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The Montessori approach to developing behavioral regulation in children aged 3–5 years: a study at daycare X

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Abstract

Behavioral regulation is an important developmental capacity in early childhood as children learn to control impulses, sustain attention, remember activity sequences, and adjust actions to different situations. The Montessori approach provides an orderly and purposeful environment in which these capacities can be practiced through concrete materials. This study describes the implementation of Montessori education to foster behavioral regulation among children aged 3–5 years at Daycare X. Using a qualitative case study design, participants included five children aged 3–5 and a Montessori classroom teacher, with the daycare principal serving as an informant. Data were obtained through observations, semi-structured interviews, and documentation, and analyzed using data condensation, data display, and conclusion drawing and verification. The findings indicate that a prepared environment, freedom within limits, material use, work cycles, and teacher guidance provided repeated opportunities for children to regulate their behavior during Montessori learning. Observed regulatory behaviors involved inhibitory control, working memory, and cognitive flexibility.

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INTRODUCTION

Ages 3–5 constitute an important period in children's development. At this stage, children learn to understand rules, manage desires, sustain attention, and adjust behavior to environmental demands. Behavioral regulation is reflected not only in children's 'compliance' but also in their ability to inhibit impulses, wait their turn, follow activity sequences, complete tasks, and restore the environment after using materials. These abilities are associated with school readiness and greater independence in everyday activities (Blair & Raver, 2015; McClelland et al., 2026).

In early childhood education, developing behavioral regulation is essential because children learn through repeated experiences. An organized environment, consistent routines, and supportive relationships offer opportunities to practice regulating behavior. Research on preschool self-regulation interventions suggests that intentionally designed learning experiences can support executive function development (Muir et al., 2023). In this study, behavioral regulation is understood through three interconnected executive functions: inhibitory control, working memory, and cognitive flexibility (Diamond, 2025). Inhibitory control involves suppressing responses or impulses inappropriate to a situation; working memory enables children to retain and use information during an activity; and cognitive flexibility involves shifting attention, rules, or strategies when circumstances change

The Montessori approach has characteristics relevant to these regulatory capacities. Montessori positions children as active learners through a prepared environment, concrete materials, freedom within limits, and teachers who observe and guide. Children can select work, follow material-use procedures, sustain attention, complete activities, return materials to their places, and correct errors through experience. Previous research has associated Montessori education with academic and nonacademic developmental outcomes, including executive functions, independence, concentration, and social skills (Demangeon et al., 2023; Randolph et al., 2023).

In Practical Life, for example, children pour water, transfer objects, tie laces, or button clothing. These apparently simple activities allow them to control movements, follow sequences, sustain attention, resist rushing, and complete the full cycle of returning materials. Research has also linked Practical Life activities to children's independence (Kamil & Asriyani, 2023). In the other Montessori areas—Sensorial, Language, Mathematics, and Culture Studies—activities likewise demand attention, sequencing, precision, memory, and adjustments to strategies when difficulties arise. Thus, behavioral regulation in Montessori is not necessarily taught as a separate subject but can develop through the environment and everyday experiences.

Nevertheless, Montessori implementation in daycare must be distinguished from its use in conventional preschool classrooms. Although both serve young children and may pursue educational goals, their daily routines differ. Preschool activities are generally concentrated within a relatively limited school day and organized into opening sessions, classroom or center activities, play, group work, and closing sessions. In Montessori preschools, a work cycle allows children to select and use Montessori materials in a prepared classroom (Afifah & Kuswanto, 2020). Accordingly, observations of Montessori implementation in preschools can focus more directly on classroom instructional periods.

Daycare has a different daily structure. Children typically spend longer periods there, experiencing not only planned learning activities but also care routines such as arrival, storing personal belongings, meals, handwashing, toileting, changing clothes, rest, play, transitions, and departure. Daycare therefore combines education and care across the day. Opportunities to regulate behavior emerge not only when children use learning materials but also when waiting for food, recalling handwashing steps, stopping play for transitions, readjusting after rest, sharing space, and returning objects after use.

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This distinction matters when Montessori is applied in daycare. In Montessori preschool classrooms, implementation may be recognized through a prepared environment, Montessori materials, individual or small-group presentations, freedom of work choice, and a work cycle. In daycare, Montessori principles may extend beyond formal materials-based periods. Independence, order, freedom within limits, grace and courtesy, respect for children's pace, and environmental organization can also be practiced throughout care routines. Children may collect and put away eating utensils, clean spills, dress themselves, wait for shared facilities, select activities after completing responsibilities, and return objects. Thus, the boundary between 'learning activities' and 'daily activities' becomes less rigid, because care routines themselves provide opportunities to practice independence and behavioral regulation.

This context reveals an important research gap. Much Montessori research has examined implementation in schools or preschool classrooms and its associations with children's developmental outcomes. Such research identifies potential relationships with executive functioning, academic abilities, independence, and social development. Yet outcome findings do not fully explain how these abilities emerge through children's interactions with the environment, materials, teachers, and routines. Daycare differs further from preschool classrooms because Montessori activities must coexist with care needs, meals, rest, transitions, and children's individual needs throughout the day.

Two gaps therefore guide this study. First, research emphasizing Montessori outcomes or effectiveness has received more attention than investigations describing the process by which behavioral regulation emerges during everyday experiences. Detailed accounts are still needed of how children inhibit impulses while waiting, remember rules and sequences, sustain attention until a task is complete, change strategies when struggling, and respond to teachers' boundaries.

Second, there is a contextual gap between Montessori preschool classrooms centered on instructional periods and daycare environments integrating education with care routines throughout the day. Less is known about how Montessori principles extend from materials-based work to everyday daycare routines, or how these routines allow children aged 3–5 to demonstrate and develop inhibitory control, working memory, and cognitive flexibility. Montessori implementation in daycare therefore should be understood through the child's overall experience rather than only the presence of materials or a work cycle.

These gaps are particularly relevant in Indonesia. Previous studies suggest that strengthening Montessori implementation requires educators who understand its principles and can adapt them to institutional contexts and children's needs (Kusumawardani & Rusman, 2025; Suteki et al., 2025). It is therefore important to examine how teachers enact Montessori principles in everyday situations, including activities outside formal lessons. This provides a rationale for investigating children's and teachers' actual experiences at Daycare X.

This study aims to describe how the Montessori approach is planned and implemented to foster behavioral regulation among children aged 3–5 at Daycare X, and to document forms of regulation observed during everyday activities. Its focus makes it possible to understand learning contextually: not merely whether children follow rules, but how the environment, materials, teachers, and routines offer opportunities for children to regulate themselves. Research on Montessori assessment and child development also highlights the importance of understanding development holistically and in the context in which children learn and live (Furwanti et al., 2026; Puspitaloka et al., 2026).

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METHOD

This research employed a qualitative approach with a case study design. The design was selected to understand Montessori implementation in depth under real conditions at Daycare X, rather than to measure score gains or compare groups. A case study enables examination of processes, interactions, and the experiences of children and teachers within everyday Montessori learning.

The study took place at Daycare X on July 20–24, 2026. Observations followed a sequence of Montessori activities each day. Participants were five children aged 3–5—A1 (3 years), A2 (4 years), A3 (5 years), A4 (5 years), and A5 (5 years)—and the Montessori classroom teacher; the daycare principal served as an interview informant. Children's identities were protected through the codes A1–A5. The five-day observation period was not assumed to constitute a universal qualitative research standard. Its adequacy was considered in relation to the study objectives, observational intensity, coverage of relevant situations, and recurrence of behavioral patterns. Rather than estimating behavioral prevalence or making statistical generalizations, the study sought to identify and describe naturally occurring regulation as children interacted with Montessori materials, teachers, peers, and their environment within the bounded case of Daycare X.

Data were collected through observation, semi-structured interviews, documentation, and field notes. Observations examined how the teacher prepared the environment, presented materials, established limits, provided assistance, and responded to children's behavior. The teacher interview explored implementation and pedagogical decisions. The daycare principal was interviewed about institutional policies, reasons for Montessori adoption, lesson planning, environmental arrangements, rules, and strategies supporting independence and regulation. Information from parents addressed children's behavior outside the observed daycare setting, particularly independence, rule-following, task completion, and responses to change or difficulty. Documents included lesson plans, activity schedules, photographs of the environment and Montessori materials, and records of activities.

Trustworthiness was assessed through methodological and source triangulation. Triangulation involved more than the inclusion of multiple data sources: evidence was systematically compared. Multiple sources are particularly important in case study research because they provide different perspectives and reduce reliance on a single form of evidence (Houghton et al., 2017). Systematic, documented analysis likewise allows readers to trace how themes were generated and assess their credibility (Nowell et al., 2017).

Triangulation proceeded in stages. First, data were organized by source: observation records and field notes, teacher accounts, statements from the daycare principal, parent reports, and supporting documents. Observations were further classified by date, child, Montessori area, type of activity, and behavioral context. This organization allowed the evidence underlying each code or category to be retrieved.

Second, the researcher conducted initial coding using three executive function components as an analytical framework: inhibitory control, working memory, and cognitive flexibility. Inhibitory control was identified in behaviors such as suppressing impulses, waiting turns, stopping actions upon request, and adhering to limits. Working memory involved remembering instructions, activity sequences, rules, and material-use procedures. Cognitive flexibility was indicated by retrying, changing approaches, accepting alternatives, moving between activities, and adapting to changed circumstances (Diamond, 2025; Putri et al., 2024). Behaviors and patterns arising inductively from the field were also recorded.

Third, similar codes were grouped into provisional categories and entered into a triangulation matrix. Rows represented provisional categories or themes and columns represented

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observation/field notes, teacher, daycare principal, parents, and documentation. The matrix made visible which sources supported, elaborated, or contradicted a category, allowing the triangulation procedure to remain transparent and traceable.

Fourth, the researcher examined convergence, complementarity, and divergence across sources. Convergence occurred when several sources provided consistent evidence—for example, repeated independent behavior during observation was also reported by teachers and parents. Complementarity occurred when one source expanded another: observation showed what a child did, while the teacher explained why particular assistance or limits were provided. Discrepancies were not simply removed. If a teacher reported that a child usually waited appropriately but observations documented repeated attempts to take materials, field notes were revisited to consider the situation, type of material, activity conditions, peers' responses, and teacher support. Differences were treated as contextual information rather than forced into agreement, because triangulation may reveal varied perspectives and conditions under which behavior occurs.

Fifth, thematic categories were verified. Main categories were not based on a single informant's statement or isolated incident but were checked against evidence across times, activities, and sources. Field notes remained the primary record of directly observed behavior, while teacher, principal, and parent interviews confirmed, contextualized, or suggested alternative explanations. Documents were examined to compare observed practice with institutional plans and rules.

Through these procedures, each thematic category retained an evidence trail from raw data to codes, categories, and final themes. Supporting as well as discrepant evidence was preserved. These steps were intended to reduce researcher assumptions and strengthen credibility, dependability, and confirmability. Accountable thematic analysis requires systematic coding, documentation of analytical decisions, and traceable connections between data and themes (Nowell et al., 2017).

Overall data analysis involved data condensation, data display, and conclusion drawing and verification. During condensation, material relevant to Montessori implementation and behavioral regulation was selected, coded, and categorized. Data displays comprised case narratives and matrices linking children, Montessori activities, behavioral indicators, and evidence sources. Emerging patterns were checked against field notes, interviews, and documents before conclusions were finalized. Consequently, findings concerning inhibitory control, working memory, and cognitive flexibility drew on the convergence and interpretation of different types of evidence rather than on any one informant's perception.

RESULTS AND DISCUSSION

Results

The study was conducted at Daycare X on July 20–24, 2026, with five children aged 3–5, coded A1–A5. The following data are presented from observations and anecdotal records covering five Montessori areas. Because this was a qualitative case study, findings describe observed behaviors rather than improvement scores or population-level characteristics. Montessori implementation at Daycare X occurred within daily learning and care routines. Observations suggested connections among lesson planning, environmental organization, teachers' roles, material use, and children's regulatory behaviors. The findings are presented below.

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Table 1. Children's Characteristics and Documented Montessori Activities

Child code	Age	Documented activities
A1	3 years	Tying shoelaces, Pink Tower, Large Movable Alphabet, Constructive Triangles, animal magnetic puzzle.
A2	4 years	Pouring water, Broad Stairs, Sandpaper Letters, Constructive Triangles, animal cards.
A3	5 years	Buttoning clothing, Large Movable Alphabet, Number Rods, animal cards.
A4	5 years	Pouring water, connectors, Large Movable Alphabet, Division Board, animal magnetic puzzle.
A5	5 years	Tying laces, Color Tablet, Golden Beads, botanical puzzle.

The activity mapping in the table follows the available observational records. Some descriptions retain the content of anecdotal notes and use activity names consistent with their narratives.

1. Planning and Implementation of Montessori Learning

Lesson planning at Daycare X went beyond deciding which activities children would undertake. The teacher prepared the environment, selected materials, and considered children's needs and developmental stages. Lesson plans guided the Montessori area, materials, objectives, and work steps. The environment was arranged before activities began so that children could locate and use materials independently. Such planning also established conditions in which behavioral regulation could be practiced

Materials on open, accessible shelves provided a clear work sequence: selecting materials, carrying them to the work area, using them, completing the activity, and returning them. Rather than merely being instructed to keep the classroom tidy, children experienced each step. This reflects Montessori's view of the learning environment as an integral part of education and a means of fostering independence (Qadafi, 2023).

Such planning can serve preventive and stimulating functions. Children need not wait continually for teacher instructions because aspects of expected behavior are communicated through the environment: materials have designated places, activities follow sequences, and freedom operates within agreed limits. Research indicates that consistent Montessori environments and practices may support independence and nonacademic outcomes (Ningsih et al., 2021; Randolph et al., 2023).

During implementation, the teacher acted as a directress by demonstrating, observing, and assisting when necessary. The teacher first modeled material use and then allowed children to try. When difficulties arose, support generally took the form of reminders or brief guidance instead of immediately taking over, enabling children to learn from experience.

Observations showed that Montessori practice at Daycare X depended on prepared materials, demonstrations, opportunities for children to experiment, and responsive assistance. Children used materials across Practical Life, Sensorial, Language, Mathematics, and Culture Studies. The recurring sequence—watching a demonstration, using materials, completing work, and tidying up—provided a recognizable structure.

Teachers provided examples and guidance as needed without routinely taking over children's tasks. For example, A1 paused when a lace did not align, A2 and A4 adjusted their movements when pouring water, and A3 tried again when a button would not fit through its hole. These

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observations illustrate assistance at moments of difficulty while preserving children's opportunities to complete their own work.

Lesson presentation was an important moment. Before using materials, children attended to the movements and sequences demonstrated by the teacher. This provided practice in resisting the impulse to pick up an object immediately and remembering newly observed steps. Such experiences may relate to inhibitory control and working memory; structured activity and active engagement are also discussed in previous Montessori research (Demangeon et al., 2023; Randolph et al., 2023).

Freedom within limits was also evident in daily activities. Children could choose work, but choices entailed rules: using materials appropriately, respecting peers' workspaces, waiting when materials were occupied, and returning materials afterward. These boundaries offered concrete experiences of delaying desires, recalling rules, and adjusting choices when circumstances differed from initial plans.

The work cycle reinforced this pattern. Children were guided to complete chosen work before moving to another activity. Some sustained attention through completion, whereas others needed gentle reminders when distracted. Repeating the choose–work–complete–tidy sequence helped establish predictable routines. Approaches targeting preschool self-regulation and executive function similarly emphasize consistent and repeated experiences (Muir et al., 2023).

Findings concerning the teacher's role indicate the importance of appropriate support. The teacher neither withdrew entirely nor dominated learning, but observed, maintained boundaries, modeled tasks, and assisted as necessary. This matters because children develop at different rates. Strengthening teacher capacity is also important for sustained Montessori implementation (Kusumawardani & Rusman, 2025).

2. Children's Activities Across the Five Montessori Areas

Table 1 summarizes individual outcomes documented in anecdotal notes. Specific behaviors are presented to avoid reducing the findings to the general assertion that Montessori trains behavioral regulation.

Table 2. Observed Children's Behaviors and Their Relationship to Behavioral Regulation Across Montessori Areas

Area/date	Child and activity	Recorded observational findings	Relationship to behavioral regulation
Practical Life 20 July	A1 – Tying shoelaces	Followed the demonstrated sequence; hesitated when the laces were misaligned, then retried after a brief reminder and completed the task.	Remembering steps, persisting through difficulty, and trying again.
Practical Life 20 July	A2 – Pouring water	Held the container carefully and poured slowly; after spilling some water, repeated the action more slowly; needed guidance to tidy materials.	Controlling movements and adjusting actions after an unsuccessful outcome.
Practical Life 20 July	A3 – Buttoning clothing	Attempted to insert buttons one at a time; after difficulty, reexamined the section and tried again with limited assistance.	Sustaining attention and repeating steps to continue.

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Practical Life 20 July	A4 – Pouring water	Followed the example, adjusted the container after water spilled, and tidied the materials with gentle guidance.	Controlling movements and adapting strategies.
Practical Life 20 July	A5 – Tying laces	Patiently followed the steps, completed work before moving on, and returned materials relatively independently.	Following the work sequence and completing the routine relatively independently.
Sensorial 21 July	A1 – Pink Tower	Stacked blocks by size; when the arrangement was inaccurate, checked again and repositioned the blocks.	Attending to details, reviewing outcomes, and correcting errors.
Sensorial 21 July	A2 – Broad Stairs	Compared the dimensions of pieces and changed the arrangement when something did not fit; continued working.	Sustaining attention and remembering the assembly sequence.
Sensorial 21 July	A4 – Konektor	Connected pieces following a demonstration; retried and repositioned them when they did not fit.	Flexibility in retrying or changing positions.
Sensorial 21 July	A5 – Color Tablet	Arranged shades from dark to light, comparing similar shades before selecting their positions.	Sustained attention and use of visual information.
Language 22 July	A1 – Large Movable Alphabet	Correctly formed the Indonesian words 'nanas' and 'cabai' and attempted to finish before changing activities.	Sustaining attention and following a work sequence.
Language 22 July	A2 – Sandpaper Letters	Repeated 'ba-bi-bu-bo' after modeling but could not independently identify the letters when asked again; needed repetition.	Sound recall and symbol recognition still required assistance and repeated practice.
Language 22 July	A3 – Large Movable Alphabet	Accurately and carefully formed 'manis' and 'asin'; continued after noticing an incorrect element.	Following steps and maintaining attention.
Mathematics 23 July	A2 – Constructive Triangles	Combined triangular pieces into a shape; checked and repositioned pieces when they did not fit.	Remembering shapes, checking outcomes, and retrying.
Mathematics 23 July	A3 – Number Rods	Counted rods from 1 to 10 and arranged a 'rod house'; was encouraged to recount when the arrangement was incorrect.	Remembering number sequences and checking accuracy.
Mathematics 23 July	A4 – Division Board	Practiced counting 1–10 and introductory addition and	Maintaining attention with support when

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		multiplication; needed support for unfamiliar calculations but retried.	concepts were challenging.
Mathematics 23 July	A5 – Golden Beads	Practiced counting tens from 10 to 90; accepted a reminder and resumed when the sequence was forgotten.	Recalling sequences and continuing after a reminder.
Culture Studies 24 July	A1 – Puzzle magnet hewan	Matched puzzle pieces by shape; checked and changed the position of pieces that did not fit.	Maintaining attention and attempting to correct work.
Culture Studies 24 July	A2 – Kartu hewan	Matched picture cards; carefully reexamined similar-looking pictures and corrected a choice with brief guidance.	Observing, recalling visual information, and adjusting choices.
Culture Studies 24 July	A3 – Kartu hewan	Named animals in pictures; needed time and simple clues for unfamiliar images before trying again.	Connecting pictures with recalled knowledge and attempting another response.
Culture Studies 24 July	A4 – Puzzle magnet hewan	Repositioned pieces that did not fit and continued without immediately asking the teacher to solve the puzzle.	Trying alternative strategies rather than abandoning the task.
Culture Studies 24 July	A5 – Puzzle botani	Assembled plant parts, attended to shapes, and corrected misplaced pieces to continue the task.	Maintaining attention, remembering forms, and correcting outcomes.

Across areas, children displayed different abilities. In Practical Life, for example, A1 and A5 attempted to complete their tasks, but A1 still needed reminders when tying steps went wrong, whereas A5 followed the sequence and returned materials relatively independently. In Language, A1 and A3 constructed words using the Large Movable Alphabet, whereas A2 imitated sounds with assistance but could not yet identify letters independently. Success in one activity therefore should not be taken to imply mastery of every regulatory or academic skill.

3. Emerging Patterns of Behavioral Regulation

Based on the available data, inhibitory control was most clearly observed in children's ability to regulate movements during work, rather than as general obedience. A2 and A4 slowed their movements while pouring water after an unsuccessful attempt; A5 did not rush away from the lace-tying activity; and children continued challenging tasks when given time. These are concrete examples of response and movement regulation. However, individual records did not consistently document waiting turns separately, so claims about turn-taking should not extend beyond the available evidence.

Working memory was indicated when children retained or reused sequences and information to continue tasks. A1 followed lace-tying steps after a demonstration; A3 counted Number Rods sequentially; A5 resumed counting tens with Golden Beads after a reminder; and

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A2 still needed repetition to recall sounds and recognize letters in the Sand Paper activity. The latter example illustrates uneven development in working memory-related task performance and letter recognition, with continued teacher assistance needed.

Cognitive flexibility was observed when children reviewed outcomes and adjusted their actions. A1 repositioned Pink Tower blocks and puzzle pieces; A4 rearranged connector materials and animal-puzzle pieces; A2 adjusted Broad Stairs and Constructive Triangles; and A4 changed the position of a container after spilling water. These behaviors provide situational evidence of trying alternative approaches, but they do not establish stable cognitive flexibility across all contexts

Tabel 3. Summary of Behavior Regulation Patterns

Dimension	Observed evidence	Variation/support needed
Inhibitory control	Regulating movements while pouring water; not immediately abandoning tasks; completing work before transitioning.	Some children still required reminders or guidance to tidy materials and continue steps.
Working memory	Following lace-tying steps; counting Number Rods 1–10; resuming Golden Beads counting from 10 to 90.	A2 could not yet recognize Sandpaper Letters independently and still needed modeling and repetition.
Cognitive flexibility	Readjusting Pink Tower blocks, Broad Stairs, connector pieces, and puzzle pieces; changing pouring strategies after spills.	Adjustments were observable in particular tasks and should not be generalized to all settings.

Discussion

Findings suggest that behavioral regulation can be observed in small actions during interaction with materials: slowing down movements, recalling steps, checking results, trying again, and completing tasks. Discussion should therefore address not only task success but also how children respond when tasks become difficult. This pattern accords with executive function as a set of capacities supporting response inhibition, information maintenance, and strategic adaptation (Diamond, 2025; Putri et al., 2024).

Practical Life activities provide the clearest link with everyday actions. Pouring water, tying laces, and buttoning clothes require movement control and sequencing. Spilled water or incorrectly positioned laces produce immediate consequences and opportunities for correction. Rather than abandoning the activity, A2 and A4 adjusted their movements or container positions following spills. This is consistent with Kamil and Asriyani's (2023) discussion of Practical Life and independence; here, field notes also document regulation during task performance.

In Sensorial activities, children compared sizes, shapes, connections, and colors. A1's Pink Tower work, A2's Broad Stairs activity, and A5's Color Tablet work demonstrate the attention to material properties and rechecking required for task completion. When outcomes were incorrect, children repositioned items or compared them again. These processes offer opportunities to use working memory and cognitive flexibility. Nevertheless, the data describe behavior during activities rather than directly measuring executive functioning.

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The Language area illustrates why outcomes must be presented individually. A1 and A3 constructed words using the Large Movable Alphabet, whereas A2 repeated 'ba-bi-bu-bo' after modeling but could not yet identify the letters when asked again. Imitating sounds or following a model is not equivalent to independently remembering and recognizing symbols. A2 therefore required consistent repetition, scaffolded questions, and pressure-free practice. This should be interpreted as a developing ability at the time of observation, not as failure.

In Mathematics, concrete materials enabled children to connect quantities, sequences, and shapes with direct actions. A3 counted Number Rods from 1 to 10 and arranged them into a 'rod house'; A5 practiced tens from 10 to 90 with Golden Beads. A3's need to recount after an incorrect arrangement and A5's need for reminders after forgetting a sequence show that remembering and checking are part of learning. A4 continued Division Board work while still requiring guidance on unfamiliar counting concepts. Outcomes should therefore consider how children persist when answers are not immediately correct, not only answer accuracy.

In Culture Studies, animal magnetic puzzles, animal cards, and botanical puzzles required visual matching and recall of shapes or names. A2 reexamined similar-looking cards, A3 needed simple clues to name unfamiliar animals, and A4 repositioned puzzle pieces when they did not fit. These activities provided opportunities to practice attention and strategic adjustments. Again, these behaviors indicate opportunities for regulation practice, not evidence that Montessori alone caused improvements.

Overall, the findings suggest that organized environments, concrete materials, freedom within limits, and support that does not immediately take over children's work can foster opportunities to regulate behavior. Randolph et al. (2023) systematically reviewed Montessori education in relation to academic and nonacademic outcomes, while Qadafi (2023) emphasized child-centered learning. This case study contributes a process-level account: opportunities to regulate behavior occurred through concrete work sequences and varied by child. Because the study involved one daycare, five children, and five observation days, its findings cannot establish causal effectiveness or support statistical generalization.

Practically, teachers can allow children to try independently before intervening, offer brief reminders when needed, and avoid completing tasks prematurely on their behalf. Documentation should record not only whether a task was finished but also the steps performed independently, the type of help provided, responses to errors, and attempts to retry. Such records distinguish relatively independent skills from those still requiring support.

CONCLUSION

This study indicates that implementing the Montessori approach at Daycare X created opportunities for children aged 3–5 to learn behavioral regulation through everyday experiences. Planning involved preparing the environment, selecting materials, organizing activities, and offering freedom within clear boundaries. Implementation included demonstrations, opportunities for independent work, teacher observation, proportionate guidance, and repeated work cycles. The five Montessori areas—Practical Life, Sensorial, Language, Mathematics, and Culture Studies—offered different yet complementary experiences for practicing attention, order, independence, and task completion.

Regulation observed during learning included inhibitory control, working memory, and cognitive flexibility. Children demonstrated behaviors such as waiting, following rules, recalling steps, sustaining attention, completing work, trying again, and adapting strategies when encountering difficulties. These abilities did not develop uniformly across children, so teacher support remains essential, provided it does not take over children's work. Daycare X should

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maintain a consistent and orderly Montessori environment. Teachers are encouraged to allow children to attempt, make mistakes, correct, and complete tasks independently. Consistency between daycare and home routines may help children apply behavioral regulation in broader contexts. Future studies could involve more institutions or alternative research designs to provide a broader understanding of the relationship between Montessori practices and behavioral regulation development in early childhood.

REFERENCES

Afifah, D. N., & Kuswanto, K. (2020). Membedah pemikiran Maria Montessori pada pendidikan anak usia dini. *Pedagogi: Jurnal Anak Usia Dini dan Pendidikan Anak Usia Dini*, *6*(2), 57-67. https://doi.org/10.30651/pedagogi.v6i2.4950

Blair, C., & Raver, C. C. (2015). School readiness and self-regulation: A developmental psychobiological approach. *Annual Review of Psychology, 66*(1), 711–731. https://doi.org/10.1146/annurev-psych-010814-015221

Courtier, P., Gardes, M.-L., Van Der Henst, J.-B., Noveck, I. A., Croset, M.-C., Epinat-Duclos, J., Léone, J., & Prado, J. (2021). Effects of Montessori education on the academic, cognitive, and social development of disadvantaged preschoolers: A randomized controlled study in the French public-school system. *Child Development, 92*(5), 2069–2088. https://doi.org/10.1111/cdev.13575

Demangeon, A., Claudel-Valentin, S., Aubry, A., & Tazouti, Y. (2023). A meta-analysis of the effects of Montessori education on five fields of development and learning in preschool and school-age children. *Contemporary Educational Psychology, 73*, 500–525. https://doi.org/10.1016/j.cedpsych.2023.102182

Diamond, A. (2025). Insights from a career at the border of developmental psychology and cognitive neuroscience. *Annual Review of Developmental Psychology, 7*(1), 1–40. https://doi.org/10.1146/annurev-devpsych-010923-114435

Furwanti, E., Krismayanti, Y., Apriani, N., Listia, Y. B., & Sofiah, Y. S. (2026). The role of Montessori learning assessment in early childhood education 3–6 years old. *Socius: Jurnal Penelitian Ilmu-Ilmu Sosial, 3*(9), 71–78. https://doi.org/10.5281/zenodo.19601567

Kamil, N., & Asriyani, S. (2023). Analisis penerapan metode Montessori pada aspek kemandirian anak melalui kegiatan pembelajaran practical life. *Jurnal Buah Hati, 10*(1), 1–15. https://doi.org/10.46244/buahhati.v10i1.2098

Kusumawardani, D. A., & Rusman, R. (2025). Contextualized Montessori teacher training: A learning impact evaluation. *Curricula: Journal of Curriculum Development, 4*(2), 1093–1106. https://doi.org/10.17509/curricula.v4i2.86718

Lillard, A. S., Loeb, D., Berg, J., Escueta, M., Manship, K., Hauser, A., & Daggett, E. D. (2025). A national randomized controlled trial of the impact of public Montessori preschool at the end of kindergarten. *Proceedings of the National Academy of Sciences, 122*(43), 1390–1500. https://doi.org/10.1073/pnas.2506130122

McClelland, M. M., Kenny, S. A., Didrichsen, S., Herrera, P. N., Halliday, S. E., Ahmadi, A., & Cameron, C. E. (2026). HTKS measure of executive function and self-regulation: Two decades of progress in early childhood measurement. *Frontiers in Psychology, 17*, 1590–1600. https://doi.org/10.3389/fpsyg.2026.1801156

TUNAS SILIWANGI
P-ISSN : 2476-9789 E-ISSN: 2581-0413
Volume. 12, Number. 2, October 2026

Muir, R. A., Howard, S. J., & Kervin, L. (2023). Interventions and approaches targeting early self-regulation or executive functioning in preschools: A systematic review. *Educational Psychology Review, 35*(1), 45–50. https://doi.org/10.1007/s10648-023-09740-6

Ningsih, S., Wiyono, B. B., & Atmoko, A. (2021). Implementasi model pembelajaran Montessori dalam membentuk karakter disiplin anak usia dini. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan, 6*(2), 292–299. https://doi.org/10.17977/jptpp.v6i2.14503

Puspitaloka, V. A., Azizah, S. N., & Irbah, A. N. (2026). Peran metode Montessori dalam mengembangkan kemandirian anak usia dini: Studi literatur. *Early Stage, 4*(1), 20–31. https://doi.org/10.56997/earlystage.v4i1.2838

Putri, A. R., Djuwita, E., & Wiswanti, I. U. (2024). The role of age and imaginative play as predictors of cognitive flexibility in preschool-aged children. *Journal of Family Sciences, 67*(2), 86–98. https://doi.org/10.29244/jfs.vi.49946

Qadafi, M. (2023). Metode Montessori: Implikasi student-centred learning terhadap perkembangan anak di PAUD. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 7*(3), 2961–2976. https://doi.org/10.31004/obsesi.v7i3.3323

Randolph, J. J., Bryson, A., Menon, L., Henderson, D. K., Kureethara Manuel, A., Michaels, S., Rosenstein, D. L. W., McPherson, W., O'Grady, R., & Lillard, A. S. (2023). Montessori education's impact on academic and nonacademic outcomes: A systematic review. *Campbell Systematic Reviews, 19*(3), 800–830. https://doi.org/10.1002/cl2.1330

Saputra, E. E. (2025). The impact of Montessori based learning on early childhood cognitive and social development. *Jurnal E-MAS (Edukasi dan Pembelajaran Anak Usia Dini), 1*(1), 13–22. https://doi.org/10.64690/e-mas.v1i1.28

Suteki, S. R. S., Hasanah, F., & Hidayati, N. (2025). Analysis of the impact of the Montessori model in early childhood education. *Islamic EduKids: Jurnal Pendidikan Anak Usia Dini, 7*(1), 460–500. https://ftkjournal-uinmataram.id/index.php/IEK/article/view/13269