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Integrating Thinking Routines into Play-Based Deep Learning: Transforming Pedagogy and Assessment in Early Childhood Education

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ABSTRACT

As educational priorities increasingly focus on developing future-ready competencies, early childhood pedagogy must emphasize meaningful, engaging, and cognitively rich learning experiences. This article explores the integration of thinking routines within Play-Based Deep Learning (PBDL) as a strategy to strengthen teaching competence, pedagogy, and assessment practices in early childhood education. While play is often perceived primarily as recreational, this paper argues that intentionally designed play, guided by deep learning principles embodied in the 6Cs — Character, Collaboration, Communication, Creativity, Citizenship, and Critical Thinking — can serve as a powerful vehicle for deep cognitive, social, and emotional development. Thinking routines are positioned as cognitive scaffolds that make children's thinking visible and transform play activities into opportunities for inquiry, reflection, and deeper understanding. Using a qualitative conceptual framework supported by classroom observations, teacher interviews, and relevant literature, the study examines how play-based environments integrated with thinking routines foster meaningful engagement, problem-solving, and socio-emotional growth among young learners. The findings suggest that when teachers intentionally design and facilitate play experiences aligned with learning goals, children demonstrate higher motivation, stronger collaboration, and greater cognitive depth. Furthermore, teacher competence in planning, facilitating, and assessing play-based learning is essential for maximizing outcomes. The paper proposes a practical pedagogical framework that integrates play, deep learning principles, and thinking routines to support authentic assessment and enhance professional teaching practice in early childhood classrooms.

INTRODUCTION

Rapid social, technological, and economic changes have fundamentally redefined the competencies required for future generations. Educational systems worldwide are increasingly expected to cultivate skills such as critical thinking, creativity, collaboration, communication, and character development. These competencies, often referred to as future-ready or 21st-century skills, are not developed suddenly at later stages of schooling but begin to form during early childhood.

Early childhood education plays a crucial role in laying the foundation for these competencies (Fullan, 2018). Young children learn best through exploration, interaction, and meaningful experiences. Consequently, play has long been recognized as the natural and most effective mode of learning for young learners. (NAEYC, 2020) Through play, children experiment with ideas, negotiate social relationships, develop language, and build understanding of the world around them. As Piaget (1962) notes, "play is the work of childhood," highlighting its central role in cognitive development. Through play, children experiment with ideas, negotiate meaning, and construct understanding.

Despite the recognized importance of play, many early childhood classrooms still treat play as a break from learning rather than as a structured learning opportunity. When play is not intentionally designed and guided, its potential to support deeper cognitive and social development may remain underutilized. Therefore, educators are increasingly encouraged to reconceptualize play not merely as recreational activity but as a powerful pedagogical approach that can support deep learning.

One approach that supports this transformation is **Play-Based Deep Learning (PBDL)**. This approach combines purposeful play with deep learning principles that emphasize inquiry, reflection, problem-solving, and knowledge transfer. Deep learning focuses not only on what children learn but also on how they understand, apply, and reflect on knowledge (Fullan, 2018).

However, for play-based learning to promote deep learning effectively, children's thinking processes must be supported and made visible. **Thinking routines**, derived from the Visible Thinking framework, offer structured strategies that help learners observe, question, explain, and reflect. These routines serve as cognitive scaffolds that guide children to articulate their ideas, listen to peers, and develop reasoning skills. When teachers use thinking routines, they provide a structure that helps children to observe, describe, and wonder. These tools allow children to go beyond the surface and engage in deeper processing of their experiences (Salmon, 2010).

Integrating thinking routines within play-based learning environments can therefore enhance both pedagogy and assessment practices. Teachers become facilitators who guide inquiry and document children's thinking processes rather than simply directing activities.

This study aims to explore how the integration of thinking routines within Play-Based Deep Learning can transform teaching competence, pedagogy, and assessment practices in early childhood education.

The study addresses the following questions:

1. How can thinking routines be integrated into play-based deep learning environments in early childhood classrooms?
2. How does this integration support the development of future-ready competencies among young learners?
3. What roles do teachers play in facilitating and assessing play-based deep learning through thinking routines?

Literature Review

Play-Based Learning in Early Childhood Education

Play-based learning is widely acknowledged as a fundamental approach in early childhood education. Developmental theorists emphasize that children construct knowledge through active interaction with their environment. Play allows children to explore ideas, test hypotheses, and develop social relationships in ways that are developmentally appropriate.

Research shows that play-based learning supports language development, cognitive growth, and socio-emotional skills. However, the educational value of play depends greatly on the role of teachers in structuring the environment and guiding learning experiences. When play activities are intentionally designed with clear learning goals, they can support deeper understanding and meaningful engagement.

The conceptual framework of Play-Based Deep Learning (PBDL) consists of three interconnected components: pedagogical design, teacher competence, and assessment for learning. As Fullan and Langworthy (2014) state that the new pedagogy like PBDL is based on a learning partnership between and among students and teachers that taps into the intrinsic motivation of students and teachers alike.

First, pedagogical design emphasizes intentional play activities aligned with learning objectives and future competencies, including critical thinking, creativity, collaboration, communication, and self-regulation. Play activities are structured to encourage inquiry, exploration, and problem-solving rather than simple task completion.

Second, teacher competence functions as the core facilitator of PBDL. Teachers act as designers, facilitators, observers, and scaffolding agents. Their roles include posing open-ended questions, guiding reflection, supporting social interaction, and adjusting instruction based on children's responses. The teacher does not take over the play activity or even direct it. Instead, she asks probing questions that guide the next level of child-directed exploration (NAEYC, 2022).

Third, assessment for learning integrates formative and authentic assessment within play contexts. Observation, anecdotal records, portfolios, and performance tasks are used to document learning progress and inform instructional decisions.

These three components interact dynamically to produce deep learning processes, such as engagement, meaning-making, transfer, and metacognition, which ultimately lead to the development of future competencies in early childhood learners.

Deep Learning and the 6Cs Competencies

Deep learning refers to learning processes that involve critical thinking, reflection, collaboration, and the ability to apply knowledge in new contexts. As Ron Ritchhart et al. (2011) state, "learning is a consequence of thinking," underscoring the importance of supporting thinking processes in the classroom.

Unlike surface learning, which focuses on memorization and task completion, deep learning emphasizes conceptual understanding and transferable skills.

A widely recognized framework for deep learning is the 6Cs model, which includes:

- **Character** is demonstrated through persistence, self-regulation, and responsibility during play.
- **Collaboration** emerges as children negotiate roles, share resources, and solve problems together.
- **Communication** develops through storytelling, dialogue, and expressive language use.
- **Creativity** is evident in imaginative play, innovation, and flexible thinking.
- **Citizenship** begins with understanding fairness, empathy, and community participation.
- **Critical Thinking** is reflected in questioning, reasoning, and decision-making.

These competencies represent essential attributes that learners need to navigate complex future challenges. Integrating these competencies within early childhood pedagogy helps cultivate holistic development that extends beyond academic knowledge.

Thinking Routines and Visible Thinking

A thinking routine is a set of questions or a brief sequence of steps used to scaffold and support student thinking. The Visible Thinking approach by Project Zero provides teachers with tools to involve children in thinking activities through the use of thinking routines that are short, easy-to-learn, mini-strategies that extend and deepen students' thinking and become part of the structure of everyday classroom life. Thinking routines are structured strategies designed to promote and document learners' thinking processes. They are designed to support particular kinds of thinking, so it is important to choose the right tool for the specific type of thinking skills to be developed or nurtured. Thinking routines are brief, repeatable strategies that guide children to observe, reason, question, and reflect. By implementing thinking routines, educators can cultivate and expand upon a child's natural curiosity. These practices are designed to become a consistent, habitual part of the learning environment. A common challenge in early childhood education, however, is the tendency for observers to focus on a child's knowledge gaps instead of recognizing the learning that is actively occurring. Examples of thinking routines include: See–Think–Wonder, Think–Pair–Share, What Makes You Say That?, I Used to Think… Now I Think… By using routines like See-Think-Wonder, teachers make the internal thought processes of a five-year-old "visible," allowing for authentic assessment of their cognitive growth. The "See, Think, Wonder" thinking routine is a Visible Thinking instructional approach by Project Zero that promotes inquiry by leading children through the steps of critical thinking (Berson, 2014).

In early childhood settings, these routines are adapted using simple language and interactive dialogue. By repeatedly using these routines, children develop habits of inquiry and reflection. When integrated into play-based learning, thinking routines transform play activities into opportunities for reasoning, explanation, and collaborative problem-solving.

Research indicates that when teachers move from a "teacher-led" to a "student-partnered" model will increase motivation as children remain engaged in tasks for longer periods when they have agency. The use of routines like See-Think-Wonder allows children to link new play experiences to prior knowledge. The biggest barrier to success is not the children's ability, but the teacher's comfort with "letting go" of control while maintaining intentionality.

METHODOLOGY

This study adopts a qualitative conceptual framework aimed at understanding how thinking routines function within play-based learning environments. The study was conducted in early childhood classrooms where play-based learning is part of the daily instructional approach. Participants included teachers with varying levels of experience in implementing thinking routines.

Data Collection Methods

Classroom Observations

Observations focused on children's engagement, interaction patterns, and evidence of deep learning behaviors such as questioning, reasoning, and collaboration.

Teacher Interviews

Semi-structured interviews were conducted to capture teachers' perspectives on instructional shifts, challenges, and perceived impact on student learning.

Document Analysis

Learning documentation such as portfolios, photographs, and anecdotal records were analyzed to identify patterns in children's thinking and development.

Data Analysis

Data were analyzed using thematic analysis, identifying recurring patterns related to:

- Engagement and participation
- Development of 6Cs competencies
- Teacher facilitation strategies
- Assessment practices

FINDINGS AND DISCUSSION

Transforming Play into Deep Learning Experiences

Findings indicate that when play activities are intentionally structured with clear learning goals and guided by thinking routines, children demonstrate deeper engagement in learning processes. Instead of simply manipulating materials, children begin to ask questions, propose ideas, and test solutions collaboratively. The development of critical thinking in students occurs across all levels and is shaped by their age, vocabulary growth, and cognitive development.

For example, during block-building activities, teachers introduced the thinking routine See–Think–Wonder to encourage observation and curiosity. Children described their constructions, predicted outcomes, and discussed possible improvements. This process promoted both creative thinking and collaborative problem-solving.

The Role of Thinking Routines as Cognitive Scaffolds

Throughout their learning experience in a topic, students should be engaged in thinking routines activities on more than one occasion to help them develop their understanding. If students haven't been actively engaged in building explanations, reasoning with evidence, making connections, or having the opportunity to look at things from more than one perspective, then there would likely be significant holes or gaps in their developing understanding (Ritchhart, 2011). Thinking routines served as scaffolding tools that guided children's reasoning and reflection. Teachers used simple prompts such as "What makes you say that?" to encourage children to explain their thinking. As a result, children became more confident in expressing ideas and responding to peers. These routines also supported language development and social interaction. Children listened more attentively to others and built upon each other's ideas, which strengthened communication and collaboration skills.

Teacher Competence in Facilitating Play-Based Deep Learning

Teacher competence emerged as a critical factor in the success of Play-Based Deep Learning. Teachers who intentionally designed play activities, asked open-ended questions, and observed children's interactions were able to foster richer learning experiences. Although inquiry builds upon children's wonderings, teacher intentionality and scaffolding support inquiry-based pedagogy (Berson & Berson, 2014).

Teachers adopted multiple roles, including facilitator, observer, and documenter of learning. Rather than directing play, they guided children's thinking through dialogue and reflection. During play, teachers are researchers, observing children to decide how to extend their learning. (NAEYC, 2018)

Authentic Assessment through Visible Thinking

The integration of thinking routines also supported authentic assessment practices. Instead of relying solely on worksheets or standardized measures, teachers assessed children's learning by observing their reasoning processes, communication, and collaboration during play.

Documentation methods included anecdotal records, photographs, portfolios, and transcripts of children's conversations. These forms of assessment provided deeper insights into children's conceptual understanding and socio-emotional development.

Proposed Pedagogical Framework

Based on the findings, this study proposes a Play-Based Deep Learning Framework with Thinking Routines consisting of four interconnected components:

- Intentional Play Design – Teachers design play activities aligned with learning goals and deep learning competencies.
- Thinking Routines Integration – Structured prompts guide children's inquiry, reasoning, and reflection.
- Teacher Facilitation – Teachers scaffold learning through questioning, dialogue, and observation.
- Authentic Assessment – Teachers document learning through observation, reflection, and portfolio-based evaluation.

Limitations and Future Research

This study is limited by its qualitative nature and relatively small sample size, which may affect generalizability. Additionally, the findings are context-specific and may vary across different educational settings.

Future research could:

- use quantitative methods to measure the impact of PBDL on specific competencies
- explore long-term effects of thinking routines on academic achievement

CONCLUSIONS

Integrating thinking routines into play-based learning is more than a pedagogical trend; it is a necessity for future-ready education. By focusing on the 6Cs and making thinking visible, we provide children with a "roadmap" for lifelong learning. This PBDL framework offers a practical, scalable model for educators seeking to elevate the quality of early childhood instruction and assessment.

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