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### Play-Based Design Materials for Kindergarten Learners

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#### Abstract

This study developed and investigated the effectiveness of play-based instructional materials in improving the fine motor, self-help, and cognitive skills of 27 kindergarten learners of Antongalon Elementary School. It utilized a descriptive developmental evaluation research design approach in designing play-based design materials aligned with the developmental needs of kindergarten learners. The developed materials were validated by five experts from the Department of Education (DepEd) Butuan City Division, using the standard validation and evaluation tool, the Early Childhood Care and Development (ECCD) Checklist. Results of the validation indicated that the play-based instructional materials were valid, appropriate and reliable for use with kindergarten learners. Based on the scores given by the experts, the mentioned play-based materials were valid and reliable. The pretest results showed that the majority of the learners manifested delays in their development in terms of fine motor, self-help, and cognitive skills. After the implementation of the play-based instructional materials, the posttest results revealed that most learners progressed to an average level of development, while some were classified as having slightly advanced and highly advanced levels. Furthermore, paired t-test results revealed a statistically significant improvement in the learners' fine motor, self-help, and cognitive skills after exposure to the play-based instructional materials. This study provides empirical evidence that play-based learning materials are an effective pedagogical tool for enhancing the analytic development of kindergarten learners.

**Keywords:** Cognitive Skills, ECCD, Fine-Motor Skills, Play-Based, Self-Help

#### Introduction

Play is an essential part of early childhood education because it supports children's holistic development. It provides opportunities for young learners to explore, interact, solve problems, communicate, and develop cognitive, social-emotional, language, physical, and creative skills. Play-based learning materials can further promote curiosity, creativity, active participation, and meaningful learning experiences.

In the Philippines, the Department of Education (DepEd) recognizes play as an important approach in kindergarten education. The Kindergarten Curriculum emphasizes child-centered and developmentally

appropriate learning experiences. However, teachers often encounter difficulties in providing sufficient play-based materials that are affordable, culturally appropriate, and suited to learners' needs.

This study was conducted to address the need for developmentally appropriate and accessible play-based materials for kindergarten learners. Designing and developing such materials may provide teachers with additional resources that can support active participation, skill development, and meaningful learning through play. The study also determines how the developed materials can support learners' performance in selected developmental areas and identify aspects to improve based on the learners' performance.

The use of locally available resources may help address these challenges while allowing children to connect classroom learning with their familiar environment and experiences. Play-based learning is especially valuable in kindergarten because children learn effectively through active and hands-on experiences. Through play, learners can develop foundational literacy and numeracy skills, fine motor coordination, communication, problem-solving, and self-help abilities.

The present study is centered on the development of play-based learning materials for kindergarten learners aged 4–6 years old at Antongalon Elementary School. It specifically addresses identified learning needs in foundational literacy, numeracy, and self-help skills. The Kindergarten Curriculum Guide and the Early Childhood Care and Development (ECCD) Checklist served as references in identifying learners' needs and ensuring that the materials are developmentally appropriate and aligned with learning standards.

The developed materials were focused on the cognitive, fine motor, and self-help domains. Through these materials, learners were provided with meaningful opportunities to practice foundational skills through enjoyable and purposeful play. Overall, the study sought to develop play-based learning materials that are developmentally appropriate, locally relevant, and aligned with kindergarten standards.

## **Review of Related Studies**

This section presents related literature and studies focusing on the importance, design, implementation, and challenges of play-based learning materials for kindergarten learners.

Play-based learning has increasingly been recognized as a developmentally appropriate approach for kindergarten learners because it combines purposeful learning with children's natural inclination to explore, manipulate, imagine, communicate, and solve problems. Recent scholarship describes play-based learning as a multidimensional approach that can support cognitive, academic, social-emotional, language, physical, and self-regulation outcomes when play experiences are intentionally designed and supported by teachers.

Mohammed et al. (2026), in a scoping review of 51 studies involving children aged four to six, found evidence that play-based learning contributes to cognitive, academic, and socio-emotional development while also supporting independence and problem-solving. Similarly, Yee et al. (2022) concluded from a systematic review that learning through play is particularly appropriate for kindergarten because it corresponds with young children's developmental characteristics and provides opportunities for holistic development.

These findings establish a strong conceptual basis for designing instructional materials that are not merely entertaining but intentionally embed learning objectives within playful activities. A major strength of play-based design materials is their potential to increase learners' motivation and active participation. Play transforms learning tasks into experiences that are enjoyable and meaningful, which can encourage children to persist longer and participate more willingly. Alotaibi (2024) found positive effects of game-based learning on motivation and engagement in addition to cognitive and social outcomes.

Cañete et al. (2025) conducted in kindergarten classrooms, this study examined how teachers consistently incorporated structured and unstructured play and its relationship with social skills such as cooperation, sharing, and empathy. Findings showed that well-designed play materials provided immediate feedback, repetition, opportunities for success, and social interaction, encouraging participation. Teacher

mediation was found essential, as teachers observed, asked questions, modeled strategies, and adjusted difficulty to connect play experiences with learning competencies.

Cheung et al. (2022) stated that in Hong Kong, 90 kindergarten teachers participated in a university-school partnership project across three cohorts. Using questionnaires analyzed through EFA and CFA, the study found that teacher beliefs were significantly associated with their pedagogical practices of play-based learning and perceptions of whole-child development. Capacity building partially mediated these associations, showing that teachers who could design and adjust play curricula based on school context and children's needs demonstrated stronger practices.

Results reveal that teacher beliefs are significantly associated with their pedagogical practices of play-based learning and their perceptions of whole-child development. Capacity building of teachers to practice a play-based learning curriculum partially mediates these associations and exhibits a strong association. Such capacities refer to teachers being able to design and adjust a play-based learning curriculum based on school background and developmental needs of children. Findings have significant practical implications for teacher education and professional development by strengthening relevant capacities.

The literature offers a strong rationale for designing play materials that target fine-motor, self-help, and cognitive competencies simultaneously. Manipulative activities such as threading, sorting, matching, assembling, opening and closing containers, drawing, puzzles, and construction tasks can require children to coordinate hand and finger movements while solving age-appropriate problems. Such activities are especially useful in kindergarten because fine-motor development supports participation in drawing, writing, dressing, feeding, and other everyday tasks.

Cognitive activities embedded in play can also involve classification, sequencing, memory, recognition, counting, vocabulary, and problem-solving. The 2024 systematic review of coding toys illustrates how carefully designed playful materials can support cognitive and socio-emotional outcomes when children are given opportunities to experiment and collaborate. Mohammed et al. (2026) similarly found that the broader play-based learning literature reports benefits in cognitive and academic development as well as independence and problem-solving. Therefore, play-based design materials should be developed around observable competencies rather than around play alone, ensuring that every activity has a clear developmental purpose while preserving children's autonomy and enjoyment.

Aguilar, (2024), Reviewed the concept of play-based learning and the development of teaching in private preschools, focusing on imagination, creativity, cognitive growth, emotional and behavioral benefits, literacy, independence, and physical fitness. The study also measured play-based teaching development in language and literacy, social and emotional skills, creativity, confidence, positive attitudes toward learning, and motor skills.

It is the proper way of selecting the sample size where the respondents chosen have expertise and experience in teaching preschool. The study is conducted in Vietnam because the researcher is presently teaching there which serves as the basis for her study. The study comprised one hundred twenty-five (125) respondents only.

Results reveal that the concept of a play-based learning approach on imagination creativity creates a combined imagination and knowledge in the school teachers' practices to stimulate children's development of learning, cognitive growth shows to promote learning development and benefits for students in an interactive environment, emotional and behavioral benefits show to boost self-esteem and joy for the preschool learners to understand better the emotions of every individual child as the center of learning improves literacy shows to develop resources and better learning on the strategy to facilitate learning actively in the trend of quality education, greater independence shows to help socialize and observe cues and interaction on the tasks among the members of the group as part of the learning process, and physical fitness shows to provide motivation on the learning process and implementation on play-based learning in the preschool level of teaching.

On the other hand, play-based learning development on language and literacy development shows its best way for learning and play for preschool children on their skills literacy and skills in language, social and emotional skills show to establish the ability to maintain meaningful and healthy relationships towards each other as to support, resolve conflicts, resist negative pressure, listen, cooperate, and communicate clearly, creativity and imagination show to provide concepts for students who are prominent for nature of learning in the subject areas of competency, positive attitude toward learning shows to design and understand the issue of predicting observation on positive learning processes, motor skills show that it requires precision and control among the learners with proper knowledge of the process.

Mohammed (2026). A scoping review of play-based learning (PBL) literature for pre-primary school-aged children, analyzing scope, outcomes, implementation factors, and gaps. The study synthesized findings from qualitative, quantitative, and mixed-method research to explore the relationship between PBL and holistic development of 4- to 6-year-old learners. Global coverage, with studies spanning North America, Europe, Asia, and Africa. 2026, reviewing articles published between 2015 and 2023.

A comprehensive search of three databases (EBSCOhost, Web of Science, and ScienceDirect) identified 1,811 articles, of which 51 met the inclusion criteria. These studies, which spanned regions such as North America, Europe, Asia, and Africa, utilized diverse data collection methods—including interviews, observations, surveys, and experiments—across qualitative, quantitative, and mixed-method research designs. Studies employing quantitative and mixed-methods research designs emphasized the cognitive, academic, and socio-emotional benefits of PBL. At the same time, qualitative findings highlighted its positive impact on children's independence and problem-solving skills and explored stakeholder perceptions.

This review provides valuable insights into implementation challenges, stakeholder perceptions, and assessment practices of PBL. The findings offer significant implications for educators, researchers, and policymakers, enhancing understanding and application of PBL in early childhood education. describes the results of an eight-year research collaboration between Project Zero (PZ), a research center at the Harvard Graduate School of Education, and the Lego Foundation to create a Pedagogy of Play (PoP) to support playful learning in classrooms and schools. After sharing a brief vignette of a group of teachers who foster learning through play at the International School of Billund (ISB), Denmark, I propose six principles that provide a foundation for a PoP in schools.

Celedonio. (2025) stated incorporation of play-based learning in the kindergarten curriculum has been a very effective pedagogical strategy, enhancing the cognitive, social, and emotional growth of young children significantly. Recognizing the crucial role of play in early childhood education, this research aims to study the effect of incorporating play-based learning in the MATATAG curriculum, with the goal of improving the performance of kindergarten pupils at Alpha Christian School in Baybay City Division for School Year 2024-2025. This study adopted a quasi-experimental research design, utilizing both pre-test and post-test measures to ascertain the significant difference in the performance of the learners before and after the integration of play-based learning.

This study examined teacher educators' perceptions of play-based learning in the context of university-based teacher education programme in Palestine. Methods: Using a cross-sectional, multi-method design, we explored factors relating to teacher educators' capability, opportunity and motivation to incorporate play-based learning into their practice. Thirty-six staff from four Palestinian universities completed an online survey and 17 were interviewed. Results: Teacher educators recognize the value of play-based learning and are motivated to apply this pedagogical approach.

However, attempts to incorporate play-based learning into their practices is affected by insufficient knowledge and skills to apply play-based learning in practical contexts. Furthermore, social cues, cultural norms and physical challenges currently limit their opportunity to adopt play-based approaches. Conclusion: Our findings highlight that Palestinian teacher educators are motivated to embrace play-based learning as a

pedagogical approach and recognize the importance of using play-based learning in educational practices. The findings can inform future professional development programs for teacher educators.

Fostering playful learning in school through a Pedagogy of Play: Mara Krechevsky. (2024). This chapter describes the results of an eight-year research collaboration between Project Zero (PZ), a research center at the Harvard Graduate School of Education, and the Lego Foundation to create a Pedagogy of Play (PoP) to support playful learning in classrooms and schools. After sharing a brief vignette of a group of teachers who foster learning through play at the International School of Billund (ISB), Denmark, I propose six principles that provide a foundation for a PoP in schools.

Ramesh (2022). Examined the development of the human brain during the first two years of life, focusing on how family characteristics, environmental features, nutrition, and epigenetic mechanisms shape structural and connective brain development. The study explored the interplay between early experiences, gene expression, protein production, and cognitive capacity. Contextualized within family and environmental settings, Infants in their first two years of life, analyzed in relation to family income, nutrition, and environmental stimuli. Brain growth in the first 24 months lays the foundation for lifelong structural and functional development. Family income influences access to food quality and frequency, with nutritional value having a stronger impact on brain development than meal frequency. Pre- and post-natal environments provide stimuli that alter gene expression through epigenetic mechanisms, affecting protein production and brain structures. Poor childhood experiences can inhibit gene expression, leading to suboptimal protein quality and weaker neuronal connections.

Optimal brain development occurs when proteins produced are both high in quality and quantity, supporting exponential neural connections. Emotional regulation develops in late infancy as the amygdala connects with other brain regions, supporting cognitive growth. Language acquisition expands cognitive capacity by enabling infants to construct thoughts through words. As children grow, brain regions become increasingly specialized, reinforcing the importance of early developmental experiences.

Jafer (2026) Kindergarten education is a fundamental building block in educating young learners and has long-term implications for educational outcomes and adulthood. Applying effective pedagogical and didactic approaches that support children's overall development, including their cognitive development, is imperative. Interdisciplinarity positively affects children's learning and cognitive development. However, this approach in Kuwait has received less attention, especially regarding the Science and Arts discipline in kindergartens.

This study explored the effects of an interdisciplinary approach on the cognitive development of kindergarten children in Kuwait. The study sample comprised 17 participants aged 4 to 5 years from single kindergarten. Natural observations, drawings, and semi-structured interviews were used to collect data. The data was analyzed using a mixed methods design. The results indicate that the interdisciplinary approach effectively improved children's cognitive development. Integrating the arts with science enhances children's creativity, which fosters problem-solving skills. Additionally, encouraging children to explore scientific concepts from kindergarten effectively minimizes future persistent misconceptions.

Saragih (2022). Explained that although many core themes and concepts unite the field of cognitive development, it is a wide and varied field, particularly when it comes to cognitive development in early. Piaget proposed four cognitive developmental stages for children, including sensorimotor, preoperational, concrete operational, and the formal operational stage. Although Piaget's theories have had a great impact on developmental psychology, his notions have not been fully accepted without critique. Piaget's theory has some shortcomings, including overestimating the ability of adolescence and underestimating infant's capacity.

Piaget also neglected cultural and social interaction factors in the development of children's cognition and thinking ability. Cognitive development occurs at several stages during childhood. As a result, cognitive development studies the nature of child development in terms of how they gain conscious control

over their intellect and behavior. Piaget contributions, particularly in regards to the process of education among children and transferring cognition into psychology, have had a significant effect on the science of child development.

Nicole Bilodeau. (2025) Stated that exploring the Benefits of Sensory Play in Developing Fine Motor Skills. Sensory play is vital for developing fine motor skills in children, offering a multitude of benefits across different domains. Tactile manipulation activities, like playdough molding and sand bins, help build grip strength, dexterity, and tactile awareness. These activities are practical and straightforward yet highly effective in fostering fine motor skills.

Additionally, sensory play is instrumental in enhancing hand-eye coordination. Activities like pouring between containers and lacing beads not only refine precision but also promote accuracy. Moreover, sensory play activities stimulate sensory integration, linking diverse sensory experiences, such as olfactory memory, to the tactile experience.

Finally, sensory play can also foster social interaction and affect regulation, making it a thorough tool in child development. Importantly, it also provides a calming effect, allowing children to manage discomfort better and focus on the task at hand, thus enhancing their emotional well-being.

Supporting children's self-regulation development in play-based kindergarten classrooms. Play is an intrinsically motivated, process-oriented, and often joyful activity through which children explore, imagine, negotiate, and make meaning of their experiences

Zosh et al., (2022). In the context of early childhood education, play provides rich opportunities for children to engage with their environment, acquire social and cultural competencies, and practice navigating complex emotional experiences. Within social interactions during play, children begin to understand others' perspectives, respond empathically, and build foundational social-emotional learning (SEL) competencies.

Connections between play and young children's developing self-regulation have been emphasized in both research and practice. However, our knowledge of how to scaffold children's play to develop regulation in practice is limited. The current study examined strategies utilized by teachers to support self-regulation in play contexts. Observational and interview data were collected in 11 kindergarten classrooms in Canada.

Results show two differing approaches to the role of play in self-regulation development. One focused on nurturing emotional aspects of self-regulation through free play. The other focused on a holistic definition of self-regulation nurtured in both free and teacher-guided play. Results underscore teachers' diverse approaches towards promoting self-regulation and provide practice-based examples for supporting multiple facets of self-regulation development in play.

Play-Based Learning and Its Impact on Cognitive Development in Preschoolers Kohli (2025). Play-based learning has gained extensive popularity as an effective pedagogical approach to early childhood education. This study takes into account the impact of play-based learning on the cognitive development of preschool children. Cognitive development, as processes of knowledge and understanding acquisition through cognition, experience, and sensory stimulation, is a key aspect of early childhood.

Drawing on a critical review of the literature and empirical studies, the study brings out the strengths of play in the development of cognitive abilities such as memory, problem-solving, language acquisition, and attentional abilities. Furthermore, the study takes into account the educators' roles, play centers, and the learning environment in supporting cognitive development. The findings bring out the usefulness of play as a natural and inherent aspect of children's development with extensive implications for educators and policymakers seeking to improve practice in early childhood education.

In recent years, an increasing number of scholars have begun to focus on the relationship between children's motor development and school activities, with the relationship between children's fine motor skills and academic achievement being a particularly researched area. However, due to different research perspectives among scholars, the results in this field have been somewhat controversial. Therefore, this study

aims to delve deeper into the relationship between children's fine motor skills and their various academic abilities through systematic review and meta-analysis.

Zentai (2023). Stated that Fine motor skills (FMS) are fundamental for children's growth, influencing their writing progress and everyday activities. However, the development of these skills is a multifaceted process that is affected by various factors. Consequently, it becomes essential to comprehend the disparities in children's fine motor skills (FMS) development and the predictive factors. To address this aspect, we aimed to investigate the development of children's FMS, and the factors that can predict their development.

Our analysis encompassed comparing FMS development between the two countries, examining gender and age discrepancies, and discerning the variables that predict FMS development. Employing a reliable instrument (the FMS development battery), we conducted a survey study involving 3050 Hungarian children living in both Slovakia and Hungary. The analysis, powered by R packages, yielded significant findings. Notably, students from Slovakia showcased significantly higher levels of FMS compared to their counterparts from Hungary. Furthermore, we observed a noteworthy gender disparity, with female students outperforming male students in both countries.

Additionally, differences emerged across various age groups, indicating that older age groups exhibited more advanced FMS compared to their younger counterparts. With the help of regression analyses, our research also revealed the direct impact of gender and age on students' FMS development, while parental education entered an indirect influence on this aspect. These discoveries offer valuable insights for educational leaders and policymakers seeking to enhance children's FMS.

Fitri et. al (2024) Emphasized that fine motor skills are essential in early childhood development because they support children's ability to perform everyday tasks and participate effectively in learning activities. This study focused on the development of fine motor skills among young children through appropriate stimulation and play-based learning activities. Classroom observations revealed that only 4 out of 13 children were able to hold scissors and pencils correctly, indicating a need for activities that strengthen hand and finger coordination, control, and manipulation skills. The study recognized the important roles of teachers and parents in providing children with meaningful opportunities to practice and develop these skills. Play-based activities were considered appropriate because they encourage children to explore, create, and express themselves while developing their motor abilities and cognitive skills. The development of suitable learning materials and activities may provide children with engaging experiences that promote active participation and skill development. The study therefore emphasized the importance of providing age-appropriate, stimulating, and enjoyable activities to support children's fine motor development during the early childhood years. The findings and insights may serve as a basis for teachers, parents, and other early childhood education stakeholders in designing learning experiences that enhance children's fine motor abilities and overall development. Keywords: fine motor skills, early childhood, play-based learning, learning materials, child development

Thao (2025) asserted that the management of self-help skill development activities in two early childhood institutions in Hanoi, focusing on how planning, organizing, guiding, and evaluation practices support young children's independence. The research was conducted over an eight-week period with the participation of 128 children, 18 teachers, 4 school leaders, and 42 parents. Data were collected through teacher surveys, classroom observations, semi structured interviews, parent questionnaires, and document analysis.

The findings show that consistent routines, accessible learning environments, and effective teacher facilitation significantly enhance children's ability to carry out daily tasks such as handwashing, independent dressing, organizing materials, caring for plants, and managing personal belongings. Children in both schools demonstrated clear progress, with higher independence levels observed in classrooms that were intentionally arranged to promote autonomy.

The results also identify limitations including the lack of formal evaluation tools, limited child-sized materials, and uneven reinforcement from families. Overall, the study highlights the importance of coordinated management practices that involve teachers, administrators, and parents. It provides practical implications for improving self-help skill education in early childhood settings and suggests directions for future research.

Alam (2026) expressed that the development of self-help skills is a fundamental aspect of early childhood education, as it supports children's self-help skill, responsibility, and readiness for daily life activities. However, many early childhood learners still demonstrate limited self-help skill, indicating the need for effective and developmentally appropriate learning approaches. One promising approach is center-based learning utilizing natural materials, which provides meaningful, hands-on experiences and encourages active engagement.

This study aims to explore the formation of self-help skills in children aged 4–5 years through the implementation of a natural materials center-based learning model. The study employed a qualitative case study design involving nine children as participants. Data were collected through observations, interviews, and documentation, and analyzed using pattern matching techniques to identify consistent themes and behavioral patterns. The findings revealed that children demonstrated increased self-help skills, including the ability to complete tasks independently, initiate simple problem-solving, maintain personal hygiene, and interact confidently with peers.

These improvements were supported by structured and consistent scaffolding provided during center-based learning activities, which facilitated active participation and strengthened children's confidence. In conclusion, the natural materials center-based learning model effectively promotes the development of self-help skills in early childhood by positioning teachers as facilitators who provide appropriate guidance based on children's developmental needs. It is recommended that educators integrate natural materials and structured scaffolding strategies into center-based learning environments to optimize the development of children's self-help skill. It establishes rationale, it shows why play-based learning is important by presenting evidence from different contexts (e.g., Cañete, Cheung, Aguilar, Mohammed, Project Zero, Ramesh). This justifies why your study is needed.

**Identifies Gaps:** By synthesizing findings, you can see what has already been studied and where there are still unanswered questions (e.g., limited localized studies, challenges in implementation, or lack of systematic reviews).

**Provides Comparative Insights:** It allows you to compare results across different countries, participants, and methodologies, helping you situate your study within a global and local perspective. **Supports Methodology Choices:** Prior studies highlight effective approaches (e.g., scoping reviews, descriptive correlational methods, purposive sampling), guiding you in selecting or justifying your own research design. **Strengthens Theoretical Framework:** The literature connects play-based learning to cognitive, socio-emotional, literacy, motor, and self-help domains, giving you a multidimensional lens for analyzing your own findings.

The reviews presented above showed several cases where play-based materials are used to improve kindergartens' performance relative to national and international standards. In the local setting, the literature presents a gap in the application or utilization of play-based materials in many classrooms in the Philippines. Hence, this study was conducted to explore the effectiveness of using play-based materials in improving the fine-motor, self-help, and cognitive skills of kindergarten learners from Antongalon Elementary School.

## **Theoretical/Conceptual Framework**

This study was anchored on Erik Erikson's Psychosocial Theory of Development, particularly the stage 3: Initiative versus Guilt, which generally occurs during the preschool years. stage typically spans the

preschool years, from approximately ages 3 to 6. During this period, children experience a dramatic expansion in cognitive, linguistic, and social abilities. They become increasingly capable of planning activities, directing play, asking questions, and asserting their preferences. The social world broadens beyond the family to include peers, teachers, and community members.

Initiative refers to the child's emerging ability to envision, plan, and execute activities. It encompasses leadership in play, creative problem-solving, and the courage to pursue goals despite uncertainty or potential failure. Initiative is expressed through imaginative play, constant questioning, and the willingness to take on new challenges. Imaginative or make-believe play is the primary arena for the development and expression of initiative. Through play, children learn to practice leadership and decision-making by assigning roles and directing action. Experiment with adult roles, test social boundaries and learn to negotiate, compromise, and resolve conflicts. Develop problem-solving skills and emotional regulation in consequence-free scenarios.

Guilt arises when children's initiatives are consistently discouraged, punished, or ridiculed. Rather than feeling empowered, children develop self-doubt, hesitation, and a pervasive sense that their ideas or actions are inappropriate or bothersome. Guilt at this stage is less about moral wrongdoing and more about a generalized inhibition of self-expression and agency.

Erik Erikson's Industry vs. Inferiority stage typically encompasses the elementary school years, from about ages 5 or 6 to 12. This period is marked by formal schooling, increased social comparison, and the systematic evaluation of skills and achievements. Children encounter structured expectations, academic challenges, and feedback from teachers and peers. Industry: A child persists through a challenging science project, practices a musical instrument despite initial frustration, or masters a complex household task. Inferiority: A child who is constantly compared unfavorably to peers, criticized for mistakes, or denied opportunities to build skills withdraws, avoids challenges, and internalizes self-doubt.

On the other hand, Piaget's Constructivist theory also posits that children actively construct knowledge through interaction with their environment. Stage of cognitive development for kindergarten learners (preoperational stage), materials must support symbolic thinking, curiosity, and hands-on exploration. Discovery learning play-based materials should allow children to manipulate objects, test ideas, and build understanding through direct experience. Adaptation materials must be flexible to accommodate individual differences in learning pace and style. This story informs the design of interactive exploratory materials that promote active knowledge construction rather than passive learning. Industry: A child persists through a challenging science project, practices a musical instrument despite initial frustration, or masters a complex household task.

The study also anchored on Lev Vygotsky's Sociocultural Theory of Learning which emphasizes that children's learning and development occur through social interaction, language, cultural experiences, and guidance from more knowledgeable individuals. For kindergarten learners, learning is not limited to individual exploration, children also learn through interactions with teachers, classmates, parents, and other people in their environment.

Vygotsky's concept of the zone of Proximal Development (ZPD) is particularly relevant to the use of play-based materials. The ZPD refers to the difference between what a learner can accomplish independently and what the learner can accomplish with approximate guidance or assistance. Play-based materials can provide opportunities for teachers to scaffold learning by giving instructions, modelling how materials are used, asking questions, providing hints, and gradually reducing assistance as learners become more capable.

The sociocultural perspective also supports the use of locally available and culturally relevant materials. When play-based materials reflect children's familiar objects, experiences, language and environment, learners may be able to connect new learning with what they already know. For example, materials based on familiar household objects, community activities, local surroundings, or culturally familiar situations can make play more meaningful and encourage children to participate actively.

Therefore, the development of play-based materials for 4-6-year-old kindergarten learners should opportunities for children to explore independently, make choices, interact with others, receive appropriate guidance, solve problems, and experience successful accomplishment. These theoretical perspectives support the study's purpose of designing and designing and developing play-based materials that respond to the developmental needs of kindergarten learners.

#### Conceptual Framework of the Study

This study's conceptual framework is anchored on three major theoretical principles that collectively support the design and implementation of play-based learning materials for kindergarten learners aged 4–6.

Erik Erikson's psychosocial theory emphasizes the stages of initiative vs. guilt and autonomy vs. shame and doubt, which are critical during early childhood. Play provides opportunities for children to exercise autonomy, make choices, and take initiative in a safe environment. Through guided play, learners develop confidence, independence, and social responsibility — essential foundations for lifelong learning.

Jean Piaget's constructivist theory, particularly the *preoperational stage*, highlights that children construct knowledge through active manipulation of objects and symbolic representation. Play-based learning allows learners to explore, experiment, and build understanding through direct experiences. Materials designed under this framework encourage curiosity, imagination, and problem-solving, enabling children to internalize concepts through hands-on engagement.

Lev Vygotsky's sociocultural theory further strengthens the framework by emphasizing the role of social interaction and cultural context in learning. Through collaborative play, children engage within their *Zone of Proximal Development (ZPD)*, guided by teachers and peers who act as *More Knowledgeable Others (MKOs)*. Scaffolding strategies embedded in play activities help learners progress from assisted to independent performance, fostering both cognitive and social growth.

Together, these theories inform the development of play-based materials using the ADDIE Model (Analysis, Design, Development, Implementation, and Evaluation). This structured approach ensures that materials are developmentally appropriate, culturally relevant, and responsive to learners' self-help, fine motor, and cognitive domains. By integrating psychosocial, constructivist, and sociocultural principles, the framework promotes holistic development and active knowledge construction rather than passive learning.

The framework illustrates how the identified performance levels of learners serve as the basis for developing appropriate materials that address their needs in the cognitive, fine motor, and self-help domains. The process follows a developmental cycle in which the results of assessment guide the preparation, utilization, and enhancement of the play-based materials.

The process begins with Analysis. The first phase focuses on determining the level of performance of the kindergarten learners at the start of the class. The learners are assessed in three domains: cognitive, fine motor, and self-help skills. The results of this initial assessment provided baseline information about the learners' existing abilities, strengths, and areas that needs improvement.

These findings served as the basis for identifying the appropriate skills and learning activities to be incorporated into the play-based materials.

**Design and Development:** The researcher designs and develops play-based materials based on initial assessment results to provide meaningful, age-appropriate, engaging, and developmentally suitable activities for kindergarten learners.

**Expert Validation:** The materials are validated by experts to ensure appropriateness, relevance, clarity, safety, and suitability, with recommendations incorporated before classroom use.

**Preparation/Refinement:** The materials are refined according to expert feedback to align with learning competencies and developmental needs, ensuring readiness for classroom implementation.

**Implementation:** The refined materials are implemented in classroom activities to promote learning through play, exploration, manipulation, participation, and interaction.

**Evaluation:** The effectiveness of the materials is evaluated using the ECCD Checklist and post-tests, comparing results with baseline performance to identify improvements in cognitive, fine motor, and self-help domains.

**Enhancement:** The evaluation findings inform further enhancement, resulting in improved play-based materials that continuously evolve through assessment, validation, implementation, and refinement.

The expected output of the framework is a set of enhanced play-based learning materials for kindergarten learners. These materials are improved based on the assessment results, expert validation, classroom implementation, and evaluation findings. Thus, the framework demonstrates a continuous process in which assessment evaluates the development, development leads to implementation, and evaluation leads to further enhancement of the learning materials. The framework follows the sequence: Learners' initial performance informs design and development, which undergoes expert validation, followed by preparation and refinement, leading to classroom implementation, evaluation of effectiveness, and enhancement, culminating in improved play-based materials for kindergarten learners.

The development of play-based materials is learner-centered and evidence-based, beginning with an assessment of kindergarten learners' existing skills to ensure that their actual needs guide the process. The findings from this assessment inform the design of appropriate materials, while expert validation and classroom implementation provide opportunities to refine and improve their quality. Evaluation then determines the usefulness of the materials in supporting learners' growth, leading to enhanced play-based resources that better promote development in the cognitive, fine motor, and self-help domains.

The creation of play-based materials is guided by theoretical principles that prioritize hands-on exploration, as emphasized by Piaget, and independent use, as highlighted by Erikson. To ensure effectiveness, validated prototypes undergo pilot testing accompanied by careful observation of learner engagement and interaction patterns. Safety and usability are addressed by designing materials that are appropriately sized for small hands to support fine motor development, simple enough for independent use to foster self-help skills, and open-ended to encourage multiple pathways of exploration consistent with Piaget's constructivist approach.

During Phase 4 implementation, pedagogy positions the teacher as both facilitator, in line with Piaget's view of guided discovery, and supporter, in accordance with Erikson's emphasis on autonomy, introducing activities, posing guiding questions, and allowing learners to explore rather than dictating outcomes. Adaptation is integral to this process, as teachers adjust materials based on learners' responses, modifying tasks to provide additional opportunities for concrete exploration whenever challenges arise. This dynamic cycle ensures that play-based materials remain learner-centered, developmentally appropriate, and responsive to the evolving needs of kindergarten learners.

In this phase, observations takes place where materials are analyzing effectiveness, usability, durability, and adaptability. Finally, Phase 5: Evaluation. **Measurement:** Compare pre-assessment data from the ECCD Checklist, while also observing how learners apply knowledge in new context (Piaget's indicator of true understanding) and demonstrate increased independence (Erikson's measure of psychological growth).

**Figure 1.** The Research Paradigm Showing the Flow of the Study



## Objectives of the Study

This study sought to bridge the gap in kindergarten education by designing and developing play-based materials that are evidence-based, developmentally appropriate, and responsive to the actual skills and needs of learners. Specifically, it sought to: (1) determine the level of performance of kindergarten learners before and after the use of play-based materials in terms of fine motor skills, self-help skills, and knowledge skills; (2) design, develop, and validate play-based materials as evaluated by experts in terms of content, learning outcomes, and manipulatives; (3) determine whether a significant difference exists between the level of performance of kindergarten learners before and after the utilization of the play-based materials; and (4) propose enhancements to the developed play-based materials based on the findings of the study.

## Methodology

This study employed a descriptive-developmental evaluation research design to design, develop, validate, and evaluate play-based materials intended to enhance the performance of kindergarten learners. The study was conducted at Antongalon Elementary School, East Butuan District II, Butuan City, and involved all 27 kindergarten learners through an intact group approach. Data were gathered using the Early Childhood Care and Development (ECCD) Checklist to assess learners' performance in fine motor skills, self-help skills, and knowledge skills before and after the utilization of the play-based materials. The developed materials were validated by experts using the Learning Resources Management and Development System (LRMDS) evaluation criteria in terms of content, other findings, and manipulatives. Following the necessary approvals and ethical procedures, observations and assessments were conducted, and data were organized and analyzed to determine learners' developmental performance and the effectiveness of the play-based materials. Frequency and percentage were used to describe learners' performance and validate the materials, while the paired t-test was used to determine whether a significant difference existed between learners' performance before and after the utilization of the play-based materials. The findings served as the basis for enhancing the developed play-based materials.

## Results and Discussion

**Problem 1. What is the level of performance of kindergarten learners before and after the use of play-based materials in terms of fine motor skills, self-help skills, and knowledge skills?**

**Table 1. Level of Performance of Kindergarten Learners Before and After the Use of Play-Based Materials**

| Domain                   | Scaled Score Range | Descriptive Rating | Before f (%) | After f (%) |
|--------------------------|--------------------|--------------------|--------------|-------------|
| <b>Fine Motor Skills</b> | 17–19              | Highly Advanced    | 0 (0%)       | 0 (0%)      |
|                          | 14–16              | Slightly Advanced  | 0 (0%)       | 1 (4%)      |
|                          | 7–13               | Average            | 6 (22%)      | 10 (37%)    |
|                          | 4–6                | Slight Delay       | 4 (15%)      | 5 (19%)     |
|                          | 1–3                | Significant Delay  | 17 (63%)     | 11 (40%)    |
| <b>Self-Help Skills</b>  | 17–19              | Highly Advanced    | 0 (0%)       | 0 (0%)      |
|                          | 14–16              | Slightly Advanced  | 0 (0%)       | 0 (0%)      |
|                          | 7–13               | Average            | 0 (0%)       | 0 (0%)      |
|                          | 4–6                | Slight Delay       | 1 (4%)       | 4 (15%)     |
|                          | 1–3                | Significant Delay  | 26 (96%)     | 23 (85%)    |
| <b>Knowledge Skills</b>  | 17–19              | Highly Advanced    | 0 (0%)       | 0 (0%)      |
|                          | 14–16              | Slightly Advanced  | 0 (0%)       | 3 (11%)     |
|                          | 7–13               | Average            | 5 (19%)      | 8 (30%)     |
|                          | 4–6                | Slight Delay       | 17 (62%)     | 9 (33%)     |
|                          | 1–3                | Significant Delay  | 5 (19%)      | 7 (26%)*    |

Table 1 shows a marked improvement in learners' fine motor skills after the use of play-based materials. Before the intervention, the majority of learners (63%) fell under the Significant Delay category, with only 22% rated as Average and none reaching the advanced levels. After the intervention, the proportion of learners in Significant Delay decreased to 40%, while those in the Average category increased to 37%. A small percentage (4%) progressed to Slightly Advanced, indicating that the play-based materials provided opportunities for learners to strengthen manipulation, hand-eye coordination, and control. This demonstrates that the intervention was effective in reducing delays and promoting skill development in fine motor abilities.

Moreover, the self-help domain remained the most challenging area for learners. Prior to the intervention, almost all learners (96%) were classified under Significant Delay, with only 4% in Slight Delay and none in the average or advanced categories. After the intervention, there was a modest improvement: the proportion of learners in Significant Delay decreased to 85%, while those in Slight Delay increased to 15%. However, no learners reached the Average or Advanced levels. This suggests that while the play-based materials contributed to some progress in personal care, independence, and responsibility, further enhancement and sustained practice are needed to achieve more substantial gains in self-help skills.

Furthermore, the learners also showed notable progress in the cognitive domain. Before the intervention, 62% of learners were in Significant Delay, 19% in Slight Delay, and 19% in Average, with none reaching advanced levels. After the intervention, the proportion of learners in Significant Delay dropped to 33%, while those in Average rose to 30%. Additionally, 11% of learners advanced to the Slightly Advanced category, reflecting improved understanding of concepts, observation, and environmental awareness. These results indicate that the play-based materials were effective in stimulating cognitive growth and fostering higher-level thinking among kindergarten learners.

Across domains, the data reveal that the play-based materials had a positive impact on learners' performance. The most significant improvements were observed in the Fine Motor and Cognitive domains,

where learners shifted from delay categories toward average and advanced levels. The Self-Help domain showed progress but remained an area of concern, highlighting the need for further refinement of materials and strategies to better support independence and responsibility. Overall, the intervention successfully reduced delays and provided learners with meaningful opportunities to practice foundational skills through purposeful play.

The statements are supported with the DepEd Order No. 47, s. 2016, also known as the Omnibus Policy on Kindergarten Education, institutionalizes kindergarten as the first stage of formal education in the Philippines. It ensures compliance with Republic Act No. 10157 (*Kindergarten Education Act*) and Republic Act No. 10533 (*Enhanced Basic Education Act of 2013*).

## **Problem 2. How may the play-based materials be designed, developed, and validated by experts in terms of content, learning outcomes, and manipulatives?**

Designing and developing Play-Based Materials for Kindergarten Learners Designing and developing play-based materials for kindergarten learners is an important approach to making learning more engaging, meaningful, and appropriate for young children. Kindergarten learners naturally learn through exploration, movement, interaction, and play.

Therefore, learning materials should provide opportunities for children to manipulate objects, make choices, solve simple problems, communicate with others, and practice newly acquired skills. Well-designed play-based materials can transform ordinary classroom activities into enjoyable learning experiences while helping children develop their cognitive, language, social-emotional, fine-motor, and self-help skills.

The design of play-based materials should consider the developmental level, interests, abilities, and learning needs of kindergarten learners. Materials should be colorful, attractive, safe, durable, easy to handle, and appropriate for children's age. Activities may include letter and picture matching, counting games, color and shape sorting, puzzles, lacing activities, pattern-making, and games involving familiar household objects.

These activities allow learners to learn concepts through hands-on experiences rather than relying only on verbal explanations or written exercises. Through repeated play, children can strengthen their skills while developing confidence, independence, creativity, and problem-solving abilities. The development of these materials should also be aligned with the DepEd Matatag Kindergarten Curriculum to ensure that every play activity has a clear educational purpose.

The materials should support the competencies expected of kindergarten learners and provide opportunities for holistic development. Teachers can use the materials during classroom activities, learning centers, small-group activities, or independent play. The teacher serves as a facilitator who guides learners, provides appropriate assistance, observes their progress, and adjusts activities according to their individual needs and abilities.

The process of designing and developing play-based materials may begin with identifying the learners' needs and the competencies to be addressed. This is followed by planning, designing, creating, testing, and validating the materials. Feedback from kindergarten teachers and other appropriate evaluators can be used to improve the materials in terms of content, appropriateness, safety, attractiveness, usability, and effectiveness. After refinement, the materials can be implemented in the classroom and evaluated based on how well they engage learners and support the intended learning outcomes.

In this way, play-based materials become valuable instructional resources that make learning enjoyable while supporting the overall development of kindergarten learners.

**Table 2.** Experts' Evaluation of the Play-Based Materials for Kindergarten

| Evaluation Dimension                                         | Weighted Mean | SD          | Verbal Description       | Interpretation      |
|--------------------------------------------------------------|---------------|-------------|--------------------------|---------------------|
| Content Quality                                              | 3.74          | 0.46        | Very Satisfactory        | High Quality        |
| Other Findings                                               | 4.00          | 0.00        | Very Satisfactory        | High Quality        |
| Additional Requirements (Instructional and Technical Design) | 3.83          | 0.33        | Very Satisfactory        | High Quality        |
| <b>Overall Evaluation</b>                                    | <b>3.86</b>   | <b>0.26</b> | <b>Very Satisfactory</b> | <b>High Quality</b> |

*Legend: 3.50–4.00 = Very Satisfactory/High Quality; 2.50–3.49 = Satisfactory/Good Quality; 1.50–2.49 = Poor/Poor Quality; 1.00–1.49 = Not Satisfactory/Very Poor Quality*

Table 2 presents the experts' evaluation of the play-based materials for kindergarten in terms of content quality. Results reveal that the materials show the highest rating ( $w_m = 4.00$ ,  $SD = 0.000$ ) by the indicator stating that the material is free from ideological, cultural, religious, racial, and gender biases and prejudices on the other hand, the lowest ratings ( $w_m = 3.60$ ,  $SD = .548$ ) are observed in the materials' potential to arouse learners' interest, typographic layout, appropriate size, and ease of use and durability. All indicators manifest Very Satisfactory, rating, interpreted as high quality, showing a consistently positive evaluation of the materials

It can be gleaned that an average weighted mean of 3.74, described as "Very Satisfactory" and interpreted as "High Quality" is the overall rating of the play-based materials. This indicates that the experts generally found the materials appropriate, relevant, developmentally suitable, and useful for kindergarten learners. These findings imply that the play-based materials possess high-quality content that is suitable for kindergarten learners and aligned with their developmental needs and learning objectives. The low standard deviations (0.000–0.548) indicate relatively consistent ratings among the experts. Overall, the evaluation confirms that the materials are appropriate, inclusive, safe, and educationally relevant, making them suitable for use in kindergarten classrooms.

In terms of other findings, specifically focusing on the presence of errors across four dimensions: conceptual, factual, grammatical/typographical, and other errors such as computational mistakes, obsolete information, or inaccuracies in visuals. All four items obtained a perfect weighted mean of 4.00 with a standard deviation of 0.00, indicating unanimous agreement among the evaluators that the material was entirely free of these errors, earning a "Very Satisfactory" verbal description and a "High Quality" interpretation. This outcome reflects strict adherence to DepEd's quality assurance protocols, which mandate that all locally developed and supplementary learning resources undergo rigorous content evaluation to ensure they are free from conceptual, factual, and grammatical errors before being approved for use in classrooms (DepEd Order No. 43, s. 2013).

The absence of any recorded errors across all four items further demonstrates that the material underwent careful revision and proofreading before expert evaluation, consistent with the emphasis DepEd places on accuracy and correctness as non-negotiable standards in the development of instructional and learning materials (DepEd Order No. 42, s. 2016). The zero-standard deviation across all items also signals a high level of consistency in the experts' assessments, suggesting that the material's freedom from errors was not a matter of subjective interpretation but a clearly evident and verifiable quality. Taken together, these findings affirm that the play-based material fully satisfies the department's standards for accuracy and technical correctness, reinforcing its suitability and readiness for actual classroom implementation without need for further revision on these particular aspects.

In the area of additional requirements, findings show that for Instructional Design, all three indicators are rated Very Satisfactory ( $w_m = 3.80$ ,  $SD = .447$ ) interpreted as High Quality. This indicates that the materials

provide adequate support materials, include summarized activities and extension activities, and incorporate activities that support innovative pedagogy. The consistent ratings indicate that the experts found the instructional components appropriate and supportive of Kindergarten learners' learning needs.

For Technical Design, the indicator on the safety of the manipulatives obtained a weighted mean of 3.60, while the indicators on the appropriateness of the size and composition of the manipulatives and the compatibility of manual tasks with the learners' motor skills both obtained 4.00. All are interpreted as of High Quality. These findings indicate that the manipulatives are considered safe, appropriately designed, and suitable for the developmental and motor abilities of kindergarten learners.

The results show an overall rating of Very Satisfactory (ave.wm=3.83) interpreted as. High Quality. This indicates that the play-based materials generally met the additional requirements identified by the experts. This implies that the play-based materials are appropriate, safe, and developmentally suitable for kindergarten learners. The high ratings from the experts further indicate that the materials possess the necessary instructional and technical qualities for their intended use.

In summary, the post-intervention results confirm that play-based learning fosters active engagement and developmental progress, validating its effectiveness as a pedagogical approach for kindergarten learners.

### **Problem 3. Is there a significant difference between the level of performance of kindergarten learners before and after the use of the play-based materials?**

*Table 3. Test of Significant Difference Between Pretest and Posttest Scores Using Wilcoxon Signed-Rank Test*

| <b>Domains</b> | <b>N</b> | <b>Z</b> | <b>alue</b> | <b>p-value</b> | <b>Decision</b>        | <b>Interpretation</b>             |
|----------------|----------|----------|-------------|----------------|------------------------|-----------------------------------|
| Fine Motor     | 27       |          | -4.457      | .000           | Reject null hypothesis | There is a significant difference |
| Self-Help      | 27       |          | -2.032      | .042           | Reject null hypothesis |                                   |
| Cognitive      | 27       |          | -4.032      | .000           | Reject null hypothesis |                                   |

*0.05 level of significance*

The Wilcoxon Signed-Rank Test results are presented in Table 3. Findings show that Fine Motor Skills obtained a Z-value of -4.457 ( $p = .000$ ), Self-Help yielded a Z-value of -2.032 ( $p = .042$ ), and Cognitive skills recorded a Z-value of -4.032 ( $p = .000$ ). It can be gleaned that all p-values are less than the .05 level of significance, hence, the null hypothesis which states that, "there is no significant difference between the pre test and the post test of the fine motor skill, self-help skill and the cognitive skills" is rejected at 0.05 level of significance set for statistical analysis. These findings indicate that the learners demonstrated statistically significant changes in their developmental performance following the exposure to the designed manipulative materials. Among the three domains, Fine Motor Skills ( $Z = -4.457$ ) and Cognitive Skills ( $Z = -4.032$ ) show stronger statistical evidence of change, while Self-Help also exhibited a significant difference, although at a comparatively higher p-value. Overall, the findings suggest that the intervention contributed to measurable improvements in the learners' developmental skills across the three (3) assessed domains.

**Fine Motor Skills.** The strongest improvement was observed in fine motor skills, suggesting that the manipulative and play-based activities were highly effective in enhancing learners' hand-eye coordination, control, and manipulation abilities. This aligns with developmental expectations at the kindergarten level, where fine motor growth is critical for writing readiness and classroom participation.

**Cognitive Skills.** The significant gains in cognitive skills highlight the effectiveness of play-based materials in fostering concept development, observation, and environmental understanding. The shift of

learners from “Significant Delay” to “Average” and “Slightly Advanced” categories demonstrates that purposeful play can stimulate higher-order thinking and problem-solving abilities.

**Self-Help Skills.** Although improvements were noted, self-help skills showed weaker statistical evidence compared to the other domains. This suggests that while play-based materials contributed to progress in independence and responsibility, additional reinforcement and sustained practice may be necessary. It implies that self-help development may require longer exposure, consistent routines, and stronger integration of real-life tasks beyond classroom play.

**Holistic Development.** Overall, the results confirm that play-based materials are not only engaging but also effective in bridging developmental gaps. The intervention provided learners with structured opportunities to practice foundational skills, thereby reducing delays and promoting readiness for higher learning tasks.

**Educational Significance.** The findings underscore the importance of integrating play-based approaches into the kindergarten curriculum. By aligning materials with developmental standards and validating them through expert review, educators can ensure that interventions are both pedagogically sound and responsive to learners’ needs.

This study is anchored on three major theories of child development: Erik Erikson’s Psychosocial Theory. Specifically, the stages of Initiative vs. Guilt (ages 3–6) and Industry vs. Inferiority (ages 6–12), which emphasize the importance of play, exploration, and social comparison in fostering confidence, problem-solving, and skill mastery. Jean Piaget’s Constructivist Theory. Highlighting the Preoperational Stage (ages 2–7), where children actively construct knowledge through symbolic play, curiosity, and hands-on exploration. Play-based materials support discovery learning and adaptation to individual learning styles.

Lev Vygotsky’s Sociocultural Theory. Stressing the role of social interaction, language, and cultural context in learning. His concept of the Zone of Proximal Development (ZPD) underscores how guided play and scaffolding help learners progress from assisted to independent performance..

#### **Problem 4. Based on the findings of the study, how may the play-based materials be enhanced?**

The results indicated that scribbling spontaneously, identifying the uses of common household items, and matching uppercase and lowercase letters, were demonstrated less and. may give more opportunities to explore, manipulate, practice, and learn through play.

For fine motor development, materials for scribbling may be enhanced by incorporating varied scribbling activities that allow learners to strengthen hand muscles, develop hand-eye coordination, and gain confidence in making different strokes and patterns.

For cognitive development, materials involving household items may be enhanced through sorting activities, and role-playing tasks that help learners recognize familiar objects and understand their functions in everyday life. Similarly, uppercase and lowercase letter activities may be improved through puzzles, memory games, letter cards, and hands-on alphabet activities to provide repeated exposure to letter forms.

#### **Conclusions**

Based on the findings obtained from the data, the following conclusions were drawn.

1. There exists a noticeable gap between learners’ actual and expected developmental levels, underscoring the need for a structured and developmentally appropriate intervention to address these delays.

2. The design and development of play-based materials enhanced the three developmental domains (fine motor domain, self-help, and cognitive domain).
3. The play-based material was found to be a positive influence on learners' developmental progress.
4. The intervention was effective in facilitating growth across fine motor, self-help, and cognitive skills within the study period.
5. The play-based learning materials are an effective pedagogical tool for enhancing the holistic development of kindergarten learners.

## Recommendations

In light of the findings and conclusions presented above, the following conclusions are made.

**DepEd Management.** Consider adopting and institutionalizing the validated play-based material as a supplementary resource for kindergarten classrooms, given its demonstrated validity and effectiveness. Include the development and validation of play-based materials as a priority area in localized learning resource development programs and Learning Action Cell (LAC) sessions.

**Kindergarten Teachers.** Integrate the validated play-based materials into daily classroom routines and lesson plans to support learners' fine motor, self-help, and cognitive development. Conduct regular developmental assessments (pre- and post-exposure) to identify learners who may need differentiated or additional support.

**Parents.** Reinforce play-based learning activities at home that support fine motor, self-help, and cognitive skill development, in coordination with the teacher's guidance. Actively participate in school activities, orientations, or workshops related to their child's developmental progress and the use of play-based materials.

**Researchers.** Conduct similar studies with a larger sample size and across different school settings to validate and generalize the findings. Explore the long-term effects of play-based materials on learners' development beyond the kindergarten level, such as tracking progress into Grade 1 and beyond

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