

Pedagogical Strategies for Developmental Activities in Early Childhood Education: A Systematic Review of Teacher Roles, Child Agency, and Holistic Developmental Outcomes

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Abstract

Developmental activity strategies in early childhood education (ECE) encompass diverse approaches, including guided play, pretend and role play, interactive storytelling, inquiry, project-based learning, STEAM, learning centers, and nature-based learning. Although each approach has been widely investigated, existing literature commonly evaluates single strategies in isolation and therefore provides limited cross-strategy understanding of how teacher roles and child agency shape learning experiences. This review maps pedagogical strategies used in ECE, examines teachers' roles and levels of child agency across strategies, identifies reported developmental outcomes, and formulates design principles for holistic developmental activities. The study is designed as a systematic literature review reported with reference to PRISMA 2020. The preliminary search covers empirical journal articles published in Indonesian and English from 2020 to 28 August 2026 using Google Scholar, ERIC, Garuda, and DOI cross-searching. The preliminary synthesis matrix contains 21 empirical reports representing guided play and play-responsive teaching, storytelling and pretend/role play, inquiry and inquiry-project approaches, project-based learning, STEAM/makerspaces, learning centers, and nature-based learning. Initial synthesis indicates that developmental outcomes depend not merely on the strategy label but on the pedagogical interaction structure: goal clarity, meaningful child choice, teacher responsiveness to initiatives, scaffolding, dialogic quality, flexible materials and environments, and ongoing assessment. Strategies balancing intentional teaching with child agency were reported to support engagement, language, early numeracy, problem solving, critical thinking, creativity, collaboration, socio-emotional development, and autonomy. The review proposes the ECE Strategy–Agency Continuum (SA-ECE), positioning developmental activities across teacher-directed, guided/shared, and child-initiated modes and linking these modes to teacher roles, child agency, learning environments, assessment, and developmental outcomes.

Keywords

Keywords: child agency; early childhood education; pedagogical strategies; teacher role; systematic literature review

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INTRODUCTION

Early childhood education (ECE) aims to support children's holistic development through meaningful, active, enjoyable experiences appropriate to their developmental stage. In practice, this aim is translated through various activity strategies: free and guided play, storytelling, role play, experiments, inquiry, projects, learning centers, nature activities, STEAM, maker activities, and various combinations thereof. The many names of strategies often create the impression that learning quality is primarily determined by the choice of model. In fact, strategies with the same name can produce very different experiences depending on how teachers organize goals, environments, interactions, choices, scaffolding, and assessment.

Debates concerning ECE strategies also relate to the positions of teachers and children. On the one hand, overly teacher-directed learning risks reducing children's exploration, choice, creativity, and agency. On the other hand, activities that are completely left open without intentional teaching and responsive support do not automatically produce deep learning. A meta-analysis of guided play showed that adult guidance in play contexts can provide benefits for some outcomes such as early mathematics, shape knowledge, task switching, and spatial vocabulary compared with certain conditions, but effects are not consistent across all outcomes (Skene et al., 2022). These findings emphasize that the main issue is not choosing between 'playing' or 'teaching,' but designing a productive relationship between teacher goals and children's initiatives.

Recent literature shows increasingly strong attention to this relationship. A study of play-responsive science in preschool showed that children's agency develops when teachers provide space for initiative, respond to children's ideas, and flexibly connect the 'as if' world of play with the 'as is' content to be understood (Henriksson et al., 2025). In digital storytelling, agency also appears as a relational process negotiated together with the teacher, rather than as a fixed characteristic possessed solely by the child (Shengjergji, 2024). In guided mathematics play, small-group games with mathematical language scaffolding can support early numeracy (Payne, 2024).

In project-based strategies, implementation problems show a similar pattern. Indonesian research found that teachers often understand Project-Based Learning (PjBL) as an activity for making products or crafts, so projects remain teacher-directed and do not fully provide problem solving, investigation, choice, and children's decision-making (Sadaruddin et al., 2025). On the other hand, projects combined with loose parts, inquiry, or STEAM are reported to provide greater space for exploration, creativity, literacy, collaboration, and critical thinking (Aisyah et al., 2025; Chafidah et al., 2024; Yuliani et al., 2023). Thus, the label 'project' is insufficient to explain pedagogical quality.

The same applies to inquiry, STEAM, makerspace, role play, storytelling, learning

centers, and nature-based strategies. Inquiry can become a sequence of teacher instructions or an exploratory process that gives children room to ask questions and solve problems. STEAM can become a science-themed worksheet or an authentic design and making experience. Role play can merely follow a teacher's scenario or become a space for negotiating roles and perspectives. Learning centers can become a tightly controlled rotation of activities or an environment that enables exploration. Therefore, a synthesis framework that goes beyond a list of strategies is needed.

This need is increasingly clear because recent reviews have largely focused attention on particular approaches. Play-based learning has been mapped in a large scoping review covering 51 studies, while guided play has been the subject of a systematic review and meta-analysis (Mohammed et al., 2026; Skene et al., 2022). PjBL in ECE has also been addressed in a recent systematic literature review focused on conceptual clarification (Lahe et al., 2026), while critical thinking in preschool has been reviewed through dialogue, questioning, thinking language, and story-based approaches (O'Reilly et al., 2022). In other words, the opportunity for novelty no longer lies in reviewing a single strategy, but in comparing pedagogical structures across strategies.

Based on this gap, this review focuses its analysis on the relationship among activity strategies, teacher roles, child agency, the organization of learning experiences, assessment, and developmental outcomes. The research questions are formulated as follows: (1) what developmental activity strategies are dominant in ECE research from 2020–2026; (2) how are teacher roles constructed across different strategies; (3) how much space for child agency is offered; (4) what developmental and engagement domains are reported; (5) how do media, environments, peers, and assessment support implementation; and (6) what factors distinguish strategies that are merely labeled child-centered from strategies that genuinely provide space for children's participation.

The novelty of this review lies in the development of the ECE Strategy–Agency Continuum (SA-ECE). Rather than ranking strategies from 'good' to 'less good,' this continuum maps how a single strategy can shift from teacher-directed toward guided/shared and child-initiated according to the pedagogical decisions occurring within it. This framework is expected to help teachers select strategies based on developmental goals and interaction quality, rather than merely on trends in learning models.

METHODS

Study Design

The study was designed as a systematic literature review (SLR) with reporting guided by PRISMA 2020 (Page et al., 2021). Synthesis was conducted narratively and thematically because relevant studies used heterogeneous designs, strategies, contexts, ages, and outcomes. A meta-analysis was not planned at this stage, but quantitative and experimental studies were still mapped to indicate the strength and

direction of the evidence.

Search Strategy

The preliminary search was conducted through 28 August 2026 using Google Scholar, ERIC, Garuda, as well as DOI cross-searching and publisher websites. The 2020–2026 publication range was selected to capture post-pandemic developments in pedagogy, the implementation of Kurikulum Merdeka in Indonesia, increasing attention to child agency, and the integration of inquiry, STEAM, makerspaces, and technology in ECE.

- ("early childhood education" OR preschool OR kindergarten) AND ("pedagogical strategies" OR "teaching strategies" OR "learning activities") AND (agency OR engagement OR development)
- ("guided play" OR "play-responsive teaching" OR "pretend play" OR storytelling OR "role play") AND (preschool OR "early childhood")
- (inquiry OR "project-based learning" OR STEAM OR makerspace OR "learning centers" OR "nature-based learning") AND (preschool OR kindergarten OR "early childhood education")
- ("learning strategies" OR "activity strategies" OR "developmental activities" OR play OR project OR centers OR inquiry OR STEAM OR storytelling OR "role play") AND (ECE OR "early childhood" OR kindergarten).

Inclusion and Exclusion Criteria

Aspect	Inclusion	Exclusion
Publication	Empirical, peer-reviewed journal articles; 2020–28 August 2026; Indonesian/English.	Reviews, opinions, theses/dissertations, community service, purely conceptual articles.
Context	ECE, preschool, kindergarten, children around 3–6/7 years old, or ECE teachers implementing strategies.	Elementary school and above without specific analysis of early childhood education.
Focus	Explains activity strategies and at least one of: teacher role, child agency/choice, interaction structure, environment, assessment, or developmental outcome.	Only discusses media without activity structure; only general perceptions without implementation data.
Outcome	Engagement or development: moral, socio-emotional, language, cognitive,	No information about the process or outcomes of the activity.

	motor, arts, creativity, executive function, early numeracy/literacy, problem solving.	
Access	Abstract and main methodological information can be verified.	Metadata are insufficient to determine design or relevance.

Selection, Extraction, and Appraisal

Selection was conducted through deduplication, title and abstract screening, followed by full-text examination. Extracted data included author/year, country, design and participants, main strategy, activity organization, teacher role, forms of child agency, media/environment, assessment, and outcomes. Methodological quality in the final rerun was planned to be assessed using the Mixed Methods Appraisal Tool (MMAT) 2018 according to the research design. Because this manuscript is a draft article based on an actual search, the numbers at each PRISMA stage will be locked after the documented final rerun.

Coding Strategy

Coding was conducted at two levels. First, studies were grouped according to strategy families: play-based/guided play, expressive-symbolic, inquiry, project, STEAM/maker, center/environment, and nature-based. Second, each study was mapped onto the pedagogical continuum: teacher-directed, guided/shared, or child-initiated. Placement was not based on the strategy name, but on evidence concerning who determined the goals, choice of materials, sequence of actions, level of challenge, dialogue, and form of outcomes. Teacher roles were coded as director, model, facilitator, scaffolder, co-player/co-inquirer, or observer; child agency was assessed based on opportunities to choose, initiate, negotiate, solve problems, change the direction of activities, and express outcomes.

Table 1. PRISMA Protocol Locked in the Final Rerun

Stage	Number
Records identified from all sources	[n = to be filled after final rerun]
After duplicates removed	[n = ...]
Title/abstract screened	[n = ...]
Full texts assessed	[n = ...]
Empirical reports included in synthesis	Initial matrix: 21 reports; confirmed after final rerun

RESULTS AND DISCUSSION

Initial Study Characteristics

The initial matrix contains 21 empirical reports published in 2020–2026. Studies came from Indonesia and several international contexts, including Sweden,

Switzerland, the United States, Zambia, China, and Türkiye. Research designs included case studies and video observations, quasi-experiments, randomized/controlled interventions, mixed methods, and descriptive implementation research. This diversity of designs provides an opportunity to examine not only whether a strategy is associated with a particular outcome, but also how activities unfold and how teacher–child positions are shaped.

Table 2. Initial Synthesis Matrix of Empirical Studies

Study	Context/design	Strategy	Teacher role	Child agency	Relevant findings
Nakawa (2020)	Zambia; mathematics lesson study/guided play	Guided play for shapes/geometry	Organizes goals and environment; asks questions and modifies play	Moderate–high: exploring shapes in play	Guided play enables geometry learning through activity modification according to children’s responses.
Suggate et al. (2021)	293 preschoolers; cluster randomized intervention	Interactive elaborative storytelling	Dialogic storyteller; elaboration and contextual questions	Moderate: children actively respond and develop story meaning	Story-vocabulary increased most strongly under interactive elaborative storytelling.
Ernst, Sobel, & Neil (2022)	147 preschoolers; year-long practice comparison	Nature-based learning	Designs access to nature and exploratory experiences	High: moving, exploring, and interacting with the environment	Exposure to nature-based practices was associated with higher executive function at the end of the year.

Widyastuti & Sakti (2022)	Indonesia; pre-post	Center and Circle	Organizes centers and scaffolding; facilitates activities	Moderate: choosing/engaging in activity centers	Learning interest increased after use of the center and circle approach.
Astuti, Mutiara, & Madyawati (2023)	Indonesia; one-group pre-post	Inquiry-Based Learning	Provides problems/questions and scaffolding	Moderate-high: exploration and social responses	IBL affected children's social skills.
Yuliani, Jabar, & Maryatun (2023)	Indonesia; pre-experimental, 35 children aged 5–6 years	Inquiry Project-Based Learning	Prepares problems/projects and supports the process	High: investigation, decision-making, problem solving	Critical thinking skills increased after inquiry-project learning.
Putri & Maulidiah (2023)	Indonesia; quasi-experimental, 24 children	Macro role play	Prepares scenarios/settings and role support	High: enacting and negotiating social roles	Role play affected children's interpersonal intelligence.
Jaggy et al. (2023)	Switzerland; controlled intervention, 211 children	Social pretend play tutoring	Tutor/co-player; supports pretend-play quality	High: developing roles and shared play	Play tutoring improved pretend-play competence, social behavior, and peer relationships; not all socio-emotional outcomes changed.
Payne	US;	Guided play	Math-dialogue	Moderate-	The

(2024)	randomized, 95 Head Start children	math games / Math Talk Learning Environment	scaffolder in small-group play	high: playing and using math talk	mathematics play group showed numeracy gains; language scaffolding was an important feature.
Shengjiegji (2024)	Sweden; teacher-child interaction, ages 4–5	Digital storytelling	Responsive facilitator; negotiates story-production decisions	High: creating, choosing, and negotiating digital story content and form	Agency emerges as a relational process; teacher responsiveness can expand or constrain children's initiatives.
Henriksson, Fridberg, & Leden (2025)	Sweden; video observations of children aged 2–4 years	Play-responsive science	Co-player/co-inquirer; triggering and responding to initiatives	High: children's initiatives change the direction of play-science	Agency is supported when teachers balance science goals with responses to children's ideas.
Nurhalisa, Hidayat, & Purbayani (2024)	Indonesia; pre-experimental, 15 children aged 4–5 years	Project-Based Learning	Project and collaboration facilitator	Moderate–high	Socio-emotional development increased after PjBL implementation.
Chafidah, Hayati,	Indonesia; quasi-	PjBL integrated	Organizes the project and	High: producing	PjBL-STEAM

& Maryatun (2024)	experimental, 30 children aged 5–6 years	with STEAM	scaffolds design/literacy processes	products, discussing, exploring	with pop-up books supports early literacy.
Tajqiyah et al. (2024)	Indonesia; quasi-experimental	STEAM + loose parts	Prepares challenges and open-ended materials	High: constructing and choosing materials	The STEAM-loose parts group showed higher cognitive ability.
Ananda, Parwoto, & Ilyas (2023)	Indonesia; quasi-experimental, children aged 5–6 years	STEAM + loose parts	Facilitator of exploration and creation	High	STEAM learning with loose parts was effective for children's creativity.
Rosidah, Zulaeha, & Formen (2024)	Indonesia; case study of children aged 4–6 years	Inquiry-Based Learning	Question- and exploration-based facilitator/scaffolder	High	Inquiry supports critical thinking when experienced teachers manage exploration and problem solving.
Aisyah, Utamimah, & Baharun (2025)	Indonesia; descriptive qualitative	PjBL + loose parts	Facilitator; provides open-ended materials and project support	High	Integration of loose parts expands exploration, problem solving, and collaboration in projects.

Sadarudin et al. (2025)	Indonesia; descriptive qualitative	Project-Based Learning	Varied; often still director	Low–moderate when projects are determined by teachers	Teachers often equate PjBL with craft/display projects; project quality depends on pedagogical understanding and children’s decision-making space.
Yang, Liang, Xiang, & Yeter (2025)	China; quasi-experimental, 231 preschoolers	Makerspace curriculum	Organizes the makerspace and supports making/engineering	High: making, problem finding, design, communication	The makerspace intervention improved STEM habits of mind and showed effects on emotional developmental aspects.
Widianti, Kartadinata, & Zainah (2026)	Indonesia; case study	Guided play	Scaffolder; connects curriculum goals with play	Moderate–high	Guided play bridges developmental goals with children’s choices and exploration.
Okatan & Tomul (2026)	Türkiye; mixed methods, 69 children aged 60–72	5E inquiry–STEAM and AR-supported STEAM	Inquiry facilitator; AR as a representational scaffold	Moderate–high	Both inquiry–STEAM conditions produced

	months				greater learning gains and retention than the standard curriculum; AR-supported instruction was strong in scientific inquiry processes.
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The initial synthesis shows that strategies do not stand as completely separate categories. Instead, many studies combine elements of play, inquiry, projects, stories, making, and environments. For analytical purposes, seven strategy families can be used.

- Play-based and guided/play-responsive strategies: guided play, math games, play-responsive science, and pretend play. Their main characteristic is play experiences with varying levels of teacher involvement.
- Expressive-symbolic strategies: storytelling, digital storytelling, role play, dramatic/pretend play. Activities rely on symbols, narratives, language, perspectives, and social representation.
- Inquiry and experimental strategies: children observe, ask questions, predict, try, compare, and explain with teacher scaffolding.
- Project-based strategies: longer activities centered on questions/challenges and producing meaningful processes or products; their quality depends greatly on the authenticity of the problem and the space for children's decisions.
- STEAM and maker strategies: integrating exploration of science, technology, engineering, arts, mathematics, design, and making through open-ended materials and technology.
- Center/environment-based strategies: learning centers or activity centers as an environmental structure that organizes choices, materials, groups, and teacher scaffolding.
- Nature-based strategies: natural environments become the main context for exploration, movement, discovery, self-regulation, and interaction.

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- Nature-based strategies: natural environments become the main context for exploration, movement, discovery, self-regulation, and interaction.

2. Teacher Roles: More Than Just a Facilitator

The term 'teacher as facilitator' is too general to explain the practices found. Cross-study analysis indicates at least six roles that can shift during a single activity: director, model, facilitator, scaffolder, co-player/co-inquirer, and observer. The director establishes steps and outcomes in detail; the model demonstrates a particular method or language; the facilitator prepares access to materials and situations; the scaffolder provides questions, prompts, or gradual support; the co-player/co-inquirer enters the child's world of play or investigation; while the observer reads children's responses to determine the next intervention.

Effective roles are dynamic. In play-responsive science, teachers do not merely follow children but also engage in triggering so that science content develops without interrupting the flow of play. In interactive storytelling, teachers guide dialogue while still allowing children space to construct meaning. In PjBL, problems arise when teachers remain directors throughout the project so that children only replicate a product. Thus, the quality of intentional teaching is not measured by how little the teacher is involved, but by the timing, intensity, and form of support.

3. Child Agency: From Following Instructions to Changing the Direction of Activities

Child agency in the studies can be mapped at three levels. Low agency occurs when children mainly follow predetermined sequences, materials, and examples of outcomes. Moderate agency appears when goals remain set by the teacher but

children can choose materials, methods, roles, or levels of challenge. High agency occurs when children can initiate ideas, negotiate meaning, change the direction of activities, choose problem-solving strategies, create representations, and influence interactions with peers and teachers.

Findings from digital storytelling and play-responsive science show that agency is relational: children's freedom is not a condition that automatically appears after the teacher 'steps back.' Agency can instead develop through adult responses that recognize initiative, provide resources, ask questions that open possibilities, and do not rush to take over the problem. Therefore, child-centeredness should not be measured only by the number of choices provided, but by how genuinely children's choices can influence the process.

4. Teacher-Directed, Guided/Shared, and Child-Initiated as a Continuum

The synthesis does not support a simple dichotomy between teacher-directed and child-centered. ECE practices are more appropriately positioned on a continuum. Teacher-directed activities can be useful when children need safety demonstrations, introduction of rules, or initial modeling. Guided/shared activities are relevant when teachers have developmental goals but children still retain space for exploration and decision-making. Child-initiated activities provide the greatest agency and are important for creativity, social play, and expression, but they still require a rich environment and teacher observation.

The best position on the continuum depends on goals, age, previous experience, support needs, and activity risks. Guided play findings remind us that teacher direction does not always reduce play quality; instead, responsive guidance can deepen concepts. However, Indonesian PjBL shows that overly dominant direction can turn a strategy that should be investigation-based into a production task.

5. Developmental Outcomes: The Same Strategy Does Not Produce the Same Outcomes

Reported outcomes include language and early literacy, numeracy, science, problem solving, critical thinking, creativity, executive function, social skills, empathy, peer relationships, socio-emotional regulation, and autonomy. Storytelling is most clearly connected with language and narrative meaning; guided math play with numeracy and math talk; inquiry with problem solving and critical thinking; pretend/role play with social and interpersonal behavior; STEAM/makerspace with creativity, STEM habits of mind, and making; projects with collaboration and cross-domain integration; and nature-based learning with executive function and physical engagement.

However, this review avoids claiming that one strategy always causes a particular developmental outcome. Jaggy et al. (2023), for example, found that play tutoring improved pretend-play quality, social behavior, and peer relationships, but did not produce changes across all socio-cognitive and emotional outcomes. Nature-based studies also show that advantages do not emerge across all components of school

readiness. This heterogeneity emphasizes the importance of examining activity mechanisms and implementation quality, rather than only the strategy label.

6. Media, Environment, Peers, and Assessment as Strategy Infrastructure

Activity strategies always depend on pedagogical infrastructure. Loose parts increase the number of possible solutions that may emerge in STEAM and projects; natural environments expand opportunities for movement and exploration; learning centers organize the distribution of materials and groups; digital technology and AR can become representational scaffolds when they remain connected to dialogue and concrete experiences; while peers become sources of ideas, productive conflict, negotiation, and collaboration.

Formative assessment remains an element that is insufficiently explicit in many studies. Yet teachers' decisions to add challenges, provide prompts, join play, or step back require information about what children are currently understanding. Within this framework, observation is not a stage after the activity, but part of the strategy itself. Teachers observe children's actions, language, choices, persistence, and interactions and then adjust support.

7. ECE Strategy–Agency Continuum (SA-ECE)

Based on the synthesis, this review proposes the ECE Strategy–Agency Continuum (SA-ECE). The framework does not classify models as good or bad, but helps analyze the quality of the experience that actually occurs.

Dimension	Teacher-directed	Guided/shared	Child-initiated	Evaluation question
Goals	Formulated and translated in detail by the teacher	Teacher goals are clear; pathways can be negotiated	Goals may emerge/develop from children's initiatives	Are the goals sufficiently clear without closing exploration?
Choice	Limited	Curated and meaningful choices	Children create/add choices	Do children's choices genuinely change the process?
Teacher role	Director/model	Facilitator, scaffolder, co-player/co-inquirer	Observer and responsive supporter	When does the teacher need to enter, guide, or step back?
Child agency	Follows and responds	Chooses, explores, solves	Initiates, negotiates, changes direction	Are children actors or merely

		problems		implementers?
Environment/media	Determined for one pathway	Flexible and multi-use	Can be changed/redesigned by children	Does the environment open more than one possibility?
Assessment	Checks results/accuracy	Process observation and feedback	Documentation of emergent learning	Does assessment change subsequent support?
Potential outcomes	Efficiency, modeling, basic procedures	Concepts + engagement + process skills	Creativity, identity, agency, collaboration	Do outcomes align with developmental goals?

The SA-ECE framework emphasizes that a strategy can move along the continuum within a single activity. Teachers can begin with brief modeling, move to guided exploration, and then provide space for child-initiated extension. This flexibility is more consistent with the nature of ECE than ideologically assigning a single position to all activities.

Four main challenges emerge. First, teachers' conceptual understanding; terms such as project, inquiry, STEAM, or guided play are sometimes used without changes in pedagogical structure. Second, scaffolding and questioning skills; questions that are too directive can close children's ideas, while questions that are too general do not always encourage thinking. Third, teacher-child ratios, time, materials, space, and documentation burdens can limit responsiveness. Fourth, academic pressure can push strategies back toward teacher-directed practice even when they are formally called play or child-centered.

Six initial gaps were identified. First, many studies test outcomes but few document implementation fidelity and teacher-child micro-interactions. Second, the terms child-centered, guided play, inquiry, project, and STEAM are used with inconsistent operational definitions. Third, long-term outcomes and skill transfer are rarely measured. Fourth, developmental strategies in the domains of moral values, arts, physical-motor development, and life skills receive less attention than cognitive, STEM, language, and socio-emotional domains. Fifth, children's voices about their activity experiences remain limited. Sixth, research is needed that compares strategies based on the structure of teacher guidance and agency, rather than only on model names.

This matrix is the result of a preliminary search and needs to be locked through a final rerun with documentation of the number of records, deduplication, reasons for

exclusion, and quality appraisal. Cross-strategy literature is very broad, so the final search string needs to be controlled so that it does not become a review of all ECE practices. Outcome heterogeneity limits direct comparison of effects. In addition, classification of levels of agency and teacher roles is an analytical interpretation based on information available in publications; studies that do not describe interactions in detail may be classified with a lower level of certainty.

CONCLUSION

Developmental activity strategies in ECE encompass a broad spectrum, but their pedagogical quality cannot be determined from the strategy name alone. Guided play, storytelling, pretend/role play, inquiry, projects, STEAM, makerspaces, learning centers, and nature-based learning can produce very different experiences depending on how goals, choices, dialogue, media, environments, scaffolding, and assessment are organized.

The initial synthesis shows that strategies balancing intentional teaching with child agency most consistently provide space for active engagement and various developmental outcomes. Teachers do not always have to stay behind children; they can briefly become directors, models, facilitators, scaffolders, co-players/co-inquirers, or observers as needed. Child agency is also not freedom without structure, but a genuine opportunity to choose, initiate, negotiate, solve problems, and influence the course of activities.

The ECE Strategy–Agency Continuum (SA-ECE) offers a way to assess practice based on the structure of experience, rather than the model label. Future research needs to test this continuum empirically, document teacher–child micro-interactions, measure implementation fidelity, and expand outcomes to holistic development encompassing moral, artistic, physical-motor, life-skills, and child well-being domains.

REFERENCES

- Aisyah, E. N., Utamimah, S., & Baharun, H. (2025). Implementing project-based learning with loose parts in early childhood education: A qualitative descriptive study. *Golden Age: Jurnal Ilmiah Tumbuh Kembang Anak Usia Dini*, 10(1), 71–84.
- Ananda, N., Parwoto, P., & Ilyas, S. N. (2023). Efektivitas pembelajaran berbasis STEAM dengan media loose parts terhadap kreativitas anak usia dini. *Jurnal Buah Hati*, 10(2). <https://doi.org/10.46244/buahhati.v10i2.2276>
- Astuti, F. P., Mutiara, D. P., & Madyawati, L. (2023). Pengaruh Inquiry Based Learning terhadap keterampilan sosial anak. *JP2KG AUD: Jurnal Pendidikan, Pengasuhan, Kesehatan dan Gizi Anak Usia Dini*, 4(1), 48–59. <https://doi.org/10.26740/jp2kgaud.2023.4.1.48-59>
- Chafidah, N., Hayati, N., & Maryatun, I. B. (2024). Project-Based Learning integrated with STEAM: A study on educational pop-up books for early literacy. *Golden Age: Jurnal Ilmiah Tumbuh Kembang Anak Usia Dini*, 9(1), 131–143.

- Ernst, J., Sobel, D., & Neil, A. (2022). Executive function in early childhood: Harnessing the potential of nature-based practices to elevate and equalize outcomes. *Frontiers in Education*, 7, 1011912. <https://doi.org/10.3389/feduc.2022.1011912>
- Henriksson, A., Fridberg, M., & Leden, L. (2025). Preschool children's agency in play-activities with science content. *Early Childhood Education Journal*, 53, 1303–1312. <https://doi.org/10.1007/s10643-024-01729-2>
- Jaggy, A.-K., Kalkusch, I., Burkhardt Bossi, C., Weiss, B., Sticca, F., & Perren, S. (2023). The impact of social pretend play on preschoolers' social development: Results of an experimental study. *Early Childhood Research Quarterly*. <https://doi.org/10.1016/j.ecresq.2023.01.012>
- Lahe, K., Mikser, R., Tuul, M., & Kikas, E. (2026). Clarifying project-based learning in early childhood education: A systematic literature review. *Early Childhood Education Journal*. <https://doi.org/10.1007/s10643-026-02274-w>
- Mohammed, A. H., Nigussie, B., Schellens, T., & Rotsaert, T. (2026). Play-based learning in early childhood education: A scoping review. *Early Childhood Education Journal*, 54(5), 3929–3975. <https://doi.org/10.1007/s10643-026-02127-6>
- Nakawa, N. (2020). Proposing and modifying guided play on shapes in mathematics teaching and learning for Zambian preschool children. *South African Journal of Childhood Education*, 10(1), a802. <https://doi.org/10.4102/sajce.v10i1.802>
- Nurhalisa, M., Hidayat, Y., & Purbayani, R. (2024). Pengaruh model Project-Based Learning terhadap perkembangan sosial emosional anak usia dini di PAUD Dahlia. *JOECE: Journal of Early Childhood Education*, 1(2), 66–76. <https://doi.org/10.61580/joece.v1i2.71>
- Okatan, Ö., & Tomul, E. (2026). Preschool children's science learning and retention in a 5E-based inquiry framework: Evidence from STEAM and AR-supported instruction. *School Science and Mathematics*, 1–22. <https://doi.org/10.1111/ssm.70045>
- O'Reilly, C., Devitt, A., & Hayes, N. (2022). Critical thinking in the preschool classroom: A systematic literature review. *Thinking Skills and Creativity*, 46, 101110. <https://doi.org/10.1016/j.tsc.2022.101110>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., et al. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 372, n71. <https://doi.org/10.1136/bmj.n71>
- Payne, T. (2024). The math talk learning environment: Testing an early childhood math intervention. *Early Childhood Research Quarterly*, 66, 224–233. <https://doi.org/10.1016/j.ecresq.2023.10.012>
- Putri, A. S., & Maulidiyah, E. C. (2023). The effect of macro role play method on interpersonal intelligence of children 5–6 years of age. *PAUD Teratai*, 12(2).
- Rosidah, S., Zulaeha, I., & Formen, A. (2024). Cultivating critical thinking skills in early childhood through inquiry-based learning models grounded in teachers'

- experiences. *Golden Age: Jurnal Ilmiah Tumbuh Kembang Anak Usia Dini*, 9(1), 159–169.
- Sadaruddin, S., Syamsuardi, S., Hasmawaty, H., & Usman, U. (2025). Planning, implementation, and evaluation of project-based learning for early childhood in Indonesia: A descriptive qualitative study. *Golden Age: Jurnal Ilmiah Tumbuh Kembang Anak Usia Dini*, 10(2), 263–278. <https://doi.org/10.14421/jga.2025.102-05>
- Shengjergji, S. (2024). 'Yeah, I am making new stuff!': Responsivity to and negotiations of agency during digital storytelling in preschool. *European Early Childhood Education Research Journal*, 32, 834–851. <https://doi.org/10.1080/1350293X.2023.2301595>
- Skene, K., O'Farrelly, C. M., Byrne, E. M., Kirby, N., Stevens, E. C., & Ramchandani, P. G. (2022). Can guidance during play enhance children's learning and development in educational contexts? A systematic review and meta-analysis. *Child Development*, 93(4), 1162–1180. <https://doi.org/10.1111/cdev.13730>
- Suggate, S. P., Lenhart, J., Vaahtoranta, E., & Lenhard, W. (2021). Interactive elaborative storytelling fosters vocabulary in pre-schoolers compared to repeated-reading and phonemic awareness interventions. *Cognitive Development*, 57, 100996. <https://doi.org/10.1016/j.cogdev.2020.100996>
- Tajqiyah, L., Dwijayanti, I., Nugroho, A. A., Marfuah, S., & Surya, A. D. (2024). Efektivitas model STEAM berbantuan media loose parts untuk meningkatkan kemampuan kognitif anak usia dini. *AS-SABIQUN*, 6(1), 221–236. <https://doi.org/10.36088/assabiqun.v6i1.4388>
- Widianti, A., Kartadinata, E. M., & Zainah, I. R. (2026). Guided play sebagai pendekatan pedagogis dalam menjembatani STPPA dan capaian pembelajaran PAUD. *Jurnal E-MAS: Edukasi dan Pembelajaran Anak Usia Dini*, 2(1), 86–98. <https://doi.org/10.64690/e-mas.v2i1.804>
- Widyastuti, T. M., & Sakti, S. A. (2022). Effectiveness of using Center and Circle methods to increase interest in learning early in children. *Child Education Journal*, 4(3). <https://doi.org/10.33086/cej.v4i3.3097>
- Yang, W., Liang, L., Xiang, S., & Yeter, I. H. (2025). Making a Makerspace in early childhood education: Effects on children's STEM thinking skills and emotional development. *Thinking Skills and Creativity*, 56, 101754. <https://doi.org/10.1016/j.tsc.2025.101754>
- Yuliani, R., Jabar, C. S. A., & Maryatun, I. B. (2023). The influence of the Inquiry Project-Based Learning model on critical thinking skills in early childhood: A quantitative experimental study. *Golden Age: Jurnal Ilmiah Tumbuh Kembang Anak Usia Dini*, 8(3), 193–202. <https://doi.org/10.14421/jga.2023.83-08>