



BRIDGING LEARNING GAPS IN ADDRESSING COGNITIVE DEFICITS THROUGH DEVELOPMENTALLY APPROPRIATE PRACTICES IN PRESCHOOL EDUCATION

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ABSTRACT

The study explored cognitive learning difficulties in preschool pupils, how often teachers use Developmentally Appropriate Practices (DAP), and the extent to which these practices affect therapies for the identified cognitive limitations. The results showed that the most frequent cognitive difficulties were in memory skills, followed by problem-solving and attention span. Teachers were more likely to use Language and Literacy Development and Individualized Learning DAPs, but less likely to use Play-based and Nature-based Learning and Social and Emotional Development DAPs. The study indicated that DAP adoption had a small positive effect on all cognitive regions, with the largest increase in problem-solving and processing speed. The effect of the DAP application on memory and attention varied across learners, suggesting the need for more specific interventions. Additionally, DAP frequency was not associated with effectiveness, indicating that quality and intentionality of implementation are more significant. The study recommends a systematic and intentional process for implementing the DAP that specifically targets those highly salient cognitive skills—memory, attention, problem-solving, and executive functioning. An overwhelming emphasis on academics rather than play, full child development, and socio-emotional development requires teachers to be prepared through professional learning to take a more appropriate and comprehensive stance to instruction. DAP has a generally positive effect on cognitive development. However, the moderate effect supports the need for more teacher training in individualized, evidence-based ways to meet specific cognitive requirements. The results suggest adding tailored, customized, multimodal therapy to standard DAP to treat persistent attention problems. The study stresses that DAP success depends on quality and intended application, not just frequency of use.

KEYWORDS: developmentally appropriate practices (DAP), cognitive gaps, memory skills, attention span, problem-solving skills, executive functioning, early childhood education, play-based learning, individualized learning

I. INTRODUCTION

A significant period for fostering children's thinking skills and building basic learning skills begins when they start formal learning. Nevertheless, some children enter the early years of school having a gap in their learning due to a variety of early childhood experiences, environmental circumstances, input for oral languages, and the chances to be exposed to literacy as literacy is perceived to be the first aspect that many children miss or have delays in their early learning (Nazilah et al., 2022).

Developmentally Appropriate Practices (DAP) are child-friendly, child-centered learning approaches that are responsive to children's developmental capacities and individual differences. Such approaches can also include child-centered, playful practices, concrete experiences, language-based learning, social-emotional development, and physical activities.

This study investigates the potential benefits of DAP in bridging cognitive learning gaps among preschool learners, drawing on Piaget's Cognitive Development Theory, Cognitive Load Theory, and Constructivist Theory. It examines observed gaps in memory skills, attention span, problem-solving abilities, processing speed, concept recognition, and executive functioning; teachers' frequency of DAP usage in play-based, nature-based, language and literacy, social-emotional and physical development; and the perceived influence of such practices in addressing identified gaps based on the Input–Process–Output (IPO) Model.

This research was conducted at Britus International School and Abdulrahman Kanoo International School in Bahrain during School Year 2024-2025, using a descriptive quantitative approach. Preschool teachers were selected as participants by cluster sampling. Data were collected via a questionnaire prepared by the researcher. The study was limited to teachers' observations and the variables examined in the investigation. The findings are meant to enlighten teachers, parents, school administrators, legislators, and future researchers and provide a foundation for an action plan to improve the implementation of DAP and encourage more responsive preschool education.

1.1 Statement of the Problem

1. What cognitive learning gaps are most observed among preschool learners in terms of memory skills, attention span, problem-solving abilities, processing speed, concept recognition, and executive functioning?
2. How frequently do teachers utilize developmentally appropriate practices (DAP) in terms of play-based learning, nature-based learning, language and literacy development, social and emotional development, and physical development?
3. To what degree do the developmentally appropriate practices (DAP) implemented by teachers influence the addressing of cognitive learning gaps among preschool learners in terms of memory skills, attention span, problem-solving abilities, processing speed, concept recognition, and executive functioning?



4. Is there a significant difference in the degree of influence of DAP in addressing cognitive learning gaps when grouped according to the most observed cognitive gaps among preschool learners?
5. Is there a significant relationship between the frequency of teachers' utilization of DAP and its degree of influence in addressing cognitive learning gaps among preschool learners?
6. What action plan may be developed based on the findings of the study?

2. REVIEW OF RELATED LITERATURES AND STUDIES

Preschool children show signs of cognitive learning problems (working memory, attention, problem solving, data processing, concept identification, and executive functioning). These skills are important determinants of preparation for school success and subsequent learning.

Movement and experiential learning activities may also boost children's cognitive development. Long-term physical activity, particularly activities that require higher levels of coordination, may benefit working memory in children and adolescents, according to a review of data on exercise and working memory during development by Ludyga et al. (2022). This finding implies that developmentally appropriate movement-based and physical activities may give children opportunities to enhance cognitive processes related to learning and memory.

Along with cognitive skills, problem-solving is another skill to develop during the preschool years. Children tackle these problems, often through play, using their surroundings to find solutions (Anggoro et al., 2021). Similar research by Holmes et al. (2021) noted an association between learning and processing speed, as well as differences in processing speed between children with learning disabilities and average students; as such, more independent searching and problem-solving should be part of the task for students.

Meaningful application tasks can also promote the growth of conceptual and logical thinking. Lamrani and Abdelwahed (2020) propose using touch-based materials, interactive games, and inquiry learning activities to reinforce concepts. Gibb et al. (2021) also observed improved working memory retention, less set shifting, and increased response inhibition in children/adolescents who play video games. Preschoolers lack many mental processing skills, such as working memory, attention, processing speed, problem-solving, concept formation, and executive functioning.

The literature reviewed indicates that play-based, fun, tactile, age-appropriate experiences are critical opportunities to practice these skills. However, few studies have examined these cognitive skills within a combined DAP framework in Filipino preschoolers. This highlights a research gap regarding developmentally appropriate interventions to address learning deficits and close early childhood learning gaps.

Developmentally appropriate practice (DAP) is a strength-based, play-centered, and culturally responsive teaching style

that considers children's specific developmental levels, needs, and sociocultural situations (NAEYC, 2020). Despite the positive effects of DAP implementation, teachers struggled to implement it. In research on standards implementation, Lockett (2025) found that teachers recognized the difficulty of applying the standards in ways consistent with children's developmental level and emphasized the importance of professional training in DAP implementation. In research conducted in the Philippines, Tariman (2022) found that teacher participants considered DAP important and that implementation levels correlated with children's reading scores.

Early literacy and language services are vital in preparing children for formal instruction because early literacy skills strongly predict later reading and writing ability (Majorano et al., 2021). In addition, the results show that a wealth of learning experiences (reading, playing, and so on) is associated with the development of literacy, cognitive, social-emotional, motor, and executive functions among young children (Cuartas et al., 2023). In fact, evidence suggests that levels of self-regulation and executive functioning may differ among young children even before they enter kindergarten, making responsive, early-intervention schooling even more crucial (Cuartas et al., 2022).

In the Philippines, Cabaluna and Paragua (2023) discovered that language is a key developmental concern among preschool children. Similarly, Biino et al. (2021) reported that cognitively enriched physical activity may foster motor competence and executive-function-related outcomes in preschool children. Taken together, these studies indicate that DAP can promote children's cognitive, language, social-emotional, and physical development through play, experiences, literacy activities, and physical activity.

However, much of the extant evidence focuses on particular components of early childhood learning in isolation, rather than on DAP as an integrated approach to addressing multiple cognitive learning gaps. Moreover, empirical studies on the integrated implementation of DAP for preschool learners in the Philippine context remain scarce. This study thus investigates DAP as an integrated, learner-responsive technique for addressing cognitive learning gaps among preschool learners.

II. RESEARCH METHODOLOGY

Research Design

The study utilized a descriptive quantitative research design with a survey method. This approach was suitable for explaining observed cognitive learning gaps among preschool learners, establishing teachers' use of developmentally appropriate practices (DAP), and investigating the influence and interactions among the study variables (Fluet, B. 2021). The researcher gathered data through a questionnaire based on teachers' observations and assessments.

Population and Sampling

The study used cluster sampling to select preschool teachers from the selected schools in Bahrain during School Year 2024–2025.



Respondents of the Study

The respondents were 150 preschool teachers from Britus International School and Abdulrahman Kanoo International School in Bahrain who implemented developmentally appropriate practices to address preschool learners' cognitive learning gaps.

Research Instrument

A researcher-developed questionnaire was used to collect the data. It consisted of three parts. Part I identified commonly observed cognitive learning gaps in terms of memory, attention, problem-solving, processing speed, concept recognition, and executive functioning. Part II measured how often teachers used DAP in play-based learning, nature-based learning, language and literacy development, social-emotional development, and physical development. Part III determined the perceived influence of DAP in addressing cognitive learning gaps.

Validation of the Instrument

Professors with expertise evaluated the questionnaire for content validity. The researchers included their recommendations in the final instrument. The researchers conducted a pilot test and examined the questionnaire's reliability using Cronbach's alpha.

III. RESULTS AND DISCUSSION

Cognitive gaps in learning most observed among preschool learners in terms of memory skills, attention span, problem-solving abilities, processing speed, concept recognition, and executive functioning.

Table 1

The most observed cognitive learning gap among preschool learners.

Most Observed Cognitive Learning Gap	Rank						Total
	1	2	3	4	5	6	
Memory Skills	48	10	19	28	17	28	150
Attention Span	30	22	15	34	26	23	150
Problem-Solving Abilities	33	42	28	16	15	16	150
Processing Speed	18	49	45	24	7	7	150
Concept Recognition	14	13	28	25	40	30	150
Executive Functioning	7	14	15	23	45	46	150

Table 1 indicates the cognitive gaps most observed among preschool learners in Memory Skills, Attention Span, Problem-Solving Abilities, Processing Speed, Concept Recognition, and Executive Function.

The results show that the most common cognitive learning deficit in preschoolers was memory, with 48% (48) of the 150 observations rated by the teacher as having this deficit, closely followed by problem-solving skills and attention span. The

Data Gathering Procedure

The researcher sought permission from the schools involved before conducting the study. After approval, the researcher sent request and consent letters to school heads and received their responses. The researcher gave them the questionnaire and instructed them to complete it within the next two weeks. The collected questionnaires were collated, coded, and analyzed using the Statistical Package For The Social Sciences (SPSS) to conclude, make recommendations, and develop a program of action to effectively enhance the DAP in pre-school.

Statistical Treatment

The following statistical tools were used in analyzing the data. Frequency and percentage were used to identify the commonly observed cognitive learning gaps and the frequency of teachers' use of developmentally appropriate practices (DAP). The weighted mean was used to determine the degree of DAP's influence in addressing cognitive learning gaps. A paired-samples t-test was employed to determine whether significant differences existed in the perceived influence of DAP across the identified cognitive learning gaps. Finally, Pearson's r was used to determine the significant relationship between the frequency of DAP use and its perceived influence in addressing cognitive learning gaps.

deficit was lowest among the executive function categories. These findings strongly suggest the need for developmentally appropriate practice that focuses on enhancing memory skills, attention span, problem-solving ability, and executive functioning skills through routine, play, direct instruction, and repetition. Other studies also support the importance of early learning skills such as memory, attention, and problem-solving in enhancing later learning and school success (Zhou et al., 2021).

Table 2

Frequency of utilizing developmentally appropriate practices (DAP) by teachers among preschool learners

Developmentally Appropriate Practices (DAP)	Daily	Thrice (3x) a Week	Twice (2x) a Week	Once (1x) a Week	Never	Total
Play-based Learning	38	15	97	0	0	150
Individualized Learning	86	47	17	0	0	150
Nature-based Learning	41	24	85	0	0	150
Language and Literacy Development	94	31	24	1	0	150
Social and Emotional Development	39	27	84	0	0	150
Physical Development	58	16	13	63	0	150



Table 2 illustrates the frequency with which preschool teachers employ different developmentally appropriate practices (DAP).

Results showed that Language and Literacy Development was the most used DAP (94 of 150 teachers reported daily use), followed by Individualized Learning (86) and Physical Development (58). Play-based Learning, Nature-based Learning, and Social and Emotional Development, by contrast, were more often applied monthly. The results show a disparity

in the frequency of use of all DAP domains. This speaks to the importance of teaching as a means of more readily integrating play, play-based academic activities, movement, and Social and Emotional Learning for each child's growth and development. Interventions that link academic learning with extracurricular activities, including play, sports, and socioemotional activities, correlate with the development of executive functioning, self-control, and school readiness. (McClelland et al., 2023)

Composite Mean on the degree of influence of the teachers' developmentally appropriate practices (DAP) in addressing cognitive gaps in learning among preschool learners in terms of memory skills, attention span, problem-solving abilities, processing speed, concept recognition, and executive functioning.

Table 3

Composite table on the degree of influence of the developmentally appropriate practices (DAP) implemented by the teachers in addressing cognitive gaps in learning among preschool learners

	Mean	Std. Deviation	Verbal Interpretation
Memory Skills	3.39	0.23	Moderate Influence
Attention Span	3.40	0.25	Moderate Influence
Problem-Solving Abilities	3.46	0.24	Moderate Influence
Processing Speed	3.45	0.25	Moderate Influence
Concept Recognition	3.36	0.23	Moderate Influence
Executive Functioning	3.41	0.21	Moderate Influence
Degree of Influence of the Developmentally Appropriate Practices	3.41	0.10	Moderate Influence

Legend: 4 (3.50 - 4.00) – Highly Influenced 2 (1.50 - 2.49) – Low Influenced
3 (2.50 - 3.49) – Moderately Influenced 1 (1.00 - 1.49) – No Influence

Table 3 indicates a moderate perceived influence of developmentally appropriate practices (DAP) on the observed cognitive learning gaps (composite mean = 3.41). The average score of 3.39 for memory skills suggests that DAP may help children retain knowledge through play-based, interactive learning experiences. This is consistent with Vidal Carulla et al. (2021), who examined the development of preschool children's executive functions through play-based learning and suggested that play-based experiences can improve working memory and other executive-function skills. The average for attention span was 3.40, again indicating a moderate perceived impact. This might be related to children's participation in stimulating, immersive, and nature-based activities. However, Johnstone et al. (2022) had mixed results regarding the cognitive consequences of nature-based early childhood education. This implies that the quality and characteristics of the learning activities may influence children's cognitive development.

DAP also supports opportunities for playful learning, discovery, inquiry, open-ended inquiry, creativity, and real-value learning. This is backed up by a higher mean score of 3.46 in the cognitive domain of problem solving. Through play and research, a kid may see, question, choose, and find solutions in relevant circumstances. Likewise, Anggoro et al. (2021) discovered that games and learning settings help young children develop problem-solving skills.

The average of 3.40 on processing speed suggests a moderate effect of DAP. This shows that activities designed for specific developmental levels provide hands-on, active, and age-appropriate ways for children to process information and

engage in learning activities. Instead of quick replies, DAP lets children focus on information, understand directions, and generate appropriate responses at their developmental level. This is corroborated by Holmes et al. (2021), who found a link between learning and processing speed and observed disparities in processing speed between children with learning challenges and generally developing children.

The 3.36 average for concept recognition is the lowest among the cognitive domains, though still within the moderate range. This finding suggests that DAP may support children's conceptual understanding through concrete, experiential, and interactive learning experiences. In addition, Johnstone et al. (2022) found that nature-based early childhood education might promote children's cognitive development, although the effects differed across cognitive domains and learning settings.

The mean of 3.41 for executive functioning indicates a moderate reported effect across the domains of self-regulation, working memory, attentional control, and task Management. These findings add to the growing body of evidence showing that play-based and developmentally appropriate learning experiences provide opportunities for children to practice and build executive function skills. Overall, the results suggest that DAP provides engaging, developmentally appropriate, experiential learning experiences for preschool children that may boost cognitive development in several domains.

Significant difference in the Degree of influence of the teachers' developmentally appropriate practices (DAP) in addressing cognitive gaps in learning when grouped



according to the most observed cognitive gaps among preschool learners.\

Table 4 illustrates the significance of differences in the influence of developmentally appropriate practices (DAP) across various cognitive domains among preschool learners.

The results show that developmentally appropriate practices (DAPs) affected different cognitive domains in different ways. We accepted the null hypothesis for both memory skills ($p = .348$) and attention span ($p = .606$) because we observed no statistically significant differences across DAPs. Problem-solving, processing speed, concept identification, and executive functioning all showed significant differences ($p < .001$). The successful implementation of DAP programs may depend on the specific task. Reported in support of previous research in

the preschool setting, which noted that a child's cognitive development, as well as physical movement led by adults, improves aspects of the child's self-regulation and executive functions, and delivery style (intensity, activity type) is important (Muir et al., 2023).

The findings also suggest that the effects of DAPs are not consistent across all cognitive domains. For example, a study on guided play found improvements for task-switching, a measure of executive functioning, but not for all cognitive and developmental outcomes (Skene et al., 2022). In this situation, teachers might need to modify developmentally appropriate exercises to meet students' unique cognitive needs, particularly in memory and attention skills, which may require more specialized instructional support.

Table 4

Test of significant difference in the degree of influence of the developmentally appropriate practices (DAP) implemented by the teachers in addressing cognitive gaps in learning when grouped according to the most observed cognitive gaps in learning among preschool learners

	t	df	Sig. (2-tailed)	Decision	Remark
Memory Skills - Degree of Influence of the Developmentally Appropriate Practices	-0.942	149	0.348	Accept	Not Significant
Attention Span - Degree of Influence of the Developmentally Appropriate Practices	0.517	149	0.606	Accept	Not Significant
Problem-Solving Abilities - Degree of Influence of the Developmentally Appropriate Practices	-3.838	149	0.000	Reject	Significant
Processing Speed - Degree of Influence of the Developmentally Appropriate Practices	-5.702	149	0.000	Reject	Significant
Concept Recognition - Degree of Influence of the Developmentally Appropriate Practices	4.768	149	0.000	Reject	Significant
Executive Functioning - Degree of Influence of the Developmentally Appropriate Practices	8.846	149	0.000	Reject	Significant

Significant relationship between the frequency of teachers utilizing developmentally appropriate practices (DAP) and the degree of influence in addressing cognitive gaps in learning among school learners.

Table 5 presents the Pearson correlation coefficients between teachers' frequency of use of developmentally appropriate practices (DAP) and their degree of influence in addressing cognitive gaps among preschool learners.

Results indicate small, statistically nonsignificant relationships between all DAPs, including play-based learning ($r = .034$, $p =$

$.338$), customized learning ($r = -.055$, $p = .250$), and the other practices. It implies that the Extent to which teachers used DAPs was not significantly linearly connected to their perceived effectiveness in addressing cognitive outcomes among preschool learners. Thus, increasing the frequency of DAP implementation may not necessarily increase perceived impacts, suggesting that other criteria such as the appropriateness and quality of implementation, may also be essential.



Table 5

Correlation between the frequency of utilizing developmentally appropriate practices (DAP) by the teachers and their degree of influence in addressing cognitive gaps in learning among school learners

		Degree of Influence of the Developmentally Appropriate Practices
Play-based Learning	Pearson Correlation	0.034
	Sig. (1-tailed)	0.338
	N	150
Individualized Learning	Pearson Correlation	-0.055
	Sig. (1-tailed)	0.250
	N	150
Nature-based Learning	Pearson Correlation	0.054
	Sig. (1-tailed)	0.256
	N	150
Language and Literacy Development	Pearson Correlation	0.044
	Sig. (1-tailed)	0.296
	N	150
Social and Emotional Development	Pearson Correlation	0.033
	Sig. (1-tailed)	0.345
	N	150
Physical Development	Pearson Correlation	0.069
	Sig. (1-tailed)	0.200
	N	150

The lack of statistically significant associations further implies that regular usage of DAP does not necessarily assure successful implementation. Teachers may use activities that support development, but their effectiveness may depend on how well they meet children's developmental needs and fit classroom contexts. This interpretation is also supported by Lockett (2025), who found that teachers had difficulty implementing standards in developmentally appropriate ways, highlighting the importance of teachers' knowledge and professional preparation in translating standards into appropriate classroom practices. The notes that DAP is not merely a matter of increasing the use of particular teaching approaches, but should instead be responsive to children's unique development, strengths, interests, and sociocultural situations. Thus, professional development should focus not only on the frequency of DAP use but also on teachers' capacity to apply these practices appropriately, thoughtfully, and responsively to learners' cognitive needs. (NAEYC, 2020)

Action plan may be developed based on the findings of the study

I. RATIONALE

This action plan aims to strengthen the implementation of Developmentally Appropriate Practices (DAP) in kindergarten classes, with the expectation of improving learners' cognitive abilities and academic achievement. This strategy includes capacity building for teachers, LAC, and parent involvement, coupled with data-based monitoring, to ensure it results in contextually grounded and stimulating activities for learners. The program supports the constitutional right to excellent education. It is consistent with RA 10157, or the Kindergarten Education Act, and DepEd policy on developmentally appropriate, relevant, and meaningful early childhood education. It aims to improve the quality of DAP implementation and equip kindergarten learners with a strong foundation for lifelong learning.

Objectives/Target	Strategies/Activities	Time Frame	Budget Allocation	Person(s) Involved	Expected Output
Improve DAPs' quality and contextual relevance, targeting memory skills and attention span.	- Conduct LAC (Learning Action Cell) sessions on brain-based and mindfulness strategies	Q2 of SY 2025 - 2026	Php 15,000 (training kits, meals, materials)	Kindergarten Teachers, School Heads, EPS in Kinder, LAC Coordinators	Increased learner engagement and retention in memory- and attention-related activities
	- Integrate local culture and Indigenous materials in DAPs				
	- Develop visual and routine-based memory aids				



Enhance implementation of DAPs in problem-solving, processing speed, concept recognition, and executive functioning.	- Create DAP Resource Banks aligned with MELCs and 21st Century Skills	Throughout SY 2025 - 2026	Php 20,000 (instructional materials, teacher incentives)	Teachers, Curriculum Implementation Division (CID), LR Coordinators	Observable improvement in learners' cognitive functions through performance-based tasks
	- Integrate play-based critical thinking tasks, open-ended activities, and sensory games				
	- Use contextualized ECCD Checklists to monitor skill development				
Shift teacher mindset from frequency to intentionality and purpose in DAP use.	- Introduce DAP Lesson Design Templates focusing on objective alignment	Q1–Q3 of SY 2025 - 2026	Php 10,000 (printing, demo resources)	Master Teachers, District Supervisors, School LAC Coordinators	Quality-driven and learner-focused classroom planning and implementation
	- Include reflective journaling as part of teacher IPCRF/E-SAT				
	- Showcase model DAP sessions via INSET or District Demonstrations				
Strengthen Monitoring and Evaluation (M&E) of DAPs based on learning outcomes rather than activity count.	- Use DAP Implementation and Impact Toolkits (pre/post checklists)	Quarterly (SY, 2025)	Php 5,000 (forms, observation guides)	School Heads, Kindergarten Coordinators, EPS in Kinder	Data-driven instruction and adjustment in DAP selection and usage
	- Integrate DAP effectiveness reflection prompts in SF7/KRA5 documentation				
	- Schedule quarterly DAP Classroom Observations				
Foster parental involvement and home reinforcement of DAPs.	- Conduct Parent Orientation on Home-Based DAPs	Monthly	Php 8,000 (kit materials, IEC production)	Teachers, Homeroom PTA Officers, SGOD Representatives	Strengthened home-school collaboration in supporting learners' cognitive growth
	- Distribute DAP Activity Kits using recycled/Indigenous materials				
	- Encourage home journaling for concept recognition and problem-solving				
Facilitate follow-up research and action planning at	- Analyze school-based learner data to refine classroom interventions	End of SY 2025 - 2026	Php 5,000 (data tools, research write-shop)	School Research Committees, Division	Evidence-based enhancements in SIP and AIP



the school/division level.	- Present results in District/Division Research Congress			Research Coordinators	for early childhood programs
	- Update the School Improvement Plan (SIP) with cognitive-focused interventions				

IV. SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary of Findings

Preschool learners showed the greatest cognitive deficiencies in memory and attention and had varying degrees of difficulty with problem-solving, processing speed, concept recognition, and executive functioning. The most commonly adopted areas of teaching were language and literacy development, individualized instruction, and physical development. Play-based, nature-based, and social-emotional therapies were employed less frequently. Overall, DAPs had a moderately favorable effect on cognitive development, especially in problem-solving and processing speed. However, DAPs did not significantly affect memory and attention, and the frequency of their implementation was not significantly related to perceptions of their effect on cognitive growth. The statistics suggest that the quality, appropriateness, and conscious use of DAPs may be more relevant than the frequency of DAP use. The results led to the suggestion of an action plan that aims at boosting teachers' competence, contextualizing DAP implementation, increasing parental engagement, and fostering data-informed monitoring and continuous improvement.

Conclusions

Findings indicate the importance of purposeful, differentiated, and learner-responsive approaches to meet the breadth of cognitive needs for successful DAP implementation. DAPs assist several areas of cognitive development, but may not be sufficient to address memory and attention deficits without specific interventions. To support the whole child's development, educators need to mix cognitive, physical, play-based, nature-based, and social-emotional routines. The lack of a strong correlation between implementation frequency and perceived influence also indicates a need for higher implementation quality, greater relevance, and more intentional instructional design.

Recommendations

Educators must use evidence-based, differentiated, and high-quality DAPs that are responsive to every child's unique cognitive profile - e.g., working memory, attention, problem solving, and executive functions. Schools need to facilitate collaborative learning through LA sessions, provide relevant instructional materials and ongoing professional support, and encourage learning beyond the classroom through monitored follow-up, while involving parents and establishing clear indicators of success and impact measures for the action plan.

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