SILENT CALISTUNG PEDAGOGY: PLAY-BASED LITERACY AND NUMERACY STRATEGIES FOR SUPPORTING CHILDREN'S TRANSITION FROM KINDERGARTEN TO ELEMENTARY SCHOOL

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ABSTRAK

Kesiapan literasi dan numerasi awal (*calistung*) menjadi isu krusial dalam transisi anak dari taman kanak-kanak (TK) ke sekolah dasar (SD), terutama di tengah regulasi yang secara normatif melarang pengajaran calistung secara formal di jenjang TK. Artikel ini bertujuan menganalisis bagaimana strategi pedagogis berbasis permainan diterapkan oleh guru TK untuk menumbuhkan kesiapan literasi dan numerasi anak, serta bagaimana kesiapan tersebut dipersepsikan oleh guru SD pada tahap transisi awal. Penelitian ini menggunakan pendekatan kualitatif dengan desain studi kasus di TK Mawar Budi Harjowinangun 1 dan 2, Kecamatan Dempet, Kabupaten Demak. Data dikumpulkan melalui wawancara mendalam dengan empat guru TK, dua guru SD kelas awal, dan dua orang tua, dilengkapi dengan observasi partisipatif serta analisis dokumen pembelajaran. Hasil penelitian menunjukkan bahwa guru TK mengembangkan strategi *calistung berbasis permainan* melalui aktivitas simbolik, naratif, kinestetik, dan kontekstual yang terintegrasi dalam rutinitas belajar sehari-hari tanpa melanggar regulasi formal. Praktik ini membentuk apa yang dalam artikel ini disebut sebagai *silent calistung pedagogy*, yaitu proses internalisasi literasi dan numerasi yang berlangsung secara implisit, menyenangkan, dan berpusat pada pengalaman anak. Temuan juga mengungkap bahwa anak-anak lulusan TK Mawar Budi dinilai oleh guru SD telah memiliki kesiapan fungsional dalam mengenali huruf, angka, pola, serta instruksi kelas, meskipun belum terlatih secara mekanistik. Guru SD memersepsikan kesiapan ini sebagai modal adaptif yang signifikan dalam mengurangi kecemasan belajar dan mempercepat penyesuaian akademik pada kelas awal. Secara teoretis, penelitian ini memperluas diskursus *school readiness* dengan menekankan dimensi pedagogi implisit berbasis permainan sebagai jembatan transisi PAUD–SD. Secara praktis, temuan ini memberikan alternatif kebijakan dan praktik pembelajaran yang menyeimbangkan kepatuhan regulatif dengan kebutuhan kesiapan belajar anak. Artikel ini berkontribusi pada pengembangan model transisi pendidikan anak usia dini yang lebih humanistik, kontekstual, dan berkelanjutan.

Kata kunci: pembelajaran berbasis permainan; kesiapan literasi dan numerasi awal; pedagogi calistung implisit (*silent calistung pedagogy*); transisi taman kanak-kanak–sekolah dasar; pendidikan anak usia dini

ABSTRACT

Early literacy and numeracy readiness (calistung) have become a critical issue in children's transition from kindergarten to elementary school, particularly amid regulatory frameworks that normatively prohibit formal instruction in literacy and numeracy at the kindergarten level. This article aims to examine how play-based pedagogical strategies are implemented by kindergarten teachers to foster children's early literacy and numeracy readiness, as well as how such readiness is perceived by elementary school teachers during the initial transition phase. This study adopts a qualitative approach using a case study design conducted at Mawar Budi Harjowinangun Kindergarten 1 and 2 in Dempet District, Demak Regency. Data were collected through in-depth interviews with four kindergarten teachers, two early-grade elementary school teachers, and two parents, complemented by participatory observation and analysis of instructional documents. The findings reveal that kindergarten teachers developed play-based literacy and numeracy strategies through symbolic, narrative, kinesthetic, and contextual activities embedded in daily learning routines without violating formal regulations. These practices give rise to what this article conceptualizes as silent calistung pedagogy, namely an implicit, enjoyable, and experience-centered process of literacy and numeracy internalization. The study further shows that graduates of Mawar Budi Kindergarten were perceived by elementary school teachers as possessing functional readiness in recognizing letters, numbers, patterns, and classroom instructions, despite not being trained through mechanistic drills. Elementary school teachers viewed this form of readiness as a significant adaptive asset that reduces learning anxiety and accelerates academic adjustment in the early grades. Theoretically, this study extends the discourse on school readiness by emphasizing implicit, play-based pedagogy as a critical bridge in the early childhood–primary school transition. Practically, the findings offer an alternative framework for educational policy and practice that balances regulatory compliance with children's developmental readiness needs. This article contributes to the development of a more humanistic, contextual, and sustainable model of early childhood educational transition.

Keywords: *game-based learning; early literacy and numeracy readiness; silent calistung pedagogy; kindergarten–primary transition; early childhood education*

INTRODUCTION

Over the past two decades, early childhood education has shifted globally (Elliott et al., 2023; Urban, 2022). Many countries now see kindergarten as a foundation for holistic development, not just academic advancement (Bubikova-Moan et al., 2019). International research shows that excessive academic pressure at an early age can disrupt children's psychological well-being (Guo et al., 2026; Jiang et al., 2022). It can also reduce their motivation to learn and create lasting anxiety about school (Becker & Börnert-Ringleb, 2024). At the same time, demands for high-quality human resources are increasing worldwide. Educational competition, digital transformation, and complex literacy and numeracy standards all contribute. This tension between protecting development and meeting academic demands makes kindergarten readiness in reading, writing, and math a concern across countries and policies (Lin et al., 2021; Mérida et al., 2025).

In the field of educational research, particularly early childhood education, literacy and numeracy are understood not merely as technical skills, but as interrelated processes of cognitive, social, and emotional development (Carpendale et al., 2025; Claes et al., 2026). Scholars generally view kindergarten as a crucial phase for fostering children's interest in learning, symbolic sensitivity, and mental readiness before entering elementary school (Hao et al., 2025; Veraksa, 2023). The primary focus of research to date has largely centered on curriculum effectiveness, play-based learning approaches, and the role of the family environment in supporting school readiness. However, academic discourse also reveals an ongoing debate over the boundary between exploratory learning and formal academic instruction.

Previous studies can be grouped into three main themes. The first highlights play-based learning as a natural medium for children to become familiar with symbols, patterns, and basic numeracy concepts (Franco et al., 2021; Hyde et al., 2021). The second examines how kindergarten learning experiences impact

children's later academic performance (Le Diagon et al., 2025; Perrigo et al., 2025). The third discusses policies that restrict formal academic instruction to protect development (Little & Cohen-Vogel, 2016; Street, 2021). While these groups enrich our understanding, it is important to note that most research still views learning practices as either teaching or not teaching literacy and numeracy. As a result, the pedagogical space between these extremes remains largely unexplored.

However, empirical studies that deeply examine how kindergarten teachers navigate policy restrictions while still preparing children for the transition to elementary school remain very limited. Previous research has not sufficiently uncovered the implicit pedagogical practices, that is, the subtle, often unspoken teaching methods, that enable the development of literacy and numeracy readiness, defined here as the foundational skills in reading, writing, and basic mathematics needed for success in elementary school, without formal instruction. Furthermore, very few studies combine kindergarten teachers' and early elementary school teachers' perspectives to examine the continuity of children's learning readiness, which refers to their preparedness to meet academic and social expectations in elementary education. Thus, a research gap remains regarding how literacy and numeracy readiness are built through non-instructional approaches that are policy-compliant yet pedagogically effective.

Based on these gaps, this study examines how kindergarten teachers foster readiness in reading, writing, and numeracy through play without violating the ban on formal literacy and numeracy instruction. It addresses how play-based pedagogical strategies are used to develop readiness, and how this is perceived by elementary school teachers during children's early transition. A qualitative case study design enables contextual exploration and a deep understanding of classroom practices.

This study offers several important contributions. Theoretically, it proposes the new conceptualization of non-instructional literacy readiness pedagogy called "Silent Literacy Pedagogy." Empirically, it presents field data on kindergarten teachers' practices in real-world contexts and expands the understanding of school readiness from a cross-level educational perspective. Methodologically, it

integrates data from both kindergarten and elementary school teachers, offering a perspective rarely presented in early childhood education studies.

METHOD

This study uses a qualitative case study design (Creswell & Creswell, 2022; de Vries, 2020). This method was chosen to explore how specific pedagogical practices are implemented in real-world contexts, and how practitioners interpret them. A case study helps the researcher capture the complexity of pedagogical interactions, policies, and children's learning experiences holistically: elements that cannot be reduced to isolated variables. This approach best suits research questions focused on teachers' processes, strategies, and pedagogical rationales in daily learning situations.

Research Setting and Context

This study took place at Mawar Budi Harjowinangun 1 and Mawar Budi Harjowinangun 2 Kindergartens in Dempet Subdistrict, Demak Regency, Central Java. Both provide early childhood education for the MB (playgroup) and BK (senior group) levels. They follow national regulations that prohibit the instruction of reading, writing, and arithmetic at the kindergarten level.

The selection of research locations was based on several considerations. Both kindergartens consistently use play-based learning as the primary approach in daily activities. Teachers at Mawar Budi Harjowinangun 1 and 2 face real demands from parents and nearby elementary schools for graduates to show early academic readiness, especially in literacy and numeracy. These institutions also maintain stable transition relationships with local elementary schools, allowing the researcher to gain a cross-level perspective on readiness as children enter early grades. This context makes the sites relevant for examining play-based literacy and numeracy practices within a policy framework that limits formal academic instruction.

Participants and Data Sources

The research participants consisted of four kindergarten teachers from TK Mawar Budi Harjowinangun 1 and TK Mawar Budi Harjowinangun 2, two early elementary school teachers, and two parents of students. Participants were selected

through purposive sampling, based on their direct involvement in children's learning processes and in the transition from kindergarten to elementary school.

The involved kindergarten teachers have backgrounds in early childhood education and at least 3 years of experience. They play an active role in planning and implementing play-based learning. Two elementary school teachers, selected for teaching in early grades and their experience receiving graduates from TK Mawar Budi Harjowinangun, provide perspectives on children's literacy and numeracy readiness at the start of elementary school. Two parents provide insights into their children's home learning experiences and perceptions of their readiness for elementary school.

In addition to interview data, research data sources included learning documents. These documents were daily activity plans (RKH), educational game materials, and teachers' reflection notes. Combining these sources was intended to enhance the depth of analysis and ensure research validity.

Data Collection Procedures

Data collection took place over one semester to enable repeated, in-depth observations. Techniques included naturalistic classroom observations, semi-structured interviews, and document analysis (Knott et al., 2022; Morgan, 2022; Walsh, 2020). Observations focused on play activities that introduced symbols, patterns, and numeracy concepts. Interviews explored teachers' understanding of pedagogical goals, the strategies they used, and their perceptions of children's readiness. The interview guide was flexible and allowed exploration of emerging issues. All interviews were recorded with participants' consent and transcribed verbatim.

Data Analysis

Data analysis was conducted using thematic analysis (Braun & Clarke, 2006, 2019, 2025). The analysis process began with repeated readings of the interview transcripts and observation notes to gain a comprehensive understanding. The next stage involved open coding to identify units of meaning relevant to the research focus. These codes were then grouped into broader categories and conceptually interpreted to establish key themes. Analysis was conducted iteratively, with continuous comparison between data, categories, and themes until conceptual

saturation was reached. The analysis process was aided by qualitative data analysis software to enhance coding traceability and consistency.

Trustworthiness and Rigor

To ensure the validity of the research, several strategies were implemented. Credibility was maintained through triangulation of data sources and techniques, specifically by comparing results from observations, interviews, and documents (Marlina et al., 2024). Member checking was conducted by asking participants to review a summary of preliminary findings to ensure the researcher's interpretations aligned with their experiences. Transferability was supported by providing an adequate description of the context, enabling readers to assess the relevance of the findings to other contexts. Dependability and confirmability were ensured through systematic documentation of the research process and the researcher's reflections during the analysis phase.

Ethical Considerations

This study was conducted in accordance with research ethics principles (Hamilton et al., 2024). All participants provided informed consent before participating in the study. The identities of participants and institutions are kept confidential through the use of pseudonyms. Research data is stored securely and used solely for academic purposes. This study does not involve intervention in the learning process and therefore poses no risk to children or educators.

Limitations

As a qualitative case study, the findings of this research are not intended to be statistically generalized. Another limitation is the research location's relatively limited scope, so variations in pedagogical practices in other contexts may not be fully represented. However, this limitation does not diminish the value of the findings, as the primary objective of the study is to provide an in-depth, conceptual understanding of game-based literacy-readiness pedagogical practices.

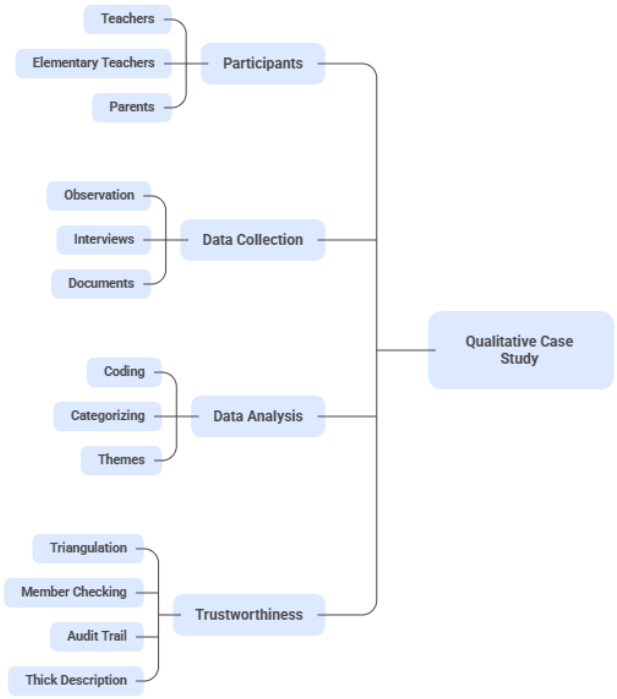

Figure 1. Qualitative Case study on Play-Based Literacy-Numeracy readiness

RESULTS AND DISCUSSION

The findings indicate that kindergarten teachers at Mawar Budi Harjowinangun 1 and 2 do not teach literacy and numeracy as formal academic content, but consciously build literacy and numeracy readiness through structured, repetitive, and meaningful play. This practice constitutes what this study conceptualizes as *Silent Calistung Pedagogy*, namely an implicit pedagogical approach that operates through symbolic habituation, motor-cognitive reinforcement, and the creation of emotional security. The findings also indicate continuity in perceptions among kindergarten teachers, elementary school teachers, and parents regarding children's readiness upon entering the early grades of elementary school.

Play-Based Pedagogical Strategies in Fostering Children's Literacy and Numeracy Readiness

Research findings indicate that kindergarten teachers at Mawar Budi 1 and 2 do not teach literacy and numeracy through formal academic instruction but instead internalize foundational literacy and numeracy skills through structured, contextualized, and repetitive play activities. Teachers consistently view this

strategy as an effort to prepare children cognitively, affectively, and socially without violating early childhood education regulations.

Interviews with four kindergarten teachers revealed that play serves as the primary medium for introducing letter symbols, numbers, and basic reading and counting concepts. Teachers do not use the term "teaching reading, writing, and arithmetic," but rather "learning through play." Activities such as letter cards, number dice, alphabet puzzles, rhythmic songs, and role-playing games are routinely incorporated into daily routines.

A kindergarten teacher stated:

> "We never label these as reading or counting lessons. The children play with letter cards, spell their own names, and count classroom objects. They aren't aware they're learning, but their foundational skills are developing." (Kindergarten Teacher 1)

Classroom observations show that these play-based activities are repeated with varying contexts. For example, letter recognition is introduced through games such as spelling friends' names, identifying the first letters of classroom objects, and singing together. Numeracy is introduced through counting concrete objects such as blocks, seeds, or educational toys. The children appear active and engaged, with no signs of academic pressure.

Another key finding is that play-based strategies are not only directed at cognitive aspects but also at children's social and emotional readiness. Teachers consciously design group games to help children practice taking turns, collaborating, following instructions, and completing simple tasks. This is viewed as a crucial foundation for readiness to learn in elementary school.

A kindergarten teacher explained:

> "What we prepare them for isn't so they can read quickly, but so they're ready to sit still, listen, dare to try, and not be afraid of making mistakes. That's far more important when they enter elementary school." (Kindergarten Teacher 3)

The observation results reinforce this statement. During group play activities, children were seen learning to communicate, express their opinions, and resolve minor conflicts with the teacher's guidance. This readiness is consistently

documented in the child development reports analyzed, particularly in terms of independence, concentration, and the courage to participate.

Analysis of documents—including Daily Lesson Plans (DLPs), anecdotal notes, and child development reports—shows that play-based strategies have been systematically planned. These documents do not include formal literacy and numeracy targets but list readiness indicators such as recognizing symbols, understanding number concepts, following game rules, and showing an interest in books.

Child development documents reveal that most children were already able to recognize vowels and numbers 1–10 informally before graduating from kindergarten, even though they were never formally tested. This suggests that literacy and numeracy readiness develop through repeated exposure to meaningful play.

Table 1. Empirical Findings on Play-Based Pedagogical Strategies

Aspect	Findings	Data Sources	Forms of Practice	Frequency of Occurrence	Interpretation
Letter recognition through play	Children acquire letter recognition gradually through play-based engagement	Interviews, Observations	Letter cards, phonetic songs, puzzle-based activities	High	Early literacy emerges organically without formal instructional pressure
Concrete object-based numeracy	Numeracy understanding develops through interaction with tangible objects	Observations, Documents	Counting blocks, dice-based games	High	Number concepts are internalized intuitively and contextually
Social interaction through group play	Children demonstrate increased social interaction and emotional regulation	Interviews, Observations	Group work, role-play activities	Moderate–High	Socio-emotional readiness develops through collective engagement
Non-academic developmental documentation	Assessment emphasizes developmental progress rather than formal academic achievement	RPPH Documents, Anecdotal Notes	Narrative assessment, daily observation records	High	Learning orientation prioritizes developmental readiness over performance outcomes

Source: Thematic analysis of primary data by the researcher

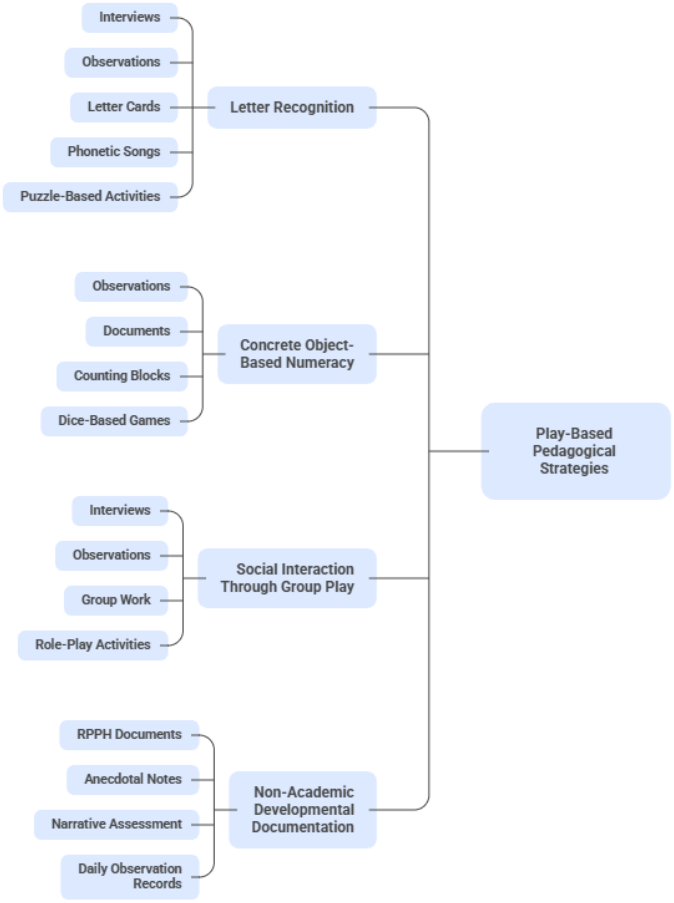

Figure 2. Empirical Findings on Play-Based Pedagogical Strategies

These results indicate that play-based pedagogical strategies at Mawar Budi 1 and 2 kindergartens serve as the primary mechanism for fostering children's literacy and numeracy readiness. This readiness does not emerge through formal reading, writing, and arithmetic instruction, but rather through structured, repetitive, and meaningful play experiences. These findings confirm that a play-based approach bridges children's academic readiness needs with early childhood pedagogical principles, serving as a crucial foundation for a more adaptive transition to elementary school.

Children's Literacy and Numeracy Readiness During the Early Transition to Elementary School

Graduates of Mawar Budi 1 and 2 kindergartens demonstrated relatively stable learning readiness during the first few weeks of elementary school. This

readiness was not always reflected in fluent reading or counting skills, but rather in learning attitudes, the ability to follow instructions, and positive responses to basic literacy and numeracy activities in the classroom.

Interviews with two elementary school teachers revealed that children from kindergartens with a play-based approach tend to be more adaptable in facing the demands of formal learning. Elementary school teachers do not assess children's readiness solely based on early reading, writing, and arithmetic skills, but rather on learning dispositions evident from the start of the semester.

One elementary school teacher stated:

> "The children from Mawar Budi Preschool seem more prepared. It's not because they can read right away, but because they dare to try, are willing to ask questions, and don't give up easily when given tasks." (Elementary School Teacher 1)

Another elementary school teacher added:

> "When given activities involving letter recognition or counting, they aren't surprised. They're already familiar with it, so they just need to be guided toward a more formal format." (Elementary School Teacher 2)

These statements indicate that readiness in literacy and numeracy is understood as a continuation of prior learning experiences, not as a separate starting point between kindergarten and elementary school.

Observations in early elementary school classrooms show that most children can participate in basic literacy activities, such as recognizing letters, matching simple words, and counting concrete objects, with low levels of anxiety. The children appear accustomed to working with simple worksheets and teacher-led activities.

Observations also indicate that children adapt relatively quickly to the learning pace in elementary school. They can sit for longer periods, complete simple tasks, and interact positively with peers. This suggests that the readiness built in kindergarten through play contributes to a smoother learning transition.

The documents analyzed at this stage include records of early-semester adaptation, student progress reports, and communication archives between

kindergarten and elementary school teachers (if available). These documents indicate that children do not face significant barriers to basic learning readiness.

Some elementary school teachers' reports noted that children were already familiar with most vowels and basic numbers, though fluency varied. However, these reports more often emphasized children's independence, attention, and self-confidence during the learning process.

Table 2. Manifestations of Literacy and Numeracy Readiness in the Early Elementary School Transition

Readiness Aspect	Data Sources	Empirical Indicators	Frequency of Findings	Interpretation
Response to early literacy	Interviews, Observations	Willingness to recognize letters, initial attempts at writing	High	Familiarity with literacy emerges without coercive instruction
Basic numeracy	Observations, Documents	Ability to count and manipulate concrete objects	Moderate–High	Foundational numerical concepts are understood contextually
Learning attitude	Interviews, Observations	Sustained attention, ability to follow instructions	High	Positive learning disposition supports early academic engagement
Classroom adaptation	Observations, Documents	Ability to sit attentively and work independently	High	Transition into formal schooling occurs more smoothly

Source: Thematic analysis of primary data by the researcher

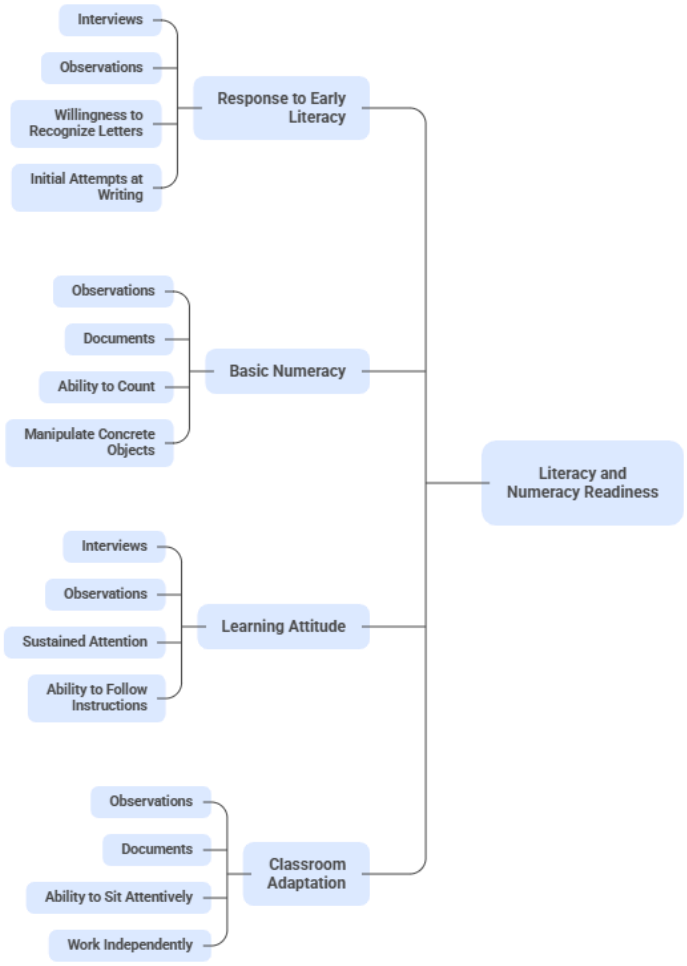

Figure 3. Manifestations of Literacy and Numeracy Readiness in the Early Elementary School Transition

The results in this theme indicate that children's literacy and numeracy readiness during the early transition to elementary school is more evident in learning attitudes and dispositions than in formal academic mastery. This finding reinforces the results in theme 1 by demonstrating that play-based pedagogical strategies in kindergarten do not stop at children's internal readiness but continue and manifest tangibly within the formal learning context of elementary school. This readiness serves as a crucial foundation for subsequent learning processes and opens avenues for more sustainable academic adaptation.

Children's Learning Readiness and Elementary School Teachers' Perceptions During the Transition Period

The readiness of graduates from Mawar Budi 1 and 2 kindergartens does not lie in formal literacy and numeracy skills, but rather in children's mental readiness,

learning attitudes, and adaptive abilities in facing a new learning environment. This perception emerged consistently across interviews, was reinforced by early classroom observations, and was reflected in new student adaptation reports.

Interview results indicate that elementary school teachers view children's learning readiness as a set of positive dispositions that enable children to gradually engage in the learning process. This readiness includes the courage to try, the ability to follow instructions, perseverance in completing tasks, and resilience in the face of initial learning difficulties.

An elementary school teacher remarked:

> "A ready child isn't one who can read right away, but one who is willing to learn. The children from Mawar Budi Kindergarten don't seem afraid of making mistakes and are willing to be guided." (Elementary School Teacher 1)

This statement underscores that readiness is understood as a psychological and pedagogical condition that enables the learning process to proceed effectively, rather than as an immediate academic achievement.

Observations of early elementary school classrooms show that graduates of Mawar Budi Kindergarten demonstrate relatively good self-regulation skills. They can follow the flow of instruction, complete simple tasks, and interact positively with teachers and peers. Although their reading and numeracy skills are still at an early stage, the children do not show resistance to literacy and numeracy activities.

Analysis of the initial semester adaptation report documents reinforces these findings. Elementary school teachers more frequently noted independence, focus, and courage in children's learning activities than fluency in reading or counting. This indicates alignment in perception between kindergarten and elementary school teachers regarding the meaning of children's learning readiness.

Table 3. Synthesis of Children's Readiness from the Perspective of Elementary School Teachers

Dimensions of Readiness	Data Sources	Empirical Indicators	Frequency of Findings	Pedagogical Implications
Learning disposition	Interviews with elementary school teachers	Willingness to try, absence of fear in making mistakes	High	Serves as a foundational condition for sustained learning engagement
Self-regulation	Classroom observations	Sustained attention, ability	High	Reflects the internalization of

Dimensions of Readiness	Data Sources	Empirical Indicators	Frequency of Findings	Pedagogical Implications
		to follow instructions		structured play-based routines
Emotional adaptation	Observations, Documents	Low frustration levels, emotional stability in tasks	Moderate–High	Facilitates a smoother transition into formal learning environments
Early literacy and numeracy	Interviews, Documents	Familiarity with basic letters and numbers	Moderate	Indicates conceptual readiness rather than technical mastery

Source: Thematic analysis of primary data by the researcher

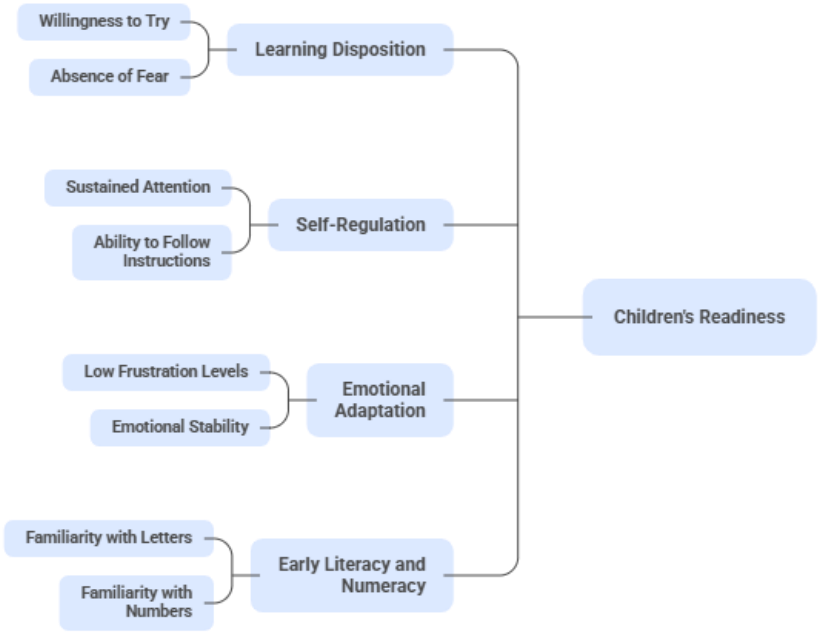

Figure 4. Synthesis of Children's Readiness

A synthesis of the overall findings indicates that children's literacy and numeracy readiness result from a continuous pedagogical process, beginning with play experiences in kindergarten and continuing into formal learning in elementary school. Elementary school teachers view kindergarten play experiences as a foundation that supports subsequent adaptation and academic learning.

Thus, the results of this study confirm that play-based pedagogical strategies in kindergarten serve as an effective transitional bridge between the world of early childhood learning and the academic demands of elementary school. Children's readiness for learning is understood as a readiness to learn, not as a requirement to have mastered reading, writing, and arithmetic prematurely.

The literacy and numeracy readiness of graduates from Mawar Budi 1 and 2 kindergartens is perceived by elementary school teachers as adaptive, psychological, and pedagogical readiness. This perception reinforces the finding that a play-based learning approach is a relevant and contextually appropriate strategy for supporting the educational transition from early childhood to elementary school.

DISCUSSION

Based on the research findings, children's learning readiness is not understood as early technical mastery of reading, writing, and arithmetic, but rather as dispositional readiness encompassing a willingness to learn, self-regulation, emotional stability, and initial familiarity with academic symbols. This finding is consistent with international approaches that view school readiness as a multidimensional construct rather than merely academic achievement (Mavungu-Blouin et al., 2025; Rymanowicz et al., 2020).

Research results indicate that structured play strategies enable children to build positive relationships with literacy and numeracy activities without evaluative pressure. Children are not positioned as subjects who must meet specific academic standards, but as active learners constructing meaning through concrete experiences. This pattern aligns with the theory of playful learning, which emphasizes that learning is most effective when children are actively, meaningfully, and enjoyably engaged (Buldu & Buldu, 2025; Fletcher et al., 2024; Hirsh-Pasek et al., 2015). In this context, play is not merely a recreational activity but the primary pedagogical medium for internalizing foundational concepts.

Theoretically, these findings can be explained through the readiness-to-learn framework, which emphasizes the importance of self-regulation, intrinsic motivation, and executive function as the foundation for long-term academic success. Blair & Raver (2015) demonstrate that strong readiness to learn at the onset of formal education is more influenced by self-regulation capacity than by initial academic ability (Duncan et al., 2018; Gullo et al., 2026). The findings of this study reinforce this argument by showing that structured play experiences in kindergarten

contribute to the regulatory readiness valued by elementary school teachers during the transition phase.

Compared to previous research, most studies on early literacy and numeracy have focused on the debate over the effectiveness or risks of academicization in early childhood education, often using normative or test-based quantitative approaches (Bassok et al., 2016; McLean et al., 2026; Ring et al., 2019). In contrast to these approaches, this study positions elementary school teachers as external evaluators of children's readiness and demonstrates that meaningful readiness is not defined by fluency in reading or counting, but rather by children's ability to adapt, persevere, and engage in formal learning processes. Thus, this study expands the discourse on school readiness from merely being prepared for school entry to being prepared for sustained learning.

The main contribution and novelty of this study lie in the conceptual formulation of literacy and numeracy readiness as the result of implicit, continuous, play-based pedagogy, presented in this article as "silent calistung pedagogy." Unlike explicit and instructional early literacy and numeracy approaches, silent literacy and numeracy pedagogy operate through symbolic exposure, meaningful repetition, and structured social experiences. This concept offers a theoretical contribution by shifting the focus of readiness from academic outcomes to pedagogical processes, an empirical contribution through cross-level data from preschool to elementary school, and a practical contribution in the form of a pedagogical model aligned with early childhood education regulations and the needs of the transition to elementary school.

The theoretical implications of these findings underscore the importance of viewing the preschool–elementary school transition as a single, interconnected pedagogical unit. Children's learning readiness cannot be separated from their prior learning experiences; therefore, a transition framework emphasizing continuity rather than curriculum discontinuity is necessary. Practically, these findings encourage kindergarten teachers to design more structured and reflective play activities and urge elementary school teachers to assess children's readiness holistically. At the policy level, these research findings support the need to synchronize learning paradigms between early childhood education

(PAUD/kindergarten) and elementary school, as also recommended in various international reports on early childhood education (OECD, 2018).

Nevertheless, this study has limitations that require careful consideration. The research context, limited to two kindergartens and one elementary school transition setting, restricts the generalizability of the findings to broader contexts. Furthermore, this study has not explored the long-term impact of play-based readiness on children's academic achievement in subsequent educational levels. Therefore, future research is advised to employ a longitudinal design and involve more diverse socio-cultural contexts, while combining qualitative and quantitative approaches to examine the relationship between dispositional readiness and long-term academic achievement.

This discussion reaffirms that children's literacy and numeracy readiness result from a humanistic, continuous, and contextual pedagogical process. Silent calistung pedagogy offers a globally relevant alternative framework to bridge the tension between school readiness demands and the principles of early childhood development, while enriching the international body of research on early education transitions.

CONCLUSION

This study concludes that literacy and numeracy readiness in early childhood cannot be narrowly understood as mastery of reading, writing, and counting skills prior to entering elementary school. Based on empirical findings from the Mawar Budi 1 and 2 kindergartens and the perceptions of elementary school teachers during the early transition phase, learning readiness is built through pedagogical processes that emphasize structured, meaningful, and sustained play experiences. This strategy enables children to develop positive learning dispositions, self-regulation, and emotional readiness, which serve as crucial foundations for successful formal learning at the next educational level.

The primary contribution of this study lies in reinforcing the concept of *silent literacy and numeracy pedagogy*—a pedagogical approach that implicitly integrates literacy and numeracy readiness through play without making literacy and numeracy the formal instructional goal in kindergarten. These findings offer a

theoretical contribution by expanding the understanding of *school readiness* from an orientation toward early academic achievement to dispositional and adaptive readiness. Empirically, this study provides cross-level evidence that the readiness built through kindergarten play is perceived as relevant and meaningful by elementary school teachers. Thus, this article enriches the international discourse on early childhood education transitions with a more humanistic and contextual perspective.

Practically, the findings underscore the importance of pedagogical continuity between kindergarten and elementary school. Kindergarten teachers are encouraged to design play activities that are not only enjoyable but also reflective and aimed at fostering long-term learning readiness. Meanwhile, elementary school teachers are expected to assess children's readiness holistically, considering aspects of learning disposition rather than solely early academic abilities. At the policy level, these findings imply the need to synchronize learning paradigms and curriculum transitions between early childhood education and elementary school to prevent premature academic pressure that could hinder children's development.

This research emphasizes that literacy and numeracy readiness are the outcomes of a continuous pedagogical process, not instant targets to be achieved prematurely. *Silent calistung pedagogy* offers a globally relevant alternative framework to bridge the tension between school readiness demands and the principles of early childhood development. By opening space for more adaptive and process-oriented pedagogical approaches, this study is expected to serve as a foundation for further research, educational practice, and policies that better prioritize children's holistic learning needs.

REFERENCES

Bassok, D., Latham, S., & Rorem, A. (2016). Is Kindergarten the New First Grade? *AERA Open*, *2*(1), 2332858415616358. https://doi.org/10.1177/2332858415616358

Becker, S., & Börnert-Ringleb, M. (2024). On the interplay of performance pressure, achievement orientations, school-related anxiety and stress. *Zeitschrift fur Erziehungswissenschaft*, *27*(5), 1329–1350. https://doi.org/10.1007/s11618-024-01250-7

Blair, C., & Raver, C. C. (2015). School Readiness and Self-Regulation: A Developmental Psychobiological Approach. *Annual Review of Psychology*, *66*(Volume 66, 2015), 711–731. https://doi.org/10.1146/annurev-psych-010814-015221

Braun, V., & Clarke, V. (2006). Using Thematic Analysis in Psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Braun, V., & Clarke, V. (2019). Reflecting on Reflexive Thematic Analysis. *Qualitative Research in Sport, Exercise and Health*, *11*(4), 589–597. https://doi.org/10.1080/2159676X.2019.1628806

Braun, V., & Clarke, V. (2025). Reporting Guidelines for Qualitative Research: A Values-based Approach. *Qualitative Research in Psychology*, *22*(2), 399–438. https://doi.org/10.1080/14780887.2024.2382244

Bubikova-Moan, J., Næss Hjetland, H., & Wollscheid, S. (2019). ECE teachers' views on play-based learning: A systematic review. *European Early Childhood Education Research Journal*, *27*(6), 776–800. https://doi.org/10.1080/1350293X.2019.1678717

Buldu, M., & Buldu, E. (2025). How to promote playful learning: Insights from innovative early childhood classrooms in the USA. *Humanities and Social Sciences Communications*, *12*(1). https://doi.org/10.1057/s41599-025-05291-z

Carpendale, E. J., Green, M. J., White, S. L. J., Williams, K. E., Tzoumakis, S., Watkeys, O. J., Harris, F., O'Hare, K., & Laurens, K. R. (2025). Middle childhood social-emotional competencies mediate the effects of school-entry literacy and numeracy skills on secondary school reading and numeracy attainment. *Learning and Individual Differences*, *124*. https://doi.org/10.1016/j.lindif.2025.102778

Claes, R., Denies, K., De Smedt, B., & Aesaert, K. (2026). Identifying early developmental profiles of 5-year-olds: A latent profile analysis using IELS 2018 data. *Large-Scale Assessments in Education*, *14*(1). https://doi.org/10.1186/s40536-025-00277-4

Creswell, J. W., & Creswell, J. D. (2022). *Research Design*. SAGE Publications, Inc. https://us.sagepub.com/en-us/nam/research-design/book270550

de Vries, K. (2020). Case Study Methodology. In K. Aranda (Ed.), *Critical Qualitative Health Research: Exploring Philosophies, Politics and Practices* (pp. 41–52). Taylor and Francis. https://doi.org/10.4324/9780429432774-2

Duncan, R. J., Schmitt, S. A., Burke, M., & McClelland, M. M. (2018). Combining a kindergarten readiness summer program with a self-regulation

intervention improves school readiness. *Early Childhood Research Quarterly, 42*, 291–300. https://doi.org/10.1016/j.ecresq.2017.10.012

Elliott, S., Carr, V., Ärlemalm-Hagsér, E., & Park, E. (2023). Examining curriculum policy and pedagogy across borders: Re-imagining socially transformative learning in early childhood education. In P. B. Corcoran, J. P. Weakland, & A. E. J. Wals (Eds.), *Envisioning Futures for Environmental and Sustainability Education* (pp. 205–216). Brill. https://doi.org/10.3920/978-90-8686-846-9_14

Fletcher, K., Wright, C. A., Pesch, A., Abdurokhmonova, G., & Hirsh-Pasek, K. (2024). Active playful learning as a robust, adaptable, culturally relevant pedagogy to foster children's 21st century skills. *Journal of Children and Media, 18*(3), 309–321. https://doi.org/10.1080/17482798.2024.2356956

Franco, J., Orellana, M. F., & Franke, M. L. (2021). 'Castillo blueprint': How young children in multilingual contexts demonstrate and extend literacy and numeracy practices in play. *Journal of Early Childhood Literacy, 21*(3), 361–387. https://doi.org/10.1177/1468798419841430

Gullo, G., Gentile, A., Imai-Matsumura, K., Yamamoto, N., & Alesi, M. (2026). Italian adaptation of the Japanese START Program for enhancing self-regulation in kindergarteners: A pilot study. *European Journal of Psychology of Education*, *41*(2). https://doi.org/10.1007/s10212-026-01123-z

Guo, X., Mueller, M. A. E., Armitage, J. M., Bonell, C., Ford, T. J., John, A., Lewis, G., Murphy, S., Ploubidis, G., Rice, F., Sullivan, A., & Lewis, G. (2026). The association between academic pressure and adolescent depressive symptoms and self-harm: A longitudinal, prospective study in England. *The Lancet Child and Adolescent Health*, *10*(4), 265–272. https://doi.org/10.1016/S2352-4642(25)00342-6

Hamilton, K., Piacentini, M., & Banister, E. (2024). Ethics and care in qualitative research. In R. W. Belk & C. Otnes (Eds.), *Handbook of Qualitative Research Methods in Marketing* (pp. 486–496). Yale University Press. https://doi.org/10.4337/9781035302727.00050

Hao, Y., Kong, L., Wang, X., & Yu, X. (2025). The impact of structured motor learning intervention on preschool children's executive functions. *Scientific Reports*, *15*(1). https://doi.org/10.1038/s41598-025-01385-5

Hirsh-Pasek, K., Zosh, J. M., Golinkoff, R. M., Gray, J. H., Robb, M. B., & Kaufman, J. (2015). Putting Education in "Educational" Apps: Lessons From the Science of Learning. *Psychological Science in the Public Interest*, *16*(1), 3–34. https://doi.org/10.1177/1529100615569721

Hyde, D. C., Mou, Y., Berteletti, I., Spelke, E. S., Dehaene, S., & Piazza, M. (2021). Testing the role of symbols in preschool numeracy: An experimental

computer-based intervention study. *PLoS ONE*, *16*(11 November). https://doi.org/10.1371/journal.pone.0259775

Jiang, M.-M., Gao, K., Wu, Z.-Y., & Guo, P.-P. (2022). The influence of academic pressure on adolescents' problem behavior: Chain mediating effects of self-control, parent–child conflict, and subjective well-being. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.954330

Knott, E., Rao, A. H., Summers, K., & Teeger, C. (2022). Interviews in The Social Sciences. *Nature Reviews Methods Primers*, *2*(1). https://doi.org/10.1038/s43586-022-00150-6

Le Diagon, S., Jacquel, M., Van der Henst, J.-B., & Prado, J. (2025). Individual differences in executive functions and theory of mind mediate the relation between academic skills from kindergarten to 5th grade. *PLOS ONE*, *20*(6 June). https://doi.org/10.1371/journal.pone.0324547

Lin, X., Liao, Y., Xue, M., & Colliver, Y. (2021). Most Chinese Preschool Teachers Value Guided Play Over Free Play: Latent Profiles and Associated Predictors. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.780367

Little, M. H., & Cohen-Vogel, L. (2016). Too much too soon? An analysis of the discourses used by policy advocates in the debate over kindergarten. *Education Policy Analysis Archives*, *24*. https://doi.org/10.14507/epaa.24.2293

Marlina, E., Purwaningsih, M., Siagian, A. H. A. M., Hakim, S. A., & Maryati, I. (2024). Ensuring Trustworthiness in Qualitative Research: The Role of Triangulation Techniques. In R. Throne (Ed.), *Qualitative Research Methods for Dissertation Research* (pp. 347–375). IGI Global. https://doi.org/10.4018/979-8-3693-3069-2.ch012

Mavungu-Blouin, C., Letarte, M.-J., Laurent, A., Lemelin, J.-P., & Garon-Carrier, G. (2025). Profiles of Low School Readiness Among At-Risk Preschoolers and Their Correlates in Kindergarten and Grade 1. *Journal of Research in Childhood Education*. https://doi.org/10.1080/02568543.2025.2483529

McLean, C., Cummings, R., LeBlanc, L. A., Briscombe, A., Mohamed, D., & McIsaac, J.-L. D. (2026). Making numeracy and literacy learning visible in play-based publicly funded programs. *Journal of Early Childhood Literacy*, *26*(1), 482–512. https://doi.org/10.1177/14687984251351202

Mérida, A. J. A., Mora, M. D. R. H., Rocío, C. B. E., & Castillo, M. D. P. J. (2025). Innovation In Early Childhood Education Through Curriculum Adaptations For Inclusion And Integral Development. *Architecture Image Studies*, *6*(3), 1355–1367. https://doi.org/10.62754/ais.v6i3.459

Morgan, H. (2022). Conducting a Qualitative Document Analysis. *Qualitative Report*, *27*(1), 64–77. https://doi.org/10.46743/2160-3715/2022.5044

OECD. (2018). *The Future of Education and Skills Education 2030*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2018/06/the-future-of-education-and-skills_5424dd26/54ac7020-en.pdf?utm_source=chatgpt.com

Perrigo, J. L., Karimli, L., Ginther, A., Stanley, L., & Janus, M. (2025). Population health begins in early childhood: Kindergarten EDI school readiness scores as a predictor of sixth-grade academic outcomes in the USA. *International Journal of Educational Research*, *134*. https://doi.org/10.1016/j.ijer.2025.102760

Ring, E., O'sullivan, L., & Ryan, M. (2019). EARLY CHILDHOOD TEACHER-AS-RESEARCHER: An Imperative in the Age of "Schoolification": Harnessing Dewey's Concept of the Laboratory School to Disrupt the Emerging Global Quality Crisis in Early Childhood Education. In O. N. Saracho (Ed.), *Contemporary Perspectives on Research on Child Development Laboratory Schools in Early Childhood Education* (pp. 173–195). Emerald Group Publishing Ltd. https://doi.org/10.1108/978-1-64113-637-220251014

Rymanowicz, K. A., Moyses, K. J., & Zoromski, K. S. (2020). School Readiness. In J. B. Benson (Ed.), *Encyclopedia of Infant and Early Childhood Development* (pp. 55–64). Elsevier. https://doi.org/10.1016/B978-0-12-809324-5.21836-1

Street, M. (2021). Theorising child well-being: Towards a framework for analysing Early Childhood Education policy in England. *Journal of Early Childhood Research*, *19*(2), 211–224. https://doi.org/10.1177/1476718X20969841

Urban, M. (2022). Scholarship in times of crises: Towards a trans-discipline of early childhood. *Comparative Education*, *58*(3), 383–401. https://doi.org/10.1080/03050068.2022.2046376

Veraksa, N. E. (2023). Mechanisms of game influence on cognitive development of preschool children. *Voprosy Psikhologii*, *69*(4), 40–50.

Walsh, K. (2020). Participant Observation. In A. Kobayashi (Ed.), *International Encyclopedia of Human Geography (Second Edition)* (pp. 39–42). Elsevier. https://doi.org/10.1016/B978-0-08-102295-5.10205-7