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The Impact of Game-Based Learning Science for Kids on the Development of Logical Thinking in Children Aged 5-6 Years

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Abstract

This study aims to examine the effectiveness of game-based Learning Science for Kids in developing logical thinking skills in children aged 5-6 years. The study involved 17 children as subjects, with data collected through observation sheets. A quantitative approach was employed using an experimental method with a one-group pretest-posttest design, which analyzes the impact of an intervention under controlled conditions using the N-gain test. The results indicate that the average N-gain score obtained was 0.731, categorized as high (g > 0.7). These findings suggest that game-based Learning Science for Kids is highly effective in enhancing children's logical thinking skills. Therefore, this learning model can serve as an effective alternative for strengthening logical thinking abilities in children aged 5-6 years.

Keywords: *Learning Science for Kids, Educational Games, Logical Thinking, Early Childhood Education*

Abstrak

Penelitian ini bertujuan untuk menguji efektivitas Learning Science for Kids berbasis game terhadap pengembangan berpikir logis anak usia 5-6 tahun. Subjek penelitian terdiri dari 17 anak, dengan data yang dikumpulkan melalui lembar observasi. Penelitian ini menggunakan pendekatan kuantitatif dengan metode eksperimen one-group pretest-posttest design, yang bertujuan untuk menganalisis pengaruh intervensi dalam kondisi yang terkendali menggunakan uji N-gain. Hasil analisis menunjukkan bahwa nilai rata-rata N-gain score yang diperoleh adalah 0,731, yang berada dalam kategori tinggi (g > 0,7). Temuan ini mengindikasikan bahwa Learning Science for Kids berbasis game memiliki efektivitas yang signifikan dalam meningkatkan kemampuan berpikir logis anak usia dini. Oleh karena itu, model pembelajaran ini dapat dijadikan alternatif yang efektif dalam penguatan keterampilan berpikir logis pada anak usia 5-6 tahun.

Kata Kunci: Learning Science for Kids, Permainan Edukatif, Berpikir Logis, Pendidikan Anak Usia Dini

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PENDAHULUAN

In the era of globalization, early childhood development plays a crucial role in a nation's progress. Education serves as the primary means of acquiring knowledge, shaping individuals to be competent and competitive in the future (Puspa et al., 2023; Syarfina et al., 2024; Wulandari & Mudinillah, 2022). New standards are required to equip children with skills relevant to the 21st century, emphasizing adaptability and mastery of various competencies (Khodijah et al., 2021). The 21st-century education, aligned with the Fourth Industrial Revolution, necessitates the integration of digital technology and the development of essential skills, particularly the 4Cs: Critical Thinking and Problem Solving, Creativity and Innovation, Communication, and Collaboration (Bybee, R., McCrae, B., & Laurie, 2009; Elas et al., 2019; Lyons & Tredwell, 2015). As technology advances, the education sector must adapt its curriculum and content to meet the demands of the times.

Previous research has shown that cognitive development plays a crucial role in supporting children's success in the learning process, as most learning activities rely on memory and thinking skills (Amalina et al., 2022; Ayomi et al., 2021; Salum et al., 2024; Warmansyah et al., 2023). Stimulation of cognitive aspects aims to enable young children to explore their surroundings through their senses, allowing them to acquire knowledge that helps them navigate life and develop optimally in accordance with their nature as God's creations (Wathon, 2022). Additionally, studies have revealed that cognitive processes encompass various aspects, including perception, memory, thinking, symbolization, reasoning, and problem-solving skills (Fitriana, 2022; Handayani et al., 2017; Khamidah & Sholichah, 2022; Mahriza et al., 2023). Thus, optimizing cognitive stimulation from an early age is a key factor in building a strong foundation for learning, enabling children to adapt to developmental challenges in the future.

Children's cognitive development occurs in several stages according to their developmental achievements. However, this study focuses on the logical thinking abilities of children aged 4-5 years. Referring to STPPA Permendikbud Regulation No. 137 of 2014, the stages of logical thinking development in this age group include: 1) Classifying objects based on function, shape, color, or size, 2) Understanding cause-and-effect relationships related to themselves, 3) Categorizing objects into the same group or pairing them with two variations, 4) Recognizing and repeating simple patterns such as AB-AB or ABC-ABC, and 5) Arranging objects in a series based on size or color (Ibda, 2015).

Early childhood learning should be delivered through concrete examples, direct demonstrations, and play, allowing children to naturally grasp the material (Desmita, Rahmadani, et al., 2023; Safitri et al., 2023; Sari et al., 2023; Sufa & Setiawan, 2018; Yuningsih et al., 2024). Cognitive development involves thinking processes, reasoning, and logical thought patterns that help individuals understand concepts (Panjaitan & P, 2023). Logical thinking in young children is reflected in their ability to observe, recognize relationships between concepts, and explore new knowledge, driven by

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curiosity and questioning habits (Sayfi'i & Ilmayanti, 2021). Thus, an appropriate learning approach will help children develop logical thinking skills optimally, laying a strong foundation for future learning.

Logical thinking is a thought process that relies on logic, rationality, and order. Etymologically, the term "logic" comes from the Greek word logos, meaning thought or words, making logic the study of reasoning (Dista, 2019). Since thoughts are expressed through language, logic is also closely related to words as a means of expressing ideas (Rosmauli & Watini, 2022). According to Piaget (1976), logical thinking in children involves the awareness of forming concepts in the thinking process, though children often struggle to understand their own thoughts. Therefore, proper stimulation is essential to develop this ability, enabling children to solve problems effectively. By enhancing logical thinking skills, young children can distinguish information and think critically about everyday events.

An initial field study conducted on Group B kindergarten children revealed that one of the main challenges in home-based learning during the pandemic is the low level of cognitive development, particularly in logical thinking skills. This is evident from weak indicators such as: 1) a lack of detailed understanding of cause-and-effect relationships related to themselves (e.g., consequences of not brushing teeth, not washing hands, or not trimming nails), and 2) difficulty in classifying objects based on size (big-small, long-short). This issue arises due to both internal and external factors. Internal factors stem from the child's own disposition, where they tend to be passive and lack motivation. External factors, on the other hand, relate to the teacher's approach, which is often monotonous and lacks creativity in delivering lessons. During the pandemic, teachers predominantly assign tasks without providing sufficient explanations through audio, visual, or audiovisual media. As a result, students receive less attention, and the selection of learning media is not adequately tailored to their needs.

Science learning requires media that enhance critical thinking skills and foster children's learning interest, making them more active (Khaeriyah et al., 2018). Learning interest is a person's engagement in understanding knowledge without coercion and plays a crucial role in the learning process (Maylitha et al., 2023). Engaging learning media can create an active and enjoyable learning experience, boost motivation, and provide positive impacts on children. With technological advancements, teachers are encouraged to innovate and adapt learning media accordingly. Proper use of technology, such as educational games and well-guided smartphone usage, can make learning more engaging and productive for children.

Digital technology has become an essential part of everyday life, with mobile and computer advancements enabling digital games to serve as effective learning tools. In the educational context, these games not only create engaging and immersive experiences but also incorporate educational content to achieve specific learning objectives (Fidyaningrum et al., 2021; Fitriyah et al., 2023; Rosdiani & Warmansyah,

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2021). Over time, digital games have evolved into educational tools that foster children's cognitive, social, and problem-solving skills through well-integrated features and principles (Desmita, Diyenti, et al., 2023; Murro Nuril Chasanah & Hasibuan, 2024; Warmansyah et al., 2024). For young learners, educational digital games provide a platform to explore virtual environments creatively, offering interactive learning experiences that promote active participation and expand their understanding within structured learning scenarios.

The integration of games in the learning process creates an engaging environment that encourages children to participate more actively. Specifically, science-based games benefit early childhood education by fostering enjoyment, stimulating imagination, and naturally enhancing children's knowledge (Pertiwi & Rusyda Firdausi, 2019). Introducing science at an early age supports the development of critical, logical, and creative thinking skills. One effective approach to nurturing creativity and logical thinking is through science experiment games (Utami & Warmansyah, 2019). These activities allow children to develop problem-solving skills, face challenges independently, and apply their cognitive abilities in meaningful contexts.

Although the benefits of game-based learning are widely recognized, there remains a gap in its implementation, particularly in fostering logical thinking among young children. Many traditional teaching methods still rely on passive instruction, limiting children's opportunities to explore and reason actively. This study aims to address this gap by examining the impact of game-based science learning on the development of logical thinking in children aged 5-6 years. The novelty of this research lies in its emphasis on structured science games as a medium to simultaneously enhance logical, critical, and creative thinking skills while providing empirical insights into their effectiveness. By analyzing how interactive learning experiences influence cognitive development, this study seeks to contribute to more innovative and exploration-based early childhood education strategies.

METHODS

Research Design

This study employs a quantitative research approach using a one-group pretest-posttest design. The one-group pretest-posttest experimental method is used to determine the effect of a specific treatment under controlled conditions by applying the N-gain test. This design allows for a more accurate measurement of treatment effects by comparing the participants' conditions before (pretest) and after (posttest) the intervention. In this study, a single experimental group will engage in game-based Learning Science for Kids as part of their learning activities. The research design aims to analyze the impact of Learning Science for Kids on improving logical thinking skills in kindergarten children (Group B). The structured experimental framework ensures a

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systematic assessment of how game-based learning influences children's cognitive development.

O_1 X O_2

Where:

O_1 = Pretest before the intervention using Learning Science for Kids through game-based learning to enhance children's logical thinking skills.

X = Intervention using Learning Science for Kids through game-based learning.

O_2 = Posttest after the intervention using Learning Science for Kids through game-based learning to measure improvements in logical thinking skills.

Sample

The experimental group consists of 17 kindergarten children (Group B) who will participate in learning activities using Learning Science for Kids through game-based learning. The research framework is structured to systematically assess how game-based learning influences the development of logical thinking skills in young children.

Data Collection Techniques

The primary data collection method used in this study is observation. Observation involves systematically recording and analyzing investigated phenomena. In a broad sense, observation includes both direct and indirect monitoring of children's logical thinking development throughout the intervention process.

Instrument Validity and Reliability

The validity and reliability of the research instruments are assessed through expert judgment. The constructed instrument, based on theoretical foundations relevant to logical thinking, is evaluated by experts in the field to ensure its appropriateness for measuring the intended aspects.

Data Analysis Techniques

The data analysis aims to process and interpret the research findings. The N-gain test is used to analyze the pretest and posttest results. The data analysis is conducted in two phases: 1) Pretest Analysis: Measuring children's logical thinking skills before the intervention; 2) Posttest Analysis: Measuring children's logical thinking skills after the intervention.

RESULTS NAD DISCUSSION

The impact of Learning Science for Kids in classroom learning was examined through the participation of 17 children. The study was conducted through observations

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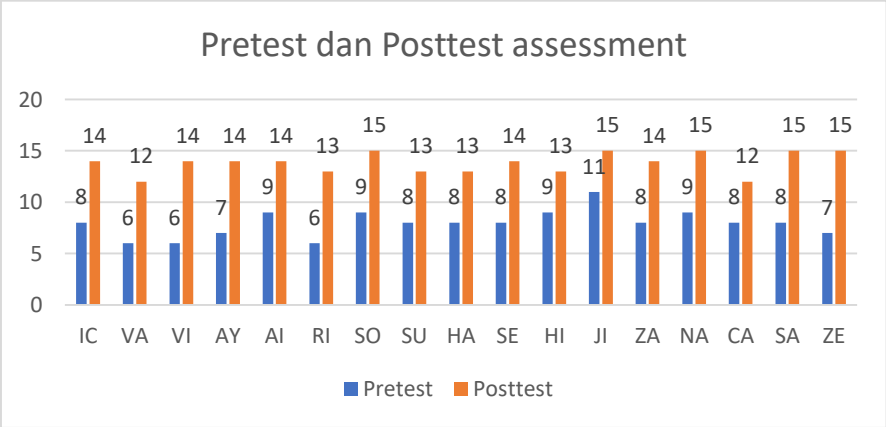
at Aisyiyah Bustanul Athfal Kindergarten 39, utilizing a pre-experimental design with a one-group pretest-posttest approach.

The results from the pretest and posttest assessments indicate a positive score improvement, demonstrating that the intervention with Learning Science for Kids had a measurable effect on children's learning outcomes. A comparison of each child's pretest and posttest scores is illustrated in the following graph:



From the results of the pretest and posttest assessment of Learning Science for Kids to improve logical thinking skills, an N-gainscore analysis was carried out using SPSS 27. The following is the calculation table:

N-gain score

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ngain_skor	17	.50	.89	.7319	.11456
ngain_persen	17	50.00	88.89	73.1863	11.45554
Valid N (listwise)	17				

This study found that the Learning Science for Kids game-based approach significantly enhanced logical thinking skills in children aged 5-6, with an N-gain score of 0.731 (g > 0.7), indicating a high level of effectiveness. This aligns with Piaget's (1964) cognitive development theory, which states that children in the preoperational to concrete operational stage develop logical reasoning through active exploration and interaction with their environment.

Game-based learning has been proven effective in improving concept comprehension and logical thinking. Gee (2003) and Prensky (2011) found that educational games enhance motivation and engagement, leading to deeper cognitive processing. This study supports those findings, showing that Learning Science for Kids encourages active exploration and experimentation, fostering logical reasoning.

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The model follows four stages: observation, exploration, experimentation, and analysis, aligning with Bybee's (Bybee et al., 2006) 5E Learning Model. Children first observe scientific phenomena through interactive media, explore concepts through game-based questions, conduct hands-on experiments, and analyze their findings to understand cause-effect relationships. This structured process enhances logical reasoning through engaging, interactive, and systematic learning experiences.

A key advantage of Learning Science for Kids is its use of simple tools, interactive technology, and game-based learning to improve children's scientific understanding. Research by (Alizkan et al., 2021) and Alucyana & Raihana, (2023) confirms that game-based learning accelerates concept comprehension and problem-solving skills in early childhood. The results of this study reinforce the effectiveness of interactive educational tools in fostering cognitive development.

With an N-gain score of 0.731, this study highlights the potential of game-based learning in early science education. Future research should explore how technology-driven educational games can further optimize learning outcomes, ensuring that interactive learning continues to support children's cognitive growth.

CONCLUSION

This study confirms that game-based learning through Learning Science for Kids effectively enhances children's logical thinking skills. By integrating play into science learning, the model fosters active engagement in observation, exploration, experimentation, and analysis, enabling children to grasp scientific concepts more effectively. The findings highlight that game-based approaches not only increase children's participation and motivation but also strengthen cognitive processing and problem-solving abilities. Additionally, the integration of interactive technology in early science education proves to be a powerful tool for sustaining curiosity and independent exploration. These insights emphasize the need for innovative, technology-driven educational strategies that support meaningful learning experiences. Educators should leverage these approaches to create engaging and developmentally appropriate learning environments that nurture children's cognitive growth.

REFERENCES

Alizkan, U., Wibowo, F. C., Sanjaya, L., Kurniawan, B. R., & Prahani, B. K. (2021). Trends of Augmented Reality in Science Learning: A Review of the Literature. *Journal of Physics: Conference Series*, *2019*(1), 012060. https://doi.org/10.1088/1742-6596/2019/1/012060

Alucyana, A., & Raihana, R. (2023). Pembelajaran Saintifik dalam Mengembangkan Kemampuan Berpikir Kritis dan Memecahkan Masalah pada Anak. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *7*(1), 829–841. https://doi.org/10.31004/obsesi.v7i1.4096

Amalina, A., Yanti, F., & Warmansyah, J. (2022). Penerapan Pendekatan Matematika Realistik terhadap Kemampuan Pemahaman Konsep Pengukuran pada Anak Usia 5-6 Tahun. *Aulad: Journal on Early Childhood*, *5*(2), 306–312. https://doi.org/10.31004/aulad.v5i2.378

DOI: 10.31958/jies.v5i1.14821

Ayomi, A. T. R., Widyorini, E., & Roswita, M. Y. (2021). Hubungan Inteligensi dengan Fungsi Eksekutif pada Anak Gifted Relationship between Intelligence and Executive Function to Gifted Children. *Jurnal Ilmiah Psikologi Candrajiwa*, *6*(2), 136.

Bybee, R., McCrae, B., & Laurie, R. (2009). PISA 2006: An Assessment of Scientific Literacy. *Journal of Research in Science Teaching*, *46*(8), 865–883. https://doi.org/https://doi.org/10.1002/tea.20333

Bybee, R. W., Taylor, J. a, Gardner, a, Scotter, P. V, Powell, J. C., Westbrook, a, & Landes, N. (2006). The BSCS 5E Instructional Model: Origins, Effectiveness, and Applications. *Bscs*, *January*, 1–19. papers://dee23da0-e34b-4588-b624-f878b46d7b3d/Paper/p424

Desmita, D., Diyenti, A. K., & Karim, N. A. (2023). The Influence of Audio Stories on Enhancing Digital Literacy In Early Childhood : A Survey Study. *Indonesian Journal of Early Childhood Education Research (IJECER)*, *2*(2), 57–70. https://doi.org/10.31958/ijecer.v2i2.11526

Desmita, D., Rahmadani, S., Kharisma Diyenti, A., Warmansyah, J., Silvianetri, S., & Binti Fakaruddin, N. A. A. (2023). The Relationship of Parent-Child Interaction in Developing Effective Communication in Early Childhood. *Indonesian Journal of Early Childhood Educational Research (IJECER)*, *2*(2), 47. https://doi.org/10.31958/ijecer.v2i2.11524

Dista, F. N. (2019). Penerapan Pendekatan Saintifik dalam Mengembangkan Berpikir logis Anak Usia 5-6 Tahun di RA Takrimah Tungkop Aceh Besar. *AL-ATHFAL : JURNAL PENDIDIKAN ANAK*, *5*(2), 217–236. https://doi.org/10.14421/al-athfal.2019.52-07

Elas, N. I. B., Majid, F. B. A., & Narasuman, S. A. (2019). Development of Technological Pedagogical Content Knowledge (TPACK) For English Teachers: The Validity and Reliability. *International Journal of Emerging Technologies in Learning (IJET)*, *14*(20), 18. https://doi.org/10.3991/ijet.v14i20.11456

Fidyaningrum, S. A., Dewayanti, S. A., & Authar, N. (2021). Improving Young Learners Vocabulary Mastery Through Game-Based Learning Using "MOFIN Mystery Box." *Child Education Journal*, *3*(2), 129–136. https://doi.org/10.33086/cej.v3i2.2433

Fitriana, D. (2022). Meningkatkan Perkembangan Kognitif Anak Usia Dini Melalui Alat Permainan Edukatif (Ape). *JCE (Journal of Childhood Education)*, *5*(2), 580. https://doi.org/10.30736/jce.v5i2.726

Fitriyah, Q. F., Rahman, F., Fatmarizka, T., Susilo, T. E., Cahyadi, M., & Lazuardy, A. A. (2023). Pendampingan Pembuatan Alat Permainan Edukatif Berbasis STEAM dan Loose Parts Pada Guru di TK Mancasan Sukoharjo. *Jurnal Pengabdian Masyarakat Ilmu Pendidikan*, *2*(2), 159–168. https://doi.org/10.23960/jpmip.v2i2.205

DOI: 10.31958/jies.v5i1.14821

Gee, J. P. (2003). What video games have to teach us about learning and literacy. *Computers in Entertainment*, *1*(1), 20–20. https://doi.org/10.1145/950566.950595

Handayani, S., Sumarno, S., & Haryati, Y. (2017). UpayaMeningkatkan Kemampuan Kognitif Dalam Memperkenalkan Konsep Pengukuran Anak Usia Dini Melalui Metode Bermain Peran. *Jurnal Karya Pendidikan Matematika*, *4*(1), 43. https://doi.org/10.1017/CBO9781107415324.004

Ibda, F. (2015). Perkembangan Kognitif: Teori Jean Piaget. *Intelektualita: Journal of Education Science and Teacher Training*, *3*(1). https://doi.org/http://dx.doi.org/10.22373/ji.v3i1.197

Khaeriyah, E., Saripudin, A., & Kartiyawati, R. (2018). Penerapan Metode Eksperimen Dalam Pembelajaran Sains Untuk Meningkatkan Kemampuan Kognitif Anak Usia Dini. *AWLADY : Jurnal Pendidikan Anak*, *4*(2), 102. https://doi.org/10.24235/awlady.v4i2.3155

Khamidah, A., & Sholichah, N. I. (2022). Digital Pop Up Learning Media for Early Childhood Cognitive. *Indonesian Journal of Early Childhood Education Research*, *1*(1), 11–19. https://doi.org/10.31958/ijecer.v1i1.5833

Khodijah, K., Malik, H. A., & Herminastiti, R. (2021). Implementasi Metode Bercerita dengan Media Boneka Tangan dalam Pembelajaran Daring. *Prosiding Seminar Nasional Pendidikan STKIP Kusuma Negara III*, *2020*, 66–73. http://jurnal.stkipkusumanegara.ac.id/index.php/semnara2020/article/view/1094%0Ahttp://files/301/Khodijah et al. - 2021 - Implementasi Metode Bercerita dengan Media Boneka .pdf

Lyons, C. D., & Tredwell, C. T. (2015). Steps to Implementing Technology in Inclusive Early Childhood Programs. *Computers in the Schools*, *32*(2), 152–166. https://doi.org/10.1080/07380569.2015.1038976

Mahriza, R., Syarfina, S., Astuti, D., Warmansyah, J., & Zain, A. (2023). *Developing Digital Learning Media to Promote Early Children's Cognitive Development* (Issue ICoeSSE). Atlantis Press SARL. https://doi.org/10.2991/978-2-38476-142-5_52

Maylitha, E., Parameswara, M. C., Iskandar, M. F., Nurdiansyah, M. F., Hikmah, S. N., & Prihantini, P. (2023). Peran Keterampilan Mengelola Kelas dalam Meningkatkan Minat Belajar Siswa. *Journal on Education*, *5*(2), 2184–2194. https://doi.org/10.31004/joe.v5i2.871

Murro Nuril Chasanah, L., & Hasibuan, R. (2024). Analysis of the Role of Facial Expression in Media Presence in the Development of Social, Emotional, and Expressive Language Skills in Children Aged 3-4 Years. *Journal of Islamic Education Students (JIES)*, *4*(1), 142. https://doi.org/10.31958/jies.v4i1.12312

Panjaitan, L. S. W., & P, J. H. (2023). Bermain Imajinasi Untuk Meningkatkan Kecerdasan Spasial Anak Usia Dini. *Pediaqu:JurnalPendidikan Sosial Dan Humaniora*, *2*(3), 11465–11471.

DOI: 10.31958/jies.v5i1.14821

Pertiwi, U. D., & Rusyda Firdausi, U. Y. (2019). Upaya Meningkatkan Literasi Sains Melalui Pembelajaran Berbasis Etnosains. *Indonesian Journal of Natural Science Education (IJNSE)*, *2*(1), 120–124. https://doi.org/10.31002/nse.v2i1.476

Piaget, J. (1964). Part I: Cognitive development in children: Piaget development and learning. *Journal of Research in Science Teaching*, *2*(3), 176–186. https://doi.org/10.1002/tea.3660020306

Piaget, J. (1976). Piaget's Theory. In *Piaget and His School* (pp. 11–23). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-46323-5_2

Prensky, M. (2011). From Digital Natives to Digital Wisdom. *From Digital Natives to Digital Wisdom*, *2*, 1–9.

Puspa, C. I. S., Rahayu, D. N. O., & Parhan, M. (2023). Transformasi Pendidikan Abad 21 dalam Merealisasikan Sumber Daya Manusia Unggul Menuju Indonesia Emas 2045. *Jurnal Basicedu*, *7*(5), 3309–3321. https://doi.org/10.31004/basicedu.v7i5.5030

Rosdiani, A., & Warmansyah, J. (2021). Perancangan Game Edukasi Berhitung Berbasis Mobile Aplikasi Inventor. *Journal of Science and Technology*, *1*(2), 198–206.

Rosmauli, C., & Watini, S. (2022). Implementasi Model ATIK untuk Mengembangkan Kemampuan Kognitif Berpikir Logis dalam Kegiatan Menggambar di TK IT Insan Mulia Pancoran. *JIIP - Jurnal Ilmiah Ilmu Pendidikan*, *5*(3), 888–894. https://doi.org/10.54371/jiip.v5i3.510

Safitri, N. D., Hasanah, U., & Masruroh, F. (2023). The Development of Thematic Board Educational Game Tools to Train The Literacy Skills of Children 5-6 Years Old. *Indonesian Journal of Early Childhood Educational Research*, *1*(2), 75–86. https://doi.org/10.31958/ijecer.v1i2.8156

Salum, R. N., Khadijah, K., & Liza Nasution, N. (2024). Optimization of Early Childhood Social Emotional Development Through Exercise Methods and Learning Videos. *Journal of Islamic Education Students (JIES)*, *4*(1), 163. https://doi.org/10.31958/jies.v4i1.12281

Sari, I. P., Warmansyah, J., Yuningsih, R., & Sari, M. (2023). The Effect of Realistic Mathematics Education (RME) Learning Approach on the Ability to Recognize Number Concepts in Children Aged 4-5 Years. *Journal of Islamic Education Students*, *3*, 38–49. https://doi.org/10.31958/jies.v3i1.8654

Sayfi'i, I., & Ilmayanti, A. F. F. (2021). Pengembangan Instrumen Penilaian Pada Perkembangan Fisik Motorik Anak Usia Dini Melalui Kegiatan Tari Kelompok B di TK Hasyim Asyari Suarabaya. *Islamic Edkids: Jurnal Pendidikan Anak Usia Dini*, *3*(1), 44–51.

Sufa, F. F., & Setiawan, M. H. (2018). Optimalisasi Peran Orangtua Dalam Mengembangkan Potensi Paud. *Adiwidya*, *II*(Nov), 289–298.

DOI: 10.31958/jies.v5i1.14821

Syarfina, S., Maulidia, M., Dari, U., Hawary, D., Hendriani, E., & Maisari, S. (2024). Understanding Earth and Space Science Concepts for Children: A Learning Media "Galaxy Gift" Development. *Journal of Islamic Education Students (JIES)*, *4*(1), 186. https://doi.org/10.31958/jies.v4i1.12360

Utami, N. R., & Warmansyah, J. (2019). Cerita gambar berseri untuk meningkatkan hasil belajar sains di lembaga paud Yogyakarta. *Jurnal Tunas Cendekia*, *2*(2), 89–100.

Warmansyah, J., Puja Diandra, Enji Novita Sari, Adam Mudinillah, Suswati Hendriani, & Mazlina Che Mustafa. (2024). Enhancing Early Childhood English Vocabulary: Teachers' Perspectives on Optimizing the Duolingo Application. *Journal of English Education and Teaching*, *8*(1), 33–45. https://doi.org/10.33369/jeet.8.1.33-45

Warmansyah, J., Utami, T., Faridy, F., Syarfina, S., Marini, T., & Ashari, N. (2023). *Perkembangan Kognitif Anak Usia Dini* (A. Ulinnuha & Tarmizi (eds.)). Bumi Aksara. https://www.google.co.id/books/edition/Perkembangan_Kognitif_Anak_Usia_Dini/aYLeEAAAQBAJ?hl=id&gbpv=1

Wathon, A. (2022). Penerapan Metode Bermain Melalui Permainan Ular Tangga Dalam Mengembangkan Kognitif Anak Usia Dini. *Jurnal Sistem Informasi Manajemen*, *5*(1), 6.

Wulandari, T., & Mudinillah, A. (2022). Efektivitas Penggunaan Aplikasi CANVA sebagai Media Pembelajaran IPA MI/SD. *Jurnal Riset Madrasah Ibtidaiyah (JURMIA)*, *2*(1), 102–118. https://doi.org/10.32665/jurmia.v2i1.245

Yuningsih, R., Andriani, L., Warmansyah, J., Sari, M., Wiliani, S., & Solin, S. S. (2024). The Implementation of the Principal's Academic Supervision in Improving the Professionalism of Early Childhood Educators. *Journal of Islamic Education Students (JIES)*, *4*(1), 23. https://doi.org/10.31958/jies.v4i1.12300