# EXAMINING PLAY-BASED LEARNING ON THE HOLISTIC DEVELOPMENT OF KINDERGARTEN LEARNERS: INSIGHTS FROM SELECTED TEACHERS

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## ABSTRACT

This study explores the influence of Play-Based Learning (PBL) on the holistic development of kindergarten learners, with a specific focus on insights derived from selected teachers. A cohort of ($n$ = 56) teachers from 28 kindergarten classrooms in Hohoe participated, having been purposively chosen based on their engagement in a play-based learning workshop. The investigation employed the Holistic Development through Play Questionnaire as the primary instrument for data collection. Construct validity of the questionnaire was established using Pearson correlation ($r=0.96$), while reliability was assessed through Cronbach alpha, adhering to a threshold of 0.7. Data analysis encompassed mean, correlation and Fuzzy C-Means Clustering. The findings revealed a moderate level of agreement among teachers ($M$ = 3.55, $SD$ = 0.945)

regarding the positive influence of PBL on the holistic development of kindergarten learners. A significant positive correlation was observed among cognitive, social, and physical development domains, underscoring the interconnectedness of these aspects within the PBL framework. Moreover, distinct patterns of development were discerned across these three domains, illuminating the diverse facets of children's development fostered by PBL. In conclusion, this study underscores the role of PBL in empowering holistic development among kindergarten learners, as endorsed by the insights of selected teachers. The findings hold implications for the design of effective PBL activities that are rich in the development in early childhood learners.

**KEYWORDS**: Play – based learning, Cognitive, Social, Physical development, KG learners

## INTRODUCTION

Early childhood education is a critical phase in children's lives that lays the foundation for future learning and development (Arshad & Zamir, 2018). During this formative period, children undergo rapid physical, cognitive, social, and emotional growth. To ensure their well-rounded development, educational approaches need to be carefully designed to align with the unique needs and characteristics of children's learning.

Tikkanen et al. (2023) expressed that play has long been recognized as an essential element of children's learning experiences. It is through play that children explore their surroundings, develop problem-solving skills, build social relationships, and express themselves emotionally. Play-based learning, a pedagogical approach rooted in constructivist theories, capitalizes on the innate curiosity and active engagement of children by integrating play into educational practices. In the context of kindergarten education, where children are typically between the ages of 3 to 6 years old, play-based learning holds particular significance. This phase marks a crucial period of brain development, socialization, and skill acquisition. Kindergarten learners exhibit a natural inclination towards exploration, imitation, and interaction with their environment, making play-based

learning a fitting and effective approach to fostering holistic development (McNally & Slutsky, 2017). McNally and Slutsky further argue that cognitive development in kindergarten learners is facilitated through play-based activities that encourage curiosity, problem-solving, and creativity. Social interactions during play help children learn to cooperate, share, negotiate, and navigate social norms, forming the basis for healthy social relationships (Palagi, 2018). Emotional growth is nurtured as children use play to express feelings, develop empathy, and learn to manage emotions. Additionally, Page et al. (2017) indicate that play-based activities promote physical development by enhancing motor skills, coordination, and spatial awareness.

The implementation and direction of curricular and pedagogical changes are mostly the responsibility of teachers (Cheung et al., 2022). Cheung et al. further express that evidence from literature on professional development points to the importance of teacher capacity in delivering high-quality education to children. Again, their study established that increasing teacher competencies in curriculum design and instructional strategies may, in turn, increase teaching effectiveness and dedication to children's learning. This development of teachers' skills is especially crucial for kindergarten education since kindergarten teachers are directly involved in assisting young children in achieving a balanced development and laying the groundwork for lifelong learning. Therefore, improving teacher skills has a significant impact on children’s learning and development in addition to improving school performance and effectiveness. Developing the skills of educators is recommended as a crucial step for designing the quality of kindergarten learning, enhancing teachers' commitment to children's learning, and enhancing teacher pedagogical practices. The 2019 reform standard-based curriculum in Ghana emphasizes play as a crucial tool for children's growth and learning, while teacher-directed instruction is said to be a popular strategy in kindergartens. This can be an indication of the lack of a kindergarten-specific professional learning community that encourages the growth of teachers' ability for curriculum reform. Teacher beliefs are seen as contributing variables to the development of curriculum planning and

pedagogical methods when educators face the problems of curriculum implementation.

Although play is a normal part of childhood, little was known about it in terms of early childhood development research until the 20th century. Few psychologists, like Piaget, Vygotsky, and Froebel, explored the introduction of play–based learning. Piaget, whose constructivist theory identified play as a means by which people can integrate new information into their pre-existing schemas, and Vygotsky, who regarded play as the leading source of development in the preschool years, are two early researchers who explored the use of play for early development. Similar to Froebel, who defined what he thought to be the essential components of play and included them in his kindergarten program (Fesseha & Pyle, 2016), play and its impact on early childhood development are still being studied by researchers as a pedagogical strategy for academic learning. Similarly, Pyle et al. (2023) indicate that early childhood education (ECE) settings can greatly benefit from understanding classroom practice through the eyes of the teachers. Pyle et al. also stated that there are discrepancies between teachers' articulated roles of play and what they report assessing during periods of play, despite the fact that many kindergarten programs emphasize play and evaluation to assist children's learning and development. The complicated linkages between perspectives and practice can be investigated using a variety of research designs; therefore, it is vital to think about which methodological approach, or combination of approaches, may be best in early years situations.

**Study Context**

Early childhood education is a critical phase that significantly impacts a children cognitive and social development. In the context of Hohoe, Volta Region of Ghana, where cultural and socio-economic factors play a pivotal role in shaping education outcomes, there is a compelling need to explore innovative and effective teaching approaches. This study seeks to justify the experimentation of play-based learning specifically in Hohoe, Volta Region, by highlighting its potential to positively influence the cognitive and social development of kindergarten learners. The Volta Region of

Ghana boasts a rich cultural heritage with unique traditions and values. Play-based learning can be customized to align with local customs and traditions, making it culturally relevant and resonating with the community. Tandon et al. (2021) opined that integrating traditional games, storytelling, and indigenous materials into play-based activities, this approach can enhance children cognitive development while preserving their cultural identity. Hohoe, like many areas face resource constraints in early childhood education. Play-based learning often relies on inexpensive and locally available materials, reducing the financial burden on schools and families. This makes it a viable and sustainable approach for kindergarten learners in the region, promoting cognitive and social development even in resource-constrained settings.

The implementation of play-based learning in Hohoe can address the need for holistic skill development. In addition to cognitive growth, Harbourne et al. (2020) opined that play-based activities promote motor skills, problem-solving abilities, and emotional intelligence. This comprehensive approach aligns with the local community aspirations for well-rounded education for their children. Given the region cultural emphasis on community and active participation, play-based learning can offer kindergarten learners opportunities for collaborative exploration and learning. Active engagement in group play activities fosters social interaction, cooperation, and communication skills, contributing to both cognitive and social development (Yunianti, 2020). Hohoe, like many regions, may experience socio-economic disparities. Play-based learning can help bridge this gap by providing a levelled playing field for children with varying backgrounds. Regardless of economic status, kindegarten learners can benefit from the experiential and interactive nature of play-based activities, fostering cognitive and social growth (Roberts et al., 2019). The study of play-based learning in Hohoe can specifically focus on its role in laying the foundation for early literacy and numeracy skills. Napoli and Purpura (2018) state that engaging in playful activities that involve counting, storytelling, and symbolic play enhance children's cognitive capacities, setting the stage for future academic success.

Despite the presence of an intervention program by Right to Play aimed at promoting play-based learning (PBL) in Ghana's early childhood education system, a significant research gap remains in understanding the specific impact of this intervention in the context of Hohoe. While most literature highlights the positive influence of PBL on holistic child development, its effectiveness in Hohoe and similar regions has not been comprehensively investigated. This research gap is particularly important to address because it pertains to an ongoing intervention program with real-world implications. By conducting a study focused on the impact of PBL intervention in Hohoe, this research aims to bridge this gap by providing empirical evidence of its effectiveness within the unique cultural, social, and educational context of Hohoe.

**Study objectives**

This study aims to explore the impact of play-based learning activities on various domains of kindergarten learners' development. It assessed how play-based activities influence cognitive development, investigated the effects of incorporating play-based learning strategies on social development, and examined the impact of integrating play-based learning approaches on physical development and gross motor skills, evaluating improvements in coordination, balance, and overall physical activity levels in kindergarten learners. In view of this, the following research questions were formulated:

1. How does the implementation of play-based learning activities contribute to the cognitive development of kindergarten learners?
2. To what extent does the incorporation of play-based learning strategies enhance social development outcomes among kindergarten learners?
3. What is the impact of integrating play-based learning approaches on the physical development and gross motor skills of kindergarten learners?

## LITERATURE REVIEW

### Experiential learning Theory and Play – based Learning

Experiential learning is a prominent educational theory that emphasizes the transformative power of hands-on experiences in the process of

acquiring knowledge and skills. This theory, often attributed to educational theorist David A. Kolb, posits that individuals learn best when they actively engage with the learning material through direct personal involvement, reflection, and application. Experiential learning is rooted in the belief that meaningful learning occurs when learners can connect new concepts and ideas to their prior experiences and integrate these insights into their understanding of the world (Sugahara & Lau, 2019). At the core of the experiential learning process is the learning cycle, which comprises four distinct stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation. Kolb and Kolb (2017) explain the stages of the theory by established that the cycle begins with a concrete experience, where learners directly engage in a hands-on activity or encounter a real-world situation. Subsequently, they engage in reflective observation, critically analyzing their experiences and identifying patterns and insights. This leads to abstract conceptualization, where learners draw overarching principles and concepts from their observations. Finally, learners engage in active experimentation, applying their newly acquired knowledge and concepts in practical situations to test their validity and refine their understanding.

Sung et al. (2017) highlights that an experiential digital game-based learning approach has the potential to enhance students' understanding of the concept and significance of learning. This understanding is pivotal in fostering a positive learning attitude and preparing students to become lifelong learners. The immersive nature of digital games coupled with experiential learning principles contributes to creating engaging learning experiences that resonate with students. By leveraging the interactive and dynamic nature of digital games, students are more likely to perceive the value of learning and cultivate attitudes conducive to continuous learning throughout their lives. Urquidi-Martín et al. (2019) reveals that the realism of a game and its simulation structure play crucial roles in influencing students' perceptions of usefulness and learning motivation. The incorporation of realistic elements in the game environment allows students to recognize the practical applications of what they are learning. Additionally, the presence of a well-structured simulation framework enhances critical thinking skills, contributing to heightened learning

motivation. This suggests that experiential learning principles, when integrated into digital game design, can create a synergy that effectively enhances students' engagement, motivation, and higher-order cognitive skills. Coates and Pimlott-Wilson (2019) highlights the positive outcomes of blending Forest School practices with mainstream educational settings, emphasizing the impact on children's social, cognitive, emotional, and physical skill development through experiential learning via play. The findings indicates that the holistic benefits of experiential learning approaches, demonstrating that a nature-based approach can foster a well-rounded development that encompasses various domains. By integrating experiential learning through play, students are exposed to diverse learning opportunities that contribute to their overall growth and well-being. The findings further suggest a revision to Kolb's model of experiential learning, proposing a framework consisting of contextually rich concrete experiences, critical reflective observation, context-specific abstract conceptualization, and pragmatic active experimentation. This revision takes into account the contextual nuances of experiential learning, emphasizing the importance of a holistic approach that aligns with real-world scenarios and practical applications (Morris, 2020).

**Implementation of Play-based Learning**

Fesseha and Pyle (2016) investigated play-based learning concept by seeking kindergarten teachers' views. The purpose of the study was to discover more about how teachers in Ontario describe play-based learning and how their viewpoints influence how it is used in kindergarten classrooms. Based on two definitions of play, a survey instrument was design to collect data from kindergarten teachers across the province of Ontario; the first definition was fixed on social development through play, while the second was on academic and social growth in play. The findings showed that participants' definitions and applications of play-based learning in kindergarten classrooms were inconsistent. It was stated that majority of the participants talked about playing in ways that had nothing to do with learning, but they still seemed to believe that it was possible to learn through play. In addition, majority of teachers discussed the implementation of kindergarten programs that did not fully incorporate play-based learning as it is defined in the Ontario educational context,

despite the fact that all teachers stated positive opinion on play-based learning. The teachers were also asked to list any difficulties they had implementing play-based teaching. Participants in every enactment group reported having difficulties putting their play into action. These findings confirm the necessity for a precise and uniform definition of play-based learning, which will aid in determining the most effective way to combine play and the acquisition of academic abilities. Pyle et al. (2023) explored play based learning and assessment practice. The study aimed to understand the linkages between teachers' views and practices in kindergarten education, the study attempted to compare the advantages of employing semi-structured and video-elicitation interview teaching approaches. A thorough, qualitative investigation was conducted. Observational data were collected from twenty kindergarten classrooms in Ontario, Canada. This was followed with some interviews. Data from the interviews were analyzed thematically. The results revealed that video-elicitation interviewing had an impact on the format and substance of participants' responses, offering extra and insightful information on the constant negotiation between perspectives and practice compared to semi-structured interviews. Based on the findings the study demonstrates how semi-structured and video-elicitation interview methodologies can be used alone or in combination to learn more about the relationship between instructors' opinions and their instructional strategies. Each strategy has specific advantages and disadvantages that can be taken into account. It was recommended that a broad research goal should be carefully considered while choosing one approach, or a combination of approaches.

**Exploring the Influence of Play-based Learning in Kindergarten Classrooms**

Keung and Cheung (2019) examined how teachers perceived play-based learning development to be effective and how their perceptions of it connected to whole-child development using a holistic support framework. A mixed-method study was used to get the data. Questionnaire was administered to 286 early childhood educators from 50 kindergarten classrooms in Hong Kong, as well as 29 principals, head teachers, and teachers underwent interviews to triangulate the survey. Through the use of play pedagogy by teachers and parent-school collaboration, quantitative

analysis revealed that school collaborative culture enhanced several elements of children's development. Qualitative interview data supported the survey findings that parents' and teachers' roles and responsibilities were important in promoting the adoption of play-based learning in kindergarten settings. This suggest that the findings have provided insight into how instructors conceptualize effective play-based learning, how play pedagogy is implemented in the classroom, and how parents and schools work together. A holistic support model should be used in the assessment of the early childhood learner, and kindergartens should actively work to incorporate parents, teachers, and other childcare providers in order to create the best possible play-based learning environment for young children. Cheung, et al. (2022) based their gap with an emphasis on the mediation of teachers' capacity building with constructing a play curriculum, the study investigated kindergarten teachers' ideas about and practices of play-based learning. A questionnaire was used to gather quantitative data from three cohort samples of 90 kindergartens' learners who took part in a university-school collaboration initiative. To ensure the validity and reliability of the constructs, the data collected from 50 kindergartens' first and second cohort years were analyzed using exploratory and confirmatory factor analysis). For the purpose of analyzing the mediation effect, data from 40 kindergartens' third cohort year are used. The findings show that teacher views are substantially correlated with their play-based learning pedagogical methods and perspectives of whole-child development. Improving teachers' capacity to implement a play-based learning curriculum partially mediates and shows a substantial link between these associations. These skills pertain to the ability of teachers to create and modify a play-based learning curriculum based on the educational background and developmental requirements of the students. By enhancing pertinent capacities, the findings have major practical ramifications for teacher preparation and professional development.

**Cognitive Development of** kindergarten **Learners through Play-Based Activities**

Ahmad et al. (2016) indicated that from birth through adolescence and into adulthood, cognitive development includes the formation of thought

processes, including remembering, solving problems, and making decisions. They further expressed that play supports cognitive growth in a variety of ways. It aids in the development of children's imagination and memory, two skills necessary for thinking about the past, present, and future. The aim of the study was to determine how play affects children's cognitive development. The investigation was quantitative in nature. A sample of 300 students were surveyed for the study. The data were gathered using a Likert scale with five points. It was found and suggested that students had a natural curiosity to investigate novel concepts through play. A longitudinal study was conducted by Muentener et al. (2018) to assess the consistency of exploratory play among early grade learners and how it relates to their cognitive development. The study evaluated children's exploratory play four times over the period of nine months. Infants' attention to novelty, inductive generalizations, exploration efficiency, face preferences, and imitative learning were used to measure exploratory play. For the entire group, the study evaluated cognitive development at the fourth visit. The effectiveness of exploration was the only metric that remained constant over development. Additionally, the efficiency score of babies predicted vocabulary size and separated at-risk babies from those who were not from those recruited from early intervention locations. More efficient exploration was connected with better IQ scores, which gave further support for the significance of the efficiency measure in follow-up analyses at age three. These findings imply that exploratory play by children can provide valuable information regarding long-term cognitive development. In like manner, Vogt et al. (2020) opined that while research emphasizes the value of early numeracy in kindergarten, practitioners need efficient and cutting-edge pedagogical strategies. The study was used as an intervention to investigates how these two pedagogies affect students' mathematical proficiency. Three groups (the control group, the play-based method using card and board games, and the training program) each included 324 six-year-old children and 35 kindergarten teachers. Semi-structured interviews were used to collect educators' opinions on the interventions. The results point to greater learning benefits for the play-based methodology. The differentiated impacts were discovered as tendencies: children with high competences benefit more from the play-based approach than the training; children with

poor skills likely to gain more from training programs compared to no intervention. The play-based solution using card and board games was deemed more appropriate for children's varied requirements by educators. In human life, especially for youngsters, play is never missing. A game must be present in order to play (Lia et al., 2018). Lia et al. further argued that games can be categorized as digital or traditional. Digital games use computers, mobile or handheld devices, or gaming consoles as its playing platforms, but traditional games may need for physical interaction and/or traditional equipment. The study attempts to look into the effects of traditional games on studies of child development for children between the ages of 4 and 9. Based on the suggested classification technique, 43 papers were found and examined in terms of year, age group, type of play, research methodology, and learning outcome. The study suggest that traditional games can encourage young children's cognitive development. **Socio-emotional Development of** kindergarten **Learners through Play-Based Activities.**

Lestari and Prima (2017) investigated the use a traditional game to enhance early childhood social and emotional development on the children of TK Pradnyandari III Kerobokan. The observational approach was employed in a classroom action research design. The 22 children that participated in this study were split between 11 boys and 11 girls. The goal of the study was to improve early childhood social and emotional development by using traditional children's activities. Cycle I result shows that 14 children (63.64%) had attained total learning mastery, whereas eight children (36.36%) had not. Only two children (9.09%) from Cycle II did not achieve the learning mastery, leaving 20 students (90,91%). It was suggested that children's social emotional skills can be improved by using traditional games. The study also revealed that children's learning mastery increased from Cycle I to Cycle II by 27.27%. This implied that the use of traditional games can enhance children social and emotional growth. Traditional games can be tested in different early childhood education skill development areas. Similarly, Astuti et al. (2019) set out to explain how engaging in play can help young children develop their emotional and social intelligence. They also argued that early social and emotional development must be nurtured and cultivated by parents, teachers, and

other caregivers in order for a child to have emotional as well as social intelligence. The study model in the investigation was approached qualitatively. The study stated that literature established that the early childhood social and emotional development of children is best achieved through play. The researchers discovered that among other things, children's play activities can help early childhood social-emotional development. For example, the games that children play in small groups or the games that include using objects like balls, marbles, rubber, and other objects. The results of this study can assist young children in their ability to employ play activities to enhance the environment and hereditary-influenced development of social-emotional intelligence. It was recommended that play can help people develop good character traits including integrity, self-reliance, responsibility, loyalty to friends and friends-for-life, compassion for others, high tolerance, and the need for intergroup cooperation.

Despite obvious connections between play, learning, and development, children's outdoor play is on the decline. Therefore, there is a need for alternative learning programs that give children a variety of play possibilities, including the ability to play outside (Coates & Pimlott-Wilson, 2019). Blewitt et al. (2018) explore the effectiveness of early childhood education and care centers' universal curriculum-based social and emotional learning (SEL) programs in fostering children's social and emotional development. By conducting a systematic review and meta-analysis of 79 distinct studies, encompassing 18,292 participants, they assessed the outcomes of children exposed to SEL interventions and compared them to control groups. The results shed light on the significant benefits of these interventions across various developmental domains during a critical period of children's growth. The findings of this study indicate that children who participated in universal social and emotional learning interventions demonstrated substantial improvements in various aspects of their social and emotional competence, behavioral self-regulation, emotional and behavioral problems, and early learning outcomes. The positive effects observed among the intervention group surpassed those of the control participants. The findings hold crucial implications for the field of early childhood education and care. The

effectiveness of universal social and emotional learning treatments underscores their potential to enhance the development of young children across multiple domains. Given that early childhood is a pivotal period for the establishment of social, emotional, and cognitive skills, implementing SEL programs in educational settings can play a vital role in supporting children's holistic growth. The suggest that early childhood education and care centers' universal curriculum-based social and emotional learning programs exhibit remarkable success in fostering children's social and emotional development. This comprehensive study, encompassing numerous studies and participants, demonstrates the significant benefits of SEL interventions.

**The influence of Physical Activities in holistic development of KG leaners through PBL**

Resaland et al. (2016) investigated how 10-year-old children's academic performance is affected by a seven-month, school-based cluster-randomized controlled study. Cluster randomization was used to assign 1129 fifth-graders from 57 elementary schools in Sogn og Fjordane County, Norway, to either the intervention group or the control group. Between November 2014 and June 2015, the kids in the 28 intervention schools took part in a physical activity intervention that had three parts: 1) 90 minutes per week of physical education instruction, mostly on the school playground; 2) 5 minutes per day of breaks for physical activity during class; 3) 10 minutes per day of physical activity homework. Using standardized Norwegian national assessments, academic achievement in reading, mathematics, and English was evaluated. Using accelerometry, physical activity was quantified objectively. In our initial analysis, the study discovered no evidence of an impact of the intervention on academic performance (0.01-0.06, $p>0.358$). However, subgroup analyses showed a positive intervention impact compared to controls for those who had the lowest numeracy performance at baseline (lowest tertile) (0.62, 95% CI 0.19-1.07; $p=0.005$ for the subgroup-group interaction). The study introduces an encouraging perspective by proposing that the integration of physical activity and learning can be particularly beneficial for academically weaker schoolchildren. This suggests that a dual approach that combines physical engagement with academic content has the

potential to facilitate better learning outcomes for those who may face academic challenges.

Seymour and Garrison (2015) examine how a new era of high-stakes testing is also contributing to an emphasis on the cognitive, rather than the physical, building on recent arguments of how current national standards for physical education promote cognitive outcomes over physical achievements. Less focus has been placed on the newest aspect of high-stakes testing: the use of student achievement test results to assess teachers. High-stakes testing has been connected to a decrease in the amount of physical education that schools offer. The authors look at new teacher evaluation regulations in New York State to investigate how this new high-stake assessment may affect curriculum objectives for physical education. After that, the authors suggested a different justification for physical education. The study highlights that physical education, through its emphasis on physical activity, exercise, and structured movement, holds a distinctive and pivotal role. It is suggested that such programs create a favorable environment that positively influences both student cognitive development and public health outcomes. This observation underscores the holistic benefits of incorporating physical education into the curriculum, as it not only supports students' intellectual growth but also contributes to improved overall well-being.

Ruiz-Esteban et al. (2020) sought to determine the effects of an organized physical activity program on the motor development of preschool-aged children between the ages of three and five. Participants were 136 preschoolers in the Region of Murcia (Spain) with normative development at ages three to four. The motor development profiles of preschoolers were compared before and after the intervention using the McCarthy Children's Psychomotricity and Aptitude Scales (MSCA) battery of psychomotor tests. A comparison group of 108 students and an intervention group of 28 pupils were created from the sample. The intervention group participated in an organized 24-week physical education program. During the same time period, the comparison group participated in an immersive program built around free play. In comparison to pre-intervention and post-intervention, preschoolers in both groups showed a significant

improvement in limb coordination. Post-intervention results revealed statistically significant differences between the comparison group and the intervention group, with the intervention group displaying higher arm coordination values ($F(1,134)$ = 14,389, $p$ = 0.000, 2 = 0.097), and higher leg coordination values ($F(1,134)$ = 19,281, $p$ = 0.000, 2 = 0.126) than the comparison group. Free play is not as effective an educational strategy as structured physical activity instruction to ensure that preschoolers' motor skills develop properly. The study indicates the significance of structured physical activity education as a more effective methodology than free play for achieving adequate motor development in preschool children. The observation emphasizes the value of purposeful and guided physical activities in nurturing motor skills during the critical early years.

## METHODS AND MATERIAL

**Participants and Sampling:** This study aimed to investigate the play-based learning on the holistic development of kindergarten learners, focusing on insights from selected teachers. To achieve this objective, a quantitative descriptive survey design was employed, encompassing various stages of data collection and analysis. The study population comprised ($n$ = 56) teachers from 28 kindergarten classrooms in Hohoe, who were purposefully selected based on their participation in a workshop on the use of play-based learning.

**Data collection procedure:** The data collection process began with the administration of the Holistic Development through Play Questionnaire (HoDPQ) to the selected teachers. The questionnaire was designed to assess teachers' perspectives on the use of play-based learning on holistic development. The questionnaire utilized a five-point Likert scale, ranging from 1 (Extremely Disagree) to 5 (Extremely Agree), to measure the responses of teachers. Following the questionnaire administration, teachers were given one academic term (3 months) to implement play-based learning strategies in their classrooms. The teachers' observations focused on assessing changes in kindergarten learners' performance using qualitative indicators such as on-task activities, communication, expression, and overall engagement, rather than relying solely on written score exams.

**Validity and Reliability:** The construct validity of the questionnaire was established using Pearson correlation (r=0.96) to ensure that the items effectively captured the intended constructs. Additionally, the reliability of the instrument was assessed using Cronbach alpha, with a threshold of 0.7. This ensured that the questionnaire consistently measured the same constructs across different items.

**Data analysis procedure:** The collected data was subjected to rigorous analysis to draw meaningful insights: descriptive analysis (mean scores) was calculated to determine the extent of agreement among teachers regarding the use of play-based learning on holistic development. In addition, Pearson correlation coefficients were computed to explore potential relationships between teachers' perceptions of play-based learning and observed holistic changes in kindergarten learners focusing on cognitive, social and physical development. The Fuzzy C-Means Clustering was employed to categorize teachers based on their responses to the questionnaire. This allowed for the identification of distinct patterns or clusters of opinions among the participants. The study ensured the protection of teachers' rights and privacy. Informed consent was obtained from all participating teachers, and their anonymity was maintained throughout the study.

## RESULT

**Table 1: Scale Validity and Reliability Statistics**

| | Mean | SD | Cronbach's α | Item-rest correlation |
|---|---|---|---|---|
| **Cognitive Development** | 3.41 | 0.981 | 0.961 | 0.958 |
| **Social Development** | 3.65 | 0.986 | 0.907 | 0.964 |
| **Physical Development** | 3.59 | 0.909 | 0.963 | 0.987 |
| **Overall** | 3.55 | 0.945 | 0.985 | |

Table 1 presents the validity and reliability of the assessment instrument, Holistic Development through Play Questionnaire (HoDPQ). The HoDPQ underlines robust validity and reliability in capturing the perceptions of the teachers of play-based learning influence on cognitive, social, and

physical development among kindergarten learners. This suggests the confidence in the efficacy of HoDPQ for investigating play-based learning to observe holistic development in kindergarten learners. Furtherance to the above, the mean scores indicate teachers' agreement levels with the effects of play-based learning. In cognitive development, the teachers reported a mean score of 3.41 (*SD* = 0.981), suggesting a agree consensus on its influence. For social and physical development, the mean score was 3.65 (*SD* = 0.986) and 3.59 (*SD* = 0.909) indicating a moderate agree concurrence regarding positive social and physical impacts on play-based learning role in enhancing affective and motor skills. The Overall mean score illustrates positive inclination of PBL towards holistic development in the learners. Details of the summary in table can be seen in table 2.

**Table 2: Mean of Teachers Perspective of PBL on KG leaners holistic development**

| Cognitive Development through Play-Based Learning | Mean | SD |
|---|---|---|
| Play-based learning activities significantly enhance problem-solving skills in KG learners. | 3.39 | 1.07 |
| Engaging in play -based learning contributes to improved memory retention among KG learners. | 3.71 | 0.89 |
| Participation in play-based learning fosters critical thinking abilities in KG learners. | 3.13 | 1.08 |
| **Social Development through Play-Based Learning** | | |
| Play-based learning strategies effectively encourage cooperation and teamwork among preschool children. | 3.50 | 0.99 |
| Engagement in play -based learning activities positively influences the development of communication skills and peer interactions. | 3.80 | 1.07 |
| **Physical Development through Play-Based Learning** | | |
| The implementation of play -based learning approaches noticeably contributes to children's gross motor skill development, including balance and coordination. | 3.52 | 0.99 |
| Play-based learning activities have a significant impact on the overall physical activity levels and engagement of children in early childhood education programs. | 3.48 | 0.99 |
| Specific play-based learning techniques show promise for enhancing fine motor skills among KG learners. | 4.02 | 0.86 |
| Children's engagement in outdoor play -based activities contributes to their physical health and well -being in early childhood education settings. | 3.36 | 0.98 |

*Extremely Disagree (1 – 1.8); Moderately Disagree (1.9 – 2.6); Agree (2.7 – 3.4); Moderately Agree (3.5 – 4.2); Extremely Agree (4.3 – 5.0)*
From table 2, it was established all items except (Participation in play-based learning fosters critical thinking abilities in KG learners with *M* = 3.13) rated from moderate to extreme agree. This emphasis the holistic development of KG learners through PBL.

**Table 3: Correlation Matrix of Cognitive, Social and Physical development through Play-Based Learning**

| | | Cognitive development through Play-Based Learning | Social Developmen through Play -Base Learning |
|---|---|---|---|
| **Social Development through Play-Based Learning** | Pearson's r | 0.937*** | — |
| | p-value | < .001 | |
| **Physical Development through Play -Based Learning** | Pearson's r | 0.967*** | 0.975*** |
| | p-value | < .001 | < .001 |

*Note. * p < .05, ** p < .01, *** p < .001*
Table 3 presented correlation matrix to explain the relationship between different developmental domains as perceived through the lens of PBL by teachers. Notably, a robust positive correlation emerged between cognitive and social development ($r = 0.937$, $p < .001$). This finding suggests that as teachers observe improvements in cognitive skills through PBL, they are also more likely to identify corresponding improvements in social interactions and interpersonal abilities among kindergarten learners. Furthermore, the study uncovered a strong and significant correlation between cognitive and physical development ($r = 0.967$, $p < .001$). Similarly, the association between social and physical development was found to be substantial ($r = 0.975$, $p < .001$), reinforcing the idea that teachers who perceive positive social developments through Play-Based Learning are also inclined to recognize concurrent improvements in physical capabilities. The correlations highlight the comprehensive nature of holistic development foster multifaceted growth among kindergarten learners through PBL from the teachers' perspective.

**Table 4: Fuzzy C-Means Clustering**

| Clusters | N | $R^2$ | AIC | BIC | Silhouette |
|---|---|---|---|---|---|
| **3** | 56 | 0.856 | 41.14 | 59.36 | 0.55 |

A Fuzzy C-Means Clustering analysis in table 4 examine the data cluster structure. The dataset consisted of 56 teachers, and the clustering algorithm identified three distinct clusters. The analysis revealed a high $R^2$ = 0.856, (85.6%) of the data points were well-represented by the identified clusters. The Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) values were 41.14 and 59.36, respectively, suggesting a relatively good fit of the clustering model. Additionally, the Silhouette = 0.55, indicating that the clusters had reasonably well-defined boundaries, with higher values indicating better cluster cohesion. These results suggest that the Fuzzy C-Means Clustering effectively partitioned the data into meaningful clusters, providing valuable insights into the underlying structure of the dataset.

**Table 5: Clustering of Cognitive, Social and Physical development through PBL**

| Cluster | Cognitive development thru PBL | Social development thru PBL | Physical Activity development thru PBL |
|---|---|---|---|
| **Size** | 13 | 20 | 23 |
| **Explained proportion within-cluster heterogeneity** | 0.183 | 0.336 | 0.481 |
| **Within sum of squares** | 4.234 | 7.78 | 11.122 |

The data was subjected to a cluster analysis to examine the development of children in cognitive, affection, and physical activity domains through Play-Based Learning (PBL). Three clusters were identified, with 13 teachers in the first cluster, 20 teachers in the second cluster, and 23 teachers in the third cluster. The analysis of within-cluster heterogeneity revealed that the first cluster explained 18.3% of the total variance in children's cognitive development through PBL, the second cluster explained 33.6% of the variance in children's affection development through PBL, and the third cluster explained 48.1% of the variance in children's physical activity development through PBL. Moreover, the

within sum of squares (WSS) for each cluster was found to be 4.234 for cognitive development, 7.78 for affection development, and 11.122 for physical activity development through PBL. These results demonstrate that the cluster analysis effectively grouped teachers based on their perceptions about children development in different domains through PBL. The identified clusters vary in their proportions of explained variance and within-cluster sum of squares, indicating distinct patterns of development across the three domains. The findings shed light on the potential benefits of PBL in meeting diverse aspects of children's development.

## DISCUSSION OF FINDINGS

Cognitive Development through PBL: The findings in this study suggests that cognitive development activities within the PBL framework contribute moderately to the holistic growth of KG learners. This indicates that incorporating cognitive enrichment through play-based activities can significantly impact learners' cognitive abilities, such as problem-solving, critical thinking, and language skills. The key finding by Ahmad et al. (2016) expressed that play supports cognitive growth in a variety of ways, finds empirical support in this study's outcome. Cognitive development through PBL, as indicated emphasises the importance of play-based activities in fostering crucial cognitive skills. Specifically, the study of (Muentener et al. 2018; Vogt et al., 2020) found that PBL aids in the development of children imagination and memory, which are essential cognitive faculties for comprehending and processing information. They further established that the connection between PBL and cognitive development is illuminated through the skills of imagination and memory. This suggests that PBL experiences allow kindergarten learners to engage their imaginations, thereby enhancing their capacity to think creatively, generate ideas, and explore alternative perspectives. Additionally, the observed impact of PBL on memory development is significant, enabling children to recall past experiences, apply learned knowledge to present situations, and envision potential future scenarios.

Social Development through PBL: The social development through PBL indicates a relatively stronger contribution of social development activities

within the PBL context to the holistic growth of KG learners. The implications suggest that PBL fosters rich social interactions, cooperation, and communication skills among learners, preparing them for effective interpersonal relationships. The insight that children's social emotional skills can be improved by using traditional games resonates harmoniously with the findings related to social development through PBL as found in this study. It is also established the contribution of social development through PBL to the holistic growth of kindergarten learners, aligns with the notion that traditional games and play-based activities can serve as effective tools for enhancing social emotional skills (Lestari & Prima, 2017). The correlation between traditional games and social emotional skill improvement (Astuti et al. 2019), finds empirical support in this study finding. The study demonstrated that PBL experiences significantly contribute to social development, as indicated by the argument that traditional games, often embedded within PBL approaches, indeed have the potential to foster essential social emotional skills. The finding suggests that PBL enables kindergarten learners to engage in activities that necessitate cooperation, teamwork, and effective communication. These are fundamental aspects of social emotional growth. Traditional games, a subset of PBL, inherently encourage interaction, empathy, and the ability to understand and manage emotions within a social context. The past and the present studies indicate a positive impact of PBL on social development and the notion that traditional games can enhance social emotional skills.

Physical Activity Development through PBL: The physical activity development through PBL demonstrated the highest significant and substantial contribution of PBL to the holistic growth of kindergarten learners. The implications emphasize that PBL, which engages learners in movement and physical challenges, contributes significantly to motor skills, physical coordination, and overall health. In support of this study Seymour and Garrison (2015) established that promoting physical activity within an educational context, schools have the opportunity to foster well-rounded individuals who are equipped with both cognitive skills and a foundation of health-conscious habits. Furthermore, Resaland et al. (2016) revealed that incorporating movement and activity into the learning

process, educators can create an engaging and dynamic educational experience that resonates with a broader spectrum of learners, ultimately leading to improved academic performance and a more. Similarly, Ruiz-Esteban et al. (2020) suggestion to prioritize structured physical activity highlights the importance of deliberate planning and instruction in motor skill development. This insight can inform the design of preschool curricula and activities, ensuring that children receive targeted opportunities for motor skill enhancement, thereby setting a strong foundation for their physical capabilities.

## CONCLUSION

Although the findings suggest that all three domains contribute to the holistic development as opined by experiential learning theory and PBL pedagogy, it can be concluded in this study that the PBL contribute more physical development in kindergarten learners compared to cognitive and social development.

## RECOMMENDATIONS

Based on the findings, the following recommendations were set to enhance the efficacy of PBL and optimize holistic growth among kindergarten learners:

1. Balanced Integration of Domains: While the study highlights the prominent role of PBL in fostering physical development, it is essential to ensure a balanced integration of all developmental domains within the pedagogy. Educators and curriculum designers should focus on designing PBL activities that intentionally target cognitive and social growth alongside physical skills.
2. Professional Development for Teachers: To fully harness the potential of PBL in promoting holistic development, teachers should receive targeted professional development that equips them with strategies to effectively nurture cognitive and social skills through play-based activities.
3. Collaborative Curriculum Design: Collaborative efforts between educators, curriculum specialists, and child development experts (NGOs) can lead to the creation of play-based curricula that intentionally and explicitly address cognitive, social, and physical

developmental goals. Regular reviews and updates to the curriculum can further ensure that each developmental domain is adequately represented and nurtured through PBL.

## LIMITATION AND SUGGESTION FOR FUTHER STUDIES

While this study sheds light on the differentiated contributions of Play-Based Learning (PBL) to cognitive, social, and physical development among kindergarten learners, it is important to acknowledge certain limitations that may influence the findings. The reliance on self-reported perceptions and observations introduces the possibility of bias and subjectivity, which could impact the accuracy of the reported outcomes. Lastly, the duration of study for one academic term may not capture long-term effects or changes that may manifest over extended periods of time.

To build upon the insights gained from this study, future research could explore the long-term effects of balanced integration of cognitive, social, and physical developmental domains within the PBL framework. Additionally, investigating the effectiveness of professional development programs for teachers, specifically focusing on enhancing their ability to facilitate cognitive and social growth through PBL activities, could contribute valuable insights to pedagogical practices. Moreover, exploring the impact of individual learner characteristics, such as learning styles or abilities, on the efficacy of PBL interventions for cognitive, social, and physical development, could provide nuanced perspectives on personalized approaches to holistic growth.

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***Participants can rate each statement on the Likert scale according to their level of agreement or disagreement with the statement. (Extremely Disagree - Moderately Disagree - Agree - Moderately Agree - Extremely Agree)***

| Objective 1: Cognitive Development through Play -Based Learning | ED | MD | A | MA | EA |
|---|---|---|---|---|---|
| 1. Play-based learning activities significantly enhance problem -solving skills in KG learners. | | | | | |
| 2. Engaging in play -based learning contributes to improved memory retention among KG learners. | | | | | |
| 3. Participation in play -based learning fosters critical thinking abilities in KG learners. | | | | | |
| Objective 2: Social Development through Play-Based Learning | | | | | |
| 1. Play-based learning strategies effectively encourage cooperation and teamwork among preschool children. | | | | | |
| 2. Engagement in play -based learning activities positively influences the development of communication skills and peer interactions. | | | | | |
| Objective 3: Physical Development through Play-Based Learning | | | | | |
| 1. The implementation of play -based learning approaches noticeably contributes to children's gross motor skill development, including balance and coordination. | | | | | |
| 2. Play-based learning activities have a significant impact on the overall physical activity levels and engagement of children in early childhood education programs. | | | | | |
| 3. Specific play -based learning techniques show promise for enhancing fine motor skills among KG learners. | | | | | |
| 4. Children's engagement in outdoor play -based activities contributes to their physical health and well -being in early childhood education settings. | | | | | |