

Effect of Game-Based Learning on Non-Cognitive Skills and the Affective Domain of Learners: A Systematic Review

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ABSTRACT

This systematic review screened SCOPUS and Education Resources Information Centre (ERIC) databases on recent studies on GBL using the PRISMA framework. 35 open-access journal articles were selected from 2021 to 2025 on the effect of GBL on non-cognitive skills and affective domain factors among pre-school and school students. They were synthesized based on demographics, game activities and research methods. A thematic summary of GBL's effect on K-12 students' non-cognitive skills and affective domain factors is presented. Findings highlight the scope for future research on GBL as an instructional tool, personalising educational approaches at different educational levels and combining games with other pedagogical interventions for developing cognitive and non-cognitive competencies among young learners.

Keywords: 21st century skills, affective domain, game-based learning, non-cognitive skills, play-based education

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INTRODUCTION

Non-cognitive skills such as learner behaviour and personality traits are considered as important as, or even more important than, cognitive skills, because they are critical for success in academics and at the workplace (Heckman et al., 2006; Megginson, 2009; Gutman & Schoon, 2013). Cognitive skills refer to the ability to “perform higher mental processes of reasoning, remembering, understanding and problem solving” (Bernstein et al., 2007). While cognitive skills are reflected through academic performance and achievements in standardized tests, non-cognitive skills are complex to measure (Bjorklund-Young, 2016).

Non-cognitive skills have many collocations (Khine, 2016). They go by many names such as social-emotional skills, abilities, soft skills, personality traits and character skills (Heckman & Kautz, 2013). Personality traits that fall under the purview of affective domain such as motivation, attitude and self-efficacy, are also included in non-cognitive skills (Bjorklund-Young, 2016).

Megginson (2009) identified three categories of constructs that comprise non-cognitive skills: personality factors (including constructs like emotional stability, personality traits such as conscientiousness and extraversion), attitudinal factors (including self-efficacy and intrinsic motivation) and quasi-cognitive factors (including creativity and emotional intelligence) which are considered emotional in nature, but also involve cognitive processes.

At the school level, educational objectives span three overlapping domains: cognitive, affective and psychomotor (Bloom et al., 1956). The affective domain encompasses interests, attitudes, values and appreciation (Bloom et al., 1984). They help learners understand and express themselves as well as others, and cope with daily demands. They also include soft skills and 21st-century skills such as critical thinking, innovation, communication and collaboration (Voogt & Roblin, 2012).

Many psychologists also classify personality traits as non-cognitive skills such as openness to experience, conscientiousness, extraversion, agreeableness and neuroticism, which together make the ‘Big Five’ traits (Bernstein et al., 2007). Personality traits are enduring patterns of thoughts, feelings and behaviours and impact life outcomes by influencing how individuals think, feel and behave in different situations (Cieciuch & Strus, 2021).

Recent pedagogical approaches have emphasized the importance of integrating play and instruction through game-based learning (Lojero, 2025). Game-based learning (GBL) refers to the use of digital and non-digital games as educational tools to enhance student engagement, to obtain new concepts and skills and to reinforce the learning process (Grace, 2019). Young learners benefit the most as they naturally learn through interaction, exploration and play. Game-based strategies are enjoyable and learner-centred, making them effective at improving early literacy outcomes (DeLuca, 2020).

Play is an intrinsically motivated activity, freely chosen, and often lacking external goals (Zosh et al., 2017). Various types of play have been identified by researchers, each contributing uniquely to children's development, such as symbolic play, socio-dramatic play, physical play, constructive play and rule-based play (Buldu & Buldu, 2025). Play, such as board games or sports, helps children understand structure, fairness and cooperation.

Play-based and game-based pedagogy has been shown to improve students' cognitive, affective and social-emotional skills across all educational levels (Zosh et al., 2017; Samuelsson & Carlsson, 2008). A key element of a game is the adoption of narratives into activities that help students engage critically with cultural diversity and societal norms. Engaging through dialogues and narratives helps students gain insights into different cultural perspectives, develop empathy, improve communication skills and foster an inclusive learning environment (Tetteh et al., 2025). Classroom exercises such as role-playing encourage students to empathize with diverse viewpoints to understand cultural narratives and their implications (Uddin et al., 2025). This is further substantiated by collaborative knowledge construction activities, which make honing social and emotional skills among students effective (Eid & Al-Sainidi, 2025). Games help learners build self-trust, participate in learning freely and foster expression and creativity while engaging in discussions and asking questions. It also gives children an opportunity to freely express themselves with teachers who offer them scaffolding, and it also develops their social skills through peer collaboration (Bodnar & Clark, 2017).

Much of the existing research focuses primarily on the cognitive variables and domain-specific knowledge aspects of learning (Haro et al., 2022; Román-González et al., 2018). There had been limited empirical research exploring the effectiveness of game-based learning on non-cognitive skills and affective factors until recent years. An up-to-date systematic review of recent studies on the effect of non-cognitive skills and the affective domain of young learners was needed. This SLR synthesized a vast array of research articles on non-cognitive skills and the affective domain in the post-COVID-19 pandemic years.

LITERATURE REVIEW

Theoretical Framework

Game-based pedagogical practice has been studied through multiple theoretical frameworks comprising several interrelated concepts such as creativity, motivation and interest (Mitton & Murray-Orr, 2022; Plass et al., 2025). Sociocultural theory and cognitive development theory promote play and social interaction as essential components of children's learning (Piaget, 1952; Vygotsky, 1978). Scaffolding within the Zone of Proximal Development (ZPD) guides

children through interaction, which is the key to social, behavioral and cognitive growth.

Non-cognitive skills are studied through frameworks that focus on motivation and social interaction. Self-determination theory and social cognitive theory offer robust frameworks for understanding the cultivation of these skills (Urhahne & Wijnia, 2023; Vu et al., 2021). Self-determination theory emphasizes the internalization of motivation driven by the satisfaction of basic psychological needs for autonomy, competence and relatedness (van der Sande et al., 2023). Social cognitive theory emphasizes the interaction of personal, behavioural, and environmental factors (Bandura, 1986; Zimmerman, 1994). The theories offer a distinct explanation to address facets of perceived self-efficacy, self-regulation and motivational drivers. They suggest a complementary relationship between the constructs in elucidating the development of non-cognitive skills (Martin, 2023).

Conceptual models built on social cognitive and sociocultural theories formulate frameworks for knowledge and skill acquisition. This study delves into the social cognitive model of self-regulated learning (Zimmerman 1998; Zimmerman 2000; Schunk, 1989). It posits that such learning is a proactive, goal-directed process driven by reciprocal interactions among personal, environmental and behavioural factors. Students perceive self-efficacy as an influential construct for their persistence, effort and acquisition of skills, which leads to a change in their behaviour towards the task (Schunk, 1989). Learners self-regulate themselves over three aspects of active participation in the learning process: metacognitive, motivational and behavioural. Students use a set of proactive processes to learn and acquire skills such as setting goals, selecting and using strategies, self-monitoring and self-evaluating the learning outcomes (Zimmerman, 2008).

This systematic review uncovers the effect of game-based learning on non-cognitive skills and affective domains of learners using the theoretical lens of social constructivist, self-determination and social cognitive theories.

Game-Based Learning on Non-Cognitive Skills and the Affective Domain

Studies conclude that integrating games, both traditional and digital, into the educational curriculum can support social-emotional skills, enhance academic performance and promote overall student engagement across different age groups, educational levels and disciplines. Engaging students through games and scaffolding their learning has been shown to increase their motivation, independence and self-esteem (Papanastasiou et al., 2022). GBL promotes a multi-sensory learning style and has proven valuable in almost every aspect of the curriculum. Dialogic learning in small group activities and play can foster empathy and cultural awareness in educational settings (Uddin et al., 2025). Studies have demonstrated that game-based approaches can enhance problem-solving abilities and improve mathematics learning outcomes (Pratama & Setyaningrum, 2018).

Game-based creativity training protocols are found to effectively increase social-emotional competencies in elementary school children (Fatourehchi et al., 2024). Involving students in the learning process through play and activities increases engagement, aids in habit formation and retention, builds learners' confidence and fosters inclusion. Game elements within the gamified learning can stimulate curiosity, reinforce and develop key non-cognitive skills by promoting collaboration and healthy competition among primary learners (Al-Hafdi & Alhalafawy, 2024).

Several systematic reviews are available on GBL. Sousa et al. (2023) reviewed studies conducted between 2012 and 2022 on the pedagogical role of playful games (board, analogue-based and tabletop games) and their effectiveness to achieve learning outcomes, thereby indicating a positive effect on soft skills, cognitive abilities and psychological outcomes. Li and Kangas (2024) investigated studies from 2014 to 2023 on teachers' roles in playful learning at the primary level, suggesting that teachers have an important role in planning activities, facilitating and supervising students' learning and assessing progress. Alotaibi (2024) in their meta-analysis examined the studies on GBL for early childhood education, published between 2013 and 2023. The findings indicate GBL has a moderate to large effect on cognitive, social, emotional, motivational and engagement outcomes. Furthermore, Zhou et al. (2024) in their SLR of articles between 2011 and 2021, found that the application of digital game-based learning and serious games resulted in significant improvements in learning outcomes and academic achievement at higher educational level. Cheng and Weatherly (2025) did moderator analysis from 37 studies examining the effects of digital games on 21st-century skills. The effect of critical thinking and communication was found to be larger than that of collaboration and creativity. Discipline, game type, design and grade were identified as moderators influencing digital games' effect on 21st-century skills.

A growing number of studies are reporting on the effects of GBL on non-cognitive skills. There is a need to filter these studies. This study consolidates literature from five years (2021-2025) on game-based learning and comprehensively synthesises the findings on the effects on non-cognitive skills and affective domains of pre-school and school students.

RESEARCH QUESTIONS

This systematic literature review (SLR) synthesizes the findings of the review articles over the past five years extracted from the literature search on game-based learning practices at the pre-school and school levels from SCOPUS and ERIC databases.

The following research questions guided this study:

1. What trends are observed in articles published (authorship, year and country of publishing, research method, design of study) in recent studies on the use of games for developing non-cognitive and affective abilities in students?
2. What are the demographics of participants (school level of participants, sample size) considered for the sample in recent studies on the use of games for developing non-cognitive and affective abilities in students?
3. What key themes (game type, domains of the non-cognitive skills assessed, study outcomes) are reflected from recent studies on the use of games for developing non-cognitive and affective abilities in students?

RESEARCH METHODOLOGY

Research Design

This systematic review employs a systematic analysis approach based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). Two databases, SCOPUS and ERIC (Education Resources Information Center), were searched on 5th March 2026 for research articles and were accessed through the on-campus service for students of the University of Delhi. These databases provide a comprehensive coverage of high-quality peer-reviewed literature in the field of Education.

PRISMA guidelines were considered for systematicity of this study (Moher et al., 2009). Following keyword search, we screened journal articles covering studies at the school level on the influence of game-based learning (GBL) on non-cognitive and affective abilities of students and then analyzed them thematically. The scope of the literature search was limited to recent articles published from 2021 to 2025 on contemporary pedagogical practices post-COVID-19 pandemic.

All efforts were made to completely discover and synthesize the reviewed articles through a transparent and systematic manner. Both reviewers conducted the reviews independently to ensure methodological rigour and biases in the inclusion of studies.

Screening, Inclusion and Identification of Review Articles

For this systematic literature review (SLR), SCOPUS and ERIC databases were used for the preliminary search. Choosing appropriate keywords was essential at the outset to ensure alignment with the study objectives. The preliminary searches led to the finding that the term non-cognitive was not

explicitly included in studies on corresponding sub-skills. Instead, 21st century skills, social and emotional skills, personality traits and soft skills were collocations for non-cognitive skills. Hence, these terms were also included in the keyword search.

The keywords used as search terms in two databases were as follows:

1. SCOPUS (<https://www.scopus.com/home.uri>)

TITLE-ABS-KEY = ("Game*" OR "Game Based" OR "Game Based Learning" OR "Game-Based Learning" OR "GBL") OR ((Play OR TOY) AND (LEARN* OR PEDAGOG*)) AND ("Affective Domain*" OR "Non Cognitive" OR "Non-Cognitive" OR "personality traits" OR "soft skills" OR "character skills" OR "21st century skills" OR "social skills" OR "emotional skills" OR " socio-emotional skill*")

2. ERIC (<https://eric.ed.gov/?q=>)

SEARCH = ("Game*" OR "Game Based" OR "Game Based Learning" OR "Game-Based Learning" OR "GBL") OR ((Play OR TOY) AND (LEARN* OR PEDAGOG*)) AND ("Affective Domain*" OR "Non Cognitive" OR "Non-Cognitive" OR "personality traits" OR "soft skills" OR "character skills" OR "21st century skills" OR "social skills" OR "emotional skills" OR " socio-emotional skill*")

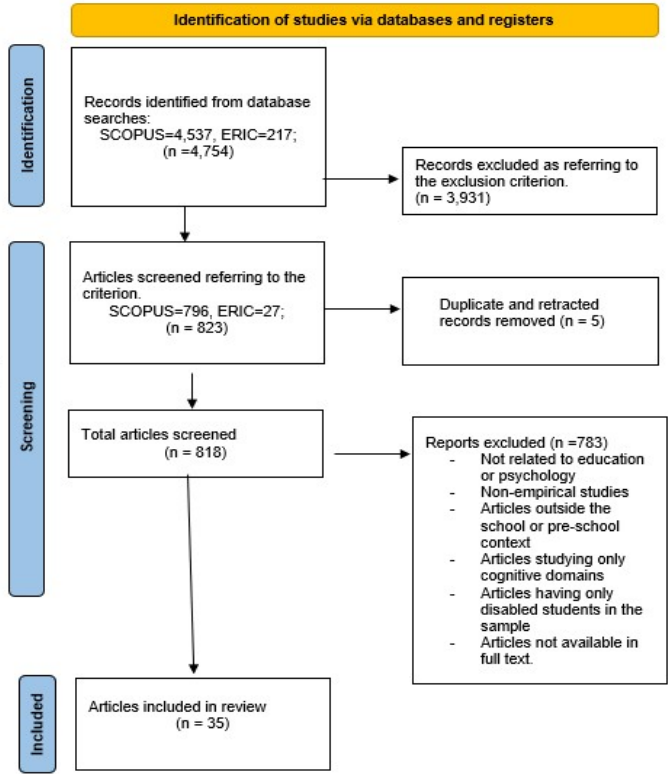
The keyword search in the identification phase retrieved 4,537 articles from SCOPUS and 217 from ERIC using Boolean operators. In total, there were 4,754 articles. The filters available on databases help screen only open-access journal articles in English and published between 2021 and 2025. This eliminated 3,931 articles. The remaining articles were imported to Zotero desktop software for examination. Five duplicate and/or retracted articles across SCOPUS and ERIC databases were identified and eliminated. The final count at the end of this phase was 818.

The articles' titles, abstracts and the authors were screened in two parts thereafter. Firstly, both researchers cross-checked information like article titles, author names, journal names and publishing years. Then, we read each article's title and abstract to determine if they were relevant to game-based learning and non-cognitive skills. Finally, using a specific set of criteria, we decided whether to include or exclude each article in the study. The inclusion criteria were as follows: (i) articles published since 2021, (ii) journal articles only, (iii) articles from the fields of education and psychology, (iv) articles in English only, (v) articles with full-text articles available, and (v) articles covering empirical study. The screening filtered a total of 137 items.

In the next step, we downloaded these articles. Both researchers independently screened the full text of studies and extracted data to minimize selection bias that could affect the validity of this review. To ensure a balanced representation, articles were screened, ensuring the following specific criteria: (i) having a sample of pre-school and/or school students (primary to secondary level), (ii) having a sample of non-disabled students and those without neurodivergent disorders, and (iii) having constructs related to non-cognitive skills in the study. Consequently, 102 articles from the two databases were found irrelevant for this study and eliminated, leaving a total of 35 articles. Figure 1 shows the flow diagram for this systematic review adopted as per PRISMA guidelines.

After reading the full text of selected articles, recurring themes were identified. The studies were reviewed and assigned to themes. The articles were congruent with at least one of the themes. Discussions between the authors resolved discrepancies. A descriptive synthesis of the studies was conducted based on the interpretations from analysis.

Figure 1: *PRISMA 2020 flow diagram for systematic reviews*



Note. Adapted from Page et al. (2021)

RESULTS

The 35 articles finally extracted at the end of the selection process, their title, author(s), publication year and country are summarized in Table 1.

Table 1: *Titles of 35 articles identified, their authors, years of publication, countries of study and sub-domains of non-cognitive and affective domains observed in the studies*

Title	Author(s)	Country	Sub-domains of the non-cognitive skills and affective domain factors observed in the studies
Determinants of Trust: Evidence from Elementary School Classrooms	Araya and González - Vicente (2025)	Chile	Emotional intelligence, personality traits and trust
Role-play Experience's Effect on Students' 21st Century Skills Propensity	Aura et al. (2023)	Finland	21st-century skills, communication, leadership, and responsibility, collaboration, self-direction, flexibility, adaptability, initiative, accountability, productivity, social skills and cross-cultural skills
It Takes Two: Examining the Dynamic Nature of Cooperative Behavior in Adolescents	Berman et al. (2024)	Canada	Trust, reciprocity and social skills
Conceptual Playworld as a Method of Facilitating Learning Beyond Subject Matter in Elementary School	Bjerknes et al. (2023)	Norway	Social skills, positive emotions, engagement and motivation to learn
How do Preschoolers Interact with Peers? Characterising Child and Group Behaviour in Games with Tangible Interfaces in School	Blanco et al. (2022)	Spain	Social interaction
Academic achievement helps coordination on mutually advantageous outcomes	Brocas and Carrillo (2025)	United States	Coordination and strategic thinking
Active Gamification in the Emotional Well-Being and Social Skills of Primary Education Students	Carcelén-Fraile (2025)	Spain	Emotional (self-esteem, self-concept), social skills (communication, empathy, cooperation, conflict resolution)
Game Jams as Valuable Tools for the Development of 21st-Century Skills	Contreras-Espinosa and Eguia-Gomez (2022)	Mexico	21st-century skills (creativity, collaboration, communication, critical thinking)
Effects of Implementating a Hybrid Teaching Model in a Basketball Didactic Unit	Ferraz et al. (2024)	Portugal	Performance, decision making and motivation

Exploring the Use of a Learning-Based Exergame to Enhance Physical Literacy, Soft Skills, and Academic Learning in School-Age Children: Pilot Interventional Study	Goncalves et al. (2024)	France	Soft skills, motivation, self-efficacy and concentration
Shaping Future Planners: Insights From SULAM's English Teaching for Aboriginal School Children in Kampung Putra	Hanapiah et al. (2025)	Malaysia	Soft skills like communication, teamwork, civic responsibility, cultural competence and resource management
Integrating Social Skills in Traditional Games with Physical Education Interventions	Hartanto et al. (2021)	Indonesia	Social skills and social behaviour
Developing Key Competencies in Primary Education Using Modern Board Games	Herrero-Martín et al. (2025)	Spain, Romania, and Greece	Communication, motivation, collaboration, learning to learn (metacognition), emotional skills
Research on the Influence of Physical Games in the Process of Preschool Children's Psychological Development	Hua (2024)	China	Emotional integration, social skills, perseverance, psychological resilience, spiritual recovery, self-restraint and communication, empathy
The Effectiveness of Traditional Game-Based Physical Literacy Model in Reducing Sedentary Lifestyle among Adolescents	Kurniawan et al. (2025)	Indonesia	Social skills, motivation and self-confidence
Developing Students' Digital Competences through Collaborative Game Design	Laakso et al. (2021)	Finland	Digital competences (technical and artistic) and connected learning (integration through peer relations)
Effects of Game-Based Activities on Student's Social Skills and Attitudes toward Learning Science	Lasala (2024)	Philippines	Social skills and attitudes towards learning
Implementation of traditional games based on Ki Hadjar Dewantara's philosophy to develop social skills in early childhood	Lathifah et al. (2025)	Indonesia	Social skills such as cooperation, sharing, conflict resolution, communication, and empathy
Video Game Playing Frequency, Social Cognition, and Social Behavior in Childhood	Lavertu et al. (2022)	Canada and Chile	Social cognitive skills, social behavior and social adaptive skills
Opening the Window to the Children's Mind: The Superior Efficacy of Open-Ended Physical Games in the Development of Attention and Socio-Emotional Skills	Lyu and Zhang (2025)	China	Attention and social-emotional skills
Learning of gross motor skills based on fun games: a study of coordination development in 5-6-year-old children	Masrun et al. (2025)	Indonesia	Coordination, motivation, responsibility and social skills

Capturing the protective value of culture: The ‘Deadly Gaming’ pilot	Meston et al. (2025)	Australia	Cultural capital, academic confidence, teamwork, problem solving, critical thinking, and 21st-century skills
The theory and practice of modifying soccer: Maximizing learning outcomes in elementary school physical education	Moon and Lee (2025)	USA and South Korea	Tactical skills and affective domain
Play-Based Learning: A Pedagogical Approach for Social Skills Development in ECE Learners in Zambia	Mwinsa and Dagada (2025)	Zambia	Social skills development, self-esteem, including resilience, cooperation, self-confidence and children's agency
From Play to Progress: Student Learning of Social Skills with a Solution-Focused Approach	Niu et al. (2025)	China	Social skills (cooperation, self-control, empathy and communication)
Mens Ana In Corpore Sano: The Effects of Sport on Children’s Learning in Italy	Nosvelli (2023)	Italy	Extraversion, agreeableness, conscientiousness, emotional stability and autonomy.
The Effectiveness of the Sport Education Model with Local Wisdom in Shaping Social Attitudes among Elementary School Students	Nur et al. (2025)	Indonesia	Independent and cooperative attitudes
Bola Bali Maning Games Movement Activity to Physical Fitness Improvement	Nurharsono et al. (2023)	Indonesia	Character, attitudes, will, self-control, responsibility for self and others, helpfulness and collaboration with peers
Developing Life Skills Through Physical Education: Social Skills and Teamwork in Moroccan Secondary School Students	Ouaddou and Kanbaai (2025)	Morocco	Social skills and teamwork
“The Park of Emotions”: A Serious Game for the Development of Emotional Intelligence in Children	Papoutsi et al. (2024)	Greece	Emotional intelligence and socio-emotional well-being
Using Games to Ignite Teens’ Civic and Social and Emotional Learning	Rivers and Bertoli (2024)	United States	Engagement, teamwork, critical thinking, negotiation, empathy, social and emotional skills
Cooperative Model, Digital Game, and Augmented Reality-Based Learning to Enhance Students’ Critical Thinking Skills and Learning Motivation	Rizki et al. (2024)	Indonesia	Learning motivation.
The Relationship between Emotional Intelligence and Internet Game Addiction among Adolescents in Aceh Indonesia	Satria et al. (2024)	Indonesia	Emotional intelligence
Froebel Box: A Tool for Participatory and Creative Learning	Sillanpää et al. (2022)	Finland	Forms of expression, play, collaboration, exploration and interaction with the environment.
The Effect of Mobile Application Types on Learner’s Vocabulary Ability and Affective Domain	Yang and Bae (2022)	South Korea	Attitude, self-esteem, motivation, and facing anxiety

Descriptive Summary of the Studies

The 35 articles were analyzed, and the findings are reported in this section, including the year, the country of publication and the level of education of participants taken as sample (Table 1 and Table 2).

Year-Wise Distribution of Studies

The distribution of articles selected based on publication year is shown on a bar graph in Figure 2(a). In summary, a majority of papers, that is, fifteen, were published in 2025. Nine articles were published in 2024, five in 2022 and four in 2023. The least number of papers, two, were published in 2021. The reason for the lesser number of studies published during these years may be attributed to the COVID-19 pandemic. During this time, with global restrictions, the imposition of social distancing and schools being mostly closed, it would have been extremely difficult to carry out game-based learning at schools. Observing and implementing physical classroom games in progress would be rare across the world, especially between 2020 and 2021.

Country-Wise Distribution of Studies

The 35 articles extracted were from sixteen countries and are listed in Table 1. They are shown as a bar graph in Figure 2(b). Of these, eight studies were carried out in Indonesia, three studies were carried out in China, United States, Spain, and Finland, two from Chile, South Korea and Greece, and one in Norway, Mexico, Portugal, France, Philippines, Canada, Zambia, Morocco, Romania, Malaysia, Australia and Italy each.

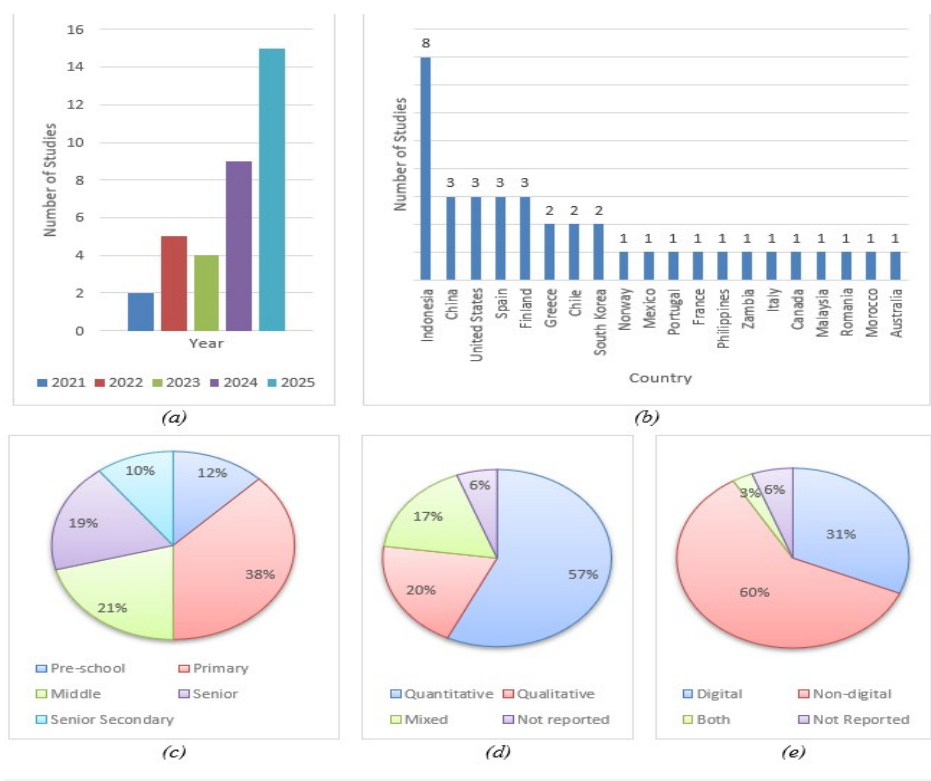
Distribution of studies across different school levels

As per the inclusion criteria, the selected studies only had pre-school and school students served as the participants. They were categorized into pre-school, primary, middle, secondary and senior secondary. Many of the studies were with a sample belonging to 2 or more levels. Six (10%) studies covered the preschool level, and eighteen (38%) studies focused on the primary level. Ten (21%) studies covered the middle school level. Nine (19%) studies covered secondary school and five studies (12%) covered senior secondary school levels each. Figure 2(c) illustrates the demographic distribution of participants across different school levels, presented as a pie chart.

Distribution of Studies Based on Research Method

Twenty (57%) quantitative studies, whereas seven (20%) studies used a qualitative approach. Also, six (17%) of the studies used a mixed-methods approach, while two (6%) studies did not report the research method they used. Figure 2(d) summarizes these findings in the form of a pie chart.

Figure 2: Trends in the number of (a) published articles from 2021 to 2025 and (b) studies carried out across 20 countries in the area of GBL and the affective domain. Distribution of (c) participants based on their school level, (d) research methods, and (e) types of games (digital, non-digital or both) across studies



Game Types (Digital or non-digital)

Eleven (31%) studies used digital games, whereas twenty-one (60%) studies employed non-digital types of games. One (3%) study used both, and two (6%) studies did not report the type of game used in the study. Figure 2(e) shows the distribution of the type of game (digital/non-digital) in different studies in a pie chart.

A summary of the game tools and forms used in the study, their types, as well as the school level of participants as samples in the study, is given in Table 2.

Table 2: *Game tools/game form, type of game and the level of education of participants in the identified study (as reported)*

Author	Name of Game/ Form of Game	Game Type	School Level
Araya and González-Vicente (2025)	Public Goods Game	Digital	Primary
Aura et al. (2023)	Me and My City, a roleplay	Non-digital	Middle
Berman et al. (2024)	Trust Game, an interactive game	Non-digital	Secondary and senior-secondary
Bjerknes et al. (2023)	Conceptual Playworld (CPW), a narrative-driven role-play game	Non-digital	Primary
Blanco et al. (2022)	An augmented collaborative game for small children.	Non-digital	Preschool
Brocas and Carrillo (2025)	Find the Balance and Risky Stars Games (Asymmetric Battle of the Sexes and Hawk-Dove games)	Digital	Middle
Carcelén-Fraile (2025)	Narrative-based, gamified and immersive physical activities	Non-digital	Primary
Contreras-Espinosa and Eguia-Gomez (2022)	Game Jams, collaborative video games	Digital	Middle, Secondary and senior-secondary
Ferraz et al. (2024)	Basketball	Non-digital	Secondary and senior-secondary
Goncalves et al. (2024)	Play LÜ, exergaming	Both	Primary
Hanapiah et al. (2025)	Interactive games	Non-digital	Primary
Hartanto et al. (2021)	Traditional games	Non-digital	Middle
Herrero-Martín et al. (2025)	Modern board games (MBGs)	Not Reported	Primary
Hua (2024)	Sport games	Non-digital	Pre-school
Kurniawan et al. (2025)	Ketik Jaran, Begelompongan, Kideng, Panji	Non-digital	Middle, secondary and senior-secondary
Laakso et al. (2021)	Platform, car, fighting, adventure, labyrinth games	Digital	Primary and Middle School
Lasala (2024)	Active games developed and validated by the researcher	Non-digital	Middle
Lathifah et al. (2025)	Dakon, Cublak-Cublak Suweng, Gobag Sodor	Non-digital	Preschool
Lavertu et al. (2022)	Video games	Digital	Primary
Lyu and Zhang (2025)	Open physical games and closed physical games	Non-digital	Primary
Masrun et al. (2025)	Not reported	Non-digital	Preschool
Meston et al. (2025)	Mario Kart 8, Crash Bandicoot, and Little Big Planet	Digital	Pre-school, primary and middle
Moon and Lee (2025)	Soccer	Non-digital	Primary

Mwinsa and Dagada (2025)	Indigenous games	Non-digital	Primary
Niu et al. (2025)	Curious About Others, an interactive pedagogical approach-based game	Non-digital	Primary
Nosvelli (2023)	Sports	Non-digital	Primary
Nur et al. (2025)	Sports Education Models (SEM)	Not Reported	Primary
Nurharsono et al. (2023)	Bola Bali Maning (Back Ball Match/BBM), a sport with paddles and balls	Non-digital	Primary
Ouaddou and Kanbaai (2025)	Handball	Non-digital	Middle, secondary and senior-secondary
Papoutsis et al. (2024)	The Park of Emotions, a serious digital game	Digital	Primary
Rivers and Bertoli (2024)	iThrive Sim, a technology-supported roleplay	Digital	Secondary
Rizki et al. (2024)	Adventuring Physics, an augmented reality-based gamified mobile application	Digital	Secondary
Satria et al. (2024)	Online gaming	Digital	Middle, secondary and senior-secondary
Sillanpää et al. (2022)	Froebel Box materials, playing blocks	Non-digital	Pre-school and primary
Yang and Bae (2022)	ClassCard and Kahoot! For digital flash cards	Digital	Secondary

Research Design Utilized across Studies

A variety of designs were utilized in the studies. Since a majority of studies were quantitative, cross-sectional quasi-experimental and randomized control approaches were common. Case studies, along with thematic and content analysis, were preferred for qualitative studies.

Thematic Summary of the Findings

The identified studies in this systematic review showed the influence of game-based pedagogy on school students' non-cognitive skills (affective domains) over the following themes-

Traditional and Indigenous Games

Mwinsa and Dagada (2025) and Lathifah et al. (2025) in their study demonstrated that play-based learning, particularly when using traditional indigenous games, is an effective pedagogical approach for enhancing social skills development- cooperation, sharing, conflict resolution, communication, and empathy, in early-childhood and elementary-level learners, contributing to their physical (motor skills), social and emotional growth. Hartanto et al. (2021) also

found that traditional games with social elements had a better impact on elementary school students' social skills and behavior as compared to games without social elements. Kurniawan et al. (2025) demonstrated that traditional games like 'Ketik Jaran', 'Begelompongan', 'Kideng', and 'Panji' significantly reduce sedentary time, thus enhancing non-cognitive skills among adolescents. The studies also suggest participation in such games builds social-emotional competencies, problem-solving abilities and fosters active lifestyles. Nur et al. (2025) studied implementing the Sport Education Model (SEM based) on local wisdom and found it significantly effective in shaping primary-level students' independent and cooperative attitudes. Hence, the traditional games in schools can support the holistic development of children and help imbibe cultural values.

4Cs (Collaboration, Communication, Critical Thinking and Creativity), 21st Century skills and Strategic Thinking

Contreras-Espinosa and Eguia-Gomez (2022) in their studies found that playing the game increased knowledge in both children and adults. It also fostered collaborative learning, critical thinking, decision-making, scientific reasoning, creativity and problem-solving. Aura et al. (2023) found a statistically significant positive relation between holistic role-play experience and 21st-century skills. Berman et al. (2024) and Lasala (2024) found that cooperation, trust and reciprocity can be built in students through fruitful interactions through games and game-based activities. Brocas and Carrillo (2025) found that strategic coordination among students during games (Battle of the Sexes and Hawk-Dove) is dependent on their academic achievements. High achievers demonstrated better coordination, using effective strategies and obtaining higher payoffs reflecting broader cognitive skills such as strategic thinking and cooperation. The games influenced non-cognitive skills like trust and cooperation, as participants needed to anticipate others' actions and collaborate for mutual benefits. Ouaddou and Kanbaai (2025) found that handball, as part of physical education, significantly enhances teamwork, cooperation, and conflict resolution, building trust and interpersonal competence in secondary school students. These studies reflect on the interconnectedness of social skills, conceptual understanding and creative attitude, suggesting that games can be valuable tools for improving students' 21st-century skills as well as strategic thinking.

Games for Pre-School and Primary Level

Sillanpää et al. (2022) found that game-based materials from the Froebel box, like blocks, support holistic learning in early childhood education, collaboration, and active exploration in a playful environment. Hanapiah et al. (2025) found that interactive games were an effective teaching method used by

university students in a service programme to foster active participation, enhancing retention and improving communication skills among marginalised aboriginal primary level children. The study suggests games significantly develop interpersonal skills and cultural awareness in diverse educational settings. Masrun et al. (2025) showed that using fun games effectively enhances motor skills such as movements, balance and coordination, along with motivation and social skills among children for early childhood education. Bjerknes et al. (2023) suggest that Conceptual PlayWorld (CPW), a narrative-driven role-play game, can be a valuable teaching method for promoting a holistic approach to learning in natural science while also catering to improvements in social skills. Blanco et al. (2022) also found that young children (3-4 years old) can engage in collaborative play using technology-mediated activities, reaching a higher level of collaboration in most cases to promote social interaction. Students found that modern board games were enjoyable and educational, leading to improvements in motivation, collaboration, and cognitive and emotional skills (Herrero-Martín et al., 2025). Specific games like Pandemic aided metacognitive development. These studies support that roleplays and physical games significantly improved the psychological indicators, such as emotional integration, empathy, self-control and psychological resilience, while also improving social skills, cooperation, metacognition and communication in pre-school and primary level students (Hua, 2024; Niu et al., 2025).

Physical Education and Sports

Carcelén-Fraile (2025) suggested that active gamification in physical education classes significantly improved emotional well-being and social skills of primary school students. Lyu and Zhang (2025) and Ferraz et al. (2024) in their study found that open physical games and integrating sports education had superior effects on children's attention, social-emotional skills and positively impacted attention distribution, self-awareness, peer awareness, decision-making and motivation. Moon and Lee (2025) modified soccer activities, thus fostering teamwork, mutual communication and trust among students. Nurharsono et al. (2023) utilized a physical education learning model with the Bola Bali Maning (BBM), a sport played with paddles and a ball, to significantly improve students' skills, attitudes, and demonstrated a positive effect on student character. Goncalves et al. (2024) and Nosvelli (2023) demonstrated that daily implementation of a learning-based exergaming program and sports policy increased physical literacy, mathematics motivation and concentration, revealing positive development in personality traits of students. These studies thus suggest that sports and games are an effective strategy for enhancing emotional well-being and social skills.

Digital Games

Papoutsi et al. (2024) found that the serious digital game was effective in improving emotional intelligence (EI) in children as young as 9-10 years of age. Araya and González-Vicente (2025) used the Public Goods Game to effectively assess non-cognitive skills like trust in fourth-grade students, finding higher trust in classmates (in-group) than in unknown students (out-group). Personality traits like agreeableness and conscientiousness influenced trust levels. Laakso et al. (2021) suggested that collaborative game design positively impacted students' digital competences, particularly in technical and artistic skills. Yang and Bae (2022) found that digital application games, Kahoot! and ClassCard, helped with longer retention in vocabulary and were powerful in enhancing attitude among learners. Meston et al. (2025) achieved culturally aligned social outcomes among gamers using responsive digital gaming as a motivational and engaging tool, addressing sociocultural challenges faced by indigenous learners. These findings corroborate that serious video games, particularly those with adaptive feedback mechanisms, may be effective in assessing and remediating social skills among learners.

Augmented and Simulation-Based Games

Rivers and Bertoli (2024) suggest that simulation playtesting through a game indicates that students gain knowledge of politics and government, improve their understanding of decision-making processes, and develop social and emotional skills such as critical thinking, collaboration and empathy in secondary school students. Rizki et al. (2024) in their study found that the Cooperative Model, Digital Game, and Augmented Reality (CAP) based learning approach is effective in enhancing students' critical thinking skills and learning motivation. These studies also recommend engaging and enjoyable digital learning innovations in achieving learning outcomes and enhancing 21st-century skills.

Potential Side Effects of Games

Satria et al. (2024) found that adolescents with higher emotional intelligence (EI) levels tended to have lower levels of game addiction. The EI status of adolescents engaged in online gaming was slightly higher (Satria et al., 2024). The study suggests that improving EI, particularly components like adaptability, self-control, self-motivation, social skills and emotional awareness, could help prevent game addiction. Lavertu et al. (2022) found that lower video game playing frequency (VGPF) was associated with better prosocial behaviour in elementary school children. The study suggests that limiting gaming frequency

could potentially promote prosocial behaviour and increase opportunities for real-life social interactions.

The reviewed studies collectively demonstrate that GBL approaches are highly effective in fostering a wide range of non-cognitive skills, from traditional social values to 21st-century competencies such as soft skills and critical thinking. Positive impacts on learning are observed across various contexts, from traditional indigenous games and structured play to physical activities, digital games and augmented simulations. While potential risks, like game addiction, exist, the findings suggest that a well-designed and balanced approach can leverage the power of play to create engaging and emotionally supportive learning environments for the holistic development of students.

DISCUSSION AND CONCLUSION

There is a growing body of literature on non-cognitive skills and the affective domain across all student age groups. The findings from the reviewed studies consistently demonstrate that these pedagogical approaches are effective in fostering a broad spectrum of non-cognitive skills, including social skills, emotional intelligence, metacognitive skills, trust-based collaborative abilities and personality traits in post Covid-19 pandemic years. The studies from this literature review on affective skills emerged into the following key themes: (i) physical education and sports, (ii) sports and play for pre-school and primary levels, (iii) games for 21st century skills, (iv) indigenous and traditional games, (v) technology-mediated games, and (vi) potential side effects.

Most studies lacked explicit mention of a theoretical lens. Constructivism, sociocultural theory, Newell's theory of constraints, social cognitive theory and evolutionary biology theory are among the few cited.

Learner-centred teaching approaches such as game-based learning improve engagement and learning outcomes through hands-on problem solving (Papert 1980; Kafai & Burke 2015). Masrun et al. (2025) in their study demonstrated that motor development also affects cognitive, social and emotional domains positively. Sillanpää et al. (2022) allowed children to engage actively in play with a giant version of blocks and use a construction kit creatively. Children learned to take turns, share items and cooperate with friends to build things. Lyu and Zhang (2025) found that physical games in outdoor settings could be used for developing movement skills such as running, jumping, sliding and abilities that involve using the hands or feet to control or manipulate objects, such as throwing, catching, kicking and striking. The studies reflect that a fun games approach, through integration of elements of play into motor learning, supports children's engagement and motivation. The studies support hands-on activities and cognitive challenges to engage students in continuous self-reflection, improving their problem-solving skills, critical thinking and innovative thinking (Lye & Koh,

2014). These skills are crucial for the physical (motor skills) and higher levels of cognitive development of children and adolescents (Stodden et al., 2008). During the learning process, constructing and creating with hands-on approaches allows students to experience a sense of achievement and intrinsic motivation, thereby boosting their confidence and engagement. Thus, findings align with constructivist theory, which suggests that hands-on practice can enhance students' motivation and practical abilities.

From a sociocultural perspective, collaborative participation, reflection and guided efforts are involved in knowledge creation. Collaborative games encourage students to share ideas, allocate tasks and coordinate problem-solving within groups. Araya and González-Vicente (2025) concluded that students with prosocial personality traits (conscientiousness and openness) tend to be more trusting towards others in an interactive game. Games must lead to cooperation between peers by building trust and reciprocity, which is crucial in adolescents for fruitful interactions (Berman et al., 2024). Also, technology-mediated games in the classroom promote social interaction among children, where they collaborate, help their peers and learn (Blanco et al., 2022). Thus, skilled teachers improve social skills through culturally-linked active play, thereby following the zone of proximal development of each learner (Mwinsa & Dagada, 2025). Studies, grounded in sociocultural theories, showed that teachers can scaffold while children participate actively, encouraging learners to engage with their peers and teachers, leading to cognitive development.

The integration of game-based learning develops cognitive, academic and soft skills necessary for the modern day and also enriches students' learning experiences by fostering creativity and motivation (Voogt & Roblin 2012). Bjercknes et al. (2023) suggest that role-play games, authentic play and sensory play intrinsically motivate the learners. Games as a holistic pedagogic approach was used to teach natural science and facilitate different learning processes among pupils who actively participated in their own learning (Bjercknes et al., 2023). Goncalves et al. (2024) demonstrated that 30 minutes of daily exergaming has an overall positive effect on students' motivation for mathematics and develops personality traits. Laakso et al. (2021) suggested that collaborative game design positively impacted students' digital competences, particularly in technical and artistic skills and sparked their motivation. Grade 7 students taught Biology through game-based pedagogy showed a positive effect on their academic performance, social skills and learning motivation (Lasala, 2024). Modern board games, too, were enjoyable and educational, and led to improvement in learners' linguistic skills, metacognitive skills, motivation, collaboration and emotional skills. (Herrero-Martín et al., 2025). Rizki et al. (2024) in their study found Augmented Reality (AR) based learning approach to be motivating and effective in enhancing students' critical thinking skills in Physics. Yang and Bae's (2022) study demonstrated that games on Kahoot! and ClassCard applications helped in

teaching and learning, with students showing significant improvement in vocabulary ability and affective domain. These studies align with self-determination theory, suggesting that games can intrinsically lead to autonomy and competence among young learners, which maintains their intrinsic motivation towards learning tasks (Deci et al., 1999).

Gamification interventions have beneficial effects on self-concept, self-regulation and self-esteem, enabling them to overcome challenges (Carcelén-Fraile, 2025). Carcelén-Fraile (2025) suggested that active gamification in physical education classes significantly improved self-concept and self-esteem in primary school students. Roleplays and physical games have a positive effect on emotional integration, self-control and psychological resilience (Hua's, 2024). Satria et al. (2024), through their study, suggest that improving emotional intelligence through games, particularly the components of adaptability, self-control, self-motivation, social skills and emotional awareness, and could help prevent game addiction. Primary-level students also benefit from solution-focused approaches in playful learning activities to support social-emotional development and self-control (Niu et al., 2025). In summary, non-cognitive skills such as motivation and self-efficacy cultivate academic perseverance (e.g. grit and self-discipline). The studies align with Bandura's (1986;1997) social cognitive theory and self-efficacy theory, which posits that strengthening perceived self-efficacy through modelling and engaging but challenging tasks can intentionally improve students' academic functioning.

Children aged 2 and older have the ability to engage in reciprocal interaction (Brownell et al.,2006). As they grow, they can solve more complex socially interactive tasks due to their more mature cognitive and emotional functioning (Hirsh-Pasek et al., 2008; Cooper, 1980). Hence, they are able to understand and apply complex group games. This gives importance to personalising educational approaches at different educational levels (Yang et al., 2024). The effectiveness of such strategies is closely linked to the teacher's ability to plan and deliver varied forms of instruction (Masrun et al., 2025). Bjerknes et al. (2023) suggest that narrative-driven role-play games can improve social skills by enhancing relationships between pupils and teachers in an engaging learning environment. Previously, studies have also found that when teachers successfully participate as co-players in the play, the children respond acceptingly (Gaviria-Loaiza et al., 2017). A warm and responsive student-teacher relationship is needed to induce self-regulatory skills in students (Wright et al., 2024).

Synthesis of the literature strongly supports the integration of games, play and toys in pedagogy for young learners. A variety of game genres, such as flashcards, video games, technology-based role-plays, blocks, exergames, serious sports and daily physical activity programs have been shown to have a positive effect on the affective domain, social-emotional and soft skills of K-12 students. Building on a growing body of literature, this study substantiates harnessing

knowledge on game-based interventions to further support the non-cognitive abilities of learners.

LIMITATIONS

The strict inclusion criteria limited the final sample to 35 studies, excluding many valuable studies. Only primary, peer-reviewed, and published journal articles in English were included. Theses, conference proceedings and reports were excluded. This limitation affects the comprehensiveness of the findings, validity and generalisability. Future research should further explore the underlying mechanisms of different types of games influencing non-cognitive skills.

This study was limited to a descriptive synthesis of the journal articles over recent 5 years. A more elaborate study could be carried out investigating the effect of sample size, age, game tool, long-term effects of game-based interventions and moderating effects of constructs to understand the underpinnings of game-based learning. A content analysis could be conducted to identify the varying trends categorization and operationalization of non-cognitive skills and affective abilities over the years.

A challenge that research faces is the non-binary nature of how non-cognitive and cognitive skills interact, which makes understanding their impact more difficult. Hence, future studies should explore combinations of various intervention strategies along with games and examine their cumulative long-term effects to gain a more comprehensive understanding of the potential benefits of innovative classroom intervention.

IMPLICATIONS

This study synthesizes articles on recent pedagogical advancements and makes a strong correlation between cognitive, academic and non-cognitive outcomes through games. Successful classroom games require careful planning, relevant support materials and guided reflection. Future research must build on the findings of this study and continue to explore effective ways for teachers to develop their students' non-cognitive skills.

Non-cognitive skills are influenced by their interaction with peers and teachers and impact students' thoughts and skills. This study addresses the need to carry out a systematic exploration summarizing various games and their impact on non-cognitive factors related to supporting learners and improving academic performance, based on different research methods. Classroom practices and future research must continue to delve into the comprehensive findings of this study for pre-school and school students to explore different approaches with a variety of games and similar interventions, thereby enhancing the generalisability and external validity of the results.

This study draws attention from policymakers to integrating non-cognitive skills, such as character skills and soft skills, within the educational framework for young learners. Designing and preparing teacher-led interventions for the development of non-cognitive skills in classrooms and assessing their success must be further explored.

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