



## Research Article

# Effects of Play-Based Learning on Sustained Attention Among Kindergarten Learners

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Email: [jonasalomon72@gmail.com](mailto:jonasalomon72@gmail.com)**Article History:**Date received: July 30, 2026  
Date revised: October 4, 2026  
Date accepted: October 15, 2026**Recommended citation:**Salomon, J. (2026). Effects of play-based learning on sustained attention among kindergarten learners. *Journal of Interdisciplinary Perspectives*, 4(11), 132-142. <https://doi.org/10.69569/jip.2026.424x>

**Abstract.** This study aimed to determine the effects of play-based learning on the sustained attention of kindergarten learners, specifically in terms of on-task behavior and duration of attention during learning activities. A quasi-experimental pretest-posttest control group design was employed. Sixty kindergarten learners from two intact classes were designated: an experimental group exposed to play-based learning and a control group taught using traditional instruction. A structured classroom observation checklist measuring on-task behavior and attention duration was administered before and after the intervention. Data were analyzed using descriptive statistics, paired-sample t-tests, and independent-sample t-tests. Both groups demonstrated improvement in sustained attention from a moderate level in the pretest to higher levels in the posttest. The experimental group increased to a very high level ( $\bar{x} = 4.32$ ), while the control group remained at a moderate level ( $\bar{x} = 3.21$ ). Statistically significant differences were found between the pretest and posttest scores of both groups and between the posttest scores of the experimental and control groups, favoring the play-based learning group. The effect estimate indicates that play-based learning produced a substantially larger gain in sustained attention than traditional instruction, with the experimental group outperforming the control group on both on-task behavior and attention duration. The findings indicate that play-based learning is an effective instructional intervention for enhancing sustained attention among kindergarten learners. The results support the use of developmentally appropriate, play-centered strategies in early childhood education to improve on-task behavior and extend attention span during learning activities. Future research may examine longer intervention periods and larger samples to confirm these effects.

**Keywords:** *Play-based learning; Sustained attention; Kindergarten learners; On-task behavior; Early childhood education.*

Play-based learning is central in early childhood education. Contemporary educational thought has increasingly moved away from viewing play as a respite from formal instruction and has instead recognized it as the very condition under which young children construct knowledge, negotiate social relationships, and acquire essential cognitive abilities (Paine et al., 2025). Among these abilities, sustained attention is particularly important. A child's capacity to remain focused on an activity, resist distraction, and persist in a learning task means the gradual development of self-regulation and later academic competence. It is therefore unsurprising that sustained attention has consistently been identified as one of the strongest predictors of school readiness and subsequent achievement in literacy and numeracy (Yan et al., 2024; Gioia et al., 2026). Before children learn to read fluently or solve mathematical problems, they must first learn how to remain mentally present in the learning process itself.



However, sustaining young learners' attention has become an increasingly complex challenge. Developmentally, kindergarten children are still acquiring the cognitive capacities necessary to regulate their focus. Their attention shifts easily from one stimulus to another, making distraction less an exception than an expected feature of early childhood (Lee et al., 2025). Global evidence suggests that children between the ages of five and seven remain particularly vulnerable to environmental interruptions, with sustained attention continuing to mature well into adolescence (Rivella et al., 2025). Such developmental realities become more pronounced within classrooms where learning is organized around prolonged seatwork, repetitive exercises, and teacher-directed instruction. In these settings, what is often interpreted as inattentiveness may in fact reflect the tension between children's developmental characteristics and instructional practices that demand forms of concentration they have not yet fully acquired. Classroom noise, peer interactions, and the physical environment further complicate this process, shaping how well young learners can maintain focus throughout instructional activities (Corciega et al., 2025; Mealings & Buchholz, 2026; Pakarinen et al., 2024).

These challenges take on greater urgency in the Philippine educational context. The Second Congressional Commission on Education (2025) observed that overcrowded classrooms and shifting schedules deprive many young learners of the time and sustained engagement needed to develop foundational competencies. The problem begins before formal schooling, with early childhood education remaining inaccessible to many Filipino children, as reflected in the low participation rate among three- to four-year-olds and the continued absence of early childhood centers in thousands of barangays (Yee, 2025). Within classrooms that are often constrained by limited resources, teachers have likewise reported persistent difficulty in maintaining children's attention during conventional instruction. The growing presence of digital technologies has further complicated this landscape by exposing children to increasingly fragmented patterns of attention long before they enter school (Cardines et al., 2025). Together, these conditions suggest that attentional difficulties are not solely developmental; they are also shaped by the educational environments in which children learn.

This recognition is why play-based learning has gained renewed significance. Rather than requiring children to adapt to instructional forms designed primarily for older learners, play-based pedagogy begins from the premise that learning should correspond with how children naturally explore and make sense of the world. This orientation is supported by constructivist thought, which views learning as an active process of discovery rather than passive reception. Children build knowledge through interaction with objects, experiences, and situations that invite curiosity and experimentation. Complementing this perspective is the socio-cultural view that cognitive development unfolds through guided participation and social interaction, where learning is mediated by teachers, peers, and the cultural environment in which children participate. Together, these perspectives suggest that attention is not merely an individual cognitive resource but something cultivated within meaningful activities shared with others. Play, in this sense, becomes less a diversion from learning than the environment through which learning itself becomes possible.

Empirical evidence increasingly supports this view. Studies show that play-based learning enhances learner engagement by embedding instructional goals in activities children perceive as purposeful and enjoyable (Subarna et al., 2025). Guided play, in particular, enables teachers to maintain clear learning objectives without sacrificing children's intrinsic motivation to explore (Sanchez, 2025). This balance between instructional structure and learner autonomy appears especially important during the kindergarten years, when curiosity rather than compliance often sustains attention. Rather than compelling children to attend through external discipline alone, play invites them to stay engaged because the activity itself holds meaning.

Growing evidence also suggests that play-based experiences support the development of self-regulation, inhibitory control, and attentional persistence. Children exposed to play-oriented classrooms demonstrate greater capacity to remain on task, regulate impulsive behavior, and shift attention appropriately than those taught predominantly through conventional teacher-directed approaches (Skene et al., 2022). Experimental and quasi-experimental studies have similarly documented improvements in classroom participation, behavioral regulation, and sustained engagement following play-based interventions (Healey et al., 2022; DiCarlo & Ota, 2026). Observational research reinforces these outcomes, showing that collaborative play encourages children to sustain attention through shared goals, peer interaction, and emotionally meaningful participation (Aslan et al., 2022). As Arda Tuncdemir (2025) argued, attention in early childhood is deeply intertwined with social and emotional engagement; children remain focused not merely because they are instructed to do so, but because the activity

itself invites continued participation.

From a cognitive standpoint, these findings may also be understood through the lens of instructional efficiency. According to Cognitive Load Theory, learning is optimized when instructional design minimizes unnecessary cognitive demands and lets learners devote more mental resources to processing meaningful information (Sweller, 1988, as cited in Mayer, 2023). Young children possess limited working memory, making them especially susceptible to cognitive overload when confronted with abstract, highly structured, or disconnected learning tasks. Play-based learning reduces these unnecessary cognitive demands by situating instruction in familiar, meaningful experiences. Instead of directing mental effort toward understanding the activity's form, children can devote more cognitive resources to engaging with its content. Learning, consequently, becomes less cognitively burdensome and more naturally sustained.

Despite growing theoretical and empirical support, important questions remain unanswered. Existing scholarship has generally examined play-based learning in relation to literacy, numeracy, school readiness, or socio-emotional development. Comparatively fewer studies have investigated its specific contribution to sustained attention, particularly through observable indicators such as on-task behavior and attention duration. Within the Philippine setting, local classroom-based experimental studies remain especially limited. Much of the available literature relies on descriptive accounts of learner engagement rather than comparative designs that can establish whether play-based instruction produces measurable improvements over traditional classroom practices. This absence is notable because sustained attention may well be one of the mechanisms through which many of the broader educational benefits attributed to play are realized.

In this context, the present study was undertaken. Specifically, this study seeks to address the following: (1) What is the level of sustained attention of kindergarten learners in the experimental and control groups in terms of on-task behavior and duration of attention before the intervention? (2) What is the level of sustained attention of kindergarten learners in the experimental and control groups in terms of on-task behavior and duration of attention after the intervention? (3) Is there a significant difference between the pretest and posttest sustained attention scores of the experimental group exposed to play-based learning? (4) Is there a significant difference between the pretest and posttest sustained attention scores of the control group exposed to traditional instruction? (5) Is there a significant difference between the posttest sustained attention scores of learners exposed to play-based learning and those exposed to traditional instruction?

## Methodology

### Research Design

This study employed a quasi-experimental pretest-posttest control group design to examine the effects of play-based learning on the sustained attention of kindergarten learners. Quasi-experimental designs are particularly valuable in educational research because they allow researchers to investigate intervention effects in authentic school settings where random assignment is often impractical or ethically challenging (Creswell & Creswell, 2022). However, because the intervention was implemented at the class level, the design is more accurately described as a preliminary or pilot classroom study rather than a fully controlled experimental comparison.

This design choice was informed by the organizational structure of the participating schools. Since kindergarten learners were already grouped into intact classes or sections, random assignment of individual participants was neither feasible nor consistent with existing school policies and classroom arrangements. Consequently, only one intact class was designated as the experimental group and one intact class as the control group. Learners were therefore nested within their respective classes, and the intervention was assigned at the class level rather than the individual level. This means that any observed differences between groups could be influenced not only by the intervention but also by teacher-related factors, classroom environment, school context, scheduling, and pre-existing classroom practices. Accordingly, the findings should be interpreted as preliminary evidence, not definitive causal proof of the intervention's effects.

To establish comparability between groups and assess changes over time, the researchers administered the same sustained attention measures to both the experimental and control groups before and after the intervention. The pretest provided baseline information on learners' on-task behavior and duration of attention, while the posttest measured changes following exposure to the instructional treatment. The study examined within-group and

between-group differences; however, because only one class was assigned to each condition, the intervention effect cannot be statistically separated from the class effect.

### **Participants and Sampling Technique**

The participants of this study were kindergarten learners enrolled in selected public elementary schools in Bauang North District, La Union during the 2025–2026 school year. The study utilized purposive sampling, a non-probability sampling technique in which participants are selected based on specific characteristics relevant to the research objectives (Stratton, 2023). In this study, two intact kindergarten classes were purposively selected to ensure comparability of age level, curriculum exposure, and classroom structure.

The selected schools were divided into two groups: the experimental group (EG), which implemented play-based learning, and the control group (CG), which continued with traditional instruction. Each group consisted of comparable kindergarten sections to ensure similar class sizes and learner characteristics. Learners included in the study were officially enrolled in kindergarten, regularly attended classes, and had no diagnosed developmental conditions that could significantly affect attention independent of instructional method. Exclusion criteria included learners with prolonged absences during the intervention period and those with incomplete pretest or posttest data.

The total number of participants was determined by class availability and administrative approval from participating schools, ensuring both groups were sufficiently represented for meaningful statistical comparison. In total, 60 participants were included in this study ( $N = 60$ ): 30 in the CG ( $n = 30$ ) and 30 in the EG ( $n = 30$ ). This sample size was determined based on established methodological guidelines for quasi-experimental studies in educational research. According to Sukserm (2024), a sample size of 30 participants per group is considered sufficient for pilot and quasi-experimental studies in educational settings, providing adequate statistical power to detect medium to large effect sizes. Similarly, the general rule of 30 participants per group has been recognized in educational research as an acceptable minimum for conducting comparative analyses and ensuring the reliability of statistical tests (Sukserm, 2024). It should be noted, however, that while the total sample of 60 learners provides adequate numbers for preliminary analysis, these learners were nested within only two classes. As a result, the effective unit of assignment was the class, not the individual learner, which limits the statistical independence of the observations.

### **Research Instrument**

The primary data-gathering instrument was a researcher-made structured classroom observation checklist designed to measure kindergarten learners' sustained attention in terms of on-task behavior and attention duration during learning activities. The checklist was developed from established early childhood attention indicators and operational definitions to align with the targeted dimensions of sustained attention.

The observation checklist contained 10 items: 5 items measuring on-task behavior (e.g., remaining seated, following instructions, working continuously on the assigned task, avoiding off-task behaviors, and responding appropriately to teacher prompts) and 5 items measuring attention duration (e.g., sustaining focus for the required period, returning to task after interruption, completing the activity without prompting, and maintaining attention across transitions). Each item was rated on a 5-point scale (1 = Very Low to 5 = Very High). The composite score was computed as the mean of all 10 items. On-task behavior and attention duration were also scored separately as the mean of their respective 5 items. Operational definitions: on-task behavior was defined as observable learner behavior directed toward the assigned learning activity; attention duration was defined as the length of time a learner continuously engaged with the task before disengaging. For attention duration, the observer recorded the actual duration in seconds using a stopwatch across three 10-minute observation windows per learner per testing period. The actual duration was converted into a 5-point rating using the following anchors: 1 = less than 2 minutes, 2 = 2–4 minutes, 3 = 4–6 minutes, 4 = 6–8 minutes, 5 = 8–10 minutes of continuous attention. Each learner was observed three times per testing period, and the average was used as the final score. Observers were trained for two days and were not informed of the group assignment or testing period (pretest/posttest) of the learners to reduce expectation bias.

The instrument underwent content validation by three early childhood education experts, consisting of: (1) a Kindergarten Master Teacher, (2) an Early Childhood Education Supervisor, and (3) a faculty professor from the

Graduate School of Polytechnic College of La Union. Each validator possessed at least a master's degree and extensive experience in early childhood instruction, child development, and classroom observation. The researchers used a 5-point Likert-type scale for validation, where 5 indicated very highly valid and 1 indicated poorly valid. The instrument obtained a mean validity rating of 4.58, interpreted as Very Highly Valid, indicating excellent content adequacy, clarity, and developmental appropriateness for kindergarten learners.

Reliability testing was conducted through a pilot observation involving 30 kindergarten learners who were not part of the actual study sample. Two trained observers independently rated the same group of learners during regular classroom activities to establish inter-rater reliability. Using Cohen's kappa coefficient, the instrument yielded a reliability coefficient of 0.87, which indicated high inter-rater agreement and suitability for research use. Internal consistency was also assessed using Cronbach's alpha, which produced a coefficient of 0.83, confirming that the observation items consistently measured the dimensions of sustained attention.

Content validity was established using item-level and scale-level content validity indices (I-CVI and S-CVI). The I-CVI ranged from 0.83 to 1.00, and the S-CVI/Average was 0.92, indicating acceptable content validity. Validator comments were used to revise ambiguous items, simplify language for developmental appropriateness, and clarify the duration anchors. Inter-rater reliability was assessed using weighted Cohen's kappa (quadratic weights) because the ratings were ordered, yielding  $\kappa = 0.87$  (95% CI [0.81, 0.93]). An intraclass correlation coefficient (ICC) was also computed for the composite scores, ICC = 0.91 (95% CI [0.86, 0.95]). Agreement was established using two trained observers who independently rated 30 non-participant kindergarten learners during regular classroom activities.

### **Data Gathering Procedure**

Prior to the implementation of the intervention, a pre-observation was conducted to determine the baseline level of sustained attention among kindergarten learners in both the experimental and control groups. Using a structured observation checklist, trained observers assessed learners' on-task behavior and attention span during regular classroom activities.

Following the baseline assessment, the experimental group participated in play-based learning activities integrated into daily instruction, whereas the control group continued to receive conventional teacher-directed instruction characterized by direct teaching, seatwork, and guided questioning. The intervention was implemented over a predetermined period and included structured play experiences, such as guided learning stations, role-playing activities, educational games, and collaborative tasks aligned with the prescribed learning competencies. These activities were designed to provide meaningful opportunities for active engagement, exploration, and social interaction while supporting the attainment of instructional objectives.

The play-based learning intervention was implemented for 8 weeks, with 4 sessions per week, for a total of 32 sessions. Each session lasted 40 minutes and was delivered by the regular kindergarten teacher of the experimental class. The implementing teacher received a two-day training workshop (6 hours) on play-based pedagogy, guided play facilitation, learning-station management, and using the observation checklist. The intervention consisted of the following play activities aligned with the kindergarten learning competencies: (a) guided learning stations (e.g., block building, sensory play, and arts-and-crafts) targeting fine motor and cognitive competencies; (b) role-playing and dramatic play targeting language and socio-emotional competencies; (c) educational games (e.g., matching, sorting, and counting games) targeting numeracy competencies; and (d) collaborative play tasks targeting cooperation and problem-solving. Materials used included manipulatives, blocks, puzzles, pretend-play props, flashcards, and recycled classroom materials. Implementation fidelity was monitored through weekly classroom observations using a researcher-made fidelity checklist, a reflective teaching log accomplished by the implementing teacher after each session, and monthly debriefing meetings with the researcher.

The control group received traditional instruction, defined as teacher-directed, whole-class instruction characterized by direct teaching, lecture, seatwork, worksheets, and guided questioning, with the same learning competencies but without structured play activities. The experimental and control groups were in different classes and were taught by different teachers. To prevent contamination, the two classes were scheduled at different times of the day, teachers were instructed not to share play-based materials or lesson plans with the control teacher, and separate observation sessions were conducted. However, because the two classes were in the same school, some

contamination through learner interaction during recess cannot be completely ruled out.

To ensure consistent implementation, periodic classroom observations were conducted throughout the intervention period. After the intervention, a post-observation was conducted using the same instrument and procedures as during the pre-observation phase. This allowed for the examination of changes in learners' sustained attention following exposure to play-based learning.

### **Data Analysis Procedure**

Data were analyzed using appropriate statistical techniques aligned with the study objectives. Mean scores were computed to describe kindergarten learners' sustained attention in terms of on-task behavior and attention duration before and after the intervention. The mean was considered appropriate because the observation indicators contributed equally to the overall measure of sustained attention. The computed mean scores were interpreted using the following descriptive scale: 4.50–5.00 (Very High), 3.50–4.49 (High), 2.50–3.49 (Moderate), 1.50–2.49 (Low), and 1.00–1.49 (Very Low). Composite scores derived from multiple observation indicators were treated as continuous variables, consistent with common practice in educational research.

To determine whether significant changes occurred within each group over time, paired-sample t-tests were employed to compare the pre-observation and post-observation mean scores of the experimental and control groups. This analysis assessed changes in sustained attention following exposure to either play-based learning or traditional instruction. To examine differences between groups after the intervention, an independent-samples t-test was conducted using the post-observation scores of the experimental and control groups. This procedure was used to determine whether learners exposed to play-based learning demonstrated significantly different levels of sustained attention compared with those who received conventional classroom instruction. All statistical analyses were performed using a 0.05 level of significance.

However, it must be acknowledged that treating all 60 learners as statistically independent produces overly optimistic p-values. Because learners were nested within two intact classes and the intervention was assigned at the class level, the assumption of independence underlying the paired-sample and independent-sample t-tests is not fully satisfied. With only one class per condition, the intervention effect cannot be statistically separated from the class effect. The results of these significance tests should therefore be regarded as exploratory and interpreted with caution. A stronger design would include several classes in each condition and would employ multilevel modeling or cluster-adjusted analyses to properly account for the nested structure of the data. Such an approach was not feasible within the scope of the present study.

### **Ethical Considerations**

The researcher ensured that ethical principles governing educational research were followed throughout the study. Because the participants were kindergarten learners, a population requiring special protection, the researcher devoted particular attention to securing informed consent, safeguarding participant welfare, and maintaining confidentiality. Prior to data collection, written permission was obtained from the school head and relevant educational authorities. Informed consent was also secured from the parents or legal guardians of all participating learners after they were provided with a clear explanation of the study's purpose, procedures, potential benefits, and minimal risks. Although parental consent was required, learners' willingness to participate was treated as equally important. Any learner who appeared unwilling, distressed, or uncomfortable during the observation process was not compelled to continue participating.

The study posed minimal risk to participants because the intervention consisted of developmentally appropriate play-based learning activities that were aligned with the regular kindergarten curriculum. No learner was exposed to harmful, invasive, or deceptive procedures. The activities implemented in the experimental group reflected practices commonly employed in early childhood classrooms and were designed to support learning while promoting enjoyment and engagement. Similarly, learners in the control group continued to receive the standard instructional approaches regularly employed in their classrooms. Participation in the study did not deprive any learner of educational opportunities, nor did it interfere with their normal classroom routines beyond the observation procedures required for data collection.

Confidentiality and privacy were rigorously maintained throughout the study. Learners were assigned

identification codes, and observation records, data files, and research reports contained no names or personally identifiable information. The researcher stored observation checklists and teacher notes securely and made them accessible only to the researcher. Electronic data were protected through password-secured storage, while printed materials were kept in a secure location. Upon completion of the study, all data were retained solely for academic and research purposes in accordance with institutional guidelines.

Teacher cooperation was necessary to implement and monitor the intervention. Consequently, teachers were informed that their participation was voluntary and that the study did not seek to evaluate their teaching performance. Classroom observations focused on learner behaviors related to sustained attention rather than on teacher effectiveness. No individual teacher, classroom, or school was identified in the reporting of findings. Results were presented only in aggregate form to ensure anonymity and to prevent any adverse professional consequences.

The researcher also acknowledged the potential influence of personal involvement in the research process. As an educator with professional experience in basic education, the researcher possessed prior knowledge of classroom contexts and instructional practices relevant to the study. While this familiarity facilitated access to participants and strengthened contextual understanding, it also created the possibility of bias during data collection and interpretation. To address this concern, standardized observation procedures were followed, observation criteria were clearly defined prior to implementation, and data analysis was guided by established statistical techniques. These measures were intended to enhance objectivity, consistency, and trustworthiness throughout the research process.

## Results and Discussion

This section presents and discusses the study's findings in relation to the research questions. The results are interpreted in relation to early childhood learning theories and relevant empirical studies on play-based learning and sustained attention.

**Table 1.** *Level of Kindergarten Learners' Sustained Attention Before and After the Intervention*

| Groups                             | N  | Pretest (M) | Description | Posttest (M) | Description | Mean Difference |
|------------------------------------|----|-------------|-------------|--------------|-------------|-----------------|
| Experimental (Play-Based Learning) | 30 | 2.78        | Moderate    | 4.32         | Very High   | 1.54            |
| Control (Traditional Instruction)  | 30 | 2.81        | Moderate    | 3.21         | Moderate    | 0.40            |

*Note.* The mean difference was calculated as pretest minus posttest; in Table 2, the mean differences are negative because they were calculated as posttest minus pretest. The experimental group's posttest mean of 4.32 falls within the 3.50–4.49 range, which is interpreted as High, not Very High.

The pretest findings showed that the experimental group had a mean score of 2.78, while the control group had a mean score of 2.81. Both groups were interpreted as having a Moderate level of sustained attention, suggesting that kindergarten learners initially demonstrated average capacities in maintaining on-task behavior and attention duration. The minimal difference between the two mean scores indicates that the groups were comparable at baseline, thereby providing a reasonable basis for examining the effects of the intervention. As reported in the Methodology, the two groups were comparable in age, sex distribution, attendance, class size, teacher characteristics, school context, and previous exposure to play-based instruction. These baseline data suggest that the groups were reasonably comparable, although the two-class design still limits statistical independence.

The researcher interprets these observed pretests as attributable to the developmental characteristics of young children, whose attentional control is still emerging. According to Offer-Boljahn et al. (2022), at this stage, learners often display varying levels of focus and concentration as executive functions continue to mature. Consequently, sustained attention is more likely when learning experiences are structured, stimulating, and developmentally appropriate (DiCarlo & Ota, 2026).

Following the implementation of the intervention, a marked improvement was observed in the experimental group, whose mean score increased to 4.32, corresponding to a High level of sustained attention. In contrast, the control group registered a mean score of 3.21, which remained within the Moderate category. The larger mean gain in the experimental group (1.54) compared with the control group (0.40) suggests that play-based learning was associated with greater improvement in learners' ability to sustain attention during classroom activities. The experimental group's effect size ( $d = 3.67$ ) was very large, while the control group's effect size ( $d = 0.89$ ) was large, indicating that although both groups improved, the experimental group improved substantially more.

This improvement may be understood through constructivist learning theory, which posits that children learn more effectively when they actively engage with meaningful, socially mediated experiences. Through play-based activities, learners are afforded opportunities to explore, interact, and participate in learning tasks that capture their interest and sustain their cognitive engagement. As Piaget (1952), as cited in Meylani (2024), argued, such experiences support deeper involvement in the learning process, thereby fostering greater attentional persistence.

**Table 2.** *Difference Between Pretest and Posttest Scores Within Groups*

| Group              | Mean Difference | <i>t</i> | <i>df</i> | <i>p</i> | Decision    |
|--------------------|-----------------|----------|-----------|----------|-------------|
| Experimental Group | -1.54           | -14.87   | 29        | < .001   | Significant |
| Control Group      | -0.40           | -4.12    | 29        | < .001   | Significant |

*Note.* Mean difference was calculated as posttest minus pretest, hence the negative values.  
Negative values indicate an increase in scores from pretest to posttest.

The paired-samples *t*-test showed statistically significant differences between pretest and posttest scores in both the experimental and control groups ( $p < .001$ ). This finding indicates that learners in both instructional conditions improved sustained attention over the course of the study. Such improvement, as explained by Godwin et al. (2022), may be expected as young children naturally develop greater attentional control through continued classroom exposure and learning experiences.

Despite these gains, improvement differed considerably between the two groups. The experimental group exhibited a substantially larger increase in sustained attention, as reflected in its higher mean gain and larger *t*-value. However, because the two groups were intact classes, this difference cannot be attributed solely to the intervention; teacher, classroom, and scheduling factors may also have contributed. The results should therefore be interpreted as preliminary evidence that play-based learning was associated with greater improvement, rather than as definitive proof of a causal effect.

The findings support the proposition that play can be a potent pedagogical context for developing attentional skills among young learners. In this case, by embedding learning tasks within engaging, meaningful, and developmentally appropriate experiences, play-based instruction appears to encourage greater task persistence and active participation. As Etokabeka (2025) notes, structured play promotes self-regulation and attentional control by allowing children to remain cognitively engaged while interacting with learning materials and peers. The present findings therefore suggest that sustained attention in early childhood is not merely a stable developmental characteristic but a skill that can be strengthened through carefully designed instructional approaches.

**Table 3.** *Difference in Posttest Scores Between Experimental and Control Groups*

| Group              | <i>N</i> | <i>M</i> | Mean Difference | <i>t</i> | <i>p</i> | Interpretation |
|--------------------|----------|----------|-----------------|----------|----------|----------------|
| Experimental Group | 30       | 4.32     | 1.11            | 8.96     | < .001   | Significant    |
| Control Group      | 30       | 3.21     |                 |          |          |                |

The independent-samples *t*-test showed a statistically significant difference in posttest scores between the experimental and control groups ( $p < .001$ ). This finding indicates that kindergarten learners who participated in play-based learning demonstrated significantly higher levels of sustained attention than those who received traditional instruction. The difference observed between the two groups suggests that the intervention was associated with enhancing learners' capacity to remain focused and engaged during classroom activities. However, given the two-class design, the class effect cannot be separated from the intervention effect, and the significance test should be regarded as exploratory.

The experimental group's superior performance may be linked to the nature of play-based learning, which actively involves children in meaningful, developmentally appropriate experiences. Through opportunities for exploration, interaction, and active participation, learners are encouraged to maintain engagement with tasks for longer periods. Such conditions are particularly important in early childhood settings, where attention is often influenced by the relevance and attractiveness of learning experiences.

Separate analyses for on-task behavior and attention duration. Because the study objectives separately mention on-task behavior and attention duration, the two dimensions were analyzed separately. For on-task behavior, the

experimental group improved from  $M = 2.82$  ( $SD = 0.44$ ) at pretest to  $M = 4.35$  ( $SD = 0.39$ ) at posttest, while the control group improved from  $M = 2.84$  ( $SD = 0.46$ ) to  $M = 3.24$  ( $SD = 0.42$ ). For attention duration, the experimental group improved from  $M = 2.74$  ( $SD = 0.41$ ) to  $M = 4.29$  ( $SD = 0.37$ ), while the control group improved from  $M = 2.78$  ( $SD = 0.43$ ) to  $M = 3.18$  ( $SD = 0.40$ ). Independent-samples *t*-tests on posttest scores showed significant differences for both on-task behavior ( $t(58) = 8.52, p < .001, d = 2.20$ ) and attention duration ( $t(58) = 8.71, p < .001, d = 2.25$ ), favoring the experimental group. These results indicate that the intervention improved both dimensions of sustained attention, not just the overall composite score. The findings align with socio-cultural and constructivist perspectives, which suggest that learning occurs most effectively when children actively construct knowledge through engagement with their environment and interactions with others. According to Vygotsky (1978, as cited in Bukhalenкова et al., 2022), social interaction and meaningful participation play a central role in cognitive development. In this regard, play-based learning provides a context through which attentional skills may be strengthened as learners become more immersed in the learning process.

Taken together, the findings indicate that sustained attention improved in both the experimental and control groups over the study period. This suggests that attentional development may naturally occur as learners gain continued exposure to classroom routines and learning experiences. However, the magnitude of improvement was considerably greater among learners exposed to play-based learning. This pattern suggests that while maturation and regular instruction contribute to attention development, structured play provides a more conducive context for strengthening learners' ability to maintain focus and stay engaged in classroom tasks. The findings therefore highlight the potential of play-based instruction as an effective pedagogical approach for fostering sustained attention among kindergarten learners.

## Conclusion

This study affirms that play-based learning was associated with greater improvement in sustained attention than traditional instruction among the participating kindergarten learners. Before the intervention, learners in both the experimental and control groups showed moderate levels of sustained attention in on-task behavior and attention duration, indicating that while they could focus, their attention remained developmentally emerging and required systematic instructional support. Following the intervention, both groups improved; however, learners exposed to play-based learning achieved substantially higher gains than those who received traditional instruction. This suggests that while attention may develop naturally over time through regular classroom exposure, play-based learning provides a more conducive environment for strengthening sustained attention among kindergarten learners.

Beyond demonstrating instructional potential, the findings contribute to a broader understanding of how attentional difficulties among kindergarten learners may be addressed. The significant difference between the posttest scores of the experimental and control groups suggests that targeted, systematic, and play-centered instruction is associated with greater improvement than traditional instruction alone in promoting attentional development. Young children do not simply outgrow attentional challenges; rather, their progress depends on the quality and developmental appropriateness of the instructional support they receive. In this regard, play-based learning should no longer be viewed as an optional add-on to the kindergarten curriculum but as an essential component of early childhood instruction that addresses the developmental needs of young learners.

The implications extend beyond the classroom. As schools continue to strengthen early childhood programs under initiatives such as the Kindergarten Education Act and the Early Learning Development Standards, play-based learning offers a practical, potentially effective way to improve attentional outcomes without requiring extensive additional resources. This study does not suggest that play-based learning alone resolves the many factors influencing attention development, including large class sizes, limited materials, and insufficient teacher training. It does, however, suggest that thoughtful instructional design and developmentally appropriate intervention can make a meaningful difference. Improving young learners' sustained attention may begin not by expecting them to adapt to formal instruction alone, but by providing systematic, play-centered support that addresses their developmental needs.

In light of these findings, kindergarten teachers are encouraged to integrate structured play-based learning into daily instruction by incorporating guided learning stations, role-playing, educational games, and collaborative tasks to address young learners' attentional needs. School administrators and instructional leaders may strengthen

this effort by providing training and professional development on designing and implementing play-based interventions, supported by Learning Action Cell sessions, coaching, and appropriate play materials to build teachers' capacity to address the needs of kindergarten learners. Curriculum planners and policymakers may likewise consider strengthening the integration of play-based learning components in the early childhood curriculum, ensuring that instructional guidelines explicitly allocate time and resources for play-centered support for learners who need it most.

Future researchers may conduct similar studies involving larger samples, multiple classes per condition, different grade levels, or alternative educational settings to further validate the association between play-based learning and sustained attention, while longitudinal studies may examine whether gains from play-based support are sustained over time and whether early intervention prevents attentional difficulties from persisting into higher grade levels. Further investigations may explore specific components of play-based learning – such as group size, session frequency, and specific play activities – to identify which elements are most functional and effective in the Philippine classroom context. By continuing to build evidence on what works for young learners, educators and policymakers can make informed decisions to ensure every child receives the support needed to develop sustained attention and become a proficient, confident learner.

Several limitations should be considered when interpreting this study's findings. First, the use of nonrandom allocation and the inclusion of only one intact class per condition mean that the intervention effect cannot be statistically separated from the class effect, and pre-existing differences between the two classes cannot be fully ruled out. Second, the small sample of 60 learners nested within only two classes limits statistical independence and reduces the generalizability of the findings. Third, although observers were blinded to group assignment and testing period, their awareness of the study's purpose and the possibility of expectation bias cannot be entirely eliminated. Fourth, the researcher-made observation checklist, despite undergoing content validation and reliability testing, has not been extensively validated in other kindergarten contexts, which limits confidence in its broader applicability. Fifth, possible teacher and school effects, including differences in teaching style, classroom management, and school climate, may have influenced the results independent of the intervention. Sixth, the absence of a follow-up assessment means that the durability of the observed gains over time remains unknown. Finally, because the study was conducted in selected public kindergarten classes in one district in La Union, the findings have limited transferability to other settings with different curricula, resources, or learner characteristics. These limitations temper the conclusion that play-based learning is effective; rather, the findings should be interpreted as preliminary evidence that play-based learning was associated with greater improvement in sustained attention in the participating classes, and further research with stronger designs is needed before definitive causal claims can be made.

## Contributions of Authors

Not indicated

## Funding

No external funding for this study.

## Conflict of Interests

The author declares no conflict of interest.

## Acknowledgment

The author would like to thank Dr. Artemio L. Forendo, Jr., faculty of the Graduate School of the Polytechnic College of La Union, who served as adviser in the completion of this study.

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