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THE IMPACT OF GAME-BASED LEARNING ON CLASSROOM INSTRUCTION: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

This systematic literature review (SLR) examines the impact of game-based learning (GBL) on classroom instruction, synthesizing findings from 11 action research studies published since 2019. Utilizing the PRISMA 2009 framework, this review identifies trends, geographical distributions, and the interplay between GBL interventions and classroom outcomes. The analysis reveals that GBL enhances academic performance, student engagement, and social and cognitive skills while fostering positive emotional outcomes such as reduced stress and increased motivation. Key GBL strategies, including digital games, escape rooms, and role-playing, demonstrate significant benefits across diverse educational and cultural contexts. However, challenges remain, including resource constraints, implementation complexities, and risks of superficial learning. This review underscores the transformative potential of GBL in modern education and highlights the need for further research to address existing gaps, optimize implementation, and evaluate long-term impacts. These findings provide actionable insights for educators and researchers aiming to leverage GBL for improved teaching and learning experiences.

Keywords: Game-based learning (GBL); classroom instruction; learning outcomes; student engagement; systematic literature review (SLR).

INTRODUCTION

Game-based learning (GBL) refers to the use of game elements and principles within educational contexts to enhance student engagement, motivation, and learning outcomes (Corti, 2006). By

integrating interactive and often immersive experiences, GBL leverages the intrinsic motivation and enjoyment found in games to support and reinforce educational objectives (Connolly et al., 2012). Over recent years, the application of GBL has expanded across various educational levels and subjects, driven by technological advancements and a growing recognition of its potential benefits (Hierro & Seller, 2020; Mohamad et al., 2019; Vasbieva & Kalugina, 2024).

Despite its increasing popularity, the effectiveness of GBL in classroom instruction remains a contentious topic among educators, researchers, and policymakers. Proponents argue that GBL fosters active learning, enhances cognitive development, and improves retention by making learning experiences more engaging and enjoyable (Connolly et al., 2012; Awing & Nasri, 2023). They point to numerous studies and anecdotal evidence that suggest GBL can lead to better academic performance and higher student satisfaction (Hamari et al., 2014).

Conversely, critics question the pedagogical value of GBL, expressing concerns that it may detract from traditional instructional time and lead to superficial learning experiences (Clark et al., 2016). Players may resist engaging in, shame on failure, give up in advance, or progress without understanding their actions' meaning. This lack of deep engagement can result in superficial learning where students complete tasks without fully grasping the underlying educational content (Fernández Galeote et al., 2022). Additionally, some argue that the resources and time required to implement GBL effectively may not yield proportional educational benefits, potentially making it a distraction rather than a constructive learning tool (Mayer, 2019).

To address these divergent viewpoints, this systematic literature review (SLR) seeks to investigate the impact of game-based learning on classroom instruction. The central research question guiding this review is:

- *How does game-based learning impact classroom instruction?*

Through a comprehensive analysis of recent years' literature, this review aims to synthesize findings on the effectiveness of GBL, identify prevailing trends and patterns, and uncover gaps in the current research landscape. By doing so, it intends to provide a nuanced understanding of GBL's role in modern education and inform future research and practice in this dynamic field.

METHODOLOGY

Search Procedures

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2009 framework was employed to ensure a comprehensive and transparent review process (refer to Fig. 1, Moher et al., 2009). This study has been located by a thorough search of the electronic database Elsevier Scopus, using combinations of the following keywords: (*game-based learning*) AND (*action research*). The database was chosen for its comprehensive coverage of peer-reviewed literature across social science and arts disciplines. This framework encompasses four stages: identification, screening, eligibility, and inclusion.

Identification

This stage involved a thorough search of various databases to identify relevant studies. Keywords related to “game-based learning” and “action research” were used to locate studies that addressed the research question.

Screening

The initial search results were screened for relevance based on their titles and abstracts. Studies that did not meet the inclusion criteria were excluded.

Eligibility

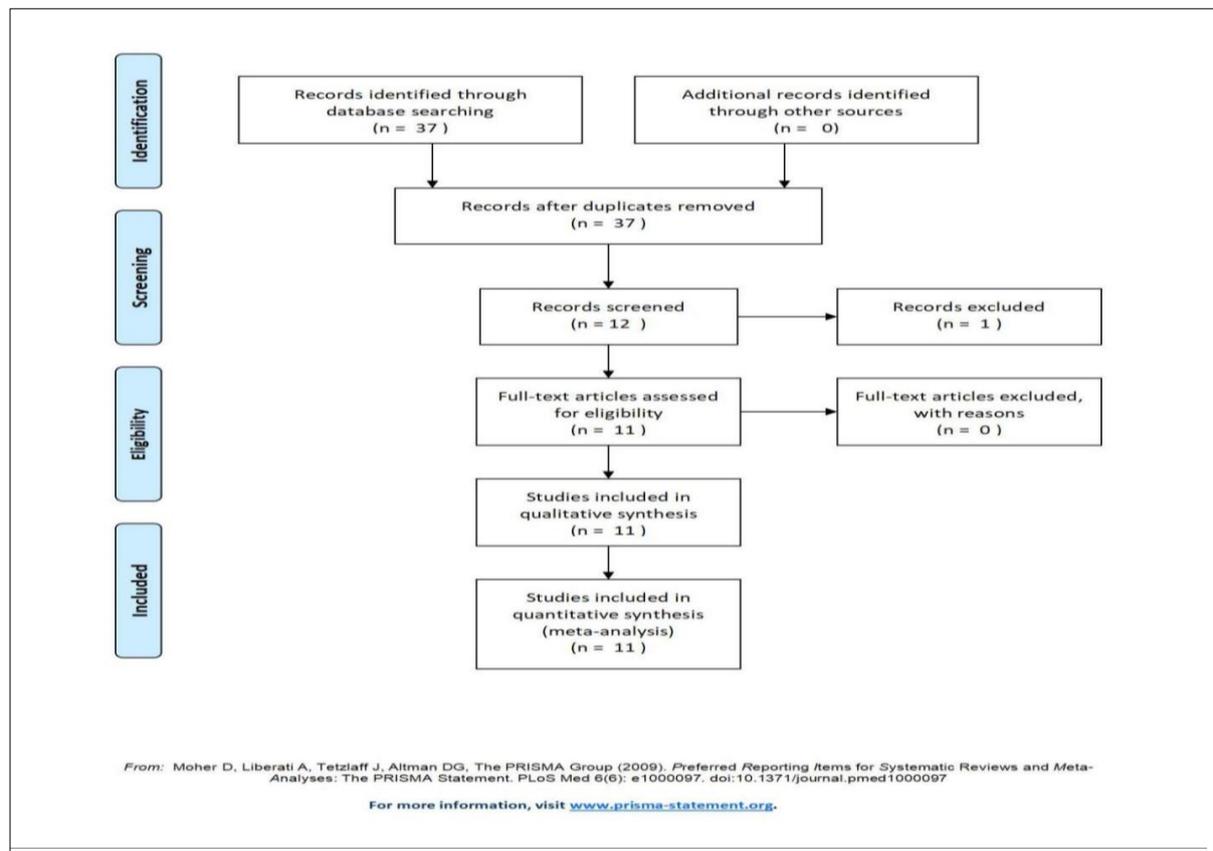
Full texts of the remaining studies were assessed for eligibility. Any study that did not provide sufficient data or did not focus on the impact of game-based learning on classroom instruction was excluded.

Inclusion

The final set of studies that met all the inclusion criteria were included in the systematic review.

Figure 1

PEISMA 2009 Flow Diagram for Literature Selection



Inclusion and Exclusion Criteria

The inclusion criteria were specifically designed to focus on recent studies (published post-2019) to capture the latest research trends and developments in the field of GBL. Studies were required to focus on the impact of GBL on classroom instruction to maintain consistency in the educational context, and include measures of instructional effectiveness and student engagement to directly address the research question.

Exclusion of certain subject areas, such as non-action research studies, ensured the review remained focused on relevant educational researching aspects.

All of the following criteria were satisfied by the papers included in this review:

- (a) published in 2019 and after;
- (b) focusing on the impact of game-based learning on classroom instruction;
- (c) included measures of instructional effectiveness and student engagement;
- (d) involved different levels of education settings;
- (e) examined the interplay between game-based learning and classroom outcomes; and
- (f) written in English.

The subject areas of the non-action research studies, and non-peer-reviewed sources such as opinion pieces and editorials. Only the findings from journal/conference articles were used.

Data Extraction Method

The statistical analysis employed a descriptive-analytic approach. Frequency analyses were conducted to ascertain the distribution of publication years and to map the geographical spread of the studies. This analysis helped identify trends over time and by region, providing insights into the evolving research focus on game-based learning (GBL) and its impact on classroom instruction. Statistical measures such as standard deviations and variance were calculated to support the synthesis of the data.

The present SLR engaged in a descriptive-analytic approach to synthesize findings from the chosen articles. Therefore, these non-meta-analytic results corresponded with the purpose of the review, which was to analyze the relationships between GBL and classroom instruction as well as introduce the features and extent of the literature concerned. The following descriptive statistics were computed:

Records Distribution Over the Years

This was carried out by undertaking a frequency analysis of the publication years of the studies on GBL and classroom instruction to identify the trend and trajectory of the research.

Country-wise Distribution

This analysis was meant to bring out the point of origin of the studies with the aim of determining the geographical distribution of the research. It may be interpreted as the cultural and educational settings in which the research studies were conducted.

Most Cited Records

A citation analysis was done in order to discover top-studied works within the corpus. This was beneficial in the sense that it served as a source of key studies and landmark works.

To ensure the methodological rigor of the studies included in this review, each study was assessed for its sample size justification, the validity of its measurement instruments, and the reliability of its results. This quality assessment helped in critically synthesizing findings to draw robust conclusions about the impact of GBL on classroom instruction.

Synthesis Method

In order to enhance the examination of the chosen studies and enable a methodical synthesis, this SLR utilized a literature classification worksheet (LR Matrix) that grouped the research based on several criteria. This strategy would help to undertake a systematic study of the methodological foundations, relationships of the constructs, contextual factors, conceptual growth of constructs, and differentiation of the interventions. The classifications were as follows:

Methodological Foundations

This review classified categories based on the research methods employed, either mixed-methods, qualitative, or quantitative. This classification contributed to the assessment of methodological quality and diversity within the corpus.

Construct Relationships

Studies were dissected to learn about their investigation of the connection between constructs. Particularly, the interaction between GBL and classroom outcomes was covered, revealing mediating variables, moderating structures, and direct relationships (if reported).

Contextual Analysis

The setting chosen for the studies was described, indicating educational settings, cultural backgrounds, and levels of education of participants. This review endeavored to see the context as a factor that can impact the connection between GBL and classroom instruction.

Intervention Differentiation

Such studies were categorized according to treatments or Interventions used to address the implementation of GBL and its effectiveness in boosting instructional outcomes. Interventions were considered and the types examined, their bases in the theories, and the effectiveness tested as well.

In summary, the methodology for this SLR on the impact of GBL on classroom instruction was meticulously designed to ensure a comprehensive analysis. Utilizing the PRISMA 2009 framework, this review followed a structured approach to identify, screen, and include relevant studies, with strict inclusion and exclusion criteria focusing on recent and pertinent research. Data extraction employed a descriptive-analytic approach, providing insights into trends and geographical distributions, supported by statistical measures. The synthesis of findings was conducted using an LR Matrix,

categorizing studies based on methods, construct relationships, contextual analysis, and treatment differentiation. This systematic approach ensured the robustness and reliability of this review, offering a detailed understanding of the current state and impact of GBL on classroom instruction.

RESULTS

Selection Outcomes

The SLR process led to the identification and inclusion of a diverse array of studies examining the impact of GBL on classroom instruction. Using the PRISMA 2009 framework, this review began with a comprehensive search across the Scopus database. The initial search yielded a substantial number of studies, which were then subjected to a rigorous screening and eligibility assessment based on predefined inclusion and exclusion criteria.

In total, 11 studies were selected for inclusion in this review (see Table 1.). These studies spanned a range of educational contexts, geographical regions, and methodological approaches, providing a broad and nuanced understanding of how GBL influences classroom dynamics, student engagement, and learning outcomes. The included studies focused on both primary and secondary education settings, ensuring a comprehensive analysis across different educational levels.

Table 1

Selection Outcomes

Authors	Title
Hierro L.M.; Sellar E.P.	Game-based learning as a social and educational tool in vulnerable community contexts
Mohamad F.S.; Morini L.; Minoi J.-L.; Arnab S.	Game-based learning to teach higher order thinking in rural schools: Case studies in Sarawak Borneo
Erbilgin E.; Macur G.M.A.	A subtraction game to scaffold primary students' word problem solving skills
Tsng S.Y.; Shahrill M.; Latif S.N.A.	Exploring the Effects and Students' Views on the Use of a Tic-Tac-Toe Game to Teach Mathematics in Brunei Darussalam
Yunus M.M.; Yen E.L.Y.; Khair A.H.M.; Yusof N.M.	Acquisition of vocabulary in primary schools via GoPic with QR code
Lien Y.-H.; Wang C.-P.; Wang S.-M.; Li C.-T.; Hou H.-T.	Designing an Escape Room Educational Game and a Game-based Learning Activity for Science Learning: Analysis of Learning Achievement and Flow State
Sousa C.; Costa C.	Game creation to promote media and information literacy (MIL) skills in basic education teachers
Hansen R.E.; Elbæk L.	Educating for the 21st century with role play in event design
Belova N.; Zowada C.	Innovating higher education via game-based learning on misconceptions
Maisiri W.; Hattingh T.	Integrating game-based learning in an industrial engineering module at a South African University
Vasbieva D.G.; Kalugina O.A.	Gamification Integration into Multilingual Classrooms

Descriptive Statistics

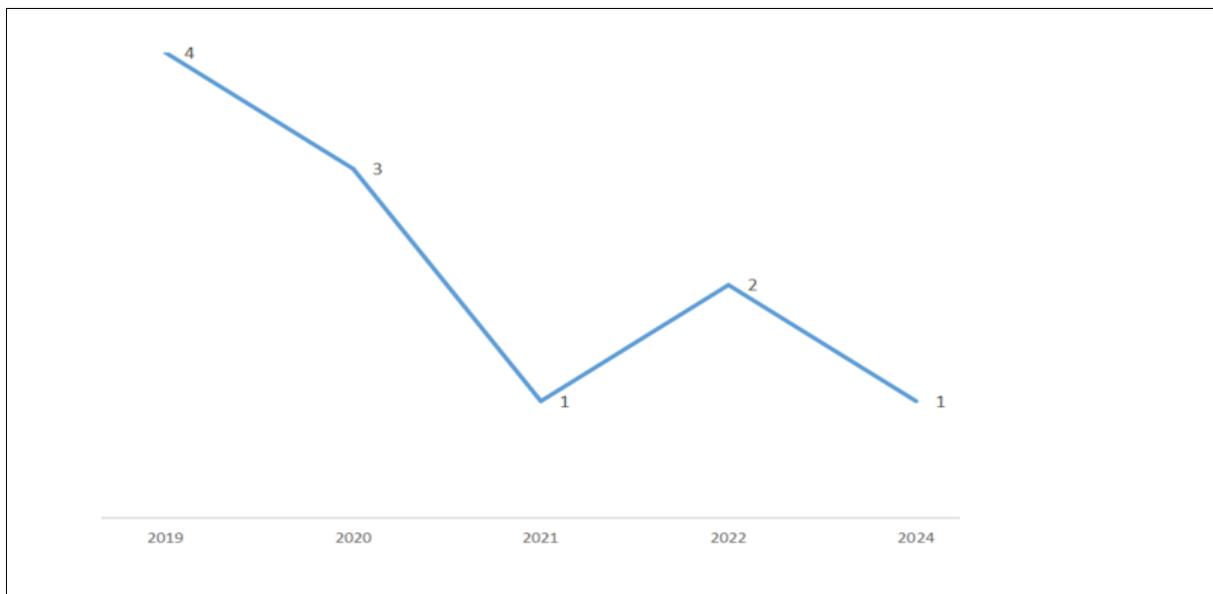
The selected studies were analyzed using descriptive statistics to map the distribution of publication years and geographical spread. This analysis revealed trends over time and across regions, highlighting the evolving research focus on GBL.

Records Distribution Over the Years

The frequency analysis of the publication years, as illustrated in Fig. 2, reveals a fluctuating trend in the number of studies on GBL from 2019 to 2024. Specifically, the distribution is as follows:

Figure 2

Records Distribution Over the Years



This distribution indicates an initial high interest in GBL research in 2019, which slightly declined in 2020. The significant drop in 2021 could be attributed to the global disruptions caused by the COVID-19 pandemic, which may have impacted academic research activities and priorities. In 2022, there was a modest resurgence in GBL research, possibly reflecting a recovery phase where educational institutions and researchers adapted to new norms and continued exploring innovative teaching methods like GBL. The decline observed in 2024 might be premature, as it is only June, and more studies could be published in the remaining months of the year.

It is also important to note that this review specifically selected articles from Scopus-indexed journals and focused exclusively on action research studies. This stringent selection criterion limited the number of eligible studies, as many conventional research articles on GBL were excluded. This focus on high-quality, action-oriented research provides robust insights but results in a smaller dataset, which partly explains the observed trends in publication numbers.

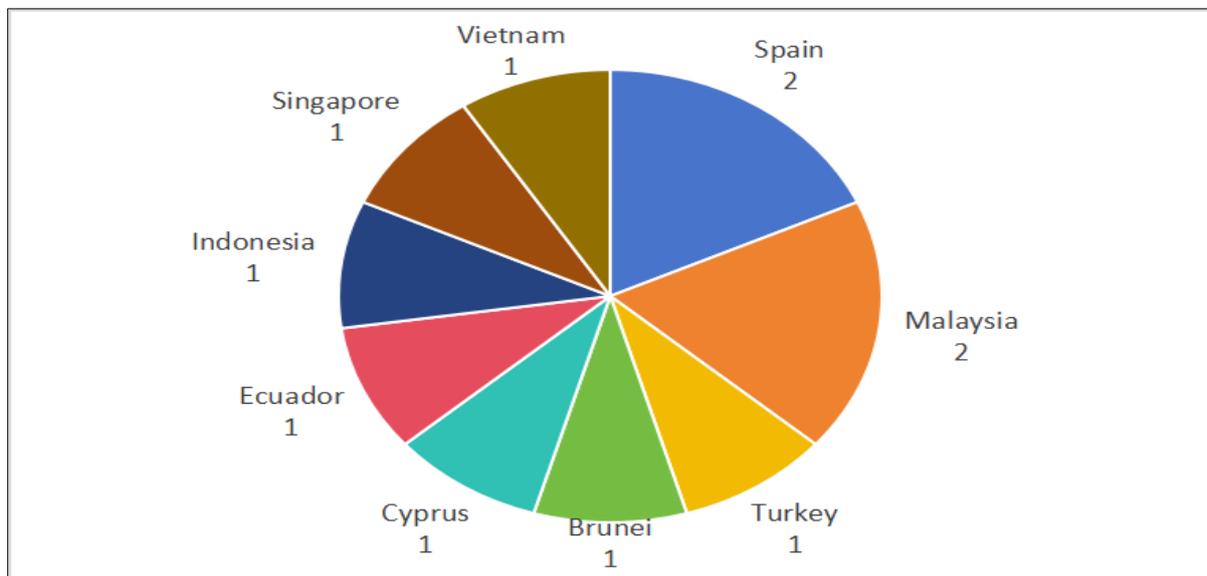
The fluctuating pattern underscores the dynamic nature of educational research, influenced by global events, technological advancements, and shifting academic priorities. This analysis provides a context for understanding the temporal trends in GBL research and sets the stage for a more detailed examination of the qualitative findings in subsequent sections.

Country-wise Distribution

The geographical analysis showed a diverse range of studies originating from various countries (see Figure 3), indicating a global interest in the potential benefits and challenges of GBL in classroom instruction. Significant contributions came from the following countries:

Figure 3

Country-wise Distribution



This distribution highlights the widespread adoption and investigation of GBL across different educational contexts and cultural settings. Spain and Malaysia were the most prolific, each contributing two studies. This might reflect a strong institutional focus on innovative educational practices within these countries, or well-established research networks that prioritize the exploration of GBL.

The single studies from Turkey, Brunei, Cyprus, Ecuador, Indonesia, Singapore, and Vietnam underscore a global reach, with researchers from diverse regions contributing to the body of knowledge on GBL. These studies provide valuable insights into how GBL is implemented and its effects in varied cultural and educational contexts, enriching the overall understanding of its impact.

This wide geographical spread also indicates that GBL is recognized as a valuable educational approach worldwide, despite differences in educational systems and cultural practices. The inclusion

of studies from both developed and developing countries highlights the universal applicability and interest in GBL as a method to enhance classroom instruction and student engagement.

Overall, this geographical diversity enriches the review by incorporating a wide array of perspectives and experiences, providing a more comprehensive understanding of the global landscape of GBL in education.

Most Cited Records

A citation analysis was conducted to identify the most influential studies within the corpus. This analysis was beneficial as it highlighted key studies and landmark works, providing insights into the foundational and highly regarded research in the field of GBL. The citation counts for each study are as Table 2.

Table 2

Most Cited Records

Authors	Year	Citations
Belova, N., & Zowada, C.	2020	12
Yunus, M. M., Yen, E. L. Y., Khair, A. H. M., & Yusof, N. M.	2020	8
Mohamad, F. S., Morini, L., Minoi, J.-L., & Arnab, S.	2019	6
Lien, Y.-H., Wang, C.-P., Wang, S.-M., Li, C.-T., & Hou, H.-T.	2019	6
Hierro, L. M., & Seller, E. P.	2020	3
Sousa, C., & Costa, C.	2019	3
Tsng, S. Y., Shahrill, M., & Latif, S. N. A.	2021	2
Maisiri, W., & Hattingh, T.	2022	2
Hansen, R. E., & Elbæk, L.	2019	1
Erbilgin, E., & Macur, G. M. A.	2022	0
Vasbieva, D. G., & Kalugina, O. A.	2024	0

The study by Belova and Zowada (2020) stands out with the highest number of citations 12, indicating its significant impact and recognition within the academic community. This study likely serves as a critical reference point for researchers exploring the intersection of GBL and educational outcomes.

The works by Yunus et al. (2020) and Mohamad et al. (2019) also received notable attention, each cited 8 and 6 times respectively. These studies contribute substantial evidence and discussions on the implementation and effects of GBL, particularly in enhancing vocabulary acquisition and higher-order thinking skills.

Lien et al.'s (2019) study, with 6 citations, further underscores the relevance of innovative educational tools like escape room games in science education, demonstrating how GBL can foster engagement and learning achievements.

The moderate citation counts for studies by Hierro and Seller (2020), Sousa and Costa (2019), and others reflect their roles in advancing specific aspects of GBL research, particularly in socio-educational contexts and media literacy.

On the other hand, the studies by Erbilgin and Macur (2022), and Vasbieva and Kalugina (2024), with no citations yet, suggest either their recent publication or niche focus areas that have yet to gain widespread academic traction.

This citation analysis not only identifies key studies but also maps out the influential works that have shaped current understandings and practices in GBL. It highlights the diversity of research areas within GBL and points to potential directions for future exploration and citation trends.

Literature Classification and Synthesis

Methodological Foundations

The studies included in this SLR utilized a variety of research methods, contributing to the assessment of methodological quality and diversity within the corpus. Based on the research methods employed, the studies were classified into mixed-methods, qualitative, and quantitative approaches.

Mixed-Methods Lien et al. (2019) utilized a design-based research approach with pre-tests and post-tests to measure learning achievement, alongside qualitative data from observations, surveys, and interviews. Tsng et al. (2021) employed a combination of pre-tests, post-tests, Likert scale questionnaires, and individual interviews to gather both quantitative and qualitative data on student perceptions and performance.

Qualitative. Hierro & Seller (2020) applied action research involving content analysis, semi-structured interviews, open interviews, family interviews, participant observation, and a field diary to evaluate the socio-community intervention project. Mohamad et al. (2019) used a composite and layered action research method including group interviews, ethnographic observation, teacher interviews, and data collection on learning interests and community values. Belova & Zowada (2020) employed participatory action research to develop and evaluate an educational game addressing misconceptions in chemistry for pre-service teachers.

Quantitative. Yunus et al. (2020) conducted an action research method following the Kemmis & McTaggart model, using pre-tests, post-tests, field notes, and survey questionnaires to evaluate the impact of GoPic with QR Code on vocabulary acquisition. Erbilgin & Macur (2022) implemented a collaborative action research methodology with pre-tests, post-tests, student worksheets, and teacher field notes to measure the effectiveness of a digital subtraction game.

Additionally, Hierro & Seller (2020), Mohamad et al. (2019), and Belova & Zowada (2020) focused on iterative cycles of planning, acting, observing, and reflecting to implement and evaluate GBL interventions. Lien et al. (2019) combined iterative design, implementation, and evaluation processes to refine educational tools and assess their impact on learning achievements and flow state. Belova & Zowada (2020) involved pre-service teachers in the development and evaluation of an educational game to address misconceptions, emphasizing collaborative and reflective practices.

This classification illustrates the rich methodological diversity and theoretical underpinnings of GBL research, highlighting the rigorous approaches used to investigate its impact on classroom instruction. The use of varied methods and theories enhances the robustness of the findings, providing a comprehensive understanding of GBL's role in education.

Construct Relationships

The selected studies were meticulously examined to understand the relationships between various constructs, focusing on the interaction between GBL and classroom outcomes. This section reveals how different studies have explored mediating variables, moderating structures, and direct relationships.

Interaction between GBL and Academic Performance

Hierro & Seller (2020) investigated how GBL, as a socio-community intervention, enhanced academic performance in vulnerable community contexts. The study found that GBL not only improved academic performance but also fostered social skills development, positive classroom coexistence, and peaceful conflict resolution. Mediating variables included student motivation and engagement. Mohamad et al. (2019) explored the effectiveness of GBL in teaching higher-order thinking skills (HOTS) in rural schools. The study highlighted that GBL facilitated deeper understanding and application of HOTS, with mediating variables such as teacher engagement and the integration of local cultural elements.

GBL and Student Engagement

Yunus et al. (2020) examined the impact of GBL on vocabulary acquisition in primary schools using GoPic with QR Code. The study revealed that GBL significantly enhanced student engagement and participation, leading to better vocabulary acquisition. The study identified student perceptions and the interactive nature of GBL as key moderating structures. Tsng et al. (2021) assessed the use of a Tic-Tac-Toe game to teach mathematics in Brunei. The study found that GBL increased student motivation, participation, and performance, particularly among average and lower-ability students. Group work and peer learning were identified as important mediating variables.

GBL and Social Skills Development

Maisiri & Hattingh (2022) integrated GBL in an industrial engineering module to enhance both technical and non-technical skills. The study emphasized that GBL fostered teamwork, communication, negotiation, and strategic thinking. The interaction between GBL and the development of these skills was mediated by the collaborative and competitive nature of the game. Sousa & Costa (2019) focused on promoting media and information literacy (MIL) skills through GBL among basic education teachers. The study found that GBL facilitated the development of critical and participatory MIL skills, with the training program's structure and collaborative experiences acting as moderating structures.

GBL and Cognitive Development

Erbilgin & Macur (2022) investigated the impact of a digital subtraction game on primary students' word problem-solving skills. The study demonstrated that GBL improved students' abilities to

represent and solve subtraction problems, with the game's design and scaffolding techniques serving as key mediating variables. Lien et al. (2019) designed an escape room educational game for science learning. The study highlighted that GBL enhanced learning achievements and engagement, with the immersive nature of the escape room and the alignment of game tasks with educational goals acting as mediating variables.

GBL and Emotional Outcome

Belova & Zowada (2020) addressed misconceptions in chemistry using a game-based approach. The study found that GBL increased student motivation and reduced learning-related stress, with the competitive and enjoyable nature of the game serving as moderating structures. Vasbieva & Kalugina (2024) compared the effects of gamification and GBL on student motivation, engagement, and enjoyment in a multilingual classroom. The study indicated that both methodologies significantly enhanced these emotional outcomes, with gamification showing slightly higher engagement levels.

These studies collectively demonstrate the multifaceted impact of GBL on various classroom outcomes, revealing a complex interplay of mediating variables, moderating structures, and direct relationships. Understanding these interactions is crucial for optimizing the design and implementation of GBL strategies to maximize their educational benefits.

Contextual Analysis

The studies included in this SLR were conducted in diverse educational settings, cultural backgrounds, and levels of education. This contextual analysis aims to understand how these factors influence the connection between GBL and classroom instruction.

Educational Settings

Hierro & Sellar (2020) conducted in socially and economically vulnerable communities, this study focused on primary education settings. The use of GBL aimed to foster inclusion and improve academic success among children aged 6 to 12. The socio-community context was crucial in understanding the broader impact of GBL on academic performance and social skills. Mohamad et al. (2019) set in rural schools in Sarawak, Borneo, the study addressed the challenge of integrating higher-order thinking skills (HOTS) into the curriculum. The rural setting, with its unique barriers such as limited resources and heavy administrative burdens on teachers, significantly impacted the feasibility and effectiveness of GBL.

Cultural Backgrounds

Yunus et al. (2020) focused on primary school students in Malaysia, this study highlighted the cultural importance of integrating Information and Communication Technology (ICT) into English language education. The cultural context influenced students' engagement and motivation levels, showing that culturally relevant and engaging GBL tools like GoPic with QR Code can enhance learning outcomes. Tsng et al. (2021) conducted in Brunei, the study explored the effects of a Tic-Tac-Toe game on teaching mathematics. The cultural perception of mathematics as a difficult subject influenced students' attitudes towards learning. The introduction of GBL helped mitigate math anxiety and made learning more enjoyable, especially for average and lower-ability students.

Levels of Education

Maisiri & Hattingh's (2022) study was conducted at the university level, specifically within a third-year industrial engineering module in South Africa. The integration of a web-based business simulation game aimed to enhance both technical and non-technical skills. The higher education context required a focus on preparing students for real-world complexities, making GBL an effective tool for experiential learning. Erbilgin & Macur (2022) focused on primary education, this study investigated the impact of a digital subtraction game on second and third-grade students in China and Turkey. The primary school setting highlighted the importance of early intervention in developing problem-solving skills and the adaptability of GBL to different educational contexts.

Cultural Sensitivity and Adaptation

Belova & Zowada (2020) conducted in German universities, the study aimed to address misconceptions in chemistry for pre-service teachers. The cultural context of German higher education, with its emphasis on Pedagogical Content Knowledge (PCK), influenced the design and implementation of the game-based intervention. Vasbieva & Kalugina (2024) examined the impact of gamification and GBL in a multilingual EFL classroom at the university level in Russia. The multicultural and multilingual context posed unique challenges and opportunities for GBL, demonstrating its potential to enhance motivation, engagement, and enjoyment in diverse classroom settings.

Community and Social Dynamics

Sousa & Costa (2019) set in the context of basic education in Portugal, this study focused on promoting media and information literacy (MIL) skills among teachers. The community-based approach and the involvement of educators in the game creation process highlighted the role of collaborative experiences in enhancing MIL competencies. Lien et al. (2019) conducted in a science education setting, involving designing an escape room educational game. The specific educational environment and the social dynamics within the classroom played a significant role in determining the success of the GBL intervention.

This contextual analysis underscores the importance of considering educational settings, cultural backgrounds, and levels of education when implementing GBL strategies. These contextual factors significantly impact how GBL interventions are perceived, adapted, and ultimately, their effectiveness in enhancing classroom instruction. Understanding these nuances is essential for tailoring GBL approaches to meet the diverse needs of students across different educational and cultural contexts.

Intervention Differentiation

In this section, the studies are categorized based on the treatments or interventions used to implement GBL and their effectiveness in boosting instructional outcomes. The interventions are analyzed for their theoretical foundations, types, and tested effectiveness, providing insights into how different GBL approaches impact classroom instruction.

Socio-Community Interventions

Hierro & Seller (2020) implemented a socio-community intervention using GBL to enhance academic performance and social skills among children in vulnerable communities. The intervention included various games designed to promote positive classroom coexistence and peaceful conflict resolution. The theoretical foundation was based on social learning theory and community-based education. The effectiveness was tested through content analysis, interviews, and participant observation, revealing significant improvements in motivation, engagement, and social skills development.

Higher-Order Thinking Skills (HOTS)

The intervention by Mohamad et al. (2019) focused on using GBL to teach HOTS in rural schools. The CreativeCulture model integrated STEAM-driven game design and computational thinking, promoting “learning by designing” through digital and analog game design processes. The effectiveness was assessed through ethnographic observation, teacher interviews, and student engagement data. The study found that GBL significantly enhanced HOTS and critical thinking skills, despite challenges related to resource constraints and cultural adaptation.

Vocabulary Acquisition

Yunus et al. (2020) utilized the GoPic with QR Code game to improve vocabulary acquisition in primary school students. The intervention blended traditional BINGO with modern technology and visual aids, based on constructivist learning theory. The effectiveness was measured using pre-tests, post-tests, survey questionnaires, and field notes, showing significant improvements in vocabulary acquisition, student engagement, and positive perceptions of the learning tool.

Mathematics Revision

Tsng et al. (2021) involved a Tic-Tac-Toe game for revising mathematics topics such as ratios, rates, and proportions. The game aimed to reduce mathematics anxiety and enhance student motivation, based on the theory of intrinsic motivation and cooperative learning. The effectiveness was evaluated through pre-tests, post-tests, Likert scale questionnaires, and interviews, demonstrating significant improvements in test scores and positive student perceptions of the game.

Media and Information Literacy (MIL)

Sousa & Costa’s (2019) GamiLearning project aimed to develop MIL skills among basic education teachers through digital game creation. The intervention was grounded in participatory action research and digital literacy theories. Pre- and post-training surveys and qualitative analysis revealed that the training program effectively enhanced teachers' MIL skills and their ability to integrate GBL into their teaching practices.

Problem-Solving Skills in Mathematics

Erbilgin & Macur (2022) used a digital subtraction game to scaffold primary students’ word problem-solving skills. The intervention was based on cognitive load theory and scaffolding principles. The effectiveness was measured through pre-tests, post-tests, student worksheets, and teacher field notes, indicating significant improvements in students' problem-solving abilities and positive attitudes towards mathematics.

Escape Room Educational Game

Lien et al. (2019) designed an escape room educational game to enhance science learning. The theoretical foundation was based on experiential learning theory and flow state. The effectiveness was assessed through pre-tests, post-tests, observations, surveys, and interviews, showing that the escape room significantly improved learning achievements and student engagement.

Integrating GBL in Industrial Engineering. Maisiri & Hattingh (2022) integrated a web-based business simulation game, The Fresh Connection, into a third-year Supply Chain Management module. Based on experiential learning theory and VUCA (Volatility, Uncertainty, Complexity, Ambiguity) principles, the effectiveness was tested through lecturers' reflections, student reflection activities, group assignments, and class attendance records. The study found that GBL enhanced both technical and non-technical skills, improving student engagement and preparedness for the workforce.

Role Play in Event Design

Hansen & Elbæk (2019) involved a role-play simulation in a university course on event design. Grounded in experiential learning and social emotional learning (SEL) theories, the effectiveness was evaluated through pre-course expectations, mid-course evaluations, and post-project CV-resumes. The study indicated that role-play effectively developed 21st-century skills such as collaboration, communication, and leadership.

Gamification in Multilingual Classrooms

Vasbieva & Kalugina (2024) compared gamification and GBL in an EFL classroom, using the Quizlet platform for gamified activities. The intervention was based on gamification theory and constructivist learning principles. The effectiveness was measured through surveys, interviews, and class observations, revealing that gamification significantly enhanced motivation, engagement, and enjoyment compared to traditional GBL methods.

This categorization highlights the diverse interventions and their theoretical foundations, illustrating the varied approaches to implementing GBL and their respective effectiveness in boosting instructional outcomes. Understanding these differences helps educators and researchers tailor GBL strategies to specific educational contexts and objectives, maximizing their potential impact on classroom instruction.

DISCUSSION

Key Insights

The central research question guiding this SLR is: *How does game-based learning (GBL) impact classroom instruction?* The analysis of the selected action research papers provides several key insights:

Enhanced Academic Performance

Studies such as those by Hierro & Seller (2020) and Mohamad et al. (2019) demonstrated that GBL could significantly improve academic performance. These interventions showed that GBL not only aids in understanding complex concepts but also promotes higher-order thinking skills and critical thinking.

Increased Student Engagement

Multiple studies, including Yunus et al. (2020) and Tsng et al. (2021), highlighted that GBL increases student engagement and motivation. The interactive nature of GBL, combined with its ability to make learning fun, has been shown to keep students more engaged and active in their learning processes.

Development of Social and Cognitive Skills

Research by Maisiri & Hattingh (2022) and Sousa & Costa (2019) indicated that GBL helps develop essential social skills such as teamwork, communication, and strategic thinking. Additionally, studies like Erbilgin & Macur (2022) found that GBL enhances cognitive skills, particularly in problem-solving and critical thinking.

Positive Emotional Outcomes

Studies by Belova & Zowada (2020) and Vasbieva & Kalugina (2024) revealed that GBL can positively affect students' emotional well-being. GBL was found to reduce learning-related stress and anxiety while increasing enjoyment and motivation.

LIMITATIONS

While the findings highlight the benefits of GBL, there are several limitations, such as:

Resource and Implementation Challenges

Implementing GBL effectively requires significant resources, including time, technology, and training for educators. Some studies noted challenges in sustaining GBL interventions due to these constraints.

Potential for Superficial Learning

Critics argue, and some studies confirm, that without careful design, GBL can lead to superficial learning where students engage with games without fully grasping the educational content (Fernández Galeote et al., 2022).

CONCLUSION

This SLR aimed to investigate the impact of GBL on classroom instruction. Through a comprehensive analysis of recent action research studies, the review provided nuanced insights into the effectiveness, benefits, and challenges of GBL.

The findings revealed that GBL significantly enhances academic performance, increases student engagement, and fosters the development of essential social and cognitive skills. Additionally, GBL positively influences students' emotional well-being by reducing stress and increasing motivation. However, the review also highlighted several limitations, including resource constraints, implementation challenges, and the potential for superficial learning.

Despite these challenges, GBL holds great promise as an innovative educational tool. Future research should focus on addressing the identified gaps, such as conducting longitudinal studies, exploring diverse educational contexts, developing comprehensive evaluation metrics, and integrating GBL with traditional teaching methods.

In conclusion, this SLR underscores the potential of GBL to transform classroom instruction by making learning more engaging, enjoyable, and effective. By continuing to explore and refine GBL strategies, educators and researchers can enhance the quality of education and better prepare students for the challenges of the 21st century.

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