

Interactive eduplay in fostering early childhood cognitive development: Insights from a qualitative field study

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Submitted:
30-06-2026

Accepted:
29-07-2026

Published:
31-07-2026

Abstract: This study aims to analyze the implementation of interactive eduplay as an educational learning medium in supporting early childhood cognitive development at Raudhatul Athfal Muslimat NU Al-Amin Sugio. The research is motivated by the need for innovative learning media that is able to provide optimal stimulation according to the characteristics of early childhood learning in the modern era. This study uses a qualitative approach with subjects of students aged 5–6 years. Data was collected through observation, interviews, and documentation, then analyzed using thematic analysis techniques. The results of the study identified three theme areas including preparation, implementation and evaluation as well as five main themes, namely (1) readiness for the implementation of interactive eduplay, (2) improving children's cognitive abilities, (3) increasing motivation and learning involvement, (4) the role of teachers as learning facilitators, and (5) collaboration between schools and parents in providing stimulation of children's development. The findings show that the use of interactive eduplay not only improves children's ability to recognize letters, numbers, colors, shapes, and logical thinking skills, but also encourages the formation of an active, fun, and child-centered learning experience.

Keywords: Cognitive, early childhood education, learning media

Abstrak: Penelitian ini bertujuan menganalisis implementasi *interactive eduplay* sebagai media pembelajaran edukatif dalam mendukung perkembangan kognitif anak usia dini di Raudhatul Athfal Muslimat NU Al-Amin Sugio. Penelitian dilatarbelakangi oleh kebutuhan akan media pembelajaran inovatif yang mampu memberikan stimulasi optimal sesuai karakteristik belajar anak usia dini di era modern. Penelitian ini menggunakan pendekatan kualitatif dengan subjek peserta didik berusia 5–6 tahun. Data dikumpulkan melalui observasi, wawancara, dan dokumentasi, kemudian dianalisis menggunakan teknik analisis tematik. Hasil penelitian mengidentifikasi tiga area tema meliputi persiapan, pelaksanaan dan evaluasi serta lima tema utama, yaitu (1) kesiapan implementasi *interactive Eduplay*, (2) peningkatan kemampuan kognitif anak, (3) meningkatnya motivasi dan keterlibatan belajar, (4) peran guru sebagai fasilitator pembelajaran, dan (5) kolaborasi sekolah dan orang tua dalam memberikan stimulasi perkembangan anak. Temuan menunjukkan bahwa penggunaan *interactive eduplay* tidak hanya meningkatkan kemampuan mengenal huruf, angka, warna, bentuk, serta kemampuan berpikir logis anak, tetapi juga mendorong terbentuknya pengalaman belajar yang aktif, menyenangkan, dan berpusat pada anak.

Kata kunci: Kognitif, pendidikan anak usia dini, media pembelajaran

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INTRODUCTION

Early childhood is called Golden Age which is a golden period in human development. It is a critical stage of infant development. During this stage, physical and psychological systems mature to prepare children to acquire environmental stimuli and develop abilities according to their developmental tasks (Susanti et al., 2024). The brain grows and develops very fast compared to other stages of life. Children's brain development takes place very fast, thereby becoming a critical moment for their growth and learning (Wasis, 2022). There

are numerous areas should be considered for optimal development, including the work of physical, intellectual, emotional, social, moral maturity and efforts to have consequences for early childhood education (Bonita et al., 2022). Proper stimulation is needed to maximise the child's potential. Educators and parents can focus on quality of equipment used in stimulating activities of creative play and learning of children (Fatimah et al., 2023). Educational game tools are one of the effective ways to support children's development.

Educational play instruments are precisely developed to encourage the many areas of children development: cognitive, social and motor. Educators are demanded to be creative and imaginative in offering learning material that can bridge the children's learning demands with the growth of the times (Winnuly et al., 2026). Educational play tools are particularly suitable to be recommended learning media to be used in every learning session, especially for early childhood (Hidayat & Al-Audiyah, 2023). Play has an important role in that through activities and exploration, children can explore the surrounding environment as well as develop cognitive, motor, intellectual, and social skills. Learning that involves children's tendency to play is much more effective because students feel more relaxed (Basri & Akhmad, 2018). Play activities are carried out spontaneously or directly, either through interaction with other people and with objects around them. Play is done with a sense of happiness, voluntarily, full of imagination and involving all five senses and the whole body (Hayati & Putro, 2021).

The game contents can be changed to the students' knowledge, experience and skills according to their present knowledge and awareness (Winnuly, 2025). Understanding the stages of children's cognitive development is important to design right learning strategy. Purwulan (2024) emphasised that cognitive growth in children include the ability to think, process information, and solve issues that continue to develop over time. The cognitive abilities of children are the different aspects of complex mental development. According to Laelawati (2023), cognitive ability - the ability of the youngster to think in a deeper way, to reason and solve different difficulties.

Based on the phenomenon in the field, it can be seen that the early childhood education system still utilises repetitive and boring conventional methods so that it pays less attention to the development of children's creative talents (Gea & Zega, 2025; Nikmah et al., 2023; Suryana et al., 2022). Many early childhood education institutions in Indonesia do not use educational game tools in learning, so that they are less interesting to children and cannot fully support optimal cognitive development. On the other hand, early childhood education is more recognised, but the key problem is to ensure that the education delivered in early childhood education institutions is able to properly promote children's cognitive and social development (Astuti & Triani, 2024). The national scale shows that data on the prevalence of cognitive development problems in early childhood is also an important concern where a report by the World Health Organization (WHO) states that around 10% to 15% of children around the world experience cognitive development problems including learning difficulties, developmental delays and developmental disorders such as autism spectrum (Dewi et al., 2022; Mulyati & Suryani, 2023). Thinking Awareness and Problem Solving The Role of Cognitive Development in Helping Children Discover Talents. This gives an insight to how youngsters gain knowledge and interact with their environment and which in turn affects their entire learning process and development (Khoiruzzadi & Prasetya, 2021).

Several studies in Indonesia state that the application of experimental methods by combining educational media can improve children's cognition, provoke motivation and children's enthusiasm in learning (Rajamuddin, 2025; Waliulu et al., 2023). The implementation of early childhood learning requires a stimulation process using various media that are packaged in structured and interactive play and enriching children's knowledge. Basri and Akhmad (2018) stated that interactive games can increase learning motivation, develop cognitive skills, and enrich children's learning experiences. Interactive eduplay is one of innovation and potential learning medium. It is an interactive learning media that incorporates gaming aspects with educational information. Interactive learning, if done correctly, can produce positive impacts in the form of increased student engagement, better understanding of concepts, and increased motivation and participation (Indriansyah, 2025; Jumiati et al., 2025).

Media interactive eduplay is aimed to create an enjoyable learning experience and to foster children's cognitive development. These educational games are intended to make the learning process more engaging and fun, resulting in a higher level of student involvement in learning activities (Eliyanti et al., 2025). Educational media is a learning media that has a collection of varied interactive games used in different learning contexts such as Quiz Game Froggy Jumps, Quiz Game Team, Matching Pairs, and Riddle Game. Furthermore, the media incorporates gamification aspects to improve student engagement and to promote the more effective and entertaining learning experience (Husada et al., 2026).

Educators are required to be creative and innovative in presenting learning media that is able to bridge children's learning needs with the development of the times. Early childhood is increasingly accustomed to innovative games that are visual, interactive, and challenging. This condition is a challenge as well as an opportunity for educators to develop and implement educational learning media by utilizing the characteristics of modern games appropriately. As research Firdaus and Prasetyo (2025) revealed that technology-based learning media can young children in understanding abstract concepts through more interesting and interactive learning experiences. The study adopted an approach Systematic Literature Review which relies on secondary data from previous research, so it does not include direct empirical data from students in the field. This limitation makes the validity of findings related to the effectiveness of interactive multimedia in real contexts less strong. Therefore, a study is needed experimental or observational which can test the real impact of interactive media on the development of children's thinking skills.

This research is here to fill this gap with an approach that allows direct observation of phenomena that occur in the original environment without any manipulation, so that the data obtained is more authentic and in accordance with the context and provides a more specific focus on one type of educational game tool. Therefore, this study aims to provide deeper insight into how effective the use of interactive learning tools is in supporting early childhood cognitive development.

METHOD

This research uses a field qualitative approach (Field Research) to analyze the implementation interactive eduplay in developing early childhood cognitive abilities at RA Muslimat NU Al-Amin Sugio. The research method focuses on an in-depth understanding of the phenomena that occur in the natural environment of the research subject. Sari et al.

(2022) stated that this approach is carried out to study the condition of natural objects, with researchers acting as the main instrument in data collection. Data collection techniques with observation, interviews and documentation. Observations It is done to observe phenomena that occur in the original environment without manipulation, so that the data is more authentic and appropriate to the learning context. Interviews were conducted with school principals, teachers and parents to explore information about children's development before and after the implementation of interactive eduplay media and to see the views of teachers and principals on the effectiveness of media. Documentation is collected to support the data.

The data analysis in this study refers to the Miles and Huberman model which includes data reduction, data presentation, and conclusion drawing (Miles & Huberman, 2007). At the data reduction stage, the researcher transcribes the results of the interviews, reads the data repeatedly, provides code (open coding), groups codes that have similar meanings into categories, and then identifies the main themes that emerge from the results of observations, interviews, and documentation. Furthermore, the data is presented in the form of narrative descriptions, tables, and verbatim citations to facilitate interpretation. The final stage is carried out through drawing conclusions based on patterns and themes that have been verified through source triangulation and triangulation techniques. The main data sources in this study include students aged 5–6 years at RA Muslimat NU Al-Amin, as well as school principals, teachers, and parents of students as supporting informants. The Table 1 is the data code of the informants in the study.

Table 1. Informant code

Code	Informants
KS-01	Principal of RA Muslimat NU Al-Amin Sugio
G-01	Group B Class Teachers
OT-01	Parents of Students
PS-01	Students

Additional data was obtained from various documents, such as school profiles, curriculum, and daily learning implementation plans. Briefly, the stages of the research are presented in figure 1.

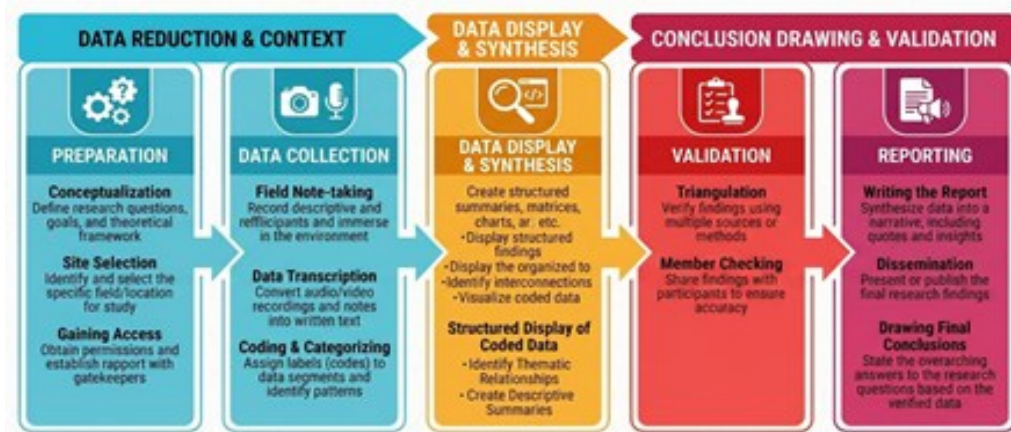


Fig. 1. Qualitatif field research flowchart

RESULTS AND DISCUSSION

Synthesis of findings based on thematic analysis

The findings of the study imply that interactive eduplay can be an alternative learning media that supports child-centered learning and strengthens collaboration between schools and families in stimulating early childhood cognitive development. The following is an Open Coding Table that is consistent with the results of observations, interviews, and documentation.

Table 2. Results of open coding research data

No	Data Citation (Raw Data)	Open Code	Initial Meaning
1	"Before using interactive eduplay, learning was still dominated by classical activities..." (KS-01)	Classical learning	Previous learning methods are less varied
2	"... Some kids lose focus quickly." (KS-01)	Loss of focus	Children's learning concentration is still low
3	"The child seems to be more active in asking..." (KS-01)	Asking activity	Increased curiosity of children
4	"... try and solve challenges independently." (KS-01)	Learning independence	Children are more confident in completing tasks
5	"Children understand instructions more easily..." (G-01)	Understanding the instructions	Media makes the learning process easier.
6	"... The media is equipped with colors, images, and play activities." (G-01)	Visual-interactive media	The characteristics of the media attract children's attention
7	"Children who are usually passive begin to dare to participate in activities until they are finished." (G-01)	Active participation	Increased student involvement
8	The observation results showed that children were able to recognize letters and numbers faster. (PS-01)	Get to know the symbols	Improvement of early literacy and numeracy skills
9	Children are able to group colors and shapes correctly. (PS-01)	Object classification	The development of logical thinking skills
10	Children are able to arrange letters and numbers according to the instructions of the game. (PS-01)	Troubleshooting	The development of systematic thinking skills
11	Children participate in meronce and sew activities with enthusiasm. (PS-01)	Fine motor	Eye and hand coordination develops
12	The teacher gives instructions before the game starts.	Scaffolding teacher	Teachers play the role of learning facilitators
13	The teacher accompanies when the child has difficulties.	Mentoring	Assistance is provided according to the needs of children
14	Your child earns a star pin after completing a challenge. (PS-01)	Reward	Strengthening intrinsic and extrinsic motivation

15	"At home, children often tell about games that are done at school." (OT-01)	Transfer of learning experience	The learning experience continues at home
16	"Children begin to recognize letters and numbers while playing." (OT-01)	Learning through play	Learning happens naturally
17	"... without having to be forced to learn." (OT-01)	Intrinsic motivation	Children learn because of pleasure, not coercion
18	Documentation shows that all activities take place according to learning procedures. (PS-01)	Systematic implementation	The media is implemented in a planned manner
19	Most students are able to complete all stages of the game. (PS-01)	Task completion	Children are able to follow the learning flow
20	Students showed enthusiastic expressions during the learning. (PS-01)	Enthusiastic about learning	Media increases children's emotional engagement

The results of the open coding showed that the field data generated a number of initial codes that described the informant's experience during the implementation of interactive eduplay. These codes are obtained from the process of identifying important statements from observations, interviews, and documentation without making too broad an interpretation at an early stage. Next, codes that have similar meanings are grouped into categories through the axial coding process, then synthesized into the main themes of the study. This process allows researchers to maintain a close relationship between empirical data and scientific interpretation, thereby increasing the credibility of research results.

Based on the results of the thematic analysis (Table 3), five main themes were obtained that describe the implementation of interactive eduplay in developing early childhood cognitive abilities. These themes are interrelated and form a learning process that starts from the readiness of media implementation, the implementation of play activities, the improvement of cognitive abilities, the strengthening of learning motivation, to the formation of collaboration between schools and parents. The first theme shows that effective media implementation requires careful learning planning, teacher readiness, and the selection of media that are in accordance with the characteristics of children's development. The second theme reveals that interactive eduplay stimulates the ability to think logically, recognize symbols, classify objects, and solve problems through concrete and multisensory play activities.

The third theme shows that the characteristics of interesting media are able to increase students' intrinsic motivation, active engagement, and curiosity during learning. Furthermore, the fourth theme shows that the success of media implementation is greatly influenced by the role of teachers as facilitators who provide scaffolding, direction, and feedback according to the needs of children's development. The last theme shows that the stimulation of cognitive development does not only occur in schools, but also continues in the family environment through the involvement of parents in accompanying children to repeat the learning experience at home.

Tabel 3. Topic area and main themes

Topic Area	Main Themes	Categories	Data Code	Empirical Evidence	Interpretation
Preparation for the use of interactive eduplay	Interactive eduplay Implementation Readiness	Learning planning	Classical learning, teacher readiness, media preparation	The teacher prepares all the components of the game before learning. The principal stated that before the use of learning media, the classical method (KS-01) was still dominated.	The success of media implementation is influenced by systematic learning planning and teachers' readiness to manage play activities.
		Media suitability	Safe, attractive, child-friendly media	Observations show that all media have been prepared according to the needs of children's development.	Media that is in accordance with developmental characteristics increases children's readiness to participate in learning.
Implementation of Interactive Use of Eduplay	Improved cognitive ability	Introduction to basic concepts	Getting to know letters, numbers, colors, shapes, animals, fruits	Children are able to recognize numbers, letters, colors, geometric shapes, fruits, and animals during learning activities. The	Interactive eduplay stimulates the ability to think logically, classify, symbolize, and solve problems.

			teacher stated that the child understood the instructions more easily (G-01).	
Learning Motivation and Engagement	Troubleshooting	Follow instructions, compose objects, complete challenges	Children are able to complete the game challenges gradually and independently.	Play activities encourage the development of systematic thinking skills through hands-on experience.
	Activeness of learning	Ask, try, enthusiastic, active participation	Observations show that children actively participate in all activities. The principal explained that the children became more active in asking questions and trying various challenges (KS-01).	Game-based learning media increases intrinsic motivation and active involvement of learners.
	Fun learning environment	Rewards, play activities	The child earns a star pin after completing the game and shows high enthusiasm.	Positive reinforcement through play activities creates a fun and meaningful learning experience.
The Role of Teachers as Facilitators	Scaffolding	Mentoring, Directing, Demonstrations	The teacher provides examples, direction,	Teachers act as facilitators who

Evaluation of Interactive eduplay Usage				and help when the child has difficulties during the game.	provide <i>scaffolding</i> according to the needs of children's development.
		Monitoring of learning	Progress observation, feedback	The teacher observes the child's development during the game and provides feedback directly.	Teacher interaction helps children build knowledge through active learning experiences.
	School and Parent Collaboration	Transfer of learning experience	Children tell about their experience of playing at home	Parents state that the child often recounts games at school (OT-01).	The learning experience does not stop at school, but continues in the family environment.
		Reinforcement of stimulation	Learn while playing at home	Parents observe that children begin to recognize letters and numbers without being forced to learn (OT-01).	School and family collaboration strengthens the stimulation of cognitive development in a sustainable manner.

Overall, the relationship between themes shows that the effectiveness of interactive eduplay is determined not only by the quality of the learning media, but also by the integration between teachers' learning strategies, active participation of learners, and family support. This synergy forms a learning experience that is meaningful, contextual, and in accordance with the principles of learning in early childhood education. These findings reinforce that the implementation of game-based media can be an effective learning alternative in optimizing children's cognitive development. Overall, the results of the study show that the effectiveness of interactive eduplay is the result of an interaction between the characteristics of learning media, teacher learning strategies, active participation of students, and parental support. The constructivist perspective, Piaget's theory of cognitive development, Vygotsky's concept of scaffolding, Bruner's theory of representation, and Bronfenbrenner's theory of ecology together explain that a child's cognitive development takes place optimally when the child has the opportunity to learn through hands-on experience in a supportive environment.

These findings expand on previous research that generally only emphasized the effectiveness of learning media on learning outcomes. This study shows that the success of interactive eduplay is not only reflected in the improvement of the ability to recognize letters, numbers, colors, and shapes, but also in the formation of learning motivation, problem-solving skills, social interaction, independence, and continuity of stimulation between school and family. Thus, interactive eduplay can be positioned as a learning innovation that supports the implementation of active, meaningful, and child-centered learning in early childhood education units.

Interactive eduplay implementation readiness

Careful planning in early childhood learning is essential to ensure that every element of play can provide optimal stimulation for the child's development. According to Lestarinigrum et al. (2022), effective learning requires planning that is tailored to the characteristics of the child, thus, activities can run smoothly and achieve the goals that have been set. Children learn most effectively with hands-on experience, play activities and exploration of the surrounding environment (Winnuly et al., 2026). Aspects of safety, visual appeal, and conformity with the principles of exploration are the main concerns in its design and emphasize that interactive games can optimally stimulate children's cognitive, social, and emotional development, by actively involving children in the learning process. Media is used to transmit or mediate communication, between the sender and the recipient of the message (Saleh et al., 2023; Sinambela et al., 2021).

Interactive eduplay Developed using a holistic approach combining multiple interactive aspects to improve children's critical thinking, problem solving and fine motor coordination skills. Interactive game design based Game-based learning can support the development of learning both cognitive and emotional by selecting materials, shapes, and colors that suit the characteristics of early childhood (Anggriawan, 2023). Every component of the game interactive eduplay Made from safe materials and adapted to global safety standards, child ergonomics and multisensory methods to enrich a fun and meaningful learning experience. The use of interactive learning media needs to be applied a learning

approach so that students can easily understand the material contained in this interactive learning media.

Table 4. Eduplay interactive elements

No	Elements	Description
1.	Color Wheel	Used to determine the order of games or tasks before the child uses a flash card.
2.	Flash Card	Cards with play instructions and engaging graphics to help toddlers comprehend orders.
3.	Magnetic Board	It serves as a medium to attach various components of the game like letters, numbers, magnet based images.
4.	Fruit Flannel Shape	It consists of apples, oranges, strawberries, and pineapples equipped with magnets so that they can be attached to the magnetic board.
5.	Animal Images	Features drawings of cats, snakes, chickens, cows, monkeys and goats with magnets for animal awareness activities.
6.	Letters A-Z	A set of alphabets with magnets to help children recognize letters and form simple words.
7.	Numbers 1-10	A set of numbers with magnets designed to introduce numbers and the concept of counting.
8.	Geometric Shapes	Various shapes such as circles, squares, and triangles equipped with holes for meronce activities.
9.	Clothing Shape	Eleven miniature clothes with small holes used for sewing activities.
10.	Colorful Beads	Tools for meronce activities to train hand-eye coordination.
11.	Kur Strap	Used in meronce and sewing activities, training children's hand dexterity.
12.	Flannel Chain	Available in red, green, yellow, and orange with buttons to practice buttoning skills.
13.	Ice Cream Cone Shape and Ice Cream	The game matches colors using a set of cones and ice cream in a variety of bright colors.
14.	Colored marbles	Contains red, yellow, green, blue, orange, and purple marbles to practice color grouping skills.
15.	Rubber Bowl	Colored containers that match the color of the marbles to support color classification activities.
16.	Spoons and Tongs	An aid for moving marbles to a rubber bowl, improving the child's fine motor coordination.
17.	Storage Box	Consists of a plastic box with partitions and without partitions to store all the components of the game neatly.
19.	Cardboard Box	The main packaging used to store the entire game tool to keep it organized.



Fig. 2. Interactive eduplay media

Interactive learning media planning needs to be supported by the right learning approach so that students can more easily understand the material presented (Mukhtar et al., 2022). As a multifunctional educational game tool interactive eduplay It consists of various components with attractive shapes and colors that are specifically designed to improve children's interaction with basic learning concepts. According to Juliandini et al. (2022), the early childhood period is a golden period of development that requires a variety of learning media that are used to provide stimulation given to children to provide optimal results. Interactive eduplay It consists of various components with attractive shapes and colors that are specifically designed to improve children's interaction with basic learning concepts. Table 4 is the various elements contained in interactive eduplay.

Improved cognitive ability

Interactive eduplay is designed as a means of play while supporting early childhood development. Interactive eduplay is designed to provide fun educational stimulation such as grouping marbles, matching ice cream cones, arranging numbers, arranging letters, looking for animal and fruit shapes, peeing, sewing and knitting.

Learning preparation is a fundamental thing that is carried out in the implementation of the use interactive eduplay. Providing early stimulation to cognitive development in early childhood is important to build a thinking foundation that supports environmental understanding and the development of more complex thinking skills at a later stage (Scott, 2025). The implementation of interactive games encourages children to be able to learn while playing and plays an important role in developing various aspects of development, especially children's cognitive development (Ismail et al., 2023). Cognitive abilities include the way a person solves problems as seen from behavior, actions, and speed of response (Tripuspa et al., 2024). Understanding cognitive concepts helps explain the process of learning, thinking, and adapting to their environment (Nasir et al., 2024; Ramadanti et al., 2022).

The results of observations at RA Al-Amin Sugio show that most of the students participate actively and enthusiastically during learning. Application interactive eduplay Makes a positive contribution to improving cognitive abilities, shown through the child's ability to follow instructions, recognize symbols of numbers, letters, numbers 1–10, fruit shapes, animals, and geometry. In addition, fine motor development is also seen through meronce and sewing activities. All learning activities are carried out safely according to procedures under the supervision of educators. Educators act as facilitators who guide students in understanding instruction and materials through the use of learning media (Gafur, 2021).

Usage Flash Card It begins with the guidance of the educator so that students understand the instructions on each card. The educator first explains the rules of the game, then the children sing together to determine the order of play. Next, the child spins the color wheel and takes Flash Card according to the color obtained, then carry out the instructions on the card with the assistance of the educator if necessary. Each child who successfully completes the challenge receives a star pin as a form of appreciation to increase learning motivation. Rewarding contributes to increasing children's motivation to actively participate in learning activities (Usman & Rohmah, 2024). As a final step, children are invited to tidy up all the components of the game that have been used in order to foster responsible habits.

Based on the results of the interviews, teachers also observed the development of children's thinking skills during the implementation of media. Students showed improvements in recognizing symbols, grouping objects, and completing game challenges more independently than before the use of media.

"Children become faster at recognizing letters, numbers, and colors because they learn as they play. They don't feel like they're learning, but they're actually developing their thinking skills." (G-01)

The findings indicate that play activities provide more effective cognitive stimulation because children gain concrete learning experiences through the exploration of various components of play. Interactive eduplay is effective in supporting early childhood cognitive development. In addition to improving cognitive abilities, this media also provides stimulation to other aspects of development, such as motor, language, and social-emotional abilities through integrated play activities.

Game-based learning allows children to have a more active, meaningful, and developmental learning experience. The results of this study are in line with the findings Aulia et al. (2024), which states that a fun learning approach through play activities can increase learning motivation while encouraging children to explore new concepts more optimally. The existence of a game guidebook makes it easier for teachers and companions to direct the play process so that learning activities take place more systematically and the material delivered is easier for children to understand (Rahma et al., 2024). The results of the study show that interactive eduplay effective in supporting children's cognitive development. These findings are expected to enrich insights into the use of game-based learning media as learning innovations in early childhood education.



Fig. 3 Documentation of using interactive eduplay

Play activities using interactive eduplay provide a learning experience that is concrete, exploratory, and multisensory. This condition is in accordance with Piaget's theory of cognitive development which states that children aged 5–6 years are at the stage of pre-operational, that is, the phase when the child understands concepts through visual representations, symbols, and direct experiences (Piaget, 1964). The use of colors, shapes, images, letters, numbers, and the manipulation of various game objects allows students to build understanding gradually through the process of assimilation and accommodation.

Improved ability to recognize symbols, group objects, and solve simple problems shows that interactive eduplay is able to provide stimulation to various indicators of early childhood cognitive development. According to Information Processing Theory, cognitive development is related to the increase in an individual's ability to receive, process, store, and use information to solve a problem (Howard et al., 2016). Play activities involving color identification, shape classification, number arrangement, and image matching provide children with the opportunity to exercise attention, working memory, and logical thinking skills at the same time.

Learning motivation and engagement

Interactive eduplay It has advantages in a design that is safe, attractive, and in accordance with the characteristics of early childhood development. The use of contrasting colors, varied shapes, and easy-to-operate game components can attract children's attention and increase children's involvement during the learning process. Empirical evidence indicates that the effectiveness of learning media is determined by the level of suitability with the characteristics of students, so the selection must consider the learning objectives, materials, and characteristics of the media in an integrated manner (Sinta et al., 2024). These characteristics are in line with the principles of early childhood learning which emphasizes the importance of enjoyable learning experiences as a means to optimize cognitive development. Interactive eduplay It not only functions as a learning medium, but also as a means of stimulation that supports children's thinking skills, problem-solving, and exploration through play activities. Teaching aids act as supporting media that facilitate educators and students at all stages of learning, especially in completing tasks that involve cognitive processes (Saleh et al., 2023). The findings of the study reinforce that game-based learning media is able to increase children's motivation, participation, and learning outcomes because it provides a more meaningful and interactive learning experience.

The increased motivation of students to learn during the implementation of interactive eduplay shows that game-based learning is able to create a fun and meaningful learning experience. In the perspective of Self-Determination Theory Ryan and Deci (2024) Intrinsic motivation will develop when learners feel pleasure, autonomy, and success during the learning process. Play activities that provide children with the opportunity to choose, try, and solve challenges independently can increase confidence and learning satisfaction. Awarding in the form of a star pin serves as positive reinforcement as described in behavioristic theory (Skinner, 1971). This positive reinforcement encourages students to repeat the expected learning behaviors, such as following instructions, completing games, and actively participating during learning. Nevertheless, the results of the study show that children's motivation is not only influenced by rewards, but also by the characteristics of media that are interesting and provide a pleasant learning experience.

The results of interviews with school principals show that the use of interactive eduplay has changed the learning climate in the classroom. According to the informant, students become more active, dare to try, and are able to complete learning activities independently.

"This media makes the learning atmosphere more lively. Children not only listen to the teacher's explanations, but actively try, discuss, and solve every challenge given." (KS-01)

The data shows that the effectiveness of media is not only reflected in the improvement of cognitive ability, but also in the improvement of the quality of interaction during the learning process. Children who previously tended to get bored easily become more active and excited because the media presents an attractive visual display and varied play activities. This condition shows that learning media design plays an important role in increasing children's attention, motivation, and involvement during the learning process.

The combination of various educational components in interactive eduplay It is not only an interactive learning medium, but also a means that supports children's exploration, creativity, and motor skills as a whole. According to Khoir and Aminatuzzuhriah (2024), the use of interactive media in learning plays an important role in increasing motivation, engagement, and the development of vocabulary and speaking skills in children.

The use of interactive media builds a more exciting, interesting and in-depth learning experience so as to help children understand various concepts in a more contextual and fun way. Educational games can also develop a variety of important skills such as problem-solving, critical thinking, and creativity. Khalil et al. (2022) calling games in the context of learning leads to the goal of getting a learning benefit guided by an educator, in which case children can be directly involved, think, understand the rules and have fun. The integration of technology in games allows children to learn while playing, learning becomes more interesting, interactive and meaningful for children. Thus, careful planning in the use of interactive media such as interactive eduplay can support aspects of children's development, as well as provide a fun and effective learning experience.

The role of teachers as facilitators

The availability of learning facilities, such as educational game tools, visual media, and classrooms that support social interaction and sensory learning, makes it easier for children to understand the material through a fun learning experience (Napitupulu et al., 2025). The following are the preparations for implementing interactive eduplay In learning: (1) Learning Needs Analysis. Before using learning media, educators need to identify the specific needs of students. The choice of media must be adjusted to the developmental aspects to be improved, such as cognitive, language, or motor (Hidayat & Al-Audiyah, 2023; Juliandini et al., 2022) . (2) Selection of the Right Media. After understanding the needs of the child, educators must choose the appropriate media. Interactive eduplay Designed to support various aspects of development, including cognitive and creativity.

The use of appropriate media can increase children's interest and motivation to learn. (3) Teacher Training and Competency Development. Educators need to understand how to use media effectively. The importance of training for teachers in developing and using technology-based learning media to ensure optimal implementation (Windiastruti et al.,

2024). (4) Planning Integration in the Curriculum. Learning media must be integrated into the lesson plan to align with learning objectives and support the achievement of targeted competencies. The use of interactive learning media in the independent curriculum can increase learning effectiveness and support students to achieve the set competencies (Ummah & Nadlir, 2023). (5) Preparation of a Supportive Learning Environment. The physical and psychological environment must be prepared to support the optimal use of media. A conducive environment can increase the effectiveness of learning media and allow children to learn comfortably (Widianto, 2021). (6) Evaluation and Feedback. After implementation, it is important to evaluate the effectiveness of the media as well as gather feedback from children and educators. This evaluation aims to determine the effectiveness of learning media and assess its contribution to student learning outcomes. Feedback from learners and educators can help identify areas that need improvement, so that interactive eduplay can be continuously upgraded according to user needs (Umihani et al., 2023).

Reinforcing the observation findings, the results of the interviews showed that the school had made preparations before the media was used in learning. The principal explained that the implementation of media begins with adjustments to the learning needs of students and teachers' readiness in managing play activities.

"Before using interactive eduplay, learning was still dominated by classical activities so that some children quickly lost focus. After this medium is used, children seem to be more active in asking questions, trying, and solving challenges independently." (KS-01, Principal)

The findings show that the change in learning strategies is not only related to the use of new media, but also reflects a change in learning approaches from teacher-centered to child-centered. This condition shows that preparation for the use of media is an important factor in creating a more meaningful learning experience for early childhood. The observation results were strengthened by interview data with classroom teachers who directly assisted the implementation of learning using interactive eduplay. The teacher explained that the media makes it easier for students to understand the instructions because learning activities are packaged in the form of interesting games.

"Children understand instructions more easily because the media is equipped with colors, pictures, and play activities. Even children who are usually passive begin to dare to participate in activities until they are finished." (G-01, Classroom Teacher)

The quote shows that the visual characteristics and manipulative activities of interactive eduplay are able to increase student engagement during learning. In addition to strengthening the ability to understand instructions, media also provides opportunities for children to learn through direct experience so that the knowledge construction process takes place more optimally.

The findings of the study show that the success of the implementation of interactive eduplay is not only determined by the quality of the learning media, but also by the readiness of teachers in designing learning experiences that are in accordance with the characteristics of early childhood development. Vygotsky's perspective of social constructivism describes learning as taking place optimally when children have the

opportunity to build knowledge through interaction with the environment, learning objects, and more competent individuals (Vygotsky, 1978). Teachers not only act as conveyors of information, but also as facilitators who provide a learning environment that allows children to explore new experiences through play activities

School and parent collaboration

The strategic role of learning media in supporting children's development requires educators to design and develop creative, innovative, and appropriate media in accordance with the characteristics and learning needs of children (Wati et al., 2024). Nonetheless, the effectiveness of use Interactive eduplay still requires optimal assistance from educators and parents. In addition to being obtained from teachers and principals, the research findings were also strengthened by the perspective of parents. Based on the results of the interviews, changes in children's learning behavior are not only seen at school, but also continue in the family environment.

"At home, children often tell about games that are done at school. He also began to recognize letters and numbers while playing without having to be forced to learn." (OT-01, Parents)

The findings show that there is a transfer of learning experience from school to the home environment. Children not only gain knowledge during learning activities, but also repeat the experience through play activities with their families. This condition indicates that interactive eduplay is able to build a continuity of cognitive stimulation between school and home so that the learning process takes place in a more meaningful way.

The results of the study show that teachers have a strategic role in optimizing the use of interactive eduplay. Teachers not only provide instruction, but also observe the students' progress, provide assistance when needed, and create a learning environment that supports exploration. Consistent interaction through providing direction, feedback, and responses to children's questions will optimize the use of media while supporting the achievement of learning goals more effectively. These findings reinforce the constructivist learning paradigm that places teachers as facilitators in building learning experiences, not as the only source of knowledge.

Assistance at school and at home functions as a form of scaffolding which helps children understand instructions, solve challenges, and develop thinking skills according to their developmental stages. The role of teachers and parents is also in line with the concept of scaffolding proposed by Vygotsky, which is the provision of temporary assistance that is gradually reduced as students' abilities increase (Vygotsky, 1978). This approach allows children to develop independence, critical thinking skills, and confidence in solving various learning challenges. Teachers as learning facilitators are required to understand the characteristics and stages of development of each student in order to be able to provide the right scaffolding, so that the learning process takes place more effectively and supports the achievement of optimal development (Anjani et al., 2025). Likewise with parents as companions for children at home to be able to optimize stimulation. Collaboration between teachers and parents can bridge the stimulation of child development aspects to the maximum.

CONCLUSION

Interactive eduplay is effective as a learning medium that supports early childhood cognitive development. The application of this media not only improves the ability to recognize basic concepts, but also encourages active involvement of children during the learning process through structured play activities. The existence of game manuals also makes it easier for educators and parents to provide assistance so that each activity can be carried out according to the learning objectives. This systematic assistance contributes to optimizing the use of media and achieving child development indicators. The results of the study identified three theme areas including preparation, implementation and evaluation as well as five main themes, namely (1) readiness for the implementation of interactive eduplay, (2) improving children's cognitive abilities, (3) increasing motivation and learning involvement, (4) the role of teachers as learning facilitators, and (5) collaboration between schools and parents in providing stimulation of children's development. Overall, the findings of this study show that interactive eduplay has the potential to be an innovative and effective alternative game-based learning media to be implemented in early childhood education units. The results of this study are expected to enrich references regarding the development of learning media that are adaptive, interesting, and in accordance with the characteristics of early childhood learning.

REFERENCES

- Anggriawan, G. A. D. (2023). *Perancangan permainan interaktif berbentuk activity pack sebagai media pengembangan motorik halus anak usia 4-6 tahun* [Magister Thesis: Universitas Dinamika]. UNDIKA Campus Repository. <https://repository.dinamika.ac.id/id/eprint/7026/>
- Anjani, N., Nisfi Setiana, L., & Turahmat. (2025). Kajian Literatur: Scaffolding Berbasis Media Dalam Mendukung Zone of Proximal Development (ZPD) Peserta Didik. *Jurnal Citra Pendidikan*, 5(2), 88–100. <https://doi.org/10.38048/jcp.v5i2.5402>
- Astuti, W., & Triani, L. (2024). Peran Pendidikan Anak Usia Dini Dalam Menunjang Perkembangan Kognitif Dan Sosial Anak. *Early Childhood Education and Development Studies (ECEDS)*, 5(2), 36–47. <https://doi.org/https://doi.org/10.35508/eceds.v5i2.18733>
- Aulia, N. R., Elnawati, E., Gery, M. I., & Damayanti, A. (2024). Strategi Peningkatan Minat Belajar Melalui Bermain Pada Anak Usia Dini Di RA Aisyiyah 2 Lebaksiuh. *Prosiding SEMNASFIP: Seminar Nasional Pendidikan*. <https://jurnal.umj.ac.id/index.php/SEMNASFIP/article/view/23556>
- Basri, S., & Akhmad, N. A. (2018). Penggunaan metode bermain snakes and ladders pada pembelajaran IPA Fisika untuk meningkatkan minat belajar peserta didik. *Jurnal Pendidikan Fisika Universitas Muhammadiyah Makassar*, 6, 309–323. <https://d1wqtxts1xzle7.cloudfront.net/111811665/1275>
- Bonita, E., Suryana, E., Hamdani, M. I., & Harto, K. (2022). The golden age : Perkembangan anak usia dini dan implikasinya terhadap pendidikan islam. *Tarbawiyah : Jurnal Ilmiah Pendidikan*, 6(2), 218–228. <https://doi.org/10.32332/tarbawiyah.v6i2.5537>
- Dewi, E. R. V., Hibana, H., & Ali, M. (2022). Loose part: Finding innovation in learning early childhood education. *Golden Age: Jurnal Ilmiah Tumbuh Kembang Anak Usia Dini*, 7(2), 53–66. <https://doi.org/https://doi.org/10.14421/jga.2022.72-01>

- Eliyanti, N. K., Suastra, I. W., & Suarni, N. K. (2025). Interactive edugame-based learning media to improve science learning outcomes of sixth-grade elementary school students. *Jurnal Media Dan Teknologi Pendidikan*, 5(4), 680–688. <https://doi.org/10.23887/jmt.v5i4.98308>
- Fatimah, F. N., Afifah, H. U. N., Auliani, R., & Larasati, S. A. (2023). Alat permainan edukatif sebagai sumber dan media pembelajaran anak usia dini. *Raudhatul Athfal: Jurnal Pendidikan Islam Anak Usia Dini*, 7(1), 44–56. <https://doi.org/https://doi.org/10.19109/ra.v7i1.15436>
- Firdaus, U. R., & Prasetyo, S. (2025). Effectiveness of using interactive multimedia for early childhood learning. *Jurnal Anak Usia Dini Holistik Integratif (AUDHI)*, 7(2), 102–112. <https://doi.org/http://dx.doi.org/10.36722/jaudhi.v7i2.3675>
- Gafur, A. (2021). Pendampingan untuk meningkatkan peran guru sebagai motivator dan fasilitator proses pembelajaran di SMA Negeri 1 Teluk Bintan. *Daiwi Widya*, 8(1), 74–84. <https://doi.org/https://doi.org/10.37637/dw.v8i1.760>
- Gea, A., & Zega, R. F. W. (2025). Metode pembelajaran kreatif dalam pendidikan anak usia dini. *Khirani: Jurnal Pendidikan Anak Usia Dini*, 3(1), 209–219. <https://doi.org/10.47861/khirani.v3i1.1622>
- Hayati, S. N., & Putro, K. Z. (2021). Bermain dan permainan anak usia dini. *Generasi Emas: Jurnal Pendidikan Islam Anak Usia Dini*, 4(1), 52–64. [https://doi.org/https://doi.org/10.25299/jge.2021.vol4\(1\).6985](https://doi.org/https://doi.org/10.25299/jge.2021.vol4(1).6985)
- Hidayat, Y., & Al-Audiyah, L. S. (2023). Manfaat penggunaan alat permainan edukatif dalam pembelajaran anak usia dini. *Jurnal Intisabi*, 6(2), 105–115. <https://doi.org/https://doi.org/10.61580/itsb.v1i1>
- Howard, J., Gagné, M., Morin, A. J. S., & Van den Broeck, A. (2016). Motivation profiles at work: A self-determination theory approach. *Journal of Vocational Behavior*, 95, 74–89. <https://doi.org/https://doi.org/10.1016/j.jvb.2016.07.004>
- Husada, N. P., Iyah, N. N. I., Aulia, N., Amelia, L. F., Zeniari, A. E., & Indrawati, D. (2026). Efektivitas media interaktif educaplay terhadap peningkatan keaktifan belajar siswa sekolah dasar. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 11(02), 187–201. <https://doi.org/https://doi.org/10.23969/jp.v11i02.45347>
- Indriansyah, R. T. (2025). Peran media interactive flat panel display (IFPD) dalam meningkatkan motivasi dan kolaborasi belajar siswa. *Dinamika Sosial: Jurnal Pendidikan Ilmu Pengetahuan Sosial*, 4(4), 493–501. <https://doi.org/https://doi.org/10.18860/dsjpips.v4i4.19859>
- Ismail, M. H., Halimah, L., Hopiani, A., & AM, M. A. (2023). Penguatan kompetensi guru PAUD di kabupaten pangandaran dalam implementasi merdeka bermain melalui media loose parts. *Jurnal Pengabdian Kepada Masyarakat Bina Darma*, 3(3), 223–232. <https://doi.org/https://doi.org/10.33557/pengabdian.v3i3.2658>
- Juliandini, A. I., Rahman, T., & Respati, R. (2022). Pengembangan alat permainan edukatif papan aktivitas sebagai stimulus kemampuan mengenal huruf anak usia dini. *Jurnal Pendidikan Dan Konseling*, 4(5), 783–789. <https://journal.universitaspahlawan.ac.id/index.php/jpdk/issue/view/222?page=6>
- Jumiati, Sulistyawan, G. D., & Siswadi. (2025). Pemanfaatan interactive flat panel (IFP) sebagai media pembelajaran interaktif pada mata pelajaran IPAS. *Jurnal Tumbuh*

- Kembang Anak Usia Dini*, 5(2), 75–79.
<https://doi.org/https://doi.org/10.23887/paud.v10i3>
- Khalil, N., Aljanazrah, A., Hamed, G., & Murtagh, E. (2022). Exploring teacher educators' perspectives of play-based learning: A mixed method approach. *Education Sciences*, 12(2), 95. <https://doi.org/https://doi.org/10.3390/educsci12020095>
- Khoir, A., & Aminatuzzuhriah, A. (2024). Pengaruh penggunaan media interaktif dalam pembelajaran bahasa pada anak usia dini. *Jurnal Review Pendidikan Dan Pengajaran*, 7(3), 12002–12008. <https://doi.org/https://doi.org/10.31004/jrpp.v7i3.33262>
- Khoiruzzadi, M., & Prasetya, T. (2021). Perkembangan kognitif dan implikasinya dalam dunia pendidikan. *Madaniyah*, 11(1), 1–14. <https://journal.stitpemalang.ac.id/index.php/madaniyah/article/view/152/146>
- Laelawati, I. (2023). Meningkatkan kemampuan kognitif pada anak usia dini. *AUDIENSI: Jurnal Pendidikan Dan Perkembangan Anak*, 2(2), 105–116. <https://doi.org/https://doi.org/10.24246/audiensi.vol2.no22023pp105-116>
- Lestarinigrum, A., Khan, R. I., Wijaya, I. P., Wulansari, W., Yulianto, D., Dwiyantri, L., Prasetyo, D., Utomo, H. B., Iswantiningtyas, V., & Wati, E. K. (2022). *Perencanaan pembelajaran kreatif untuk anak usia dini (kajian teoritis dan praktis)*. CV Widina Media Utama
- Lilawati, A. (2025). Analisis perkembangan kognitif anak usia dini di lembaga PAUD kabupaten gresik: Studi kualitatif deskriptif. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, 9(6), 2955–2963. <https://doi.org/10.31004/obsesi.v9i6.7326>
- Miles, M. B., & Huberman, A. M. (2007). *Analisis data kualitatif: Buku sumber tentang metode-metode baru*. UI press
- Mukhtar, R. U., Maimunah, M., & Yuanita, P. (2022). Pengembangan pengembangan media pembelajaran interaktif dengan pendekatan kontekstual pada materi bentuk aljabar. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, 6(1), 873–886. <https://doi.org/10.31004/cendekia.v6i1.1094>
- 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>
- Napitupulu, D. S., Hairullah, & Sahputri, A. (2025). Inovasi manajemen pembelajaran paud untuk mengoptimalkan kesiapan sekolah anak di RA humayroh. *ARJI: Action Research Journal Indonesia*, 7(2). <https://doi.org/https://doi.org/10.61227/arji.v7i2.325>
- Nasir, N. I. R. F., Mahanal, S., Ekawati, R., Damopolii, I., Supriyono, S., & Rahayuningsih, S. (2024). Primary school students' knowledge about animal life cycle material: The survey study. *Journal of Research in Instructional*, 4(1), 253–262. <https://doi.org/https://doi.org/10.30862/jri.v4i1.320>
- Nikmah, A., Shofwan, I., & Loretha, A. F. (2023). Implementasi metode project based learning untuk kreativitas pada anak usia dini. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, 7(4), 4857–4870. <https://doi.org/10.31004/obsesi.v7i4.4999>
- Piaget, J. (1964). Cognitive development in children. *Journal of Research in Science Teaching*, 2(3), 176–186. <https://onlinelibrary.wiley.com/toc/10982736/1964/2/2>
- Purwulan, H. (2024). Kajian perkembangan kognitif dan psikologi anak pada tingkat sekolah dasar kelas rendah. *Jurnal Jendela Pendidikan*, 4(04), 375–382. <https://doi.org/https://doi.org/10.57008/jjp.v4i04.995>

- Rahma, E. S., Budyawati, L. P. I., & Atika, A. N. (2024). Pengembangan buku panduan pemanfaatan bahan alam untuk menstimulasi seluruh aspek perkembangan anak usia 5-6 tahun. *Aulad: Journal on Early Childhood*, 7(2), 422–433. <https://doi.org/https://doi.org/10.31004/aulad.v7i2.605>
- Rajamuddin, I. M. A. (2025). Perkembangan kognitif anak usia dini. *Maximal Journal : Jurnal Ilmial Bidang Sosial, Ekonomi, Buday Dan Pendidikan*, 2(5), 413–422. <https://malaqbipublisher.com/index.php/MAKSI/article/view/636>
- Ramadanti, M., Sary, C. P., & Suarni, S. (2022). Psikologi kognitif (suatu kajian proses mental dan pikiran manusia). *Al-Din: Jurnal Dakwah Dan Sosial Keagamaan*, 8(1), 56–69. <https://doi.org/https://doi.org/10.30863/ajdsk.v8i1.3205>
- Ryan, R. M., & Deci, E. L. (2024). Self-determination theory. *Encyclopedia of quality of life and well-being research* (pp. 6229–6235). Springer.
- Saleh, M. S., Syahrudin, Saleh, M. S., Azis, I., & Sahabuddin. (2023). *Media Pembelajaran*. CV. Eureka Media Aksara
- Sari, I. N., Lestari, L. P., Kusuma, D. W., Mafulah, S., Brata, D. P. N., Iffah, J. D. N., Widiatsih, A., Utomo, E. S., Maghfur, I., & Sofiyana, M. S. (2022). *Metode penelitian kualitatif*. Unisma Press
- Sinambela, C., Sirait, S. H. K. N., Nasir, I. R. F., & Damopolii, I. (2021). Enhancing student achievement using the fungi learning media supported by Numbered Head Together learning. *Journal of Physics: Conference Series*, 1918(5), 052053. <https://doi.org/10.1088/1742-6596/1918/5/05205>
- Sinta, D., Pertiwi, K., & Wardhani, I. S. (2024). Karakteristik media pembelajarn interaktif untuk siswa sekolah dasar. *Jurnal Media Akademik*, 2(11), 1–13. <https://jurnal.mediaakademik.com/index.php/jma/article/view/869/788>
- Skinner, B. F. (1971). Operant conditioning. *The encyclopedia of education*, 7, 29–33. https://link.springer.com/rwe/10.1007/978-3-319-19650-3_1047
- Suryana, D., Tika, R., & Wardani, E. K. (2022). Management of creative early childhood education environment in increasing golden age creativity. *International Conference of Early Childhood Education (ICECE-6 2021)*, 668, 17–20. <https://doi.org/https://doi.org/10.2991/assehr.k.220602.005>
- Susanti, U. V., Amiliya, R., & Basori. (2024). Urgensi masa golden age bagi perkembangan anak usia dini. *Al Abyadh*, 7(2), 72–78. <https://doi.org/https://doi.org/10.46781/al-abyadh.v7i2.1372>
- Tripuspa, A., Muhtaba, I., & Damayanti, A. (2024). Upaya meningkatkan keterampilan motorik halus melalui kegiatan finger painting pada anak usia 5-6 tahun di KB TK Lab school fakultas ilmu pendidikan universitas muhammadiyah jakarta. *Prosiding SEMNASFIP : Seminar Nasional Pendidikan*. <https://jurnal.umj.ac.id/index.php/SEMNASFIP/article/view/23492>
- Umihani, U., Nurwahidin, M., Pujiati, P., & Riswandi, R. (2023). Pengembangan bahan ajar model discovery learning menggunakan media digital di SMA N 1 terbanggi besar. *Jurnal Teknologi Pendidikan: Jurnal Penelitian Dan Pengembangan Pembelajaran*, 8(1), 164–172. <https://e-journal.undikma.ac.id/index.php/jtp/article/view/6433/4100>
- Ummah, D. N., & Nadlir, N. (2023). Konsep kurikulum merdeka dan integrasi media pembelajaran berbasis digital pada jenjang sekolah dasar. *Elementeris: Jurnal Ilmiah*

- Pendidikan Dasar Islam*, 5(1), 26–38.
<https://doi.org/10.33474/elementeris.v5i1.18907>
- Usman, A. A., & Rohmah, L. (2024). Pemberian reward dalam pembelajaran untuk meningkatkan keaktifan belajar anak usia dini: Studi kualitatif deskriptif. *DUNIA ANAK: Jurnal Pendidikan Anak Usia Dini*, 7(2), 60–73. <https://doi.org/10.31932/jpaud.v7i2.3984>
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes* (Vol. 86). Harvard university press
- Waliulu, Y. S., Wahid, Arif, M., Mokoginta, D., Novita, R., Rukhmana, T., Deni, A., SENTRYO, I., & Prastawa, S. (2023). *Pendidikan dalam transformasi digital*. Cendikia Mulia Mandiri.
- Wasis, S. (2022). Pentingnya penerapan merdeka belajar pada pendidikan anak usia dini (PAUD). *Pedagogy: Jurnal Ilmiah Ilmu Pendidikan*, 9(2), 36–41. <https://ejournal.upm.ac.id/index.php/pedagogy/article/view/1078>
- Wati, S. A., Anggraini, K., Takumansang, R. C., Katolik, U., & Mandala, W. (2024). Stimulasi pengenalan huruf melalui media pembelajaran letter dermolen. *JABB: Jurnal Abdimas Bina Bangsa*, 5(2), 1578–1585. <https://doi.org/https://doi.org/10.46306/jabb.v5i2.1389>
- Widianto, E. (2021). Pemanfaatan media pembelajaran berbasis teknologi informasi. *Journal of Education and Teaching*, 2(2), 213–224. <https://doi.org/https://doi.org/10.51454/jet.v2i2>
- Windiastuti, E., Isnaini, F. N., & Untariana, A. F. (2024). The efektivitas penggunaan media teknologi dalam pembelajaran di jenjang PAUD. *Jurnal Pembelajaran Inovatif*, 7(2), 8–13. <https://doi.org/https://doi.org/10.21009/JPI.072.02>
- Winnuly. (2025). Boosting numeracy skills through multisensory board games. *JOYCED: Journal of Early Childhood Education*, 5(1), 29–44. <https://doi.org/10.14421/joyced.2025.51-03>
- Winnuly, Umroh, I. L., & Umamah, A. Z. (2026). View of inovasi media hijaiyah letters multisensori game untuk anak usia dini. *Al Fakkaar: Jurnal Pendidikan Bahasa Arab*, 7(1), 143–157. <https://doi.org/https://doi.org/10.52166/alf.v7i1.12292>