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Enhancing Geometric Shape Recognition Ability in Group A Children Through Geometric Satay Educational Toy at TK ABA

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ABSTRACT

This study intents to improve the ability to recognize geometric shapes in 15 Group A children at TK Aisyiyah Bustanul Athfal using an educational toy (APE) called “Geometric Fruit Satay.” The main issue in this study is the low level of children’s understanding of geometric shapes, as indicated by a pre-cycle average score of 1.50. This research is a Classroom Action Research (CAR) using the Elliot model (1991), conducted over two cycles. Data collection techniques included observation, documentation, and informal interviews, with descriptive quantitative data analysis. The results showed an increase in the average score of geometric shape recognition ability from 1.50 (pre-cycle) to 2.35 (Cycle I), and a significant increase to 3.20 in Cycle II. The highest improvement was in the indicator of classifying shapes by type, which increased by 1.93 points. These findings indicate that using concrete game-based APEs such as Geometric Fruit Satay effectively stimulates conceptual understanding through active motor and exploratory activities in children.

Introduction

Early Childhood Education (ECE) is a fundamental stage that

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nurtures children from birth to six years by providing educational stimuli that support optimal development in accordance with their developmental stages (Fitria et al., 2024). It serves as the foundation for forming skills and knowledge in cognitive, motor, and social-emotional domains (Elan et al., 2017). At this age, children need directed stimulation through enjoyable and educational activities to support holistic development, including school readiness through the introduction of geometric shapes that enhance cognitive and motor growth (Nada et al., 2024).

One of the key learning materials in early childhood is the introduction to basic mathematical concepts, particularly geometry (Nisa & Khalifah, 2021; Alfiah & Darsinah, 2023; Widayanthi et al, 2024). Geometry involves basic shapes that serve as the foundation for more complex mathematical understanding in later educational stages (Windasari & Dheasari, 2023). Therefore, introducing geometric shapes in a fun and appropriate manner is essential. However, in practice, many Group A children still struggle to fully recognize geometric shapes (Sari & Oktamarina, 2022), due to unengaging teaching approaches, limited learning aids, and lack of suitable methods to foster interest and understanding in geometry (Fitriyani et al., 2025).

Educational Play Tools (APE) are age-appropriate learning media designed to support children's motor, cognitive, social-emotional, and language development through play-based learning (Ministry of Education and Culture, 2020; Wigati & Wiyani, 2020). Multisensory experiences from APEs have been shown to improve engagement, comprehension, attention, and fine motor coordination, all of which are essential for writing readiness (Dewi & Wulandari, 2023). In many cases, geometry instruction still relies on abstract approaches or two-dimensional visuals without involving hands-on tools (Rahmawati et al., 2022).

For example, at TK ABA Tanggul, located in Sumbersari District, Jember Regency, which implements Islamic values-based learning for six days a week, some children still struggle to identify basic geometric shapes such as circles, triangles, or squares. Although the school has supporting facilities, the current approach has proven ineffective. Observations of 15 Group A children revealed that while they could identify everyday objects, they struggled to formally name or draw geometric shapes (Susilowati et al., 2020).

Previous studies show that children understand math concepts better through concrete and visual approaches. According to Piaget's theory (2013), children in the preoperational stage learn more effectively through direct experience and object manipulation. Wigati & Wiyani (2020) found that direct, experience-based APEs improve children's understanding of geometry. Sulistyaningrum (2022) recommends using real-life objects like geometric fruit satay to teach geometric concepts while also enhancing fine motor skills through hands-on assembly tasks.

Several studies have developed game-based learning media to improve geometric recognition in early childhood. Monita et al. (2021)

developed a Geometry Monopoly APE using board game strategies, which required complex rule comprehension. Afriani et al. (2021) introduced a Magnetic Worm Geometry APE for 5–6-year-olds, but not for younger Group A children. Mahmudah & Masykuroh (2023) created Twister Geometry using gross motor activities, while Saramita (2020) used the culturally based Gotri Legendri game, which lacked systematic visual shape exposure.

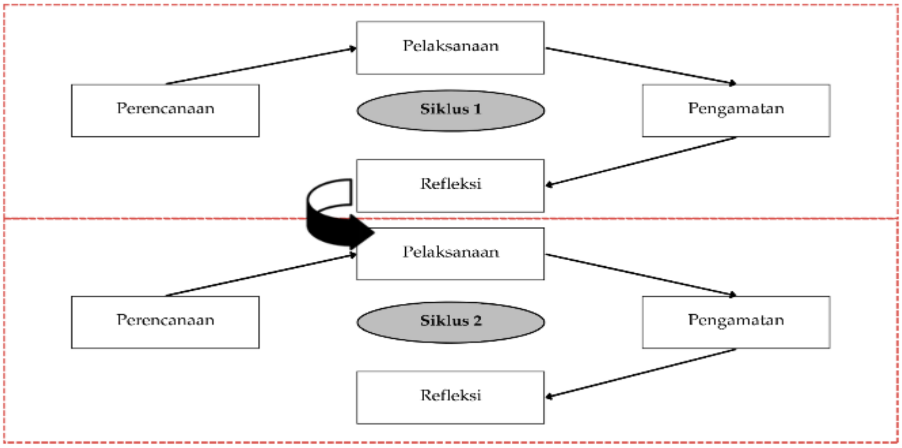
This study seeks to fill the gap by developing a fine motor kinesthetic approach through a visual and tactile learning tool—Geometric Satay APE—that aligns with Group A children's developmental stages. This method uses small sticks to form triangles, squares, and rectangles (Chairuna et al., 2019), providing enjoyable direct experiences that integrate visual, tactile, and motor coordination. The goal is to improve children's ability to recognize, differentiate, and understand basic geometric concepts as a foundation for future math learning.

The implementation of the Geometric Fruit Satay APE aims to help children recognize geometric shapes through engaging, hands-on activities that also stimulate fine motor skills, creativity, problem-solving, and cognitive development. Observations at TK ABA Tanggul indicated that children's shape recognition skills were low, prompting the need for more effective strategies using the Geometric Satay APE to improve children's identification and differentiation of shapes like triangles, squares, circles, and rectangles. This research hopes to serve as a reference for teachers in selecting play-based learning media that support geometry understanding and cognitive development in line with the theories of Piaget, Parten, and Vygotsky (Soysal, 2020).

Methods

This research employed a Classroom Action Research (CAR), referring to John Elliot's cyclical model (1991), as it enables teachers and researchers to carry out direct interventions to improve early childhood geometric recognition skills through systematic reflective actions in the classroom. The subjects were 15 Group A children (ages 4–5) at TK ABA Tanggul (TK Aisyiyah Bustanul Athfal), consisting of 7 boys and 8 girls, all actively participating in learning activities using the "Geometric Fruit Satay" Educational Play Tool (APE). The Elliot model was implemented through repeated stages: (1) planning, (2) action, (3) observation, and (4) reflection (Figure 1), to identify problems, apply solutions, and continuously refine the learning process based on evaluations in each cycle to improve geometry instruction effectiveness at TK ABA Tanggul.

Figure 1. John Elliot's cyclical model (1991)



The research subjects were all Group A students at TK Aisyiyah Bustanul Athfal, Sumbersari District, Jember Regency, totaling 15 children (7 boys and 8 girls) aged 4–5, selected using total sampling due to the small population size, allowing for comprehensive observation (Sugiyono, 2019). The site was chosen based on a conducive learning environment, sufficient learning resources, strong teacher commitment, and the implementation of Islamic value-based learning conducted six days a week, supporting optimal CAR cycle execution.

The study began with a pre-cycle observation to assess the children's baseline ability to recognize geometric shapes using conventional teaching without APEs. Cycle I then introduced the "Geometric Fruit Satay" APE through active play activities to practice naming, differentiating, grouping, and assembling shapes. Observations and reflections with teachers were conducted to evaluate improvements and determine necessary adjustments. Cycle II enhanced the learning process with more engaging media, increased teacher-child interaction, music and movement activities, and detailed observations to ensure optimal achievement in shape recognition.

Each cycle included the planning of learning strategies, implementation using the Geometric Satay APE, observation of processes and outcomes, and reflection on goal achievement. Data were collected through direct observation using observation sheets, documentation (photos and videos), and informal interviews with teachers (Sugiyono, 2019; Creswell, 2014). Instruments included observation sheets, scoring rubrics, and achievement qualification tables based on indicators adapted from Permendiknas No. 58 of 2009 (Table 1). Each cycle's results were analyzed to determine the effectiveness of the actions and to design improvements for the next cycle.

Table 1. Learning Implementation Qualifications

No	Achievement Percentage	Criteria
1	76% – 100%	Very Well Developed (BSB)
2	51% – 75%	Developing as Expected (BSH)
3	26% – 50%	Beginning to Develop (MB)
4	0% – 25%	Not Yet Developed (BB)

Source: Adapted from Permendiknas No. 58 of 2009 and Arikunto (2008)

Observation data were analyzed using a descriptive quantitative method, emphasizing percentage calculations of children's shape recognition abilities. The percentage scores were then interpreted using the qualification table to assess each child's developmental level. The scores obtained from observation sheets and scoring rubrics were calculated using the following formula:

P = (f / N) × 100

Explanation:

P = percentage of achievement

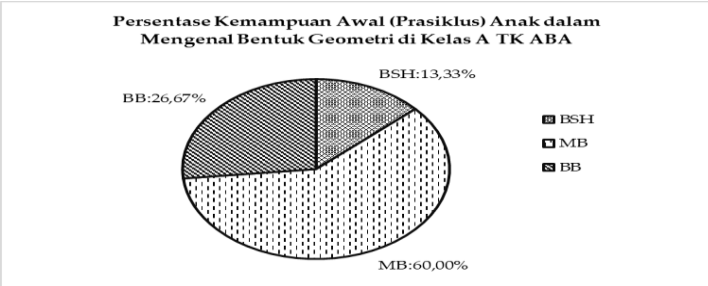
f = total score per child

N = total number of participants

Results and Discussions

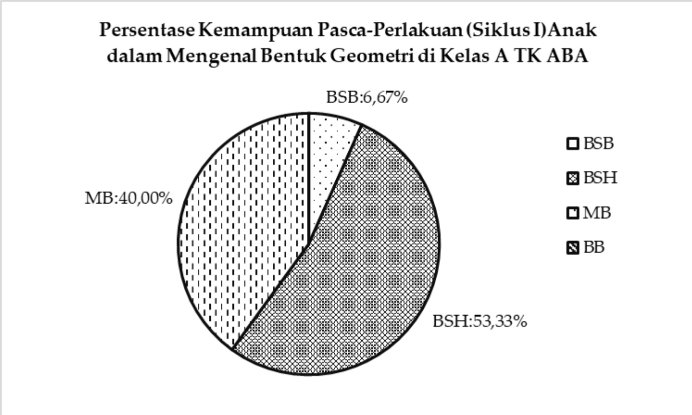
Based on preliminary observations, most children at TK Aisyiyah Bustanul Athfal showed delays in understanding the basic concepts of geometric shapes. This was caused by a lack of stimulation that integrates visual, tactile, and motor coordination in an enjoyable way. This is unfortunate, as early exposure to geometric shapes is essential for supporting children's cognitive development. Therefore, it is necessary to implement interactive and fun learning strategies, such as using the "Geometric Satay" educational toy, to help children recognize and differentiate basic shapes more effectively. With an appropriate approach, children are expected to better understand geometric concepts, forming a crucial foundation for future mathematics learning. In the pre-cycle observation of Group A, 9 children (60%) were in the Beginning to Develop (MB) category, 4 children (26.67%) in the Not Yet Developed (BB) category, only 2 children (13.33%) in the Developing as Expected (BSH) category, and none in the Very Well Developed (BSB) category. Therefore, only 13.33% of children had met the minimum success threshold of 35%.

Figure 2. Initial percentage of pre cycle



Pre-cycle activities were conducted without concrete learning media like the "Geometric Satay" APE, relying solely on images and verbal explanations. Many children were less enthusiastic, easily distracted, and often confused when identifying shapes. Some hesitated to point to the correct shape, and only a few responded actively to the teacher's questions. This indicated a need for more engaging, interactive, and concrete learning strategies using educational tools and intensive teacher support.

Figure 3. Percentage Chart of Post-Treatment (Cycle I) Ability of Group A Children in Recognizing Geometric Shapes at TK ABA

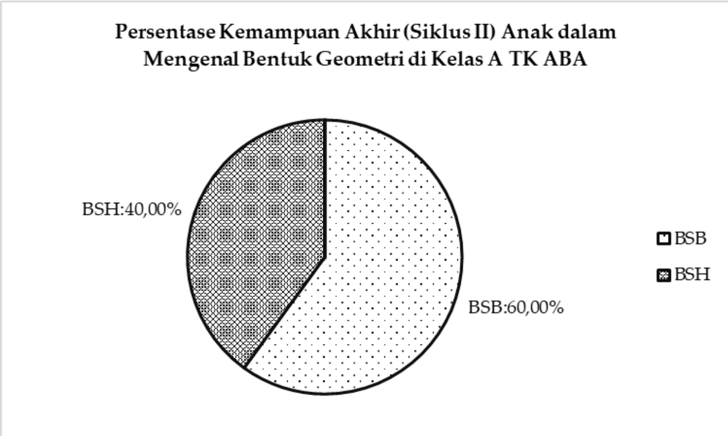


During Cycle I, the learning strategy was improved using the "Geometric Satay" APE designed to provide concrete, fun experiences, with teacher and researcher guidance to make the learning process more interactive and focused. As a result, 1 child (6.67%) reached the BSB category, 8 children (53.33%) were in BSH, and 6 children (40%) remained in MB. None were in BB, and 60% had exceeded the minimum threshold. Children began to show higher enthusiasm in learning to identify circles, squares, triangles, and rectangles using the APE. However, 40% of the children were still inconsistent in independently recognizing shapes, struggling especially between squares and rectangles. Some were still dependent on the teacher and lacked confidence in classifying shapes.

In Cycle II, improvements were made based on reflections from Cycle I. These included individualized progress notes, more vivid and larger shape pieces, more intensive interaction through questioning, songs to help remember features, and body movement warm-ups.

Children played identification games using the "Geometric Fruit Satay" with classification challenges based on color and shape to maximize learning outcomes.

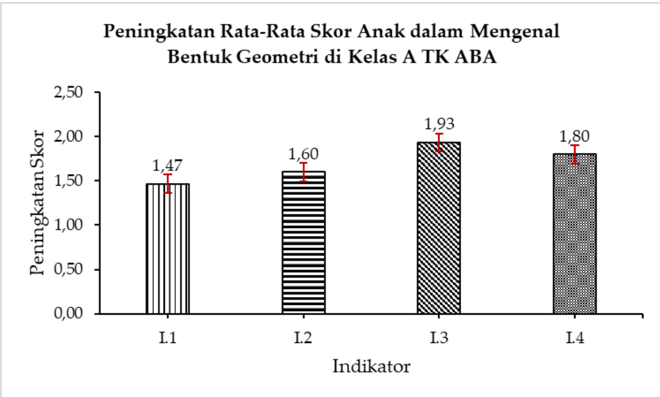
Figure 4. Final Percentage Chart (Cycle II) of Group A Children's Ability in Recognizing Geometric Shapes at TK ABA



Cycle II results showed a significant increase in geometric shape recognition ability. Nine children (60%) reached BSB and six (40%) were in BSH, meaning 100% of students had exceeded the minimum threshold. Children demonstrated cognitive growth by correctly naming and differentiating shapes, affective growth through enthusiasm and curiosity, and psychomotor growth with better eye-hand coordination while assembling shapes. Social interaction also improved, with children helping each other and engaging in discussion, making the learning environment dynamic and conducive.

Further observation revealed that the highest increase occurred in the ability to classify shapes, with a 1.93-point improvement. The ability to distinguish shapes improved by 1.60 points, and naming shapes increased by 1.47 points. The ability to assemble shapes improved by 1.80 points, indicating growth in fine motor and visual-spatial coordination, supporting the psychomotor domain of Simpson's taxonomy. Children also showed more initiative and collaboration, supporting comprehensive development in the cognitive, affective, and psychomotor domains.

Figure 5. Chart of Average Score Improvement of Group A Children in Recognizing Geometric Shapes at TK ABA



These findings support Piaget's cognitive development theory, where preoperational-stage children (ages 4–6) are developing symbolic functions but still rely on intuitive thinking. Initially, many children relied on memorization rather than understanding. Through the visual-kinesthetic stimulation of the APE, they began building new cognitive schemas.

Moreover, the APE fostered social development through cooperative play, showing a reduction in egocentrism. Children learned to wait their turn, observe, help peers, and mimic problem-solving strategies. According to Parten, preschoolers are transitioning from associative to cooperative play, and this was evident in Cycle II, where children worked together to assemble shapes.

From Vygotsky's sociocultural theory (1978), learning occurs in the Zone of Proximal Development (ZPD)—the space between what a child can do alone and what they can do with guidance. Most children were initially in the lower developmental stages and needed scaffolding (Suardipa, 2020). The teacher provided support through prompts, demonstrations, and guided practice, which gradually diminished as the children became more independent.

Language also played a crucial role as a cognitive mediator. Verbal interactions like naming and describing shapes became internalized, supporting **inner speech** development. Phrases such as "this is a triangle because it has three sides" or "this one looks like a door, so it's a rectangle" show that children were forming conceptual understanding through language. Overall, the "Geometric Satay" APE not only improved shape recognition skills but also enhanced social and cognitive development through structured and enjoyable play.

Conclusion

Based on the findings from two action cycles, it can be concluded that the use of the "Geometric Satay" Educational Play Tool (APE) is effective in improving the geometric shape recognition skills of Group A children at TK ABA Tanggul in the 2024/2025 academic year. Children were able to identify, name, and classify basic shapes such as circles, triangles, and squares with greater accuracy and confidence. In addition to cognitive development, this APE also fostered social growth through cooperative play. These results indicate that structured, play-based learning offers meaningful experiences aligned with the developmental stages of early childhood, as supported by the theories of Vygotsky (2018), Parten, and Piaget. It is recommended that educators utilize contextual APEs involving kinesthetic, visual, and social aspects, while providing opportunities for collaborative interaction. Further research could explore more complex shapes, eco-friendly materials, and examine the tool's impact on logic, fine motor skills, or language development in early childhood.

References

Alfiah, S., & Darsinah, D. (2023). The effect of stimulation on the development of the child's drawing stage. *Journal of Social Research*, *2*(3), 684-698.

Arikunto, S. (2008). *Penelitian Tindakan Kelas*. Jakarta: Bumi Aksara.

Chairuna, U., Novita, R., & Amelia, L. (2019). Efektivitas Penggunaan Media Sate Buah Pada Pengenalan Bentuk Geometri Anak Usia 5-6 Tahun Di Kelompok B Tk Save The Kids Banda Aceh. *Numeracy*, *6*(2), 283-292.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.

Dewi, E. O., & Wulandari, S. (2023). Penggunaan Alat Permainan Edukatif (APE) untuk Meningkatkan Kemampuan Keaksaraan Anak Usia Dini. *JECIE (Journal of Early Childhood and Inclusive Education)*, *6*(2). https://doi.org/10.31537/jecie.v6i2.1179

Djollong, A. F., Sari, A., Junizar, J., Pramanik, N. D., Kustanti, R., & Lubis, A. A. Z. (2023). *Konsep Dasar Pendidikan Anak Usia Dini: Teori dan*

Panduan Komprehensif. PT. Sonpedia Publishing Indonesia.

Elan, E., Muiz L, D. A., & Feranis, F. (2017). Penggunaan Media Puzzle untuk Meningkatkan Kemampuan Mengenal Bentuk Geometri. *JURNAL PAUD AGAPEDIA*, *1*(1). https://doi.org/10.17509/jpa.v1i1.7168

Elliot, J. (1991). *Action research for educational change*. Open University Press.

Fitria, D. A., Ramdani, C., & Miftahudin, U. (2024). Peran sekolah dalam upaya optimalisasi pendidikan karakter anak usia dini. *Banun: Jurnal Pendidikan Islam Anak Usia Dini*, *2*(2), 57-67.

Fitriyani, L. F., Palenewen, E., & Satriana, M. (2025). Pengaruh Bermain Geometri Untuk Meningkatkan Kemampuan Kognitif Anak Usia 5-6 Tahun. *Aulad: Journal on Early Childhood*, *8*(1), 464-472.

Hafiz, A., Romdaniah, L., Nizar, R. A., Mauliza, S., Nata, A., & Mu'ti, A. (2023). Teori Pendidikan Ibn Sina dan Jean Piaget: Perbandingan antara Perkembangan Kognitif dan Pertumbuhan Usia Peserta Didik. *Rayah Al-Islam*, *7*(3), 1268-1285.

Huseng, A. M., & Auliyauddin, S. (2025). Taxonomi Pendidikan Dimensi Pengetahuan, Sikap, dan Keterampilan. *Socius: Jurnal Penelitian Ilmu-Ilmu Sosial*, *2*(9).

Kurniati, E. (2025). Teori sosiokultural Vygotsky untuk anak usia dini. *Jurnal Studi Pendidikan Anak Usia Dini*, *1*(1), 19-24.

Kusuma, T. C., & Listiana, H. (2021). *Pengembangan pembuatan APE bagi anak usia dini*. Prenada Media.

Mauluddia, Y., & Solehuddin, M. (2023). The Application of Playing in Early Childhood Education Based on Piaget's Way of Thinking. *Al-Athfaal: Jurnal Ilmiah Pendidikan Anak Usia Dini*, *6*(2), 143-156.

Nabilah, Z., Artosandi, Y. S. R., & Haq, A. H. B. (2024). Exploring geometric shape recognition in early childhood: Insights from the pre-operational stage. In *Proceeding of International Conference on Healthy Living (INCOHELIV)* (Vol. 1, No. 1, pp. 159-164).

Nisa, K., & Halifah, S. (2021). Temu baur budaya dan matematika: Kue tradisional konjo pada pengenalan bentuk geometri anak usia dini. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, *6*(1), 445-456.

Nursanti, I. (2022). Penerapan metode scaffolding untuk meningkatkan hasil belajar matematika siswa kelas XI IPA-2 SMA Negeri 1 Bungkal tahun pelajaran 2018/2019. *Jurnal Pendidikan Tambusai*, *6*(2), 10279-10295.

Palm, M. (2023). 10.1 Piaget's Sensorimotor and Preoperational Stages. *Lifespan Human Development: A Topical Approach*.

Parten, M. B. (1932). *Social participation among preschool children*. *The Journal of Abnormal and Social Psychology, 27*(3), 243–269. https://doi.org/10.1037/h0074524

Piaget, J. (2013). Principles of Genetic Epistemology. In *Principles of Genetic Epistemology*. https://doi.org/10.4324/9781315006246

Rahmawati, I. Y., Wahyudi, W., Cahyono, H., & Fadlillah, M. (2022). APE Tradisional: Penanaman Rasa Cinta Tanah Air Berbasis Etnomatematika pada Anak Usia Dini. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *6*(6). https://doi.org/10.31004/obsesi.v6i6.3512

Sari, F. K., & Oktamarina, L. (2022). Pengaruh media realia terhadap pemahaman geometri anak usia 5-6 tahun di TK Nurul Iman Beringin Makmur I Kabupaten Musi Rawas Utara Tahun 2021. *Jurnal Ilmiah Potensia*, *7*(1), 11-22.

Saripah, I., Tabroni, I., Wang, Y., & Zou, G. (2023). Number Board Media to Stimulate the Symbolic Thinking Ability of Children Aged 5-6 Years. *Journal of Computer Science Advancements*, *1*(2), 103-112.

Sawyer, J. E. (2023). Can Private Speech and Sociodramatic Play Promote Perspective Taking and Reduce Egocentrism? A Post-Vygotskian Reply to Piaget. *American Journal of Play*, *15*(3), 254-280.

Soysal, Y. (2020). Determining the mechanics of classroom discourse in vygotskian sense: Teacher discursive moves reconsidered. *Research in Science Education*, *50*(4), 1639-1663.

Suardipa, I. P. (2020). Proses scaffolding pada zone of proximal development (ZPD) dalam pembelajaran. *Widyacarya: Jurnal Pendidikan, Agama Dan Budaya*, *4*(1), 79-92.

Sugiyono. (2019). *Metode penelitian pendidikan: Pendekatan kuantitatif, kualitatif, dan R&D*. Alfabeta.

Susilowati, E., Fathonah, N., Astutik, E. P., Hadi, S., & Prayitno, L. L. (2020). Pendampingan Bunda PAUD dalam Pembuatan Alat

Permainan Edukatif (APE) Sederhana untuk Pengenalan Konsep Bangun Datar. *Jurnal SOLMA*, *9*(1). https://doi.org/10.29405/solma.v9i1.4714

Vygotsky, L. (2018). Lev Vygotsky. *La psicología en la Revolución Rusa. Colombia: Ediciones desde abajo*.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Widayanthi, D. G. C., Subhaktiyasa, P. G., Hariyono, H., Wulandari, C. I. A. S., & Andrini, V. S. (2024). *Teori Belajar dan Pembelajaran*. PT. Sonpedia Publishing Indonesia.

Wigati, M., & Wiyani, N. A. (2020). Kreativitas Guru Dalam Membuat Alat Permainan Edukatif Dari Barang Bekas. *As-Sibyan: Jurnal Pendidikan Anak Usia Dini*, *5*(1). https://doi.org/10.32678/as-sibyan.v5i1.2700

Windasari, I. W., & Dheasari, A. E. (2023). Studi Literatur Pembelajaran Media Geometri Dalam Meningkatkan Kemampuan Kognitif Anak Usia Dini Di Taman Kanak-Kanak. *Al-ATHFAL: Jurnal Pendidikan Anak*, *4*(1), 85-93.