Journal of Islamic Education Students
Website: https://ejournal.uinmybatusangkar.ac.id/ojs/index.php/jies/index
Email: jies@uinmybatusangkar.ac.id
Volume 5 Nomor 1 (2025) Pages 86-97
Faculty of Education and Teacher Training
State Institute for Islamic Studies Batusangkar

Neuroscience-Based Board Game to Foster Environmental Awareness in Children Aged 5–6

Ika Ayu Pratiwi[1]✉, Nita Priyanti[2]
Pascasarjana, Universitas Pancasakti Bekasi, Indonesia[1,2]
email: ikaayupratiwi10@gmail.com
DOI: 10.31958/jies.v5i1.13734

Article info

Article History
Recieved: 19/11/2024
Revised: 16/04/2025
Accepted: 19/04/2025

✉ Corresponding author

Abstract

This study aims to develop a neuroscience-based game board learning media to enhance environmental awareness in children aged 5-6 years at TK Islam Al-Amanah, Depok City. Using the Research and Development (R&D) approach with the AIDDIE model, the study involves five stages: analysis, design, development, implementation, and evaluation. The results indicate that the neuroscience-based learning media is effective in increasing children's environmental awareness, as evidenced by the increase in pretest scores (39.7) to posttest scores (64.1), with a gain of 24.4 points. The implementation of this media is expected to be an innovative solution in early childhood education and improve environmental awareness in young children.

Keywords: *Environmental Awareness, Board Game, Neuroscience, Early Childhood*

Abstrak

Kesadaran lingkungan pada anak usia dini merupakan fondasi penting dalam pembentukan perilaku berkelanjutan, namun belum menjadi fokus utama dalam proses pembelajaran di PAUD. Penelitian ini bertujuan mengembangkan media papan permainan berbasis neurosains untuk meningkatkan kesadaran lingkungan pada anak usia 5–6 tahun. Pengembangan dilakukan menggunakan model ADDIE dan diuji efektivitasnya melalui desain eksperimen one-group pretest-posttest. Hasil menunjukkan peningkatan skor rata-rata dari 39,7 menjadi 64,1, dengan selisih 24,4 poin setelah penggunaan media. Temuan ini menunjukkan bahwa pendekatan berbasis neurosains yang diterapkan melalui permainan edukatif dapat menjadi strategi pembelajaran yang tepat dalam membentuk pembiasaan positif pada anak.

Kata Kunci: Kesadaran Lingkungan, Papan Permainan, Neurosains, Anak Usia Dini

INTRODUCTION

Early Childhood Education (ECE) represents a critical period in shaping lifelong habits and behavioral patterns that significantly influence a child's future development (Maromi & Hasibuan, 2024; Sabri et al., 2020; Saleha et al., 2022). Among the essential domains to be cultivated from an early age is environmental awareness (Anggraeni, 2024; Priyanti & Warmansyah, 2021; Triyanto et al., 2021). Young children should be introduced to basic practices of hygiene and cleanliness—such as handwashing,

DOI: 10.31958/jies.v5i1.13734

personal care, and proper waste disposal—as foundational routines. These behaviors not only foster environmental consciousness but also play a crucial role in the development of children's character (Adawiah, 2019; Buldur & Omeroglu, 2018).

Environmental awareness is a fundamental aspect of character development that should be nurtured from early childhood (Karim, 2018; Nurlaila et al., 2023). This formative period is not only crucial for cognitive growth but also for instilling lifelong values and behaviors, including the responsibility to care for one's surroundings . Research emphasizes that habits such as proper waste disposal, personal hygiene, water conservation, and care for nature—when introduced early—contribute significantly to the development of environmentally responsible citizens (Hadziq, 2016; Lesmi & Nuriah, 2022).

Despite this, studies and field observations show that environmental awareness among children aged 5–6 years remains underdeveloped. Many still exhibit behaviors such as littering, wasting water, or showing indifference to environmental cleanliness (Nabila et al., 2024). This issue is compounded by a tendency among educators to prioritize academic or cognitive domains, often neglecting environmental values and behaviors in early learning curricula (Suryana & Hijriani, 2021). The complexity of the problem lies not only in curriculum design but also in the absence of age-appropriate, engaging, and neuroscience-informed learning media that can stimulate meaningful behavioral change in children (Purwanto, 2018). Therefore, addressing this gap requires pedagogical strategies that integrate environmental education in a way that is aligned with children's developmental needs and natural modes of learning.

Previous studies have demonstrated that environmental awareness instilled at an early age has a significant impact on children's behavior in the future (Florencio da Silva et al., 2024; Mliless et al., 2024). Ismail, (2021) found that preschool children who were introduced to activities fostering environmental awareness, such as waste sorting and maintaining cleanliness, exhibited improved understanding and attitudes toward environmental issues. This highlights that early childhood is an ideal period to shape habits and attitudes that support environmental preservation. With the right approach, children can learn the importance of maintaining the environment as part of their daily lives.

Moreover, Jabbar & Betawi, (2019) explain that environmental-based learning programs can enhance children's awareness of the impact of human behavior on nature. Their study showed that children involved in interactive activities, such as playing environment-themed games, developed a quicker understanding of key concepts such as recycling, energy conservation, and water preservation. Additionally, Khamidun, (2012), stated that early childhood habits, such as washing hands before eating or not littering, can form the foundation of environmentally responsible behavior that persists into adulthood.

However, the reality on the ground reveals that many young children still lack sufficient understanding of environmental awareness. This is exacerbated by data from the Public Works Department of Depok City in 2022, which recorded a significant

DOI: 10.31958/jies.v5i1.13734

increase in waste generation, indicating the need for effective education to raise children's environmental awareness. Field observations conducted in November 2023 at the Al-Amanah Islamic Kindergarten in Depok revealed that although the school had implemented habits, such as washing hands with running water and placing waste in its proper place, the execution remained suboptimal due to a lack of monitoring.

The urgency of reinforcing environmental awareness becomes more apparent, given that early childhood education aims not only to provide learning experiences but also to shape children into responsible individuals who can make a positive impact on society (Buldur & Omeroglu, 2018). At the age of 5–6 years, children are at a developmental stage that is highly sensitive to the formation of habits, making engaging and interactive approaches crucial. One such medium that can support this learning is the neuroscience-based board game, which is designed to present material in a visual and interactive manner, aligning with the characteristics of young children who have short attention spans (Astuti et al., 2022; Kurniawan et al., 2021; Mulyati & Suryani, 2023).

Neuroscience-based board games have been recognized as tools that can enhance student engagement in learning. These games allow children to learn through hands-on experiences and maximize brain potential (Indrayanti et al., 2024; Nurhalisa et al., 2024; Rosdiani & Warmansyah, 2021). Previous studies have also indicated that brain-based learning can boost children's activity levels and creativity, as well as support their intellectual development (Kurniawati et al., 2018; Sholichah, 2020). However, research specifically investigating the use of this medium to enhance environmental awareness in early childhood remains limited.

Through this research, the development of a neuroscience-based board game is expected not only to increase environmental awareness among Group B children at Al-Amanah Islamic Kindergarten but also to serve as a reference for the development of innovative learning media in Indonesia. Additionally, this study aims to make a significant contribution to the field of early childhood education, particularly in addressing modern challenges such as the lack of environmental awareness. By combining visual, interactive, and dynamic narrative elements, this media is expected to foster sustainable understanding in children.

METHODS

This study employs a Research and Development (R&D) approach, utilizing the AIDDIE development model (Analysis, Design, Development, Implementation, and Evaluation). This model is used to develop a neuroscience-based board game as a learning media aimed at enhancing environmental awareness in children aged 5-6 years. The AIDDIE model is adopted to ensure that each phase of development proceeds systematically and interactively, beginning with the needs analysis and culminating in the evaluation of the final product.

In this research, the researcher follows five stages to develop the board game learning media with the goal of enhancing environmental awareness in children aged 5-

DOI: 10.31958/jies.v5i1.13734

6 years. The first stage is the analysis, during which the researcher identifies the children's needs related to environmental awareness through observations and interviews with teachers and parents. It was found that the children did not have the habit of maintaining cleanliness properly. Subsequently, during the design phase, the researcher develops a neuroscience-based learning media in the form of an engaging board game aligned with the theme of environmental awareness. The development stage involves creating a prototype of the board game and conducting one-to-one trials to test the effectiveness of the product, which is then evaluated by education media experts through expert judgment. In the implementation phase, the product is tested on a small group of children at the Al-Amin Islamic Kindergarten to observe the responses and effectiveness of the media, followed by revisions based on the trial results. The final stage is evaluation, where the changes in the children's environmental awareness are measured through pretests and posttests to assess the success of the media in enhancing this awareness.

Table 1. Research Steps in Developing Environmental Awareness Learning Media

Analysis	**Design**	**Development**	**Implementation**	**Evaluation**
Environmental Awareness Needs	Neuroscience-Based Learning Media Board Game	Prototype & One-to-One Trial	Expert Judgment	Small Group Trial
Data Analysis		Revisions Based on Trial Results	Pretest & Posttest	Measurement of Success

This research employs several data collection techniques, including interviews, questionnaires, observations, and tests. Interviews are conducted to gather information on needs analysis and interest in the use of board game-based learning media in Group B kindergarten. Questionnaires are used to collect quantitative data from respondents regarding their responses to the design of the product. Observations are made during the trial phase to assess the implementation of the learning media at the school, while tests are administered through pretests and posttests to measure changes in children's creativity after using the media. All of these techniques complement each other in gathering the necessary data for this research.

In the data analysis phase, the researcher processes both qualitative and quantitative data. Qualitative data is analyzed through reduction, presentation in the form of narratives or tables, and conclusions that are verified. Quantitative data is analyzed using a t-test with a pretest-posttest design to measure the difference in scores before and after using the learning media, in order to assess the improvement in environmental awareness among children aged 5-6 years.

DOI: 10.31958/jies.v5i1.13734

RESULTS AND DISCUSSION

Results

This research produced a product in the form of a neuroscience-based board game titled "Let's Take Care of the Earth", designed to foster environmental awareness in children aged 5–6. The game integrates neuroscience principles with physical movement and environmental education to support early childhood development in a playful and engaging manner. The development of this product followed the ADDIE model, with systematic implementation across each phase—Analysis, Design, Development, Implementation, and Evaluation. The process and results at each stage are described in detail below.

Analysis Stages

The preliminary study was conducted at TK Islam Al-Amanah, focusing on children aged 5–6 in Group B. Data were collected through interviews with three teachers and one assistant teacher, as well as through classroom observations. Findings revealed a lack of engaging learning media that effectively promote environmental awareness and channel children's high physical energy levels. Teachers reported that children often failed to sort waste and showed limited awareness of hygiene practices such as handwashing, brushing teeth, and bathing. Although teachers attempted to stimulate physical activity using fixed playground equipment and textbooks, these efforts were insufficient due to limited instructional time and monotonous activities. As a result, children frequently lost focus and became bored. To address these issues, there is a clear need for innovative, neuroscience-based learning media that integrate physical movement with environmental education. Such a medium must align with children's developmental needs and promote daily life skills through enjoyable and purposeful play.

Design and Develepment Stage

Expert Validation Results

The neuroscience-based board game learning media was validated by three experts: a board game practitioner, a neuroscience expert, and an early childhood education (ECE) specialist. The practitioner provided feedback on visuals, layout, and the alignment of images and texts. The neuroscience expert emphasized the importance of varied sequencing of neuroscience components. The ECE expert provided input regarding the appearance and functionality of the media.

Table 2. Recapitulation of Neuroscience Expert Assessment

No	Assessed Aspect	Score	Value
1	Appearance	9	3
2	Relevance	9	3
3	Neuroscience components	16	3.2

DOI: 10.31958/jies.v5i1.13734

Total	34
Average	3.0
Category	Good

Table 3. Recapitulation of ECE Expert Assessment

No	Assessed Aspect	Score	Value
1	Appearance	12	4
2	Relevance	12	4
3	Functionality	12	4
	Total	36	
	Average		4.0
	Category		Good

In summary, the validation results indicate that the media is *feasible* for field testing, with overall expert ratings categorized as "Good" based on established eligibility criteria.

Table 4. Expert Suggestions and Revisions

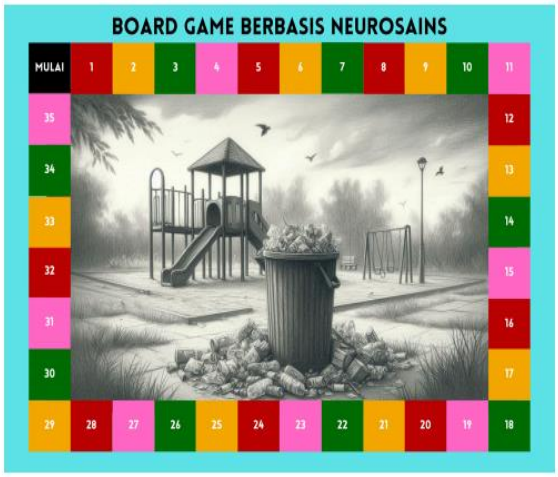
No	Expert	Suggestions	Revisions Made
1	Board Game & Neuroscience Practitioner	a. Lacked neuroscience-related movement labels b. Components could be adjusted to children's interest c. Clarify that child movements are not rigid d. Movements appeared too fixed, not explorative	a. Added descriptive movement labels b. Included notes about child interests c. Guidebook text revised d. Guidebook now includes illustrations and explanations separately
2	ECE Expert	a. Add introductory narrative on environmental awareness b. Use more concrete images c. Clarify systematic movement descriptors (hand, body, foot)	a. Introductory narrative added b. Images revised c. Movement descriptions improved

Table. 5 Revisions Summary

Before Revision	After Revision
Trash image was confusing for children	Replaced with an image of the Earth
Box pattern (e.g., red-yellow-green) appeared unclear	Simplified to red-yellow-green for better child appeal
Gray background was not visually appealing	Background color updated

DOI: 10.31958/jies.v5i1.13734

Game board lacked a title	Board has been titled appropriately



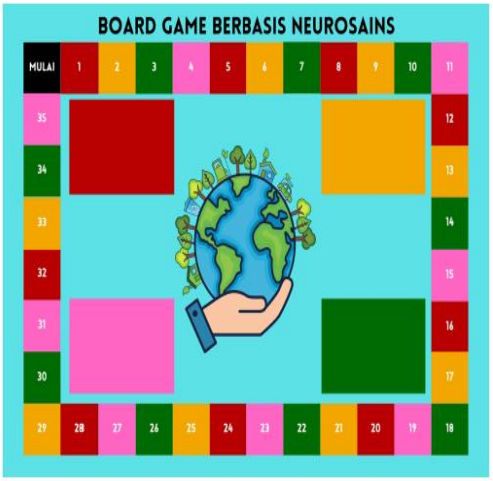


Fig 1. Final Product

These revisions were made to ensure the media was both engaging and developmentally appropriate, in accordance with expert feedback.

Implementation

Small Group Try-Out

The small group evaluation aimed to gather input for refining the second prototype of the neuroscience-based board game designed to foster environmental awareness in children aged 5–6. The trial involved eight children from Group B at TK Islam Al-Amanah and two teachers. Teachers received the board game and accompanying guidebook and were asked to implement it in class.

Following the implementation, teachers completed a questionnaire assessing clarity of instructions, visual design, relevance of text and images, ease of use, and student engagement. Results showed that the instructions were clear, the design appealing, and the activities aligned with children's developmental stages. Teachers noted that while most game activities were easily performed by children, some required teacher assistance. The media was considered effective in stimulating environmental awareness, especially in daily routines like sorting waste and personal hygiene.

DOI: 10.31958/jies.v5i1.13734

Overall, teachers found the game engaging and motivating for children, with movements aligned to neuroscience principles. The guidebook was deemed easy to understand, and the content encouraged further interest in neuroscience-based learning. Minor revisions were suggested for some image-text alignments.

Evaluation

To evaluate the effectiveness of the neuroscience-based board game in enhancing environmental awareness among children aged 5–6 years, a paired sample t-test was conducted comparing the pretest and posttest scores of 20 children. This statistical method was chosen to determine whether there was a significant difference in environmental awareness before and after using the board game as a learning medium.

Table 6. Paired Samples Statistics

Pair	Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	39.70	20	5.449
	Posttest	64.10	20	2.490

Table 7. Paired Samples Correlations

N	Correlation	Sig.
20	0.138	0.562

Table 7. Paired Sample t-Test

Mean Difference	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
-24,40	5,353	1,197	-20,38	19	0,000

The results of the analysis showed a mean pretest score of 39.70 (SD = 5.449) and a mean posttest score of 64.10 (SD = 2.490), indicating a substantial increase in scores following the intervention. The mean difference between the pretest and posttest was -24.40, with a standard deviation of 5.353 and a standard error of 1.197. The t-value obtained was -20.38 with 19 degrees of freedom, and the significance level was 0.000 ($p < 0.05$), indicating a statistically significant improvement in children's environmental awareness after using the board game. Although the correlation coefficient between the pretest and posttest was relatively low ($r = 0.138$, $p = 0.562$), this suggests that the improvement in scores was not merely due to children's initial abilities, but rather a result of the learning experience facilitated by the media.

Discussion

Field observations revealed that environmental awareness among early childhood learners—specifically group B children aged 5–6 at TK Islam Al-Amanah—remains relatively low. Daily practices related to environmental hygiene, such as handwashing, maintaining cleanliness, and drinking adequate water, were not yet consistently embedded in the children's routines. Notably, several children had not

DOI: 10.31958/jies.v5i1.13734

developed the habit of washing their hands after playing or eating, indicating a lack of sufficient stimulation to foster awareness of personal and environmental hygiene.

This finding aligns with previous research by Suyadi, (2019), which emphasized that healthy living habits in early childhood are significantly influenced by structured and consistent stimulation from teachers and parents. Santosa found that such stimulation effectively cultivates children's awareness of the importance of maintaining cleanliness and personal health. Similarly, this study observed a substantial improvement in environmental awareness among children who received regular stimulation, reinforcing the centrality of early and sustained intervention. In response to this need, this research developed a neuroscience-based educational board game as a pedagogical tool to support teachers in delivering more impactful stimulation. Initial trials of the media demonstrated a notable increase in environmental awareness, as evidenced by the contrast between pretest and posttest scores. While children initially experienced some confusion, repeated exposure to the game facilitated a clearer understanding of the concepts presented.

These findings are consistent with neuroscience principles articulated by (Fitri et al., (2020), who posited that playful and challenging learning experiences effectively stimulate children’s brains, enhancing both motivation and attention. The media developed in this study incorporates these principles, providing a gamified learning environment that engages cognitive and emotional pathways to promote behavioral change. The board game is further supported by a comprehensive guidebook containing information on neuroscience foundations and practical instructions for implementation. This enables educators to facilitate the learning process more effectively. Quantitative analysis also confirmed the efficacy of the media, showing a significant increase in posttest scores compared to pretest results.

These findings resonate with those of Kurniawati et al., (2018), who argued that neuroscience-informed educational media can enhance children's understanding of conceptual content, particularly when designed in alignment with the developmental stages of the early childhood brain. The outcomes of this study thus provide compelling evidence that neuroscience-based learning media can serve as an effective stimulus for promoting environmental awareness and fostering positive behavioral habits in young children.

Overall, the research affirms existing theoretical perspectives on the critical role of appropriate stimulation in developing environmental consciousness among early learners. The implementation of neuroscience-based instructional media offers a promising solution for enhancing environmental awareness in early childhood education, particularly within the context of Islamic kindergarten settings such as TK Islam Al-Amanah.

CONCLUSION

This study demonstrates that the neuroscience-based board game developed for children aged 5-6 at Al-Amanah Islamic Kindergarten effectively enhances

DOI: 10.31958/jies.v5i1.13734

environmental awareness. Using the ADDIE model, the media, designed with Canva, significantly engaged children and led to a notable improvement in awareness, with pretest scores increasing from 39.7 to posttest scores of 64.1, a 24.4-point rise. The findings suggest that this board game can be an effective tool for promoting environmental awareness in early childhood education and can serve as a reference for developing similar educational media in PAUD institutions. Further studies are recommended to test its long-term effectiveness.

REFERENCES

Adawiah, R. (2019). Instilling the Environmental Care Characters to the Elementary Schools Located on the River Banks. *Journal of Wetlands Environmental Management*, *6*(2), 84. https://doi.org/10.20527/jwem.v6i2.177

Anggraeni, I. (2024). Pengelolaan Komposter untuk Anak Usia Dini: Mengubah Kesadaran Lingkungan dan Pengurangan Sampah. *WISDOM: Jurnal Pendidikan Anak Usia Dini*, *5*(1), 15–27. https://doi.org/10.21154/wisdom.v5i1.8438

Astuti, R. D., Gandana, W. E., Pujiyanto, E., & Nurbi, R. S. (2022). Proposed Design Of Toy To Optimize The Brain Development Of Children Aged 3-5 Years Old. *Spektrum Industri*, *20*(1), 11–18. https://doi.org/10.12928/si.v20i1.14

Buldur, A., & Omeroglu, E. (2018). An Examination of the Relationship between Pre-school Children's and Their Teachers' Attitudes and Awareness towards the Environment. *Journal of Education and Learning*, *7*(2), 221. https://doi.org/10.5539/jel.v7n2p221

Fitri, R., Reza, M., & Agustin Ningrum, M. (2020). Instrumen Kesiapan Belajar: Asesmen Non-Tes Untuk Mengukur Kesiapan Belajar Anak Usia Dini Dalam Perspektif Neurosains. *Jurnal Pendidikan, Pengasuhan, Kesehatan Dan Gizi Anak Usia Dini (JP2KG AUD)*, *1*(1), 17–32. https://journal.unesa.ac.id/index.php/jt/article/view/8615

Florencio da Silva, R., Rodríguez Vargas, J. Á., Mc Namara Valdés, Á. de J., Soares Pereira, F. L., Monsivais Huertero, A., & Jiménez Escalona, J. C. (2024). Environmental Awareness From Childhood: Integrating Ecological Education to Cultivate Conscious and Committed Citizens. *6th International Conference on Education and New Learning Technologies*, 4906–4910. https://doi.org/10.21125/edulearn.2024.1205

Hadziq, A. (2016). Pembelajaran Agama Dan Lingkungan Dalam Kultur Sekolah Alam: Potensi Membumikan Kesadaran Lingkungan Sejak Dini Di Sekolah. *Jurnal Tatsqif*, *14*(1), 1–32. https://doi.org/10.20414/jtq.v14i1.19

Indrayanti, D., Chairani, I., Rizki, N. F., & Amini, R. K. (2024). Stacking Box Games to Stimulate Problem-Solving Skills in Children Aged 4-6 Years. *Journal of Islamic Education Students*, *4*(2), 232–240. https://doi.org/10.31958/jies.v4i2.12374

Ismail, M. J. (2021). Pendidikan Karakter Peduli Lingkungan dan Menjaga Kebersihan di Sekolah. *Guru Tua : Jurnal Pendidikan Dan Pembelajaran*, *4*(1), 59–68.

https://doi.org/10.31970/gurutua.v4i1.67

Jabbar, S., & Betawi, A. (2019). Children express: war and peace themes in the drawings of Iraqi refugee children in Jordan. *International Journal of Adolescence and Youth*, *24*(1), 1–18. https://doi.org/10.1080/02673843.2018.1455058

Karim, A. (2018). Mengembangkan Kesadaran Melestarikan Lingkungan Hidup Berbasis Humanisme Pendidikan Agama. *Edukasia : Jurnal Penelitian Pendidikan Islam*, *12*(2), 309. https://doi.org/10.21043/edukasia.v12i2.2780

Khamidun. (2012). Environmentally Awareness Behaviour Increase in Early Childhood Using Story Telling Method. *Indonesian Journal of Early Childhood Educational Studies*, *1*(1). https://doi.org/https://doi.org/10.15294/ijeces.v1i1.9201

Kurniawan, R., Razaq, A. G., & Poerbaningtyas, E. (2021). Perancangan Board Game sebagai Media Penunjang untuk Meningkatkan Minat Kegiatan Ekstrakurikuler Pramuka Penggalang Siswa Sekolah Dasar. *Jurnal Desain*, *8*(2), 132. https://doi.org/10.30998/jd.v8i2.8166

Kurniawati, N., Mustaji, M., & Setyowati, S. (2018). Implementation Of Neuroscience Learning To Develop Early Childhood's Cognitive. *Proceedings of the 2nd International Conference on Education Innovation (ICEI 2018)*. https://doi.org/10.2991/icei-18.2018.20

Lesmi, K., & Nuriah, T. (2022). Upaya Guru Dalam Penanaman Kesadaran Diri Terhadap Lingkungan Pada Anak Usia Dini. *JP3M: Jurnal Pendidikan, Pembelajaran Dan Pemberdayaan Masyarakat*, *4*(2), 456–460. https://doi.org/10.37577/jp3m.v4i2.478

Maromi, C., & Hasibuan, R. (2024). Increasing the Competency of PAUD Teachers in Sidoarjo Regency Through Leveled Basic Level Training and Integrated Mentoring. *Journal of Islamic Education Students*, *4*(2), 241–250. https://doi.org/10.31958/jies.v4i2.12475

Mliless, M., Larouz, M., & Azzouzi, L. (2024). Environmental Awareness as Part of Early Childhood Education for Sustainability. In *International Explorations in Outdoor and Environmental Education* (pp. 1–25). https://doi.org/10.1007/978-3-031-59910-1_1

Mulyati, E., & Suryani, L. (2023). Penggunaan Media Board Game dan Aplikasi Quizziz dalam Pengembangan Kemampuan Kognitif Anak Usia Dini. *JIIP - Jurnal Ilmiah Ilmu Pendidikan*, *6*(11), 8718–8729. https://doi.org/10.54371/jiip.v6i11.2690

Nabila, D. F., Putri, W., Wulandari, R., Ismandela, A., Safna, A., Warmansyah, J., Sari, M., Yuningsih, R., Islam, P., Usia, A., & Author, C. (2024). Strengthening Early Childhood Education Through Environmental Care and Utilization of School Toys. *Journal of Social Outreach: Jurnal Pengabdian Masyarakat*, *3*(1), 67–75.

Nurhalisa, E., Muzakki, M., Iskandar Zulkarnain, A., Kiptiyah, M., & Brambila, M. (2024). Enhancing Gross Motor Skills in Children Aged 5-6 Through Outbound

DOI: 10.31958/jies.v5i1.13734

Games. *Indonesian Journal of Early Childhood Educational Research (IJECER)*, *3*(1), 13. https://doi.org/10.31958/ijecer.v3i1.12432

Nurlaila, N., Daliyanda, R., Warmansyah, J., Al Husna, L., Komalasari, E., Yuningsih, R., & Sari, M. (2023). *Development of Canva-based Picture Storybook Media to Increase Reading Interest in Early Childhood* (Issue ICoeSSE). Atlantis Press SARL. https://doi.org/10.2991/978-2-38476-142-5_35

Priyanti, N., & Warmansyah, J. (2021). The Effect of Loose Parts Media on Early Childhood Naturalist Intelligence. *JPUD - Jurnal Pendidikan Usia Dini*, *15*(2), 239–257. https://doi.org/10.21009/jpud.152.03

Purwanto, N. (2018). Perilaku Sadar Lingkungan Pemukim Bantaran Sungai Jelai, Kabupaten Sukamara. *Jurnal Pembangunan Dan Wilayah Kota*, *14*(1), 41. https://doi.org/10.14710/pwk.v14i1.17348

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

Sabri, A., Warmansyah, J., Amalina, A., & Aswirna, P. (2020). Implementasi Pengintegrasian Keislaman Dalam Pengenalan Konsep Matematika Anak Usia Dini. *Math Educa Journal*, *4*(1), 23–30. https://doi.org/10.15548/mej.v4i1.1240

Saleha, L., Baharun, H., & Utami, W. T. (2022). Implementation of Digital Literacy in Indonesia Early Childhood Education. *Indonesian Journal of Early Childhood Educational Research*, *1*(1), 12–22. https://doi.org/10.31958/ijecer.v1i1.5834

Sholichah, A. S. (2020). Urgensi Pendidikan Karakter Pada Anak Usia Dini Dalam Tinjauan Neurosains. *JECIES: Journal of Early Childhood Islamic Education Study*, *1*(1), 01–14. https://doi.org/10.33853/jecies.v1i1.51

Suryana, D., & Hijriani, A. (2021). Pengembangan Media Video Pembelajaran Tematik Anak Usia Dini 5-6 Tahun Berbasis Kearifan Lokal. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *6*(2), 1077–1094. https://doi.org/10.31004/obsesi.v6i2.1413

Suyadi, S. (2019). Kisah (Storytelling) Pada Pembelajaran Anak Usia Dini Dalam Kajian Neurosains Pendidikan Islam. *Jurnal Ilmiah Islam Futura*, *18*(1), 52. https://doi.org/10.22373/jiif.v18i1.3130

Triyanto, Agustinova, D. A., & Syamsi, K. (2021). Strengthening Disaster Literacy as An Effort to Reduce the Risk of Disaster in D.I. Yogyakarta Society. *IOP Conference Series: Earth and Environmental Science*, *884*(1). https://doi.org/10.1088/1755-1315/884/1/012032