprehensive bibliographic database that provides access to a wide range of academic research, including studies on gamification and reading instruction.
2. *Scopus*: Known for its extensive coverage of scholarly literature across various disciplines, including education and educational technology.
3. *ScienceDirect*: Offers a vast collection of scientific and technical research, including articles on gamification in education.

These databases were selected for their relevance to the research topic, specialization in educational and psychological literature, and popularity among researchers in the field. They provide a comprehensive and multidisciplinary pool of resources that are likely to yield high-quality studies pertinent to the research questions. The search will be conducted in accordance with the latest standards and practices in the field, as reflected in recent journal literature published in the Web of Science (WoS). The databases will be accessed through institutional subscriptions where available, ensuring access to the full range of necessary resources for a thorough literature review.

SEARCH STRATEGY

The search strategy was carefully designed to ensure that all relevant studies were identified. The specific search strategy was as follows:

1. Keywords: Identify keywords related to various aspects of the research question, such as “gamification,” “gamified,” “reading,” “read,” and “literacy.”
2. Boolean operators:
 - OR: used to include synonyms or related terms (e.g., gamification OR gamified learning).
 - AND: used to combine different key concepts (e.g., gamification AND reading)
 - OR: used to include synonyms or related terms (e.g., gamification OR gamified learning).
 - NOT: used to exclude irrelevant terms (e.g., gamification AND reading instruction NOT video games).
 - “ ” (quotation marks): used to search for exact phrases (e.g., “gamified learning”).
3. The search string used was: (“gamification” OR “gamified” OR “game”) AND (“reading” OR “read” OR “literacy”).

Table 2. Search strategy and results

Search string	Documents obtained		
	WoS	Scopus	Science direct
(“gamification” OR “gamified” OR “game”) AND (“reading” OR “read” OR “literacy”)	126	275	22

SEARCH RESULTS

A total of 421 documents were retrieved from the three academic databases, Web of Science, Scopus, and ScienceDirect, after applying specific inclusion and exclusion criteria. Specifically, 126 documents were retrieved from Web of Science, 275 from Scopus, and 20 from ScienceDirect. The search strategy effectively excluded non-English publications, articles published before 2020, and non-peer-reviewed content such as editorials, commentaries, and opinion pieces. The search results above are to be completed by July 14, 2024. This rigorous screening process ensured that the final data set contained only high-quality, relevant empirical studies focusing on the gamification of reading instruction. These studies were further screened and selected for their suitability for a systematic literature review, ensuring a comprehensive and robust analysis of the current state of research in this field.

SCREENING AND SELECTION

The screening process was conducted in strict accordance with the PRISMA guidelines. Initially, 421 records were identified in the three databases. To simplify the screening process, we used Covidence (<https://www.covidence.org/>), a web-based software specifically designed for managing systematic reviews. Covidence is known for its efficiency in automating the screening and data extraction phases, thereby ensuring a rigorous and unbiased screening process. It helped to remove duplicates, reducing the number to 265 unique documents. Then, the titles and abstracts were carefully reviewed according to the inclusion criteria, and 240 articles that did not meet the research objectives were excluded, such as publications that did not focus on gamification learning but on game-based learning, serious games, etc., and publications that did not focus on gamification reading learning, but on gamification math learning, gamification computer learning, etc. This screening also showed that the current research in the field of gamified reading learning is not very complete, so this systematic literature review summarizes the literature on gamified reading learning in recent years to provide a reference for subsequent research.

The remaining 25 articles were then reviewed in full by two independent reviewers to ensure the comprehensiveness and impartiality of the assessment. In the event of disagreement, this was resolved through discussion or consultation with a third reviewer. This meticulous process resulted in

10 articles being excluded for various reasons, such as unavailability, language barriers, and relevance to human experiments, and 15 papers were selected as suitable for the study. The PRISMA flow diagram for this study is shown in Figure 1.

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only

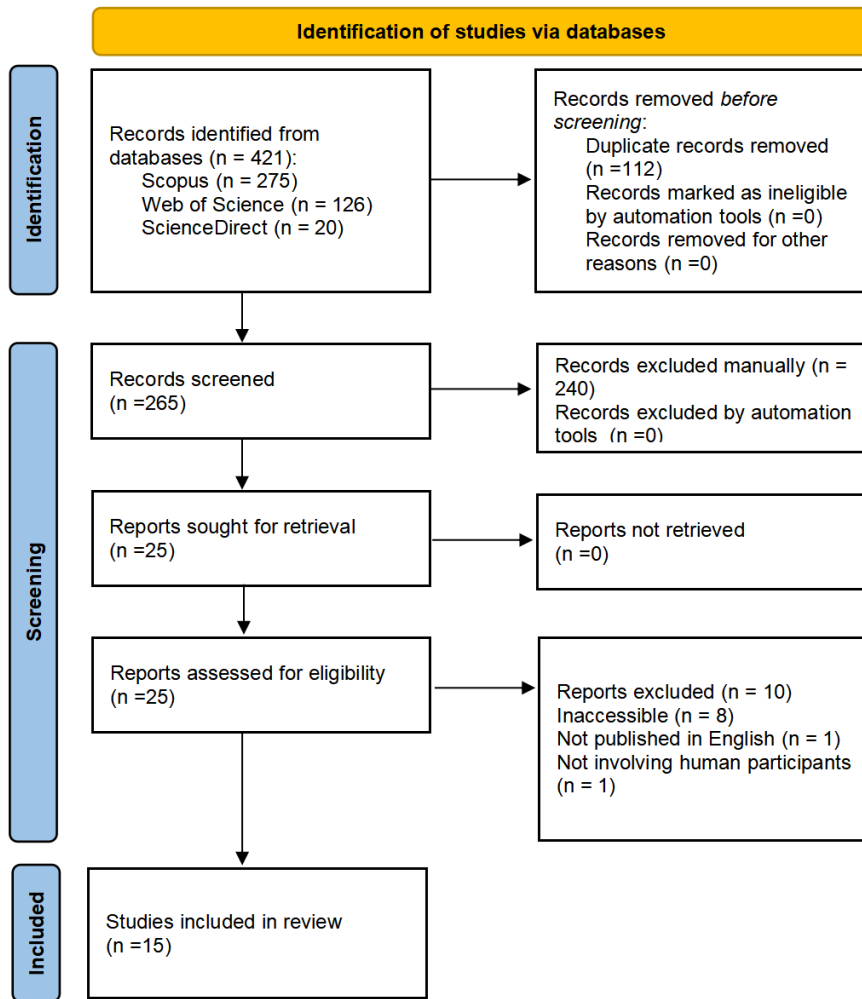


Figure 1. Gamified reading learning PRISMA flowchart

DATA EXTRACTION

The data extraction process was systematic to ensure that all relevant information from each selected study was captured accurately and comprehensively. The data extraction focused on addressing the four research questions above. First, a standardized data extraction form was developed to standardize the information collected from each study. The form included fields corresponding to the four research questions. The data extraction form was then pilot-tested in several studies to ensure that all relevant data could be effectively collected. Adjustments were made based on feedback from the pilot testing. Finally, the reviewers extracted data from each selected study using the standardized form. Any inconsistencies were resolved by discussing them with another reviewer or consulting a third reviewer.

DATA SYNTHESIS

The extracted data were synthesized using a thematic analysis approach (Braun & Clarke, 2019). This involved identifying, analyzing, and reporting patterns (themes) within the data. The synthesis was organized according to the research questions, allowing for a structured presentation of findings.

RESULT

The main purpose of this systematic literature review is to explore the use of gamification in reading instruction, specifically for the period 2020 to 2024. Given the growing interest in using gamification to increase student engagement and learning outcomes, it is critical to systematically analyze the latest research to understand its effectiveness and areas for improvement. By examining empirical studies published between 2020 and 2024, this review aims to identify emerging trends, assess the robustness of current findings, and provide evidence-based recommendations for educators and policymakers.

OVERVIEW OF REVIEWED PUBLICATIONS

Figure 2 shows the trend in the publication of empirical papers on gamification in reading instruction from 2020 to 2024.

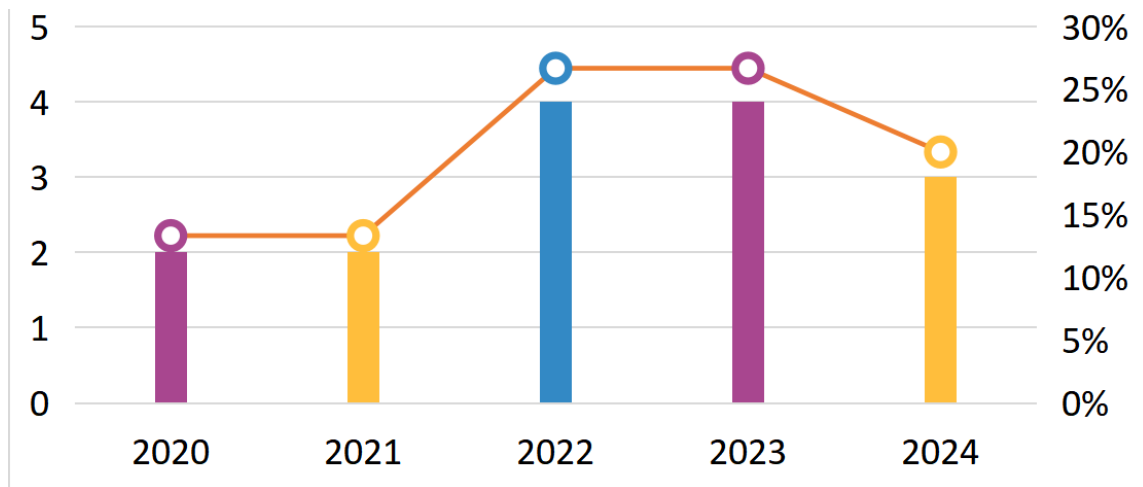


Figure 2. Year of publication of the reviewed articles

From the analysis of Figure 2, we can see the following patterns: from 2020 to 2023, the number of published papers gradually increased, indicating a growing interest in this topic. A peak in 2022 and 2023, with four papers published each year, may indicate a major development or breakthrough in the field, attracting more research attention. In 2024 (as of July), there were only three papers. This may indicate that the research trend is stabilizing, or it may simply reflect incomplete data for that year. This pattern suggests that the gamification of reading instruction is an evolving research area, with continued interest from the academic community and a growing body of empirical research over the past five years.

To understand the research interest of international researchers in the gamification of reading instruction and the research situation in this field in various countries, Figure 3 details the empirical papers published in various countries from 2020 to 2024 on the theme of gamification of reading instruction.

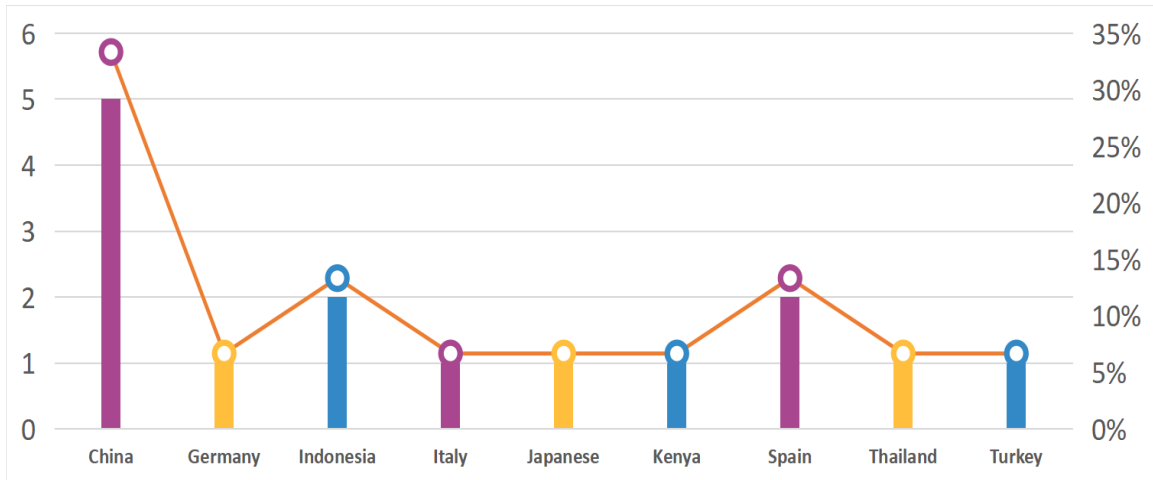


Figure 3. Countries of study participants in the reviewed articles

Figure 3 shows that China published the most papers in this field ($n=5$, 33%), followed by Indonesia ($n=2$, 13%) and Spain ($n=2$, 13%), and finally Germany ($n=1$, 7%), Italy ($n=1$, 7%), Japan ($n=1$, 7%), Kenya ($n=1$, 7%), Thailand ($n=1$, 7%) and Turkey ($n=1$, 7%).

We can, therefore, see that:

1. China has made the greatest contribution, with five papers published indicating a strong interest or initiative in this area.
2. Indonesia and Spain have made a moderate contribution, with two published papers indicating that compared with China, these two countries are actively involved in research but on a smaller scale.
3. Germany, Italy, Japan, Kenya, Thailand, and Turkey have each published one paper, reflecting their presence in this field but relatively few research results.

This distribution shows that gamification in reading instruction is a topic of interest worldwide. Still, the research results vary from country to country, with some countries paying more attention to this educational innovation.

To illustrate the distribution of empirical studies on gamified reading instruction in various educational contexts, Figure 4 summarizes the different educational contexts in which people are in the published journals on the topic of gamified reading.

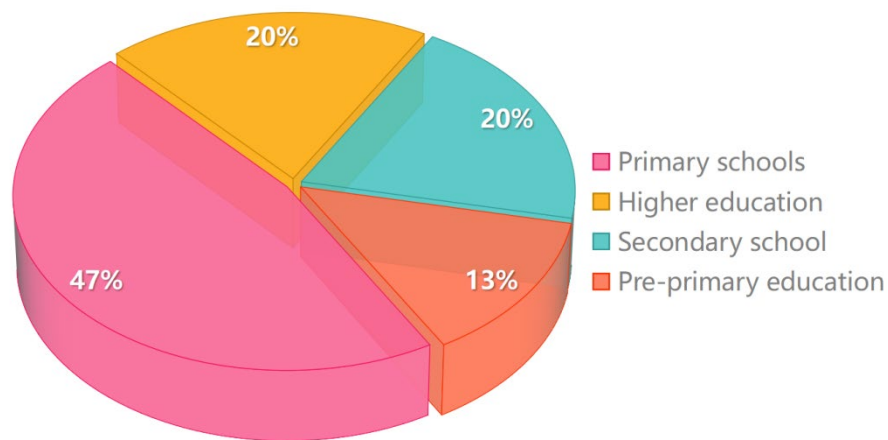


Figure 4. Educational background of the reviewed literature

According to Figure 4, the largest number of empirical studies on gamified reading instruction in primary school (n=7, 47%), followed by higher education and secondary education (n=3, 20%), and pre-primary education (n=2, 13%).

From this data, we can see that primary education is the environment in which gamified reading instruction is most researched. This suggests that gamification techniques are particularly valued at this educational stage, which may also be due to the age-appropriate appeal of game elements to younger students. Of course, gamification is also an important area of interest in secondary and higher education, although to a lesser extent than in primary education. The lower proportion in preschool education may indicate that, while there is interest in applying gamification in early education, it may be less common or more challenging to apply gamification in early childhood education.

RQ1. WHAT ARE THE MAIN THEORIES/MODELS/Frameworks FOR APPLYING GAMIFICATION IN READING INSTRUCTION?

To provide a comprehensive overview of the theories, models, and frameworks used when applying gamification in reading instruction, detailed tables have been compiled that illustrate key data points. These tables highlight the various theoretical underpinnings and frameworks that form the basis of the study, offering insights into their application and relevance.

Table 3 summarizes the theories, models, and frameworks referenced in various studies. This table helps to identify the foundational concepts that guide the research, offering a quick reference to the theoretical background used by different authors.

Table 3. Theories/models/frameworks used in research

No.	Reference	Theories/models/frameworks
1	(Cattoni et al., 2024)	Dual-Route Cascaded model, Uta Frith’s developmental framework, Self-Determination Theory (SDT)
2	(Chen et al., 2020)	Social constructivist theory, PIRLS (Progress in International Reading Literacy Study) comprehension processes
3	(Kuswandi & Fadhli, 2022)	Learning Mechanic (LM) and Games Mechanic (GM) as the basis for LM-GM implementation in learning
4	(Li & Chu, 2021)	Self-Determination Theory (SDT)
5	(Murray et al., 2024)	Self-Determination Theory (SDT)
6	(Prados Sánchez et al., 2023)	MDA (mechanics, dynamics, aesthetics) framework, PIRLS guidelines
7	(Qiao et al., 2023)	Sociocultural theory

Table 4 provides a more detailed view of the insights derived from the theories, models, and frameworks listed in Table 3. This table explains the specific contributions of each theory or model to the research.

Table 4. Detailed insights on theories/models/frameworks

No.	Items	Category	Insight	Reference
1	Self-determination theory (SDT)	Theory	Explains the differences between intrinsic and extrinsic motivation, contributing to understanding human motivation in various contexts.	(Cattoni et al., 2024; Li & Chu, 2021; Murray et al., 2024)
2	Social constructivist theory	Theory	Emphasizes learning through social interaction and is influenced by cultural contexts.	(Chen et al., 2020)

No.	Items	Category	Insight	Reference
3	Sociocultural theory	Theory	Highlights the impact of societal and cultural factors on individual development and learning.	(Qiao et al., 2023)
4	Dual-Route Cascaded model	Model	Describes two routes for processing words during reading aloud, emphasizing different cognitive pathways.	(Cattoni et al., 2024)
5	Learning Mechanic (LM) and Games Mechanic (GM) model	Model	Illustrates how game mechanics can be applied to learning processes to enhance engagement and effectiveness.	(Kuswandi & Fadhli, 2022)
6	MDA (mechanics, dynamics, aesthetics) framework	Frame-work	A framework for game design that breaks down the elements of games into mechanics, dynamics, and aesthetics.	(Prados Sánchez et al., 2023)
7	Uta Frith's developmental framework	Frame-work	Provides a stage-based approach to understanding how children develop reading skills.	(Cattoni et al., 2024)
8	PIRLS guidelines	Frame-work	Outlines the methodology and framework used to assess reading literacy internationally.	(Prados Sánchez et al., 2023)

Table 3 and Table 4 summarize the main theories, models, and frameworks applied in gamification for reading instruction as identified from a review of journal articles. It indicates that out of 15 journal articles reviewed, seven have utilized specific theories, models, or frameworks to guide their research. These include the Self-Determination Theory (SDT), Social Constructivist Theory, Sociocultural Theory Dual-Route Cascaded Model, Learning Mechanic (LM) and Games Mechanic (GM) Models, MDA (Mechanics, Dynamics, Aesthetics) Framework, Uta Frith's Developmental Framework, and PIRLS Guidelines. Among these, the Self-Determination Theory (SDT) was the most cited, with three out of the seven articles referencing this theory. As a result, we can draw the following conclusions:

- There is currently a diversity of theories/models/frameworks being applied in the field of gamified reading learning. Research on gamified reading instruction incorporates a variety of theories, models, and frameworks, highlighting the interdisciplinary nature of the field.
- Self-determination theory (SDT) has a relatively prominent place in the field of gamified reading learning: Self-determination theory is the most frequently cited theory, indicating a strong interest in understanding the motivational aspects of gamified learning environments.
- In the field of gamified reading learning, researchers have focused on incorporating sociocultural contexts. Theories such as Social Constructivist Theory and Sociocultural Theory emphasize the importance of social and cultural factors in learning, reflecting the holistic nature of educational research.

On the other hand, the current research in gamified reading learning is still in the developmental stage, and the relevant theories, models, and frameworks are not yet well developed, as nearly 53% of the gamified reading learning literature has not adopted theories, models, and frameworks. Of the seven articles that have been adopted, 57% use different theories.

RQ2. HOW IS GAMIFICATION IMPLEMENTED IN READING INSTRUCTION IN DIFFERENT EDUCATIONAL BACKGROUNDS?

Elaborated tables have been developed to demonstrate how gamification is implemented in reading instruction in different educational contexts. Table 5 summarizes the gamification elements and gamification software or applications used in the reviewed articles. The table is based on 15 studies, categorized in the following categories:

1. *Reference*: studies and their authors.
2. *Educational context*: the level of education at which gamification was applied (primary, secondary, higher education, etc.).
3. *Gamification elements*: specific elements of gamification used in the study, e.g., points, badges, leaderboards, etc.
4. *Software or application*: the software or application used to implement gamification in these studies.

Table 5. Overview of the application of gamification in different educational contexts in the reviewed articles

Reference	Educational background	Gamification elements	Software or application
(Cattoni et al., 2024)	Primary schools	Avatar, Guiding Character, Narrative Context, Challenges, Trophies, Feedback, Progress Bar, Competition	The study used gamified applications like Developmental Dyslexia and Orthography Training
(Chen et al., 2020)	Primary schools	Levels (Soldier; Knight; Bishop; Castellan; King), Leaderboards	Web-based collaborative reading annotation system (WCRAS)
(Dovhaniuk & Thelen, 2022)	Higher education	Levels, Feedback	Open-source application in development
(Freiermuth & Ito, 2022)	Higher education	Cooperation, Book-Battles, Timed Presentations, Voting Mechanism, Rewards	Bibliobattle reading game
(Kaban, 2021)	Secondary school	Points, Badges, Leaderboards	Gamified e-books
(Kuswandi & Fadhli, 2022)	Pre-primary education	Feedback, Challenges, Cooperation, Rewards	
(Li & Chu, 2021)	Primary schools	Book-Battles, Leaderboards, E-Portfolio, Badges	Reading Battle (RB): A gamified reading platform
(Manzano-León et al., 2022)	Secondary school	Narrative Context, Avatar, Cooperation, Challenges, Virtual Map Exploration, Board Games	The Legends of Elendor (a gamification and GBL program)
(Matyakhan et al., 2024)	Higher education	Points, Challenges	Quizzes and Kahoot!
(Murray et al., 2024)	Pre-primary education	Points, Rewards, Competition, Leaderboards, Level	Pokémon trading card battling game
(Ndegwa et al., 2023)	Primary schools	Points, Badges, Narrative Context	An adaptation of the StratApp
(Prados Sánchez et al., 2023)	Primary schools	Points, Badges, Leaderboards	Ta-tum

Reference	Educational background	Gamification elements	Software or application
(Qiao et al., 2023)	Secondary school	Points, Badges, Levels, Progress Bar, Leaderboards	Moodle platform with gamification plug-ins
(Rukayah et al., 2023)	Primary schools	Quiz Games	Construct2
(Tsai et al., 2020)	Primary schools	Badges, Challenges, Leaderboards	Web-based collaborative reading annotation system (WCRAS)

In order to further draw a summary of the gamification elements and gamification software or applications used in different educational contexts, Table 6 provides a detailed summary of this data based on Table 5, presenting the use of gamification for reading instruction in different educational settings (higher education, preschool, primary education).

Table 6. Gamification elements and software/applications used in different educational contexts

Educational background	Gamification element	Software or application
Higher education	Points, Challenges, Levels, Feedback, Cooperation, Book-Battles, Timed Presentations, Voting Mechanism, Rewards	Bibliobattle reading game, Open-source application in development, Quizzes, and Kahoot!
Pre-primary education	Feedback, Challenges, Cooperation, Rewards, Points, Rewards, Competition, Leaderboards, Level	Pokémon trading card battling game
Primary schools	Badges, Leaderboards, Challenges, Narrative Context, Points, Avatar, Guiding Character, Trophies, Feedback, Progress Bar, Competition, Levels, Book-Battles, E-Portfolio, Quiz Games	An adaptation of the StratApp, Construct2, X5, Reading Battle (RB): A gamified reading platform, Ta-tum, Developmental Dyslexia, and Orthography Training, Web-based collaborative reading annotation system (WCRAS)
Secondary school	Badges, Leaderboards, Points, Levels, Progress Bar, Narrative Context, Avatar, Cooperation, Challenges, Virtual Map Exploration, Board Games	Gamified e-books, Moodle platform with gamification plug-ins, The Legends of Elendor

Based on Table 5 and summarized in Table 6, it can be seen that among the gamification elements used in higher education were the main points of challenges, levels, feedback, cooperation, reading competitions, time-limited presentations, voting mechanisms, and rewards. The main software or apps used were Bibliobattle reading game, open-source apps in development, quizzes, Kahoot! The gamification elements used at the pre-primary level were mainly feedback, challenges, cooperation, rewards, points, competition, leaderboards, and levels. The software or apps used were mainly Pokémon Trading Card Battle Game.

The gamification elements used at the primary level were badges, leaderboards, challenges, narrative contexts, points, avatars, guiding characters, trophies, feedback, progress bars, competition, levels, reading competitions, electronic portfolios, and quiz games. The main gamification-related software

or applications used at the primary level were adaptations of StratApp, Construct2, Reading Battle (RB), Ta-tum, Developmental Dyslexia and Orthography Training, and Web-based Collaborative Reading Annotation System (WCRAS). The main gamification elements used at the secondary level were badges, leaderboards, points, levels, progress bars, narrative contexts, avatars, cooperation, challenges, virtual map exploration, and board games. The main gamification software or apps used at the secondary level were gamified e-books, the Moodle platform with gamification plug-ins, and Legends of Elendor.

When making Table 6 based on the data in Table 5, we found that there was a high repetition rate of gamification elements used in the articles in primary and secondary education stages, so we counted the number of times the gamification elements were used in the primary and secondary stages and came up with the commonly used gamification elements in the primary and secondary stages. Figure 5 shows the commonly used gamification elements at the primary level, and Figure 6 shows the commonly used gamification elements at the secondary level.

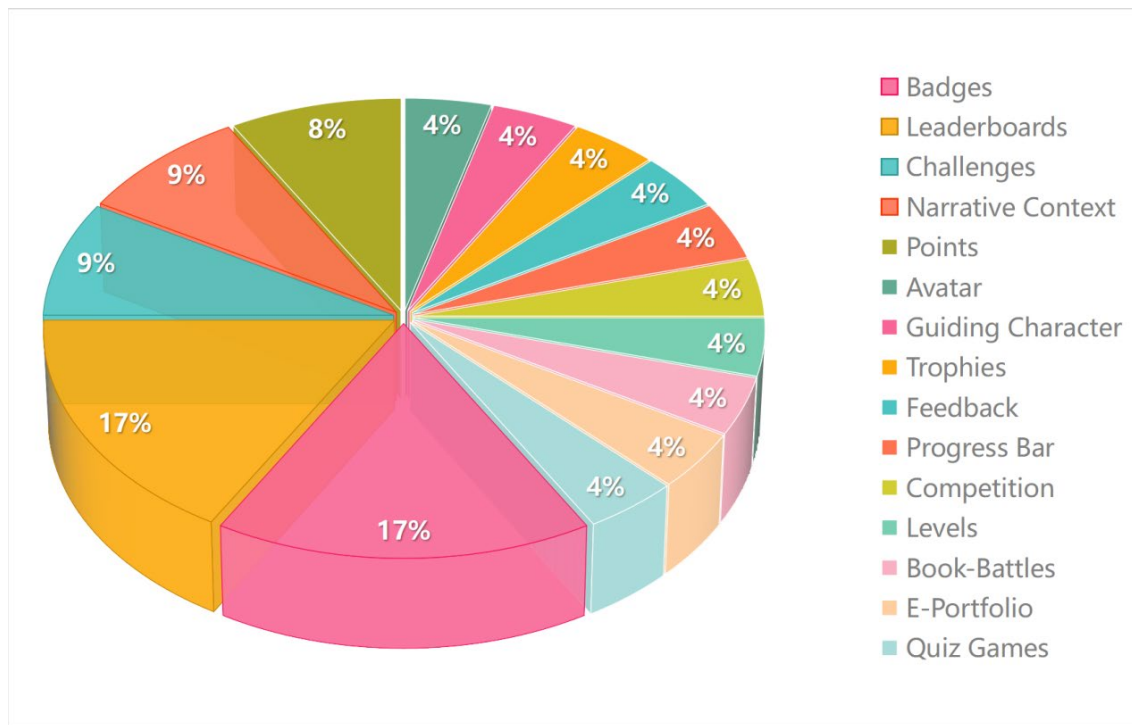


Figure 5. Commonly used gamification elements in primary school

According to Figure 5, the distribution of gamification elements at the primary level, badges, and leaderboards appeared four times each. Challenges, narrative contexts, and points each appeared twice. Other elements, including avatars, guiding characters, trophies, feedback, progress bars, competitions, levels, book battles, e-portfolios, and quiz games, each appeared once.

According to Figure 6, the distribution of gamification elements at the secondary level, the most frequent gamification elements at the secondary level were badges, leaderboards, and points, which appeared twice each. Other elements, including levels, progress, narrative context, avatars, cooperation, challenges, virtual map exploration, and board games, were mentioned only once.

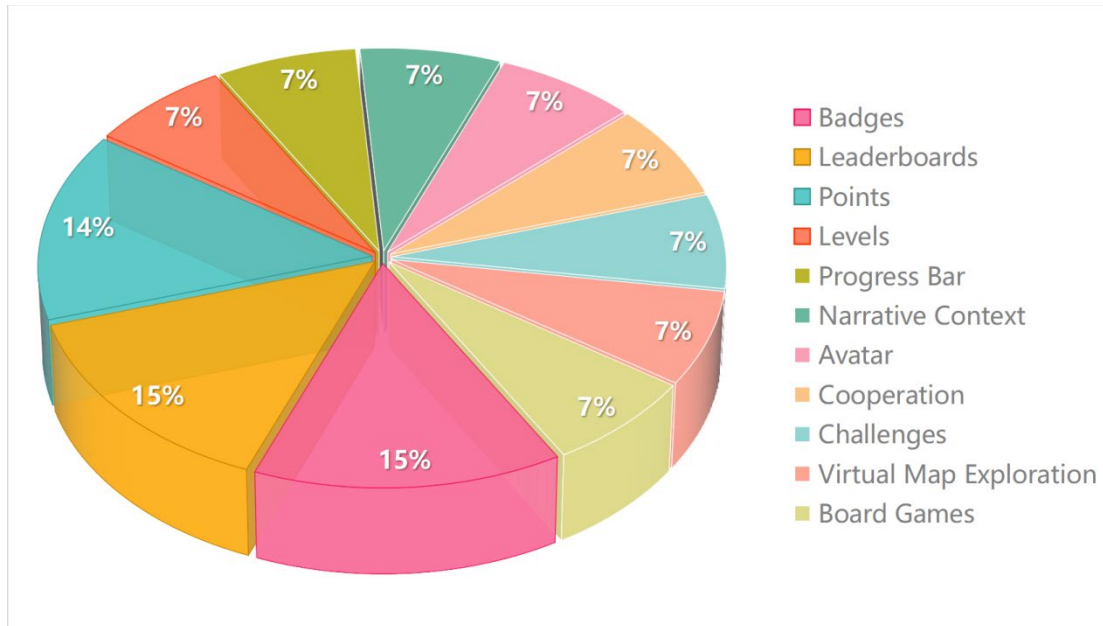


Figure 6. Commonly used gamification elements in Secondary school

Based on the contents of the table and figure, several conclusions can be drawn to understand how gamification is implemented in reading instruction in different educational contexts. First, in terms of gamification elements, the higher education level mainly uses a variety of elements such as points, challenges, and voting mechanisms, suggesting increased engagement through competition and cooperation. At the secondary level, researchers typically use elements such as virtual map exploration and board games to increase engagement through exploration and strategic thinking. At the primary level, combining various elements such as badges, narrative environments, and avatars are frequently used to create personalized and engaging learning experiences that are adapted to the learning styles of different students. At the pre-primary level, simpler elements such as feedback and leaderboards are often used to meet young children's need for instant gratification and simplicity.

Second, in terms of the use of gamified software or applications, interactive tools such as Kahoot! and the Bibliobattle reading game are often employed at the higher education level, utilizing feedback mechanisms and competitive elements in a more academic environment, sometimes integrating open-source software, designed to promote active participation and collaborative learning. At the secondary level, platforms such as Moodle are combined with gamification plug-ins or utilize more structured and competition-oriented gamified reading platforms to enhance learning. At the primary level, researchers often employ a variety of educational technologies to create an engaging learning environment to engage learners, including customized gamified reading platforms and training systems tailored to specific learning needs. At the pre-primary level, the focus is on familiar and engaging platforms, such as the Pokémon trading card game, that are highly aligned with young children's interests while emphasizing interactions and incentives to foster interest in early reading.

From the above findings, it can be seen that the higher education level focuses on collaborative and competitive activities to develop critical thinking and teamwork skills. At the secondary level, exploration, and strategic thinking are emphasized to help prepare students for more complex problem-solving tasks. At the primary education level, a balance is struck between competitive narrative-driven and personalized learning experiences to meet diverse learning needs. At the preschool level, the aim is to make learning fun and engaging through simple elements of competition and cooperation to develop early literacy skills. Overall, the implementation of gamification in reading instruction is flexible

and adaptable to the needs and constraints of the educational environment. Primary schools and pre-schools tend to use more interactive and visually appealing elements to capture the attention of younger students, while secondary and higher education focus on feedback and competition to motivate older students.

RQ3. WHAT ARE THE MEASURABLE EFFECTS OF GAMIFICATION ON STUDENT READING ENGAGEMENT AND COMPREHENSION?

In order to provide a comprehensive overview of what the measurable impacts of gamification on student reading engagement and comprehension have been in historical research, this review tabulated and analyzed the measurable impacts of reading comprehension and the measurable impacts of reading engagement for each of the 15 reviewed articles (Table 7). The analysis of the tables allows us to know how the impacts are measured in the field of gamified reading instruction and inform subsequent research in this area.

Table 7. Measurable effects in the reviewed literature

No.	Study	Measurable effects on reading comprehension	Measurable effects on reading engagement
1	(Cattoni et al., 2024)	Reading speed and accuracy	Motivation to read
2	(Chen et al., 2020)	Reading comprehension performance	Immersion experience and social interaction
3	(Dovhaniuk & Thelen, 2022)	Reading comprehension performance	User engagement through levels and ranks
4	(Freiermuth & Ito, 2022)	Reading comprehension performance	Motivation to read
5	(Kaban, 2021)	Reading comprehension performance	Autonomous and engaged
6	(Kuswandi & Fadhli, 2022)	Reading ability using the Early Reading Screening Inventory	Cognitive style using the Children Embedded Figure Test (CEFT)
7	(Li & Chu, 2021)	Reading comprehension performance	Reading interest, motivation, habits, and abilities
8	(Manzano-León et al., 2022)	Reading comprehension performance	Reading interest, frequency, and abilities
9	(Matyakhan et al., 2024)	Reading comprehension performance	Reading engagement
10	(Murray et al., 2024)	Reading fluency assessments	Number of instances of reading exercises
11	(Ndegwa et al., 2023)	Reading comprehension performance	Students' perceptions and attitudes
12	(Prados Sánchez et al., 2023)	PIRLS studies (locate information, make inferences, integrate ideas, and analyze content)	The Elementary Reading Attitude Survey (ERAS) (academic and recreational reading attitudes)
13	(Qiao et al., 2023)	Reading comprehension performance	Reading engagement (behavioral, cognitive, and emotional dimensions)

No.	Study	Measurable effects on reading comprehension	Measurable effects on reading engagement
14	(Rukayah et al., 2023)	Feedback from material experts, media experts, and expert practitioners on the quiz game learning media	Feedback on the quiz game learning media
15	(Tsai et al., 2020)	Students' reading comprehension competency indicators (vocabulary recognition, association, and generalization, and understanding and exploration)	Motivation to read

Table 7 shows the measurable effects in terms of reading comprehension and engagement to read. Nine of the 15 papers did not specifically list what factors were measured in reading comprehension. One measured reading speed and reading accuracy, and one measured reading ability on the Early Reading Screening Inventory. One measured reading fluency and one used the PIRLS study (Finding Information, Making Inferences, Integrating Ideas, and Analyzing Content) to assess reading comprehension. One assessed reading comprehension through vocabulary identification, association and generalization, and comprehension and exploration. One measured reading comprehension by using the PIRLS study (Finding Information, Making Inferences, Integrating Ideas, and Analyzing Content). One more uses feedback from materials specialists, media specialists, and expert practitioners on quiz game learning media.

In terms of measurable factors of reading engagement, three articles did not specifically list which factors were measured in terms of reading engagement (Cattoni et al., 2024; Freiermuth & Ito, 2022). One article measured immersive experiences and social interactions (Chen et al., 2020). One article measured increasing user Engagement (Dovhaniuk & Thelen, 2022). One measured autonomy and engagement (Kaban, 2021). One measured cognitive style using the Children's Embedded Figures Test (CEFT) (Kuswandi & Fadhli, 2022). One measured reading interest, motivation, habits, and ability (Li & Chu, 2021). One measured reading interest, frequency, and ability (Manzano-León et al., 2022). Two measured reading engagement (Matyakhan et al., 2024; Qiao et al., 2023). One measured the number of reading exercises (Murray et al., 2024). One measured students' perceptions and attitudes (Ndegwa et al., 2023). One measured academic and leisure reading attitudes (Prados Sánchez et al., 2023). One measured feedback on quiz game learning media (Rukayah et al., 2023).

According to the table content, the indicator of gamification in reading comprehension measurables is usually collated reading comprehension scores or performance, followed by improvements in speed and accuracy of reading comprehension. This suggests that the gamification approach is relatively clear in terms of measurable factors in reading comprehension ability. The effects of reading engagement varied and included increases in motivation, engagement, and interest in reading. Studies such as (Li & Chu, 2021) and (Manzano-León et al., 2022) highlighted the positive impact of gamification on students' reading habits and abilities, suggesting that gamification makes reading more fun and engaging. Furthermore, measuring immersive experiences, social interaction, and user engagement through levels and rankings (Chen et al., 2020; Dovhaniuk & Thelen, 2022) suggests that gamified environments can make reading more interactive and socially engaging, which in turn can further motivate reading. This also suggests that gamification methods are relatively diverse in terms of measurable factors in terms of reading engagement.

RQ4. WHAT FUTURE DIRECTIONS AND RECOMMENDATIONS DO RESEARCHERS OFFER FOR EFFECTIVELY INTEGRATING GAMIFICATION INTO READING INSTRUCTION?

In order to consolidate ideas from existing literature on enhancing and optimizing the teaching of gamified reading while also identifying areas of research that need to be explored in the future, this evaluation was conducted by analyzing and extracting from a total of 15 literature reviews on recommendations and future directions. Following the process of de-emphasis, a total of 14 recommendations were developed for gamified reading learning.

1. Emphasize comprehensive training and the integration of gamified tools into school programs. Further research is needed to understand the limitations and benefits of gamification for effective implementation (Cattoni et al., 2024).
2. Design gamification mechanisms to encourage high-quality annotations that can effectively enhance students' reading comprehension. Promote both annotation quality and connection between reading achievement and gamification mechanisms. The study suggests future research to better associate gamification features with learning performance (Chen et al., 2020).
3. The study suggests further development of engaging tasks, balancing parameters for skill repetition, and maintaining user interest. It also recommends expanding the scope to other languages and non-linguistic aspects of reading academic texts (Dovhaniuk & Thelen, 2022).
4. Implement Bibliobattles as specialized events and stimulate a love for reading in a second language (Freiermuth & Ito, 2022).
5. Suggests increasing the use of gamification in education to motivate students and improve learning outcomes. Further research on the influence of gamification on educational performance, particularly in reading skills (Kaban, 2021).
6. The use of a design science approach to evaluate the impact of gamification in education and suggest further development of the gamification method content and design. Also, the need for testing in a wider area is highlighted (Kuswandi & Fadhli, 2022).
7. Further research on collaborative and narrative gaming elements to engage children who dislike competition (Li & Chu, 2021).
8. The article suggests that for gamification to help improve reading processes, it is advisable to apply the largest number of sessions possible over the course of the school year. Address the needs of immigrant students and students with dyslexia through gamification and game-based learning (Manzano-León et al., 2022).
9. Further research and refinement of gamification strategies in reading instruction could be beneficial (Matyakhan et al., 2024).
10. It recommends incorporating longitudinal, multi-stakeholder data and adapting methodologies to the unique cognitive and developmental needs of preschoolers (Murray et al., 2024).
11. The study suggests further research with one tablet per child and replication with other linguistic groups to improve the gamification strategy (Ndegwa et al., 2023).
12. The study highlights the need for further research on the effects of gamification on reading comprehension and attitudes. It suggests evaluating variables in superficial gamification to understand their impact on engagement and learning (Prados Sánchez et al., 2023).
13. The authors suggest expanding the understanding of game design elements and creating collaborative gamification in blended learning settings. They recommend considering students' prior skill levels in gamification design to protect low-achieving students (Qiao et al., 2023).

14. Suggestions include providing more detailed feedback and discussing how teachers can support students with lower language abilities. Future studies could explore different behavior patterns using gamified WCRAS and their impact on reading comprehension performance (Tsai et al., 2020).

To gain a more distinct understanding of the recommendations and future goals, the researcher employed the theme analysis method to conduct a more in-depth examination of these items. As shown in Table 8, the recommendations and future directions for the field of gamified reading instruction were grouped into six broad categories (Integration and Training, Research and Evaluation, Gamification Design, Targeted Approaches, Methodology, and Educational Outcomes) and 19 sub-categories.

Table 8. Thematic analysis of recommendations from the reviewed literature

Category	Sub-category	Reference
Integration and Training	Comprehensive Training	(Cattoni et al., 2024)
	Integration into School Programs	(Cattoni et al., 2024)
	Use of Design Science Approach	(Kuswandi & Fadhli, 2022)
Research and Evaluation	Further Research on Benefits and Limitations	(Cattoni et al., 2024; Kaban, 2021; Matyakhan et al., 2024; Prados Sánchez et al., 2023)
	Longitudinal and Multi-stakeholder Data	(Murray et al., 2024).
	Replication and Testing in Wider Areas	(Kuswandi & Fadhli, 2022; Ndegwa et al., 2023)
Gamification Design	High-quality Annotations	(Chen et al., 2020)
	Engaging Tasks and Skill Repetition	(Dovhaniuk & Thelen, 2022)
	Game Design Elements	(Qiao et al., 2023)
	Collaborative and Narrative Gaming Elements	(Li & Chu, 2021)
	Detailed Feedback and Support for Lower Language Abilities	(Tsai et al., 2020)
Targeted Approaches	Addressing Needs of Immigrant Students and Students with Dyslexia	(Manzano-León et al., 2022)
	Cognitive and Developmental Needs of Preschoolers	(Murray et al., 2024)
	Considering Students' Prior Skill Levels	(Qiao et al., 2023)
Methodologies	Gamified Tools and Mechanisms	(Chen et al., 2020)
	Bibliobattles	(Freiermuth & Ito, 2022)
Educational Outcomes	Motivation and Learning Outcomes	(Kaban, 2021)
	Reading Comprehension and Attitudes	(Prados Sánchez et al., 2023)
	Behavior Patterns and Reading Comprehension Performance	(Tsai et al., 2020)

The thematic analysis of these elements reveals the following future directions and recommendations made by researchers in the field of gamified reading learning from 2020-2024:

1. *Integration and Training*: Emphasizes the importance of comprehensive training and the integration of gamified tools into school programs. This includes using a design science approach and ensuring these tools are effectively tested and implemented in various educational settings (Cattoni et al., 2024; Kuswandi & Fadhli, 2022).
2. *Research and Evaluation*: Highlights the need for ongoing research to understand the benefits and limitations of gamification. This includes conducting longitudinal studies and involving

- multiple stakeholders to gather comprehensive data. Further research is also needed to replicate studies in different linguistic and cultural contexts (Cattoni et al., 2024; Chen et al., 2020; Kaban, 2021; Kuswandi & Fadhli, 2022; Matyakhan et al., 2024; Murray et al., 2024; Ndegwa et al., 2023; Prados Sánchez et al., 2023).
3. *Gamification Design*: Focuses on the design aspects of gamification, including creating high-quality annotations, engaging tasks, and considering the narrative and collaborative elements of games. It also stresses the importance of providing detailed feedback and supporting students with varying language abilities (Chen et al., 2020; Dovhaniuk & Thelen, 2022; Li & Chu, 2021; Qiao et al., 2023; Tsai et al., 2020).
 4. *Targeted Approaches*: Suggests that gamification strategies should be tailored to address the specific needs of different student groups, such as immigrant students, students with dyslexia, and preschoolers. This involves adapting methodologies to cater to the cognitive and developmental needs of these students (Manzano-León et al., 2022; Murray et al., 2024; Qiao et al., 2023).
 5. *Methodologies*: Recommends incorporating various gamified tools and mechanisms, such as Bibliobattles, to stimulate interest and improve reading outcomes. It also suggests further development and refinement of these methodologies (Chen et al., 2020; Freiermuth & Ito, 2022).
 6. *Educational Outcomes*: Emphasizes the importance of measuring the impact of gamification on motivation, learning outcomes, reading comprehension, and attitudes. Future studies should explore how different gamification variables affect student engagement and performance (Kaban, 2021; Prados Sánchez et al., 2023; Tsai et al., 2020).

DISCUSSION

This systematic review addresses critical gaps in the research on the use of gamification in reading instruction, specifically focusing on the period from 2020 to 2024. The introduction highlighted that existing studies have primarily concentrated on short-term outcomes in limited educational contexts and have not extensively explored the theoretical underpinnings of gamification in reading. By synthesizing the findings of 15 empirical studies, this review has provided a comprehensive analysis that not only identifies the prevalent theories, models, and frameworks but also delves into the diverse implementation strategies and measurable outcomes across different educational settings.

The synthesis review shows a significant increase in the number of relevant publications between 2020 and 2024, reflecting the growing interest in gamified reading and learning in education. The dominance of Chinese research suggests that China is purposefully integrating innovative teaching strategies to enhance reading instruction. Countries such as Indonesia and Spain also made significant contributions, reflecting the global interest in gamification. This trend is consistent with recent research findings that gamification plays an important role in enhancing student engagement and learning outcomes (Jaramillo-Mediavilla et al., 2024).

In terms of the educational contexts in which gamification is applied, gamified reading instruction is most prevalent in primary education, as students are likely to be at the developmental stage where they are most receptive to gamified approaches. Interest in gamification remains constant at the secondary and tertiary levels, suggesting that gamification makes sense for older groups of students. The smallest number of studies in the preschool sector may reflect the fact that the exploration of gamification for this age group is still in its infancy or that a more targeted approach is needed. This discovery offers more proof of the suitability and attractiveness of gamification in many educational settings. Several reviews examining the use of gamification in education have consistently demonstrated that gamification has positive outcomes in terms of enhancing student engagement and improving academic achievement across various educational settings. These findings align with the outcomes of this investigation. Previous research has indicated that gamification is more commonly used in universities than at other educational levels. However, this study's findings contradict that, likely because

previous studies have made generalizations about gamification in education as a whole, whereas this study specifically focuses on gamification in the context of reading learning (Cavus et al., 2023; Jaftha et al., 2021; Manzano-León et al., 2021).

The diversity of theories, models, and frameworks identified in the literature emphasizes the interdisciplinary nature of game-based reading instruction. Self-determination theory (SDT) played a significant role in three of the seven studies, indicating a strong focus on understanding the motivational aspects of gamified environments. SDT's emphasis on autonomy, competence, and relevance is very much in line with the goals of gamified learning, which are to enhance intrinsic motivation and engagement (Ertan & Kocadere, 2022; Ryan & Deci, 2000, 2022). Incorporating social constructivist and sociocultural theories highlights the importance of social interaction and cultural context in learning, suggesting that gamification can promote collaborative and culturally responsive learning environments (Alavinia et al., 2014; Bruner, 1996; Vygotsky, 1968). However, the field still lacks a coherent theoretical framework, which is reflected in the variety of models and the large number of studies that do not explicitly use any theory. This fragmentation suggests the need for further theoretical development and integration to provide a more consistent basis for future research.

The implementation of gamification in the teaching of reading varies significantly between educational stages, suggesting that strategies need to be tailored to specific age groups and learning environments. The highest levels of gamification implementation were found in primary education, with a focus on badges, leaderboards, narrative environments, and avatars to create engaging and personalized learning experiences. In contrast, higher education tends to use elements such as points, challenges, and collaboration to foster critical thinking and teamwork. The use of familiar and engaging platforms such as the Pokémon Trading Card Game in preschool highlights the importance of aligning gamification strategies with the interests and developmental needs of younger students. This diversity suggests that while gamification is a versatile tool, its effectiveness depends on careful adaptation to specific educational settings and learner needs (Dicheva et al., 2015). This study offers a comprehensive analysis of the most efficient gamification components for enhancing reading learning in various educational settings, surpassing other studies that merely mention the commonly employed gamification elements such as points, badges, feedback, grades, and leaderboards (Alomari et al., 2019; Bai et al., 2020; Majid et al., 2024; Subhash & Cudney, 2018).

In terms of measurable impact on engagement and comprehension, the review shows that gamification has a positive and measurable impact on both students' reading engagement and comprehension. Studies consistently show that when game elements are integrated into reading instruction, engagement increases, as do reading time, enjoyment, and participation. For example, Huang et al. (2020) found that secondary school students who used a gamified program increased their reading time by 30%. Similarly, reading comprehension significantly improved, as confirmed by Sanabria Huertas' (2021) study, which found that gamification promoted active student participation, increased motivation, and made learning more enjoyable. Students felt more confident and aware of their reading comprehension needs, leading to improved performance. These findings support the hypothesis that gamification can increase the interactivity and fun of reading, thereby improving motivation and learning outcomes. However, the effects vary across populations and educational settings, suggesting that further research is needed to understand the long-term effects and optimize gamification strategies for different learners (Hamari et al., 2014).

In terms of future directions and recommendations, the analysis of the literature reviewed provides a number of key recommendations for future research and practice. Comprehensive training and integration of gamification tools into school curricula is essential for effective implementation. The researchers emphasized the need for ongoing evaluation to understand the strengths and limitations of gamification, calling for longitudinal studies and multi-stakeholder engagement. They also highlighted design aspects of gamification, including the creation of high-quality annotations, engaging tasks, and narrative and collaborative elements. Targeted approaches that address the specific needs of different student populations, such as immigrant students and dyslexic students, are critical. In addition, the

researchers recommend expanding the scope of gamification to include a variety of educational techniques and approaches, such as book wars and quiz games, to stimulate interest and improve reading outcomes. These insights point the way to improving and optimizing gamified reading instruction to better meet the diverse needs of students (Ryan & Deci, 2020; Sailer & Homner, 2020).

The key findings of this study directly address the research questions posed. The identification of theories and models not only supports the conceptual understanding of gamification in education but also provides practical guidance for educators seeking to implement these strategies effectively. The diversity in gamification elements across educational contexts underscores the importance of tailoring approaches to meet the specific needs of different age groups and learning environments. Compared to other studies, this review provides a more nuanced understanding of how gamification can be leveraged to enhance reading instruction, particularly by integrating elements that cater to both engagement and comprehension. The innovations in this study lie in the comprehensive synthesis of recent empirical data, offering a more detailed and actionable framework for educators and policy-makers.

However, this study has several limitations. The focus on studies published only from 2020 to 2024 may have excluded earlier influential research that could provide additional context or alternative perspectives. Additionally, the review was limited to English-language, peer-reviewed articles, potentially overlooking valuable insights from non-English publications or grey literature. These limitations suggest that the results, while robust, may not fully capture the global scope of research on gamification in reading instruction. Future research should address these limitations by including a broader range of studies, both temporally and linguistically, to ensure a more comprehensive understanding.

Future research should continue to explore the evolving nature of gamification in reading instruction, particularly by investigating its long-term effects on learners across different age groups and cultural contexts. There is also a need for more experimental studies that can establish causal relationships between specific gamification elements and learning outcomes, thereby providing clearer guidance for educators. Additionally, research should examine the role of technology advancements, such as AI and machine learning, in creating more adaptive and effective gamified learning experiences.

In conclusion, this systematic review has significantly advanced the understanding of gamification in reading instruction by synthesizing recent research findings and providing practical recommendations for future study. The findings underscore the potential of gamification to enhance reading engagement and comprehension, offering a solid foundation for continued exploration in this evolving field. The review not only fills existing research gaps but also sets the stage for future studies that could further refine and expand the use of gamification in educational settings.

CONCLUSION

This systematic literature review has provided a comprehensive analysis of the application of gamification in reading instruction from 2020 to 2024. The review has identified key theoretical models, diverse implementation strategies across educational stages, and measurable outcomes on student engagement and comprehension. The findings underscore the potential of gamification to enhance reading instruction by making it more interactive and engaging. However, the review also highlights several limitations in the current research, including the short-term focus of many studies, the lack of a unified theoretical framework, and the need for more longitudinal research to understand the long-term effects of gamification. The study emphasizes the importance of tailoring gamification strategies to the specific needs of different educational levels, with primary education showing the highest level of implementation. The positive impact on reading engagement and comprehension suggests that gamification could be a valuable tool in addressing the persistent challenges in reading instruction. However, to fully realize its potential, there is a need for further theoretical integration, more robust empirical research, and a focus on the long-term sustainability of gamification strategies. This review has filled critical gaps in the literature by synthesizing recent empirical studies and providing practical

recommendations for educators and researchers. The insights gained from this review offer a solid foundation for future research and practice, paving the way for more effective and engaging reading instruction through the use of gamification.

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REFERENCES

- Alavinia, P., Aslrasouli, M., & Rostami, M. (2014). Reappraisal of the pivotal role of social interactionist perspectives in furthering learners' reading, attitudinal dexterities. *Procedia - Social and Behavioral Sciences*, *98*, 153–160. <https://doi.org/10.1016/j.sbspro.2014.03.401>
- Alomari, I., Al-Samarraie, H., & Yousef, R. (2019). The role of gamification techniques in promoting student learning: A review and synthesis. *Journal of Information Technology Education: Research*, *18*, 395–417. <https://doi.org/10.28945/4417>
- Bai, S., Hew, K. F., & Huang, B. (2020). Does gamification improve student learning outcome? Evidence from a meta-analysis and synthesis of qualitative data in educational contexts. *Educational Research Review*, *30*, 100322. <https://doi.org/10.1016/j.edurev.2020.100322>
- Becker, K. (2021). What's the difference between gamification, serious games, educational games, and game-based learning. *Academia Letters*, Article 209. <https://doi.org/10.20935/AL209>
- Behl, A., Jayawardena, N., Pereira, V., Islam, N., Giudice, M. D., & Choudrie, J. (2022). Gamification and e-learning for young learners: A systematic literature review, bibliometric analysis, and future research agenda. *Technological Forecasting and Social Change*, *176*, 121445. <https://doi.org/10.1016/j.techfore.2021.121445>
- Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, *11*(4), 589–597. <https://doi.org/10.1080/2159676X.2019.1628806>
- Bruner, J. S. (1996). *The culture of education*. Harvard University Press. <https://doi.org/10.4159/9780674251083>
- Cattoni, A., Anderle, F., Venuti, P., & Pasqualotto, A. (2024). How to improve reading and writing skills in primary schools: A comparison between gamification and pen-and-paper training. *International Journal of Child-Computer Interaction*, *39*, 100633. <https://doi.org/10.1016/j.ijcci.2024.100633>
- Cavus, N., Ibrahim, I., Okonkwo, M. O., Ayansina, N. B., & Modupeola, T. (2023). The effects of gamification in education: A systematic literature review. *Broad Research in Artificial Intelligence and Neuroscience*, *14*(2), 211–241. <https://doi.org/10.18662/brain/14.2/452>
- Chen, C.-M., Li, M.-C., & Chen, T.-C. (2020). A web-based collaborative reading annotation system with gamification mechanisms to improve reading performance. *Computers & Education*, *144*, 103697. <https://doi.org/10.1016/j.compedu.2019.103697>
- Dehghanzadeh, H., Farrokhnia, M., Dehghanzadeh, H., Taghipour, K., & Noroozi, O. (2024). Using gamification to support learning in K-12 education: A systematic literature review. *British Journal of Educational Technology*, *55*(1), 34–70. <https://doi.org/10.1111/bjet.13335>
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining “gamification.” *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments* (pp. 9–15). Association for Computing Machinery. <https://doi.org/10.1145/2181037.2181040>

- Dicheva, D., Dichev, C., Agre, G., & Angelova, G. (2015). Gamification in education: A systematic mapping study. *Journal of Educational Technology & Society*, 18(3), 75–88. <http://www.jstor.org/stable/jeductech-soci.18.3.75>
- Dovhaniuk, E., & Thelen, T. (2022). Designing a gamified web application for training academic reading skills. *Proceedings of the 19th International Conference on Cognition and Exploratory Learning in the Digital Age*, 303–307. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85147523503&partnerID=40&md5=b415efa46727398c342407a69982ea43>
- Efriza, D., Deswarni, D., & Sepyanda, M. (2023). What can reading motivation do for improving student's reading comprehension? Implications for reading instruction in the school. *English Franca: Academic Journal of English Language and Education*, 7, 133–144. <https://doi.org/10.29240/ef.v7i1.4344>
- Ertan, K., & Kocadere, S. A. (2022). Gamification design to increase motivation in online learning environments: A systematic review. *Journal of Learning and Teaching in Digital Age*, 7(2), 151–159. <https://doi.org/10.53850/joltida.1020044>
- Freiermuth, M. R., & Ito, M. (2022). Battling with books: The gamification of an EFL extensive reading class. *Simulation and Gaming*, 53(1), 22–55. <https://doi.org/10.1177/10468781211061858>
- García-López, I. M., Acosta-Gonzaga, E., & Ruiz-Ledesma, E. F. (2023). Investigating the impact of gamification on student motivation, engagement, and performance. *Education Sciences*, 13(8), Article 8. <https://doi.org/10.3390/educsci13080813>
- Hamari, J., Koivisto, J., & Sarsa, H. (2014, January). Does gamification work? A literature review of empirical studies on gamification. *Proceedings of the 47th Hawaii International Conference on System Sciences, Waikoloa, HI, USA*, 3025–3034. <https://doi.org/10.1109/HICSS.2014.377>
- Huang, R., Ritzhaupt, A. D., Sommer, M., Zhu, J., Stephen, A., Valle, N., Hampton, J., & Li, J. (2020). The impact of gamification in educational settings on student learning outcomes: A meta-analysis. *Educational Technology Research and Development*, 68(4), 1875–1901. <https://doi.org/10.1007/s11423-020-09807-z>
- Jaftha, N., Zahra-Micallef, M., & Chircop, T. (2021). The impact of gamified instruction on students' learning outcomes: Systematic review of experimental studies. *International Journal of Education*, 13(4), 55–85. <https://doi.org/10.5296/ije.v13i4.19193>
- Jaramillo-Mediavilla, L., Basantes-Andrade, A., Cabezas-González, M., & Casillas-Martín, S. (2024). Impact of gamification on motivation and academic performance: A systematic review. *Education Sciences*, 14(6), Article 6. <https://doi.org/10.3390/educsci14060639>
- Kaban, A. L. (2021). Gamified e-reading experiences and their impact on reading comprehension and attitude in EFL classes. *International Journal of Mobile and Blended Learning*, 13(3), 71–90. <https://doi.org/10.4018/IJMBL.2021070105>
- Krath, J., Schürmann, L., & von Korfflesch, H. F. O. (2021). Revealing the theoretical basis of gamification: A systematic review and analysis of theory in research on gamification, serious games and game-based learning. *Computers in Human Behavior*, 125, 106963. <https://doi.org/10.1016/j.chb.2021.106963>
- Kuswandi, D., & Fadhli, M. (2022). The effects of gamification method and cognitive style on children's early reading ability. *Cogent Education*, 9(1), Article 2145809. <https://doi.org/10.1080/2331186X.2022.2145809>
- Landers, R. N. (2014). Developing a theory of gamified learning: Linking serious games and gamification of learning. *Simulation & Gaming*, 45(6), 752–768. <https://doi.org/10.1177/1046878114563660>
- Landers, R. N., Armstrong, M. B., & Collmus, A. B. (2017). How to use game elements to enhance learning: Applications of the theory of gamified learning. In M. Ma, & A. Oikonomou (Eds.), *Serious games and entertainment Applications* (pp. 457–483). Springer. https://doi.org/10.1007/978-3-319-51645-5_21
- Li, X., & Chu, S. K. W. (2021). Exploring the effects of gamification pedagogy on children's reading: A mixed-method study on academic performance, reading-related mentality and behaviors, and sustainability. *British Journal of Educational Technology*, 52(1), 160–178. <https://doi.org/10.1111/bjet.13057>
- Luo, S., Wang, D., & Wang, R. (2023). A study of gamified teaching activities for enhancing motivation in Grade 6 primary school students – An example of instructional design model on a field course. *SHS Web of Conferences*, 180, Article 4007. <https://doi.org/10.1051/shsconf/202318004007>

- Majid, W. M. W., Zain, F. M., & Ismail, S. N. (2024). Gamified flipped classroom in education: A systematic review. *International Journal of Evaluation and Research in Education*, 13(3), 1610–1622. <https://doi.org/10.11591/ijere.v13i3.26721>
- Manzano-León, A., Camacho-Lazarraga, P., Guerrero, M. A., Guerrero-Puerta, L., Aguilar-Parra, J. M., Trigueros, R., & Alias, A. (2021). Between level up and game over: A systematic literature review of gamification in education. *Sustainability*, 13(4), 2247. <https://doi.org/10.3390/su13042247>
- Manzano-León, A., Rodríguez Ferrer, J. M., Aguilar Parra, J. M., Fernández Campoy, J. M., Trigueros, R., & Martínez Martínez, A. M. (2022). Play and learn: Influence of gamification and game-based learning in the reading processes of secondary school students. *Revista de Psicodidáctica (English Ed.)*, 27(1), 38–46. <https://doi.org/10.1016/j.psicoe.2021.08.001>
- Matyakhan, T., Chaowanakritsanakul, T., & Santos, J. A. L. (2024). Implementing gamification to enhance reading engagement and reading comprehension of Thai EFL university students. *LEARN Journal: Language Education and Acquisition Research Network*, 17(1), 212–239.
- Murray, A., Chen, I., & Liu, Y. (2024). Unlocking the magic of gamification for preschool language learners: A non-digital approach to boosting reading engagement at home. *English Teaching and Learning*, 48(2), 155–188. <https://doi.org/10.1007/s42321-024-00166-z>
- Nair, S., & Mathew, J. (2022). Learning through play: Gamification of learning, a systematic review of studies on gamified learning. *Journal of Information Technology Management*, 14(1), 113–126.
- Ndegwa, A., Gutiérrez-Colón, M., & Manegre, M. (2023). Impact of a gamified application on reading comprehension and attitude of Swahili among young learners in Kenya. *Interactive Learning Environments*, 32(6), 3047–3059. <https://doi.org/10.1080/10494820.2023.2165507>
- OECD. (2019). *PISA 2018 results (Volume I): What students know and can do*. <https://doi.org/10.1787/5f07c754-en>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., & Brennan, S. E. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 372(71). <https://doi.org/10.1136/bmj.n71>
- Page, M. J., Moher, D., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., & Brennan, S. E. (2021). PRISMA 2020 explanation and elaboration: Updated guidance and exemplars for reporting systematic reviews. *BMJ*, 372(160). <https://doi.org/10.1136/bmj.n160>
- Polat, E. (2023). Gamification implementation for educational purposes: A scoping review (2013-2018). *Educational Technology Quarterly*, 2023(3), 367–400 <https://doi.org/10.55056/etq.589>
- Prados Sánchez, G., Cózar-Gutiérrez, R., Del Olmo-Muñoz, J., & González-Calero, J. A. (2023). Impact of a gamified platform in the promotion of reading comprehension and attitudes towards reading in primary education. *Computer Assisted Language Learning*, 36(4), 669–693. <https://doi.org/10.1080/09588221.2021.1939388>
- Qiao, S., Chu, S. K. W., & Yeung, S. S. (2023). Understanding how gamification of English morphological analysis in a blended learning environment influences students' engagement and reading comprehension. *Computer Assisted Language Learning*, 1–34. <https://doi.org/10.1080/09588221.2023.2230273>
- Rukayah, Daryanto, J., Atmojo, I., Saputri, D., Ardiansyah, R., & Ariwijaya, I. (2023). The development of quiz game learning media for Javanese script reading skills for fifth-grade elementary school students. *Pegegog Journal of Education and Instruction*, 13(1), 60–67. <https://doi.org/10.47750/pegegog.13.01.07>
- Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54–67. <https://doi.org/10.1006/ceps.1999.1020>
- Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, 61, 101860. <https://doi.org/10.1016/j.cedpsych.2020.101860>
- Ryan, R. M., & Deci, E. L. (2022). Self-determination theory. In F. Maggino (Ed.), *Encyclopedia of quality of life and well-being research* (pp. 1–7). Springer. https://doi.org/10.1007/978-3-319-69909-7_2630-2

- Sailer, M., & Homner, L. (2020). The gamification of learning: A meta-analysis. *Educational Psychology Review*, 32, 77–112. <https://doi.org/10.1007/s10648-019-09498-w>
- Sanabria Huertas, M. (2021). *Enhancing reading comprehension skills through gamification in a group of eleventh graders at a private school in Bogotá* [Masters dissertation, Universidad Pedagógica Nacional, Bogotá] <https://scihub.ru/http://repository.pedagogica.edu.co/handle/20.500.12209/17188>
- Siregar, R. M., Kisno, K., Sherly, S., & Manalu, T. S. J. (2023). On gamification and students' reading ability in vocational high school. *Edukatif: Jurnal Ilmu Pendidikan*, 5(1), 209–220. <https://doi.org/10.31004/edukatif.v5i1.4048>
- Subhash, S., & Cudney, E. A. (2018). Gamified learning in higher education: A systematic review of the literature. *Computers in Human Behavior*, 87, 192–206. <https://doi.org/10.1016/j.chb.2018.05.028>
- Tsai, L.-K., Li, M.-C., Chen, C.-M., & Kao, Y.-C. (2020). The effects of collaborative reading annotation system with gamified mechanisms on reading comprehension performance. *Proceedings of the 9th International Congress on Advanced Applied Informatics, Kitakyushu, Japan*, 254–259. <https://doi.org/10.1109/IIAI-AAI50415.2020.00057>
- Vygotsky, L. (1968). *Thought and language*. MIT Press.
- Waluyo, B., Phanrangsee, S., & Whanchit, W. (2023). Gamified grammar learning in online English courses in Thai higher education. *Online Journal of Communication and Media Technologies*, 13(4), e202354. <https://doi.org/10.30935/ojcm/13752>
- Zainuddin, Z., Shujahat, M., Haruna, H., & Chu, S. K. W. (2020). The role of gamified e-quizzes on student learning and engagement: An interactive gamification solution for a formative assessment system. *Computers & Education*, 145, 103729. <https://doi.org/10.1016/j.compedu.2019.103729>

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