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Gamified socio-emotional learning for children: Insights from a thematic and co-word analysis of recent literature

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ABSTRACT

This study investigates how gamified socio-emotional learning (SEL) promotes education for sustainable development and supports children's holistic development. In order to evaluate gamified SEL interventions for children ages 4 to 12, 17 empirical studies published between 2015 and 2024 were reviewed using a thematic analysis literature review and co-word analysis. Eight major themes surfaced, and these results show that gamified SEL improves communication, empathy, emotional control, and teamwork–all of which are key qualities that are in line with SDG4. Additional recurrent themes including motivation, teamwork, and social-emotional abilities were brought to light by a supplemental co-word analysis of 122 articles. Collectively, the findings highlight the importance of inclusive, reflective, and culturally sensitive gamified approaches in promoting emotional health and lifelong learning. For educators, developers, and politicians looking to incorporate creative, values-based pedagogies into early education, the report provides evidence-based recommendations.

Keywords: gamification, socio-emotional learning, children, thematic analysis, co-word analysis

INTRODUCTION

In recent years, integrating transformational pedagogies into educational institutions has become more and more important in an effort to prepare students for the ethical, social, and emotional concerns of the 21st century. Education for sustainable development (ESD) is at the heart of this vision because it fosters the growth of abilities like empathy, critical thinking, teamwork, and emotional intelligence–all of which are necessary for creating responsible global citizens (UNESCO, 2020). Gamified socio-emotional learning (SEL) is one of the most promising strategies in this area since it combines the deliberate development of social and emotional skills with aspects of educational games. These skills–which are increasingly seen as essential to both academic success and sustainable living–include self-awareness, cooperation, conflict resolution, and emotional control (Walog et al., 2024).

While teacher-led talks, role-playing, and reflective activities have been the mainstays of conventional SEL, modern educators are increasingly using gamified approaches that provide more immersive and interactive learning opportunities. Gamification, defined as the incorporation of game mechanics like points, rewards, challenges, levels, and cooperative play into non-game contexts (Deterding et al., 2011), provides an engaging and developmentally appropriate way for children to practice emotional decision-making, explore social scenarios, and develop interpersonal relationships as learning environments become more digitally connected and inclusive of diverse learners (Aftab & Jamil, 2022; Lee & Loo, 2021). These attributes are highly compatible with ESD's focus on learner-centered, active approaches that cultivate the values, attitudes, abilities, and knowledge required for sustainable development.

The usefulness and reach of gamified SEL tools have been expanded, particularly through the deployment of emotionally responsive digital agents–artificial intelligence (AI)-based avatars who mimic empathy and adjust to children's emotional cues. By providing real-time feedback, modeling prosocial behaviors, and assisting children in navigating emotionally challenging circumstances, these agents promote transformative learning (Lyu et al., 2024). Their application serves as an example of how educational technology can be used to enhance the experiential and value-based learning outcomes that ESD promotes.

Even though gamified SEL holds promise, the literature is still disjointed. Without considering more extensive developmental or contextual effects, the majority of research isolate limited outcomes like empathy or cooperation or concentrate only on particular game elements, like cooperative play or motivator systems (Johnson, 2024; Mumuni & Torto, 2022). Furthermore, the way that gamified SEL supports ESD objectives–like encouraging inclusivity, respect for cultural diversity, and reflective thinking across a range of learning environments and age groups–has received little attention.

Additionally, little is known about the hybrid potential of integrating digital and real-world game aspects to promote SEL. Few comparative insights into how these modalities could jointly improve children's socio-emotional trajectories are found in current research, which tends to isolate these modalities (Adubuola et al., 2023). Particularly in settings with varying resources, the gap between digital innovation and practical classroom or home-based implementation emphasizes the necessity of equitable and context-sensitive approaches (Farahiyah et al., 2024).

In order to fill these gaps, this study examines how gamified SEL interventions support children' overall development using a theme analysis of empirical literature augmented by a co-word analysis. According to the tenets of ESD, the study investigates how gamified SEL promotes lifelong learning, civic participation, interpersonal responsibility, and individual well-being. To guide this inquiry, the following research questions were posed:

1. What socio-emotional competencies are most commonly supported by gamified SEL interventions for children?
2. How do gamified SEL practices contribute to the goals of ESD?
3. What implementation strategies and contextual factors influence the effectiveness of gamified SEL programs?

METHODS

In order to investigate and synthesize the effects of gamified SEL on children, this study used a qualitative research design using the thematic analysis literature review (TALR). In addition to thematic analysis, the study also used co-word analysis using VOSviewer, which was done on author keywords extracted from articles retrieved from the Scopus database. This two-pronged approach–combining bibliometric co-word mapping with qualitative thematic synthesis–allows for a thorough examination of the dominant research themes, patterns, and relationships in the field of gamified SEL, as well as a qualitative interpretation of recurrent patterns and processes within the chosen literature.

Integration of Co-Word and Thematic Analysis

By offering a quantitative summary of important research terms and relational patterns in the field of gamified SEL, the co-word analysis enhanced the thematic analysis. VOSviewer's visual clustering of author keywords brought to light the importance of ideas like empathy, teamwork, motivation, gamification, and emotion control–all of which also surfaced as key components in the thematic analysis (Li et al., 2020). This combined approach allows researchers to detect thematic trends in educational leadership, gamification, and socio-emotional development, reinforcing the depth of qualitative insights with quantitative mapping techniques (Hosseini et al., 2023). Integration of results was achieved by systematically cross-checking co-word clusters against themes derived from qualitative coding, ensuring that conceptual patterns identified quantitatively were supported by qualitative evidence.

By showing that the thematically derived patterns correspond with prevailing trends in the larger research corpus, this combination of quantitative co-word mapping and qualitative thematic synthesis enhances the findings' legitimacy and thoroughness. Thematic evolution analysis, often used in digital game-based learning and affective states research, has shown how emotional engagement and gamification intersect in learning environments (Chen et al., 2021). Advances in machine learning-based co-occurrence analysis have further refined the ability to track conceptual shifts in gamified SEL research (Miranda & Aguilar, 2024).

Co-Word Analysis Process

In order to identify key terms and conceptual clusters within the larger research landscape, a co-word analysis was performed using VOSviewer prior to thematic analysis. The co-word analysis was used for two purposes:

(1) mapping the conceptual structure of the research field and

(2) providing preliminary insights into recurring themes and research priorities that could inform the subsequent thematic analysis (Wider et al., 2025).

Author keywords from all 122 articles that passed the initial screening were analyzed to generate a keyword co-occurrence map, which identified 63 keywords. The minimum threshold of five keyword occurrences was chosen to balance interpretability with inclusiveness, following established bibliometric practice to avoid noise from rare terms while still capturing dominant trends. This is to ensure that only frequently used and thematically relevant keywords were visualized in the VOSviewer map.

Thematic Analysis Process

The findings sections of 17 chosen articles were subjected to a thematic analysis using the six-phase methodology described by Braun and Clarke (2006). This methodical approach allowed for comparative synthesis across studies and guaranteed that the final themes were based on the data.

Phase 1. Familiarization with the data

Initially, the researcher made notes on frequently mentioned socio-emotional outcomes, game design elements, and contextual factors in order to form an initial intuitive understanding of the landscape of gamified SEL. The thematic analysis process started with a thorough reading and rereading of the findings sections in all 17 selected articles. This phase ensured deep immersion in the data and allowed the researcher to develop preliminary familiarity with key patterns, repeated terms, and overarching ideas across studies.

Phase 2. Generating initial codes

Initial codes were methodically created for each article in the second phase. Using an open-coding methodology, text passages were coded with descriptive codes that corresponded to particular concepts, procedures, or results associated with SEL through games. "Emotional regulation," "peer collaboration," "teacher facilitation," "rewards and motivation," and "social presence" were a few examples of early codes. Both deductive (based on prior knowledge of gamification frameworks and SEL) and inductive (derived from the data) codes were produced.

Phase 3. Searching for themes

After all 17 articles had undergone initial coding, the codes were categorized into more general groups that suggested possible themes. These potential themes combined related codes to create higher-order concepts, capturing patterns seen in several articles. For instance, codes pertaining to peer support, parental participation, and teacher guidance were compiled into a possible theme on "the role of adults and peers in gamified SEL." In order to make sure that themes represented cross-study patterns rather than isolated findings, this process required constant comparison across articles.

Phase 4. Reviewing themes

An iterative process was used to ensure that final themes captured the key dimensions of gamified SEL comprehensively and cohesively. The fourth phase involved a systematic review and refinement of candidate themes to make sure they were internally coherent, externally distinctive, and grounded in the data. Each theme was tested against the coded data extracts to ensure that it adequately represented the underlying content of the findings across studies, with some overlapping themes being merged (e.g., separate themes on "teacher guidance" and "parental involvement" were combined into a single "adult support" theme), while overly broad themes were subdivided for greater clarity.

Phase 5. Defining and naming themes

Following evaluation and improvement, final themes were identified and given names that reflected their central significance and pertinence to the study's goals. The definitions were written to succinctly explain the main points of each theme, with obvious links to socioemotional skills, game design elements, implementation difficulties, and contextual elements. To illustrate how both digital and physical games can promote socio-emotional skills through both structured and unstructured play, the theme "games and technology as vehicles for SEL" was established.

Phase 6. Producing the report

In order to link the identified themes back to the research objectives and existing literature, as well as to place the findings within the larger scholarly discourse on SEL and educational gamification, the final phase involved integrating the defined themes into a coherent narrative, which served as the foundation for the research paper's findings and discussion sections. Each theme was illustrated using representative extracts from the analyzed articles, illustrating how individual studies contribute to the overall thematic picture.

Data Collection and Selection Process

The Scopus database offers broad international coverage of peer-reviewed journals. It was used for the first systematic search, which focused on articles released between 2015 and 2024 to capture a full decade coinciding with the rapid growth of gamification research and international emphasis on SEL in ESD-related education policy. A variety of keywords pertaining to gamification, SEL, child-friendly games, and emotional development in educational settings were included in the search terms. 190 articles in all were found in the first search attempt.

To guarantee relevance to the research focus, the articles went through a multi-phase screening process after the identification stage. Because they were unrelated to children or did not concentrate on gamified SEL, 92 articles were eliminated during the screening phase based on title and abstract screening. 68 more articles were then eliminated because they did not fit the requirements for publication date, article type (excluding conference papers, book chapters, and non-peer-reviewed sources), and language (excluding articles written in languages other than English).

Thirty full-text articles were evaluated for inclusion during the eligibility phase. At this point, thirteen articles were eliminated for a variety of reasons, such as not being child-focused, concentrating on game development without considering socio-emotional outcomes, lacking gamified elements, being review articles, or not having the full text accessible. In the end, 17 articles were deemed qualified and added to the thematic analysis and qualitative synthesis.

The final topic analysis only contained 17 papers, yet that was enough to achieve thematic saturation. Strict inclusion criteria that focused on empirical interventions for children ages 4-12 and specifically included gamified SEL components were met by these research. A solid foundation for qualitative synthesis was established by their topic recurrence and methodological diversity (**Figure 1**).

Although the chosen studies provided insightful information, there was variation in the quality of their methodology. Few of them used randomized controlled designs, and the majority depended on small sample sizes (between 10 and 50 individuals) (Bhide et al., 2018). Furthermore, several studies may have been biased due to their dependence on self-reported results. These restrictions were considered throughout the thematic synthesis, and they emphasize the necessity of more exacting empirical designs in next studies on SEL gamification.

RESULTS

Co-Word Analysis

A networked view of important ideas and research areas pertaining to gamified SEL in children is provided by the co-word analysis with VOSviewer, which serves as a supplementary lens to the thematic analysis. Of the 473 keywords that were extracted based on the analysis, 63 of them satisfied the minimum occurrence threshold, creating 61 unique items that were arranged into six clusters. These clusters significantly correspond with the thematic patterns

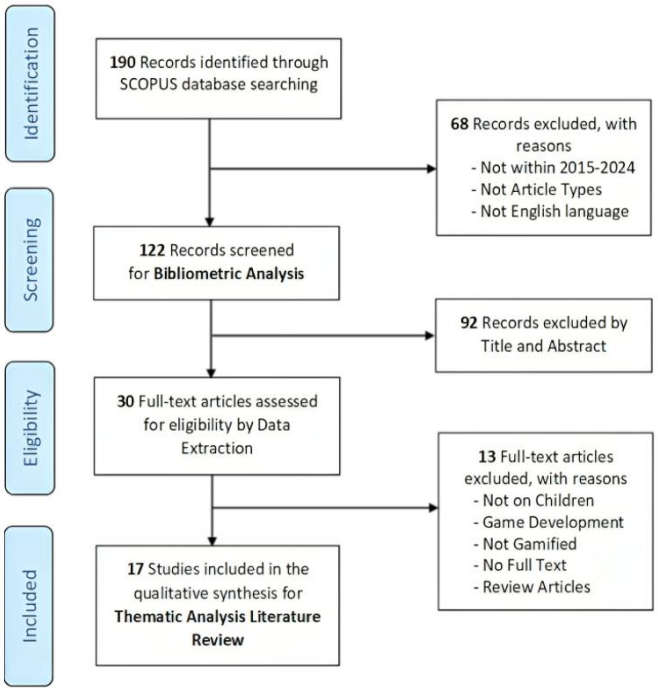

Figure 1. PRISMA flowchart (Source: Authors' own elaboration)

found in the qualitative synthesis of previous studies, despite covering more general psychological, developmental, and technological research areas.

As shown in **Figure 2**, the clusters illustrate the complementary focus on socio-emotional competencies and digital engagement in the field. This visual representation helps clarify how thematic areas converge in gamified SEL research. Keywords like "children," "empathy," "physical education," "collaborative learning," and "screen time" are found in cluster 1 (red). The main themes in the thematic analysis are strongly echoed by these terms, especially those pertaining to cooperative play, the growth of empathy, and the function of exercise in promoting emotional control and teamwork. This cluster emphasizes the interdisciplinary nature of SEL research by reaffirming how gamified SEL is incorporated into a larger educational discourse on cooperative and hands-on learning experiences.

Terms including "motivation," "development," and "digital games" are introduced in cluster 2 (green). The thematic analysis's reward and motivation systems theme, which focused on how internal and external rewards in gamified environments maintain engagement and foster the growth of prosocial behaviors and emotional resilience, is closely related to these keywords. In keeping with the games and technology serving as vehicles for the SEL theme, the inclusion of "digital games" validates the growing integration of digital learning technologies in SEL research.

Both cluster 3 (blue) and cluster 4 (yellow) emphasize the importance of emotion-focused gameplay in current educational research by concentrating on serious games, gamification, socio-emotional skills, and emotion recognition. The study of applied socio-emotional agents and emotional AI, which examined how emotionally responsive game characters can model, reflect, and reinforce appropriate social and emotional responses during gameplay, is closely related to the emphasis on serious games and emotion-focused interventions. The focus on emotion recognition also supports the observation that successful gamified SEL programs frequently use interactive play experiences to teach children how to recognize, categorize, and control their emotions.

Cluster 5 (purple) highlights internal logic, emotion regulation, and adolescents. Although younger children were the main focus of the thematic analysis, the recurrent keyword "emotion regulation" highlights the significance of developing self-regulation and emotional awareness across all age groups,

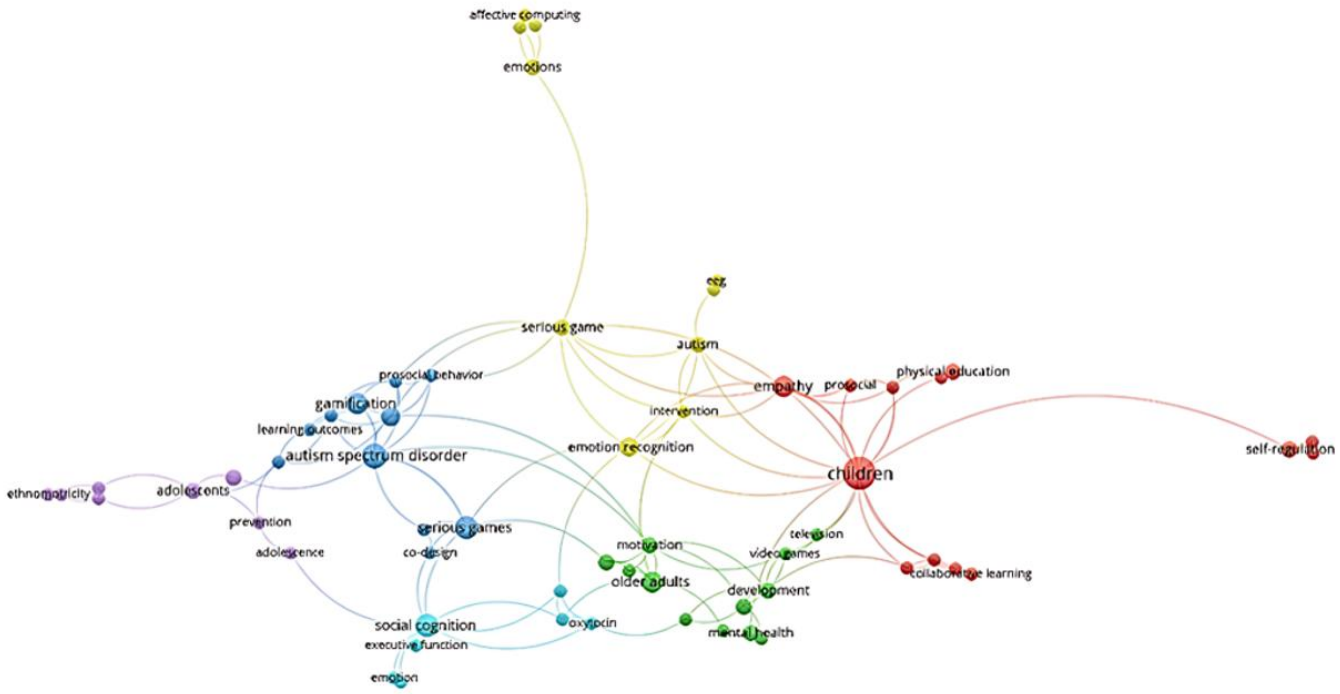

Figure 2. Co-word cluster by author keywords (Source: Authors' own elaboration, using VOSviewer)

Table 1. Summary of emerging themes

Theme	Core focus
Games and technology as vehicles for SEL	How games foster socio-emotional learning through play-based experiences
Teacher facilitation and parental involvement	The critical role of adults in guiding and supporting SEL through games
Holistic development through integrated play	Linking socio-emotional learning to cognitive and psychomotor skills
Trust, social presence, and emotional connection	The importance of gaze, presence, and peer bonding in digital SEL
Cultural and contextual variations	How cultural contexts shape preferences and engagement with SEL games
Reward and motivation systems	How rewards sustain engagement and reinforce socio-emotional behaviors
Applied socio-emotional agents and emotional AI	The role of AI characters in modelling and supporting socio-emotional learning
Developmentally appropriate and scaffolded play	Tailoring gamified SEL to children's developmental stages and needs

especially as part of SEL programs that span early childhood to adolescence. This implies that gamified SEL techniques that are employed with younger children may develop into strategies that promote SEL in older age groups, particularly when those programs incorporate internal logic–the term used to describe the cognitive processing of emotional experiences and personal reflection.

The trust, social presence, and emotional connection theme, which showed how children's socio-emotional development is closely linked to their ability to form trusting relationships and interpret social cues during gamified interactions, is in line with cluster 6 (turquoise), which focuses on social cognition, social interaction, and autism spectrum disorder (ASD). The inclusion of ASD also emphasizes how a segment of gamified SEL research is increasingly exploring how technology-supported interventions can be tailored to children with diverse social and emotional needs, highlighting the significance of adaptive, personalized game environments.

Overall, by emphasizing the importance of fundamental ideas like empathy, motivation, socioemotional skills, and collaborative learning, the co-word analysis supports and enhances the results of the thematic analysis. By highlighting new areas of interest, such as the use of gamified SEL techniques for children and teenagers with ASDs, it also broadens the thematic scope. Gamified SEL research is extremely interdisciplinary, occupying the nexus of educational technology, developmental psychology, special education, and affective computing, as evidenced by the conceptual clustering across digital games, serious games, physical play, and collaborative learning. This emphasizes how future studies must use equally integrative frameworks that can capture the emotional, social, and cognitive aspects of gamified learning for a range of learner populations.

Thematic Analysis

Eight main themes emerged from the thematic analysis of 17 chosen studies examining how gamified SEL affects children (**Table 1**). These themes show recurrent trends, procedures, and socioemotional results found in a variety of settings where gamified methods were used to promote the socioemotional growth of children. Below is an explanation of each theme backed up by concrete data from the examined articles.

Theme 1. Games and technology as vehicles for socio-emotional learning

Games, whether digital or physical, were consistently found to be effective platforms for SEL in the reviewed studies. They provided structured yet entertaining environments where children could practice social skills, express their emotions, and work together to solve problems. For example, children were urged to express their feelings, consider how they interact with others, and work out solutions to make-believe disputes in digital storytelling environments (Maulidah et al., 2021). According to Maulidah et al. (2021),

> Digital storytelling tools provided opportunities for children to articulate emotions, reflect on peer interactions, and practice social problem-solving in a safe space.

Similarly, because they had to coordinate their efforts and settle disputes while playing cooperative games with interactive tables, children were able to develop empathy and cooperative skills (Ioannou et al., 2018). According to Ioannou et al. (2018),

> Collaborative tabletop games fostered active negotiation and teamwork, requiring children to empathize with teammates and resolve conflicts.

The findings collectively demonstrate that games offer dynamic learning spaces where socio-emotional competencies are naturally developed through guided play and peer interaction. Mascarenhas et al. (2022) further highlighted those games with emotionally responsive AI agents that allowed children to experience in-game social scenarios, which enhanced their emotional and social competence.

Theme 2. Teacher facilitation and parental involvement in gamified socio-emotional learning

The ability of adult facilitators to mediate children's experiences was frequently necessary for gamified SEL programs to be effective. Teachers were especially important in encouraging reflection, modelling appropriate responses, and helping children relate in-game experiences to real-life socioemotional contexts. As noted in Ismail et al. (2017):

> Teacher involvement was essential to ensure children remained focused on the emotional aspects of the game, particularly during reflective debriefing sessions.

In home-based digital SEL contexts, parental involvement was equally significant. Children showed more complex emotional understanding and better self-regulation in homes where parents actively talked about in-game emotions and conflicts with their children (Rojas-Barahona et al., 2020). One parent observation reported:

> Children whose parents actively engaged in discussing emotions during gameplay demonstrated more sophisticated emotional vocabulary and self-awareness. (Rojas-Barahona et al., 2020)

Children frequently concentrated only on competitive aspects in the absence of such adult scaffolding, which decreased the opportunity for deeper reflection and SEL outcomes (Saleme et al., 2020).

Theme 3. Holistic development through integrated cognitive, psychomotor, and socio-emotional play

Numerous studies demonstrated how cognitive and physical development are rarely separated from SEL in games. Simultaneously, games that demanded peer coordination, strategic decision-making, and physical movement promoted cognitive, motor, and socioemotional development. This interaction was illustrated by Wu et al. (2024), who noted:

> Physical games requiring teamwork improved not only cooperation and communication but also motor coordination and spatial awareness.

This integrated approach was also evident in executive function games, which used rule-switching tasks embedded in social contexts to practice cognitive flexibility and self-regulation (Gibb et al., 2021). One game facilitator noticed:

> Executive function games, when embedded with social rules, simultaneously enhance cognitive flexibility and peer awareness. (Gibb et al., 2021)

Ismail et al. (2017) also highlighted that more holistic development outcomes were obtained from preschool play activities that were purposefully created to encourage physical movement, emotional awareness, and cooperative engagement.

Theme 4. Trust, social presence, and emotional connection in digital play

The development of social presence and emotional connection in technology-based gamified SEL experiences was especially impacted by the availability of collaborative features and non-verbal cues. According to Shahid et al. (2018), when mutual gaze features were incorporated into the game environment, children who played remotely felt more connected. According to one observation:

> Mutual gaze in video-mediated games increased children's sense of social connection, making interactions more authentic and emotionally engaging. (Shahid et al., 2018)

Through shared risk and cooperative goal-setting in games that require cooperative decision-making, players' and AI partners' trust developed over time (Marble et al., 2020). This slow process of establishing relationships encouraged expressive play and emotional safety.

Theme 5. Cultural and contextual variations in digital play preferences

Cultural, socioeconomic, and environmental contexts had a significant impact on how children interacted with gamified SEL. Gigantesco et al. (2019) found that children from collectivist cultures tended to favor cooperative games, while children from more individualistic cultures were more attracted to competitive formats:

> Students from more collaborative cultures expressed a preference for group-based games, while those from more individualistic cultures preferred competitive formats. (Gigantesco et al., 2019)

Preferences were also influenced by home learning environments. According to Lehrl et al. (2021):

> Parental mediation was more prevalent in cultures where digital literacy was already embedded in early childhood environments.

In contrast to urban classrooms, where tablet-based SEL games were preferred, children in rural areas with restricted access to technology participated more in traditional cooperative play that was facilitated by instructors (Wu et al., 2024). These variations demonstrate the ways that cultural and contextual contexts affect the structure and efficacy of gamified SEL.

Theme 6. Reward and motivation systems in socio-emotional games

Although studies cautioned against an over-reliance on extrinsic motivators, rewards were consistently found to be effective motivators for children's engagement in gamified SEL activities. As Ismail et al. (2017) observed:

> Stickers and verbal praise were effective in reinforcing turn-taking and prosocial behavior during cooperative games.

Gibb et al. (2021) further highlighted:

> Points and progress tracking motivated children to persist through challenging social scenarios.

Theme 7. Applied socio-emotional agents and emotional AI

The ability of emotionally intelligent AI agents to customize and enhance gamified SEL experiences was demonstrated in a number of studies. Mascarenhas et al. (2022) demonstrated that

> Socio-emotional agents, capable of detecting frustration and offering calming suggestions, enhanced children's emotional self-regulation.

In a similar vein, Guimarães et al. (2019) emphasized how emotionally adaptive agents simulated peer interactions:

> Emotionally responsive characters modelled appropriate emotional expressions and encouraged peer empathy.

Theme 8. Developmentally appropriate and scaffolded socio-emotional play

There was a constant emphasis on the significance of developmental appropriateness. Ismail et al. (2017) noted:

> Games were most effective when emotional scenarios were tailored to the lived experiences of children in the target age group.

While older children showed more independence but still benefited from thoughtful discussions, younger children needed adult scaffolding more frequently (Gibb et al., 2021; Wu et al., 2024).

DISCUSSION

Gamified Socio-Emotional Learning as a Tool for Transformative Education

As demonstrated by the results of this study, gamified SEL is an engaging way to foster the fundamental competencies of ESD, particularly empathy, teamwork, self-control, and effective communication. In both digital and physical game environments, children might actively practice emotional expression, conflict resolution, and teamwork on safe, inclusive platforms. SEL competencies such as empathy, cooperation, and emotional regulation align directly with ESD pillars of social equity, cultural diversity, and civic responsibility. Embedding gamified SEL, therefore, operationalizes ESD by enabling children to develop not only academic but also ethical and social capacities essential for sustainable societies.

Gamified therapies, which were in line with the CASEL framework, used cooperative storytelling, role-playing, and problem-solving to help children navigate SEL domains like self-awareness and relationship skills (Ioannou et al., 2018; Maulidah et al., 2021). In order to develop socially conscious and compassionate people, SDG4.7 calls for education that promotes global citizenship, emotional intelligence, and participatory learning. These dynamics are in line with this goal.

The Role of Adult Scaffolding in Cultivating Reflective Learners

The study emphasizes how important it is for parents and teachers to act as facilitators in gamified SEL settings. Their supervision, whether in the form of behavioral modeling, emotional debriefing, or co-play, helps children to get more out of their game-based experiences (Ismail et al., 2017; Rojas-Barahona et al., 2020). This is in line with Vygotsky's zone of proximal development, which holds that learning is most successful when supported by experienced people.

In ESD, teachers are viewed as co-learners who support critical thinking and introspection rather than as content providers. Without adult guidance, children frequently concentrate on flimsy game mechanics, losing out on chances for emotional growth (Saleme et al., 2020). This supports Deterding et al.'s (2011) warning that, especially when used in values-based education like ESD, gamification needs to be genuinely integrated with pedagogy in order to transcend amusement and progress toward intentional learning.

Integrating Physical, Cognitive, and Emotional Development for Holistic Growth

Gamified SEL integrates cognitive, psychomotor, and emotional domains to promote holistic child development, going beyond simply improving emotional skills. It has been discovered that games that require physical mobility, peer coordination, and strategic decision-making improve children's interpersonal, emotional, and executive skills (Gibb et al., 2021; Wu et al., 2024). According to Eccles and Roeser (2011), this is similar to ESD's whole-child approach, which promotes interconnected development across all areas of human potential. Gamified learning must transcend purely academic objectives in order to support children's emotional, physical, and ethical development, particularly in early childhood settings where foundational attitudes and values are formed. This is in keeping with SDG4's emphasis on inclusive and equitable quality education.

Building Social Presence and Emotional Connection Through Technology

In order to promote inclusive and peaceful communities, technology-enhanced SEL experiences can cultivate emotional connectedness and trust. Children's sense of social presence and belonging in remote learning settings was found to be improved by features including synchronous collaboration, emotive avatars, and mutual gaze (Marble et al., 2020; Shahid et al., 2018). The media richness theory (Daft & Lengel, 1986), which highlights the significance of non-verbal clues in successful communication, is consistent with these findings. These findings imply that designing for emotional resonance and social connection in digital settings is crucial for ESD, where social cohesiveness and collaborative action are crucial. The global expansion of remote and hybrid learning models necessitates the development of digitally inclusive platforms that foster empathy, emotional safety, and respect for one another.

The Importance of Cultural and Socio-Economic Contexts in Inclusive Pedagogy

The results highlight how socioeconomic circumstances and cultural norms affect children' experiences with gamified SEL. Different cultural contexts had different preferences for competitive vs collaborative play (Gigantesco et al., 2019), and children's ability to gain from SEL interventions was impacted by the level of parental involvement and technology availability (Lehrl et al., 2021; Rojas-Barahona et al., 2020). These observations highlight the importance of context-sensitive, culturally responsive design, which is a fundamental component of ESD, and are consistent with Hofstede's (2001) cultural dimensions theory. In line with ESD's mission to leave no child behind, gamified SEL must be modified to fit the values, available resources, and lived realities of students in a variety of contexts while maintaining accessibility and equity.

The Role of Motivation: Balancing Extrinsic Rewards with Intrinsic Growth

Although studies warned that an over-reliance on extrinsic rewards, such as badges and praise, could compromise

intrinsic motivation–a crucial objective in ESD-driven education–gamified SEL programs employed these to increase participation. This is consistent with the self-determination theory (Deci & Ryan, 2000), which highlights that sentiments of competence, autonomy, and social connection are the sources of long-lasting motivation. In order to ensure that children internalize values and behaviors through collaborative challenges and reflective discourse, sustainable gamified learning necessitates striking a balance between employing external rewards to pique attention (Gibb et al., 2021; Ismail et al., 2017; Wu et al., 2024). Thus, gamified SEL should therefore transition learners from reward-driven behaviors toward intrinsic growth, using cooperative quests, reflective storytelling, and collaborative challenges that naturally encourage persistence and empathy.

Emotionally Intelligent AI as ESD Enablers: Promise and Caution

The development of AI agents that are sensitive to emotions in gamified learning offers fascinating prospects for improving individualized SEL experiences. By modeling prosocial activities, identifying emotional states, and providing prompt feedback, these agents assist youngsters develop empathy and self-regulation (Guimarães et al., 2019; Mascarenhas et al., 2022) and advance the affective computing theory (Picard, 1997). Nonetheless, these technologies need to be used with ethical consideration in the context of ESD. Developers are required to guarantee developmental appropriateness, cultural sensitivity, and open AI methods (Prada, 2017). Particularly in remote or under-resourced learning situations, emotionally intelligent AI has the potential to be a potent tool for spreading SEL and ESD competencies if it is developed ethically.

Developmentally Tailored Gamified SEL for Equitable Learning

Finally, the study confirms that effective gamified SEL requires developmentally appropriate design. While older children need opportunities for self-reflection and cooperative peer learning, younger children benefit more from adult supervision and simplified scenarios (Gibb et al., 2021; Ismail et al., 2017). This age-sensitive method ensures that pedagogy corresponds with children's developing emotional, cognitive, and social capacities, which is consistent with ESD's learner-centered principles. By combining ideas from Vygotsky's sociocultural learning and Piaget's developmental theory, gamified SEL transforms into more than just a teaching tool; it becomes a transformative vehicle for sustainability education that helps children become more thoughtful, compassionate, and socially conscious adults.

CONCLUSION

The educational value of gamified SEL for children ages 4 to 12 was investigated in this study using a TALR in conjunction with co-word analysis. After 17 empirical studies were systematically analyzed, eight key themes emerged that illustrate how game-based learning environments, both digital and physical, can foster the growth of critical socioemotional skills like empathy, emotional control, teamwork, and responsible decision-making.

The results show that gamified SEL is a transformative pedagogical tool that supports the larger goals of ESD, not just a trend in instruction. SDG4.7, which asks for educational systems to enable students to become responsible, moral, and compassionate global citizens, is in line with gamified SEL since it helps children develop their emotional literacy, social awareness, and teamwork. In order to address sustainability issues and foster inclusive, harmonious, and resilient communities, these competences are crucial.

A number of limitations apply to this review. The inclusion of just English-language publications may have introduced linguistic bias and left out pertinent regional studies. Second, author keywords were used as the basis for the co-word analysis, which might have missed more subtle conceptual differences. Third, in order to represent recent advancements, the analysis only included studies conducted between 2015 and 2024; however, this may have left out important research from previous years. Finally, the range of insights on real-world applications may be limited by the omission of gray literature and non-peer-reviewed sources.

The study does point out that a number of essential enablers, such as developmentally appropriate design, cultural and contextual relevance, and active adult facilitation, are required for the successful implementation of gamified SEL. Emotionally intelligent technology and game-based narrative offer new opportunities to tailor instruction and get a variety of learners to think deeply. However, these tools must be properly integrated into learning settings that are values-based, inclusive, and egalitarian. Gamified SEL presents an appealing approach for promoting lifelong learning and social-emotional well-being from an early age, as educational systems around the world shift toward more transformative and learner-centered paradigms. The findings provide guidance for curriculum developers and policymakers, particularly in designing early childhood frameworks that embed socio-emotional competencies through gamified methods. Integrating such approaches into national curricula would help foster lifelong learning, empathy, and sustainability-focused values from an early age.

Finally, by emphasizing how engaging, playful, and emotionally charged learning experiences can act as potent accelerators for long-term human development, this study adds to the expanding corpus of ESD scholarship. Gamified SEL becomes a route to academic achievement as well as a more equitable, caring, and sustainable future by giving young students the emotional and cognitive skills they need to succeed in a complicated environment. Thus, to evaluate the long-term effects of gamified SEL on children's development, future research should take longitudinal approaches into account. In order to create context-sensitive gamification tactics, comparative research across various cultural settings is also required. Furthermore, more research is needed to determine how gamified SEL might be modified for kids with unique needs, particularly those who are neurodivergent. In both formal and informal educational contexts, researchers should investigate the difficulties educators have while implementing game-based SEL and create scalable, teacher-friendly models.

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