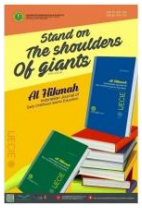
AL HIKMAH: INDONESIAN JOURNAL OF EARLY CHILDHOOD ISLAMIC EDUCATION
ISSN (P): 2550-2200, ISSN (E): 2550-1100,
VOL. 10 (1), 2026, PP. 128 – 143
https://journal.uaindonesia.ac.id/index.php/ijecie



The Utilization of AI-Based Digital Media to Realize Joyful Learning

Nurul Novitasari[1]✉, **A.M.Miftah Anshori**[2], **Siti Khoiriyah**[3], **Nur Lailatul Fitri**[4]
[1 3 4] Pendidikan Islam Anak Usia Dini, Universitas Al-Hikmah Indonesia, Tuban, Indonesia
[2]Pendidikan Guru Madrasah Ibtidaiyah, Universitas Al-Hikmah Indonesia, Tuban, Indonesia

ARTICLE INFO

Article history:
Received May 10, 2026
Revised May 20, 2026
Accepted June 20, 2026
Available online April 27, 2026

Keywords:
Digital Media, Artificial Intelligence, Joyful Learning.

ABSTRACT

This study aims to describe the use of Artificial Intelligence (AI) based digital media in creating joyful learning at TK Assurur Kedungjambe. The research subjects were 17 children from group A1. The digital media used were Wordwall and Animated Drawing, presented through an Interactive Flat Panel (IFP) that allowed children to interact directly with the media. The study employed a qualitative descriptive approach. Data collection techniques included observation, interviews, and documentation. Data analysis was carried out through data reduction, data presentation, and conclusion drawing. The validity of the data was ensured through technique triangulation and source triangulation. The results showed that the use of AI media was able to create an enjoyable learning atmosphere, with children actively engaged in motor, cognitive, and affective domains. Learning also became more contextual through the theme of family professions. The children appeared enthusiastic, focused, happy, and confident in expressing their ideas. The teacher acted as a facilitator, enabling a dialogic and participatory learning process. Thus, the integration of AI-based digital media has the potential to enhance motivation, creativity, and the quality of joyful learning for early childhood.

INTRODUCTION

Early childhood education is a crucial stage in children's cognitive, social, and emotional development. At this phase, children learn through exploration, concrete experiences, and enjoyable interactions. Therefore, the joyful learning approach is an essential principle recommended in early childhood education, as it creates more meaningful learning experiences, stimulates curiosity, and fosters intrinsic motivation (Suyadi, 2020). This approach aligns with Piaget's cognitive development theory, which emphasizes that young children are in the pre-operational stage, where effective learning must occur through play-based activities, exploration, and direct engagement with real-life experiences.

However, based on preliminary observations at TK Assurur Kedungjambe Singgahan, learning activities were found to be dominated by conventional methods such as lectures, memorization, and written tasks. This resulted in low student engagement and limited variation in teaching strategies. Furthermore, the school had not yet integrated digital media let alone artificial intelligence (AI)-based tools to support adaptive and enjoyable learning experiences. In the era of digital disruption, early childhood teachers are expected not only to

serve as instructors but also as facilitators capable of creating innovative, technology-based learning environments (Kemendikbudristek, 2023).

Technological advancements have presented significant opportunities in education, including in early childhood settings. AI-based digital media such as adaptive learning applications, interactive chatbots, and personalized learning platforms have been proven to enhance learning effectiveness and student engagement across various levels of education (Nasution, M. & Silalahi, 2021). These technologies enable more individualized learning experiences because the systems can adjust content, difficulty levels, and learning styles to meet each child's unique needs. Nevertheless, a clear research gap remains, particularly regarding the implementation of such technologies in rural kindergartens like those in Kedungjambe. Few studies have examined how AI-based digital media can effectively enhance joyful learning in early childhood settings with limited resources and teaching capacities.

Previous studies have highlighted the role of technology in early childhood education. Pratama and Sugihartono found that interactive digital media can improve learning interest among kindergarten children. However, their study did not explore AI as a central feature nor explicitly connect the findings with the concept of joyful learning (Pratama, R., & Sugihartono, 2022). This becomes the novelty of the present research: integrating joyful learning with the use of AI-based digital media, implemented in a real kindergarten setting in a rural area. This study aims not only to address the stagnation of conventional teaching methods but also to contribute to the development of early childhood educational innovations that combine local contexts with advancements in digital technology.

The rapid progression of the digital era has significantly transformed learning practices in Early Childhood Education (ECE). Children today are not only familiar with traditional media such as books and chalkboards but are increasingly exposed to digital devices, interactive applications, and various technology-based learning tools. Studies show that the use of digital media and technology in early childhood settings offers promising opportunities to improve learning outcomes, particularly in language development and peer interaction (Katharina J. Rohlfing, Eugenia Wildt, Tolksdorf, 2025). Similar findings were also reported in a study conducted at TK PKK 1 Bangilan, which demonstrated that the transformation of early literacy learning through digital media successfully enhanced children's engagement and motivation during classroom activities (*Transformasi Pembelajaran Literasi Anak Usia Dini melalui Media Digital di TK PKK 1 Bangilan*) (Novitasari, Nurul. Anik Nurul Nur'Aini, 2025). Thus, the integration of digital media is no longer merely complementary but has become an essential element in creating learning environments that are relevant to children's contemporary lives.

The concept of joyful learning has also gained popularity as an effective approach for early childhood education. Learning experiences that spark curiosity, promote active exploration, and involve concrete engagement have been shown to foster intrinsic motivation and child involvement. For example, research on game-based digital media demonstrated its effectiveness in enhancing early literacy skills in young children (Rahman, ., & Nurani, 2024). Additionally, studies on mindful, meaningful, and joyful deep learning emphasize that joy is a vital component of meaningful and profound learning (Nafi'ah & Faruq, 2025). Thus,

joyful learning is not merely a pedagogical trend but a fundamental strategy for building learning environments filled with motivation, positive emotions, and meaningful experiences.

In the context of technology integration, AI-based digital media in early childhood education has begun to demonstrate promising potential. Research by Yuniawati and Masliati (2023) revealed that AI-based digital media supports the development of emotional intelligence in young children through adaptive and responsive interactions (Nuni Yuniawati, 2025). Other studies also highlight that AI can enhance personalized learning, adjust difficulty levels and content based on individual needs, and increase learning motivation (Mutmainnah, Caroline, & Margawati, 2025). Thus, the use of AI in early childhood learning is not merely about adopting new technologies but creating more adaptive, interactive, and enjoyable learning environments the essence of joyful learning.

Despite these potentials, real challenges remain, especially in rural kindergartens. Limited infrastructure, insufficient teacher training in AI technology, and the persistence of traditional teaching models all hinder the optimal use of AI-based digital media. Research shows that although AI media offers great benefits, its implementation requires additional support, such as teacher training, integrated educational policies, and adequate infrastructure (Nurnaningsih & Mohammad Salehudin, 2025).

In this context, TK Assurur Kedungjambe represents a highly relevant setting to explore these issues. The school reflects rural early childhood institutions with limited resources yet strong enthusiasm for innovation. This study aims to develop a simple, contextual, and effective model for utilizing AI-based digital media to support joyful learning in rural kindergarten settings. It is expected that the findings will serve as a reference for teachers and early childhood institutions seeking to integrate AI-based technologies wisely, educationally, and joyfully for young learners.

METHODS

This research employs a qualitative descriptive approach with a case study design at TK Assurur Kedungjambe to describe the use of AI-based digital media in implementing Joyful Learning. The research subjects consist of 17 children in group A1, selected through purposive sampling because they are the group that directly uses AI-based digital media in the learning process. Data were collected through observations, interviews, and documentation conducted naturally in the school environment to capture children's behaviors, interactions, and learning experiences.

Data analysis followed the interactive model of Miles & Huberman, which includes data reduction, data display, and conclusion drawing (Miles, M. B., Huberman, A. M., & Saldaña, 2014). The validity of the data was ensured through source triangulation and technique triangulation by comparing the results of observations, interviews, and documentation to ensure the consistency and accuracy of the research findings.

RESULT

1. Forms and Implementation of AI-Based Digital Media to Support Joyful Learning at TK Assurur Kedungjambe

The findings of this study were obtained from direct classroom observations during learning activities in class A1, where AI-based digital media (Wordwall & Animated Drawing) were implemented to support joyful learning under the theme "family profession tools." The research was conducted over two meetings in October 2025 at TK Assurur, involving 17 children (9 girls and 8 boys), one classroom teacher, and one school principal as the informants.

Throughout the learning process, the children were actively engaged in exploration activities using the Wordwall and Animated Drawing applications. This process not only elicited positive emotional responses from the children (such as happiness, enthusiasm, laughter, and focus) but also demonstrated changes in how they interacted with the learning material. AI-based digital media created a learning experience that was not monotonous or repetitive as in conventional methods (e.g., children simply sitting and listening to the teacher), but instead fostered a flexible, interactive, and more child-centered learning environment.

Learning appeared more enjoyable and carried a strong element of "joyful learning," as the children were able to choose, experiment, try independently, and see the results of their activities directly on the screen without always needing to ask the teacher first. The children's interaction with AI-based digital media also stimulated curiosity, a desire to try new things, and expressiveness in sharing their ideas.

The class teacher of A1, Ms. Siti Nizaroh, S.Pd., stated that this model of learning made it easier for her to motivate the children because they were already interested from the beginning of the activity. She also emphasized that she no longer needed to repeatedly remind the children to stay focused, as the AI-based digital system itself effectively directed their attention and provided engaging visual-auditory stimuli suitable for early childhood learners.

The school principal, Ms. Umayaroh, S.Pd., also acknowledged that the use of AI-based digital media strongly supports the digital transformation of learning at TK Assurur. She noted that the school must begin adapting to technological advancements, and the use of AI is not intended to replace the role of teachers but rather to strengthen their role in facilitating more innovative and developmentally appropriate learning.

Observations of the children in group A1 at TK Assurur showed that:

1.1. The children enjoyed learning using digital media
1.2. They were actively eager to try the activities
1.3. They did not feel bored even though the activities lasted for a relatively long period
1.4. They remained focused on the screen display
1.5. They confidently expressed stories or ideas during the Animated Drawing activity

These results indicate that the implementation of AI-based digital media had a significant positive impact on fostering joyful learning conditions in group A1 at TK Assurur.

Thus, it can be concluded that the use of AI-based digital media in early childhood education provides a more enjoyable learning experience, enhances intrinsic motivation, and encourages greater active engagement among children during the learning process.

1.1 Details of the AI and Websites Used

This study utilized the edutainment websites **Wordwall** and **Animated Drawing** during learning activities at TK As-Surur Kedungjambe Singgahan Tuban. The Wordwall edutainment website can be accessed via **https://wordwall.net**, while the AI-powered Animated Drawing can be accessed through **https://sketch.metademolab.com**. Both websites feature several menus on their initial user interface (UI).

Accessing Wordwall requires registration through the *Login* menu; however, Animated Drawing does not require any registration beforehand. In addition, to access all available games or activities in Wordwall, users need to make a purchase. Teachers can still use the platform for free, although with limited features. If the free version is considered sufficient, teachers do not need to pay for the use of this edutainment platform.

Unlike Wordwall, Animated Drawing can be accessed free of charge without any usage limits, while the Wordwall free plan only allows two activities per day. Both platforms have their respective advantages and limitations. The wide variety of game options in Wordwall requires paid access to be fully optimized, whereas the more limited AI features in Animated Drawing make it accessible without requiring any payment.

Below is the initial user interface (UI) of the Animated Drawing platform used in this study.

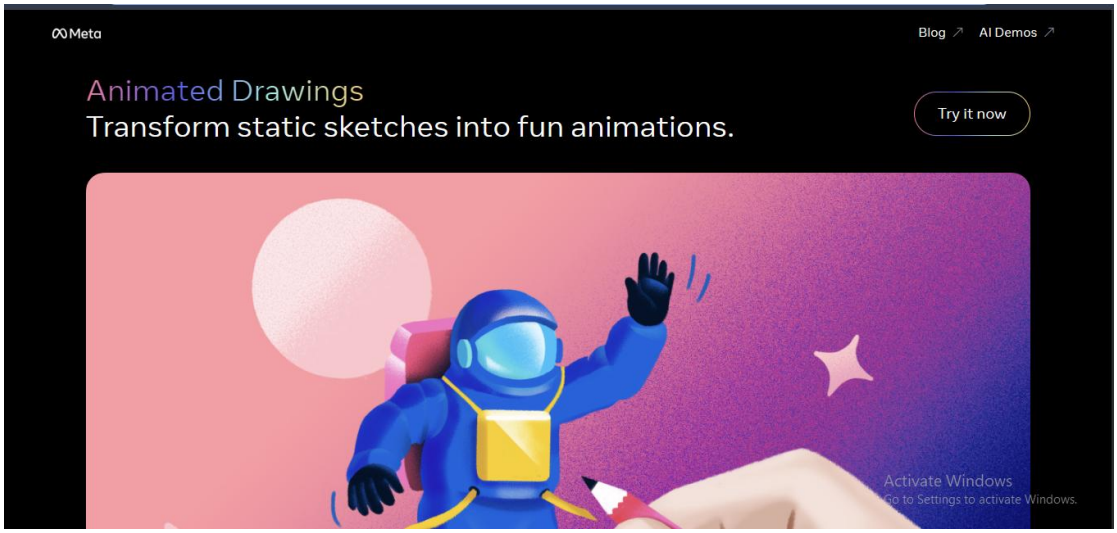


Figure 1. Initial User Interface of Animated Drawing

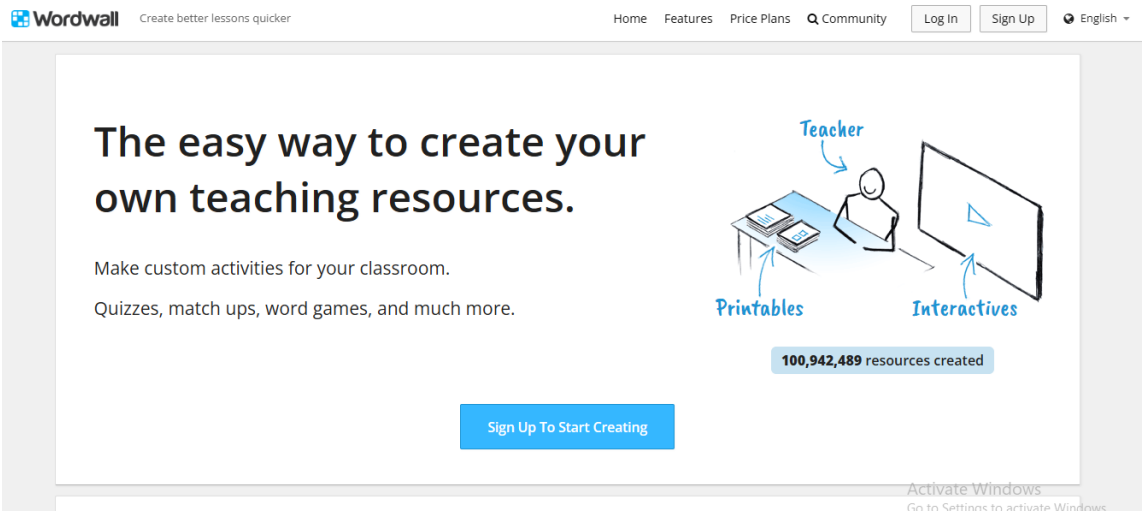


Figure 2. Initial User Interface of Wordwall

In the Animated Drawing menu, users can directly select the "Try It Now" option and immediately upload a student's drawing to be animated. Below is the upload page interface, along with several examples of children's artwork from TK As-Surur Kedungjambe Singgahan Tuban.

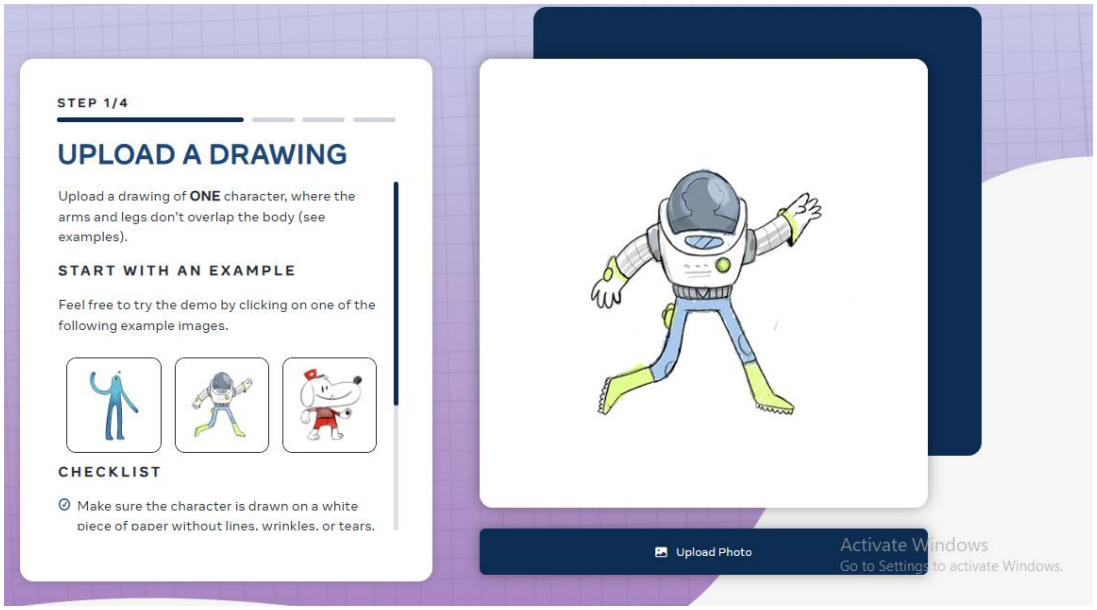


Figure 3. Image Upload Page





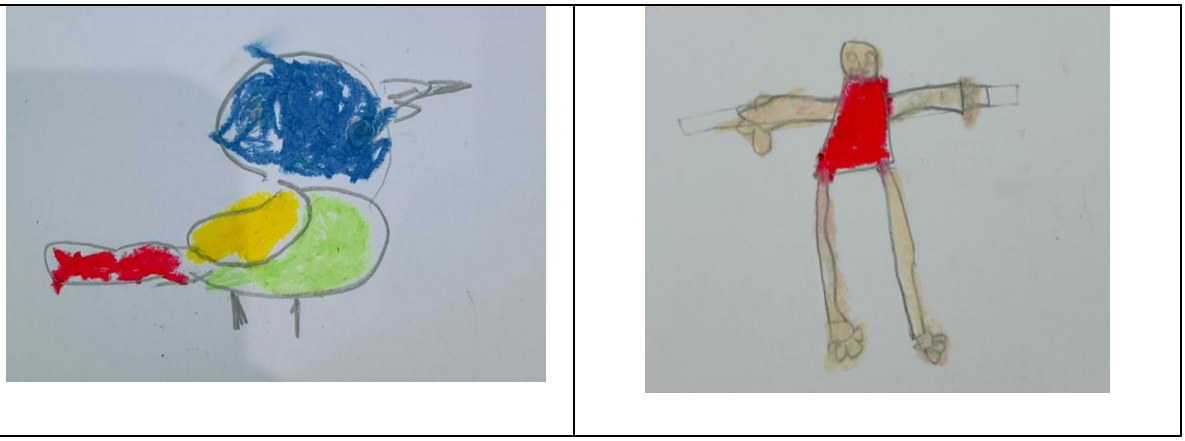
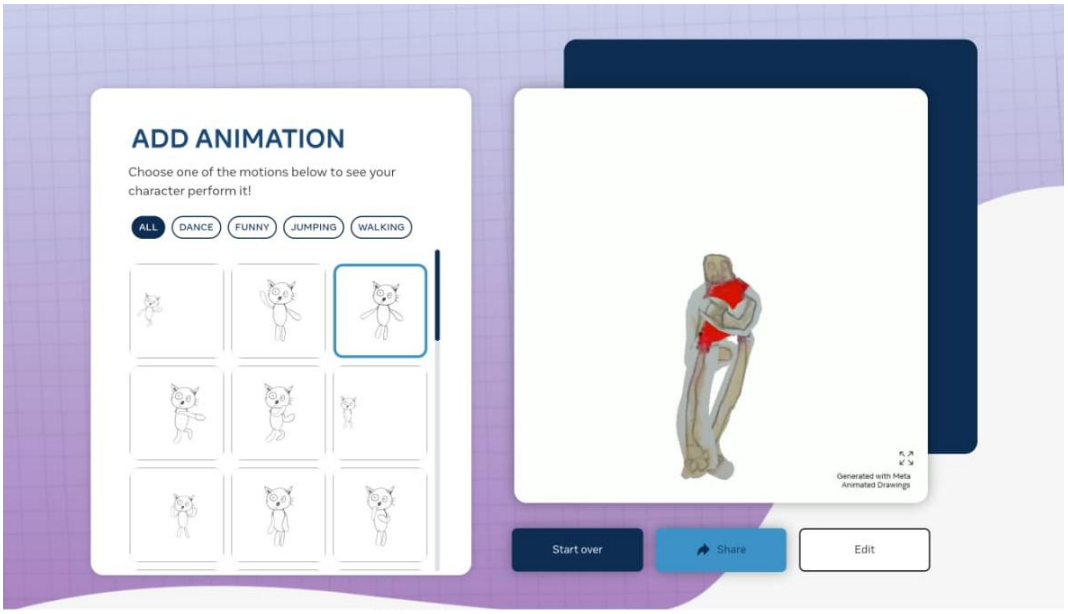



Figure 4. Several Artwork Samples by the Children of TK As-Surur Kedungjambe

One of the artworks created by a child from TK As-Surur Kedungjambe, Group A1, has been converted into an animation using AI-based Animated Drawing technology.



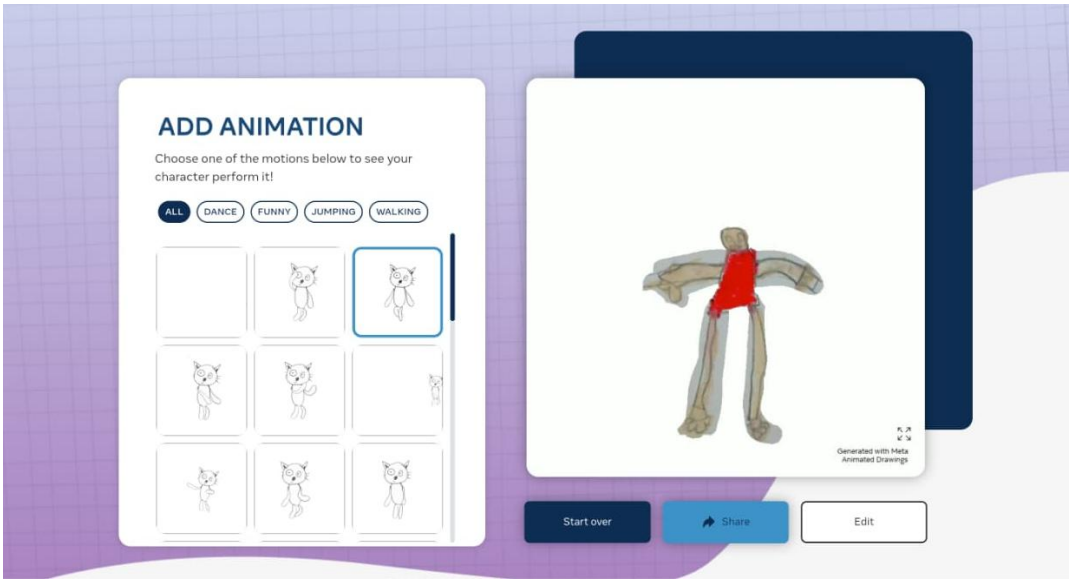


Figure 5. An Example of a Child's Artwork Converted into Animation

It can be seen that the students' drawings are able to follow movements based on the templates provided by the AI. Meanwhile, the following are several interactive game menus from Wordwall that teachers can use during classroom learning activities for young children.

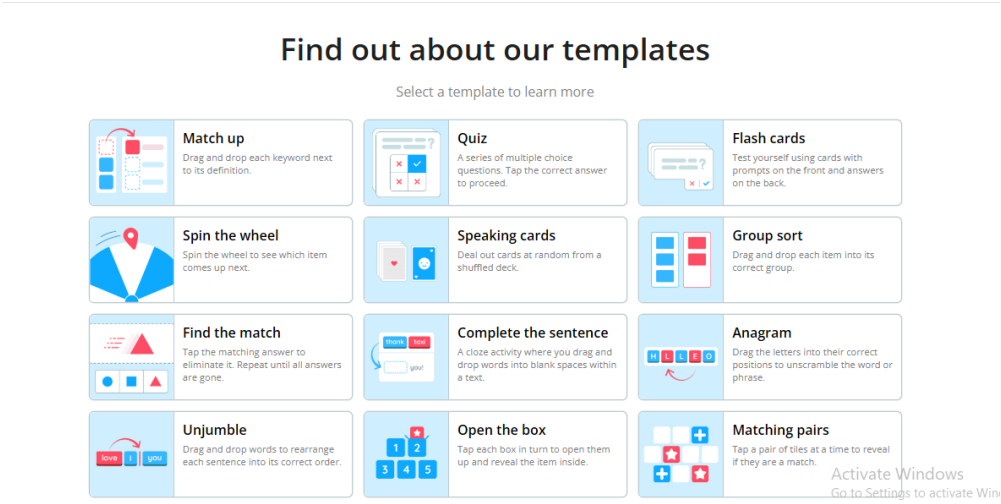


Figure 6. Several Game Templates Provided by Wordwall

Based on the available menus, there are 12 games that teachers can use. However, all menus or templates can be accessed and utilized if the teacher makes a purchase, and the number of available templates becomes much larger (more than 20 templates). In this study, the teacher selected one of the games to be used, namely *Match Up* with the theme of professions. The following is the teacher's work at TK As-Surur Kedungjambe Singgahan Tuban in optimizing this media through hardware in the form of an Interactive Flat Panel (IFP).

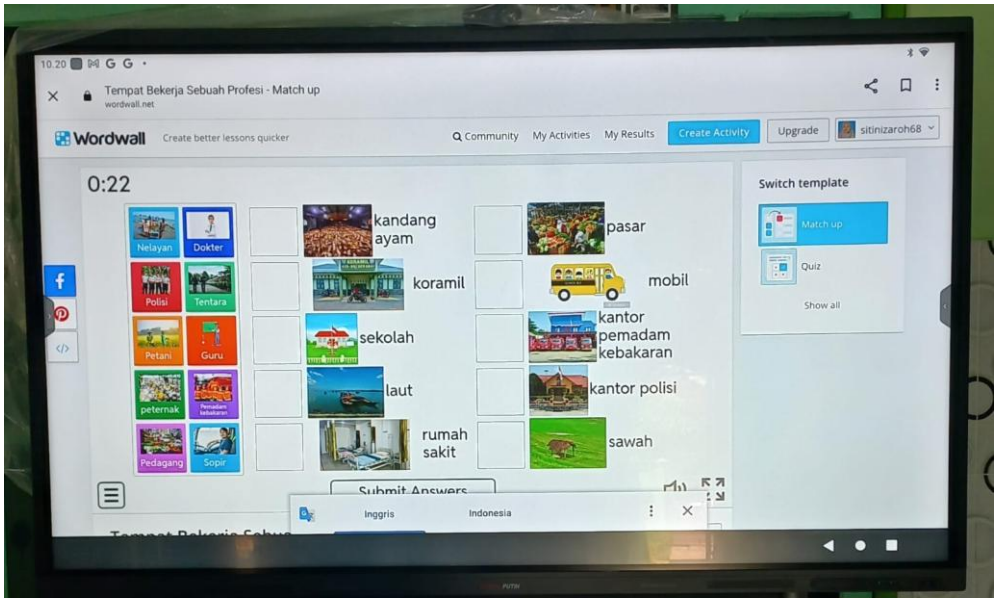


Figure 7. Teacher's Work at TK As-Surur in Operating the IFP

In addition, there is another theme created by the teacher in utilizing Wordwall as one of the learning media. This theme is related to numeracy and still uses the *Match Up* template. The following is another example of the teacher's work in using Wordwall through the smart board at TK As-Surur Kedungjambe Singgahan Tuban.

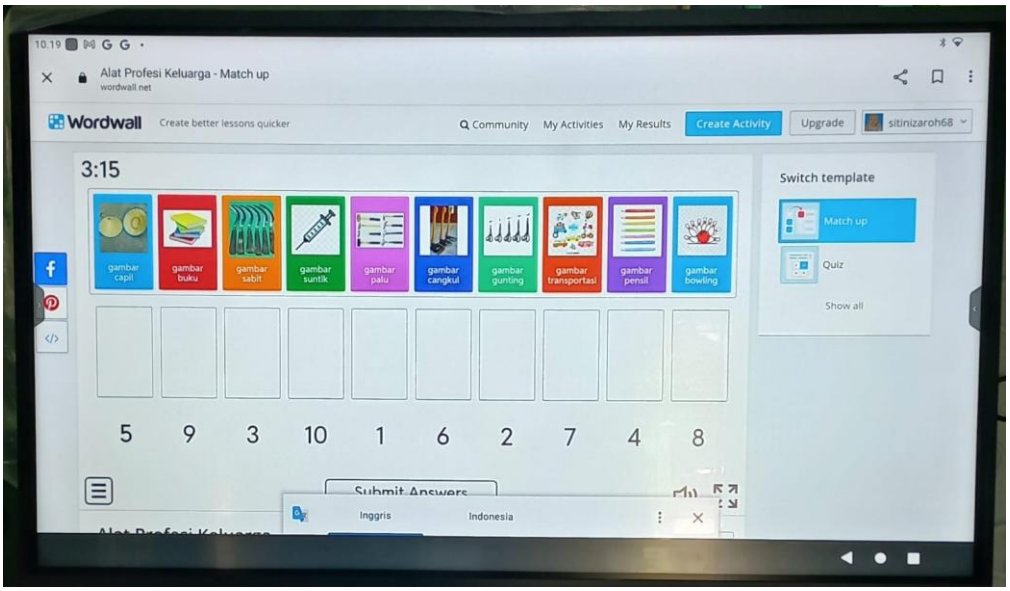


Figure 8. Another Work of the Teacher at TK As-Surur in Operating the IFP

Thus, this section explains the details of AI and edutainment operation, as well as the students' and teachers' works at TK As-Surur Kedungjambe Singgahan Tuban that were implemented during this study.

Steps for Using Wordwall Media in Class A1 at TK Assurur: During the first meeting, the teacher opened a Wordwall game containing pictures of professional tools such as stethoscopes, construction helmets, cooking utensils, and others. Before starting the game, the teacher first explained the various professional tools and the

role of each profession in daily life. The teacher then provided a prompting question related to the children's parents' professions to help them recall the concepts concretely.

After that, the teacher invited the children to take turns selecting a card on Wordwall. The children were then guided to press the images displayed on the screen, which was projected from the laptop to the classroom television.

Each time a child selected an answer, the Wordwall system automatically provided audio feedback, such as "correct" or "incorrect." The teacher provided scaffolding or light guidance when children had difficulty choosing the correct answer. The children showed happy expressions, clapping, and celebrating when they answered correctly. The teacher then gave extended value reinforcement, for example: "This tool is used by doctors. Does anyone have a family member who works as a doctor?" From this activity, children began connecting the digital images with the professions in their own families.

The observations of Wordwall use in Class A1 at TK Assurur show that:

1.1 Children patiently waited for their turns
1.2 Children stayed focused throughout the activity
1.3 Children's emotions remained stable, and they appeared joyful
1.4 Children were able to name the professional tools shown in the images
1.5 Positive social interaction emerged—children encouraged and supported one another

Steps for Using Animated Drawing in Class A1**:** During the second meeting, the teacher used the Animated Drawing application. In this activity, the children were asked to draw a professional tool (for example, a stethoscope, a pan, or a construction helmet) in their drawing books. After completing their drawings, the teacher photographed each child's work and uploaded it to the Animated Drawing application. The AI technology in the application identified the drawing and automatically transformed it into a moving animation.

When the animation appeared, the children showed expressions of amazement and excitement because the drawings they created "came alive and moved." The teacher used this moment to encourage the children to tell stories about their drawings. The children then presented their work in simple explanations, such as: What profession uses this tool? What is it used for? Where is it used?

The results of using Animated Drawing in Class A1 at TK Assurur show that:

1.1 Children appeared pleasantly surprised (expressing "wow")
1.2 Children became more confident in telling the meaning behind their drawings
1.3 Children felt proud because their work was appreciated and visualized
1.4 Children were motivated to draw with more detail on the next sheet

2. The Effectiveness of AI-Based Digital Media in Creating Joyful Learning at TK Assurur Kedungjambe

Based on observations conducted during the learning process, the use of AI-based media Animated Drawing and Wordwall significantly increased children's engagement

and enthusiasm. The children appeared more focused, excited, and actively participated in the activities. Their attention span increased from an average of 7–10 minutes to 15–20 minutes per session. The teacher reported that the visual and audio elements helped children understand instructions more easily. Several key findings based on classroom observations aligned with the indicators of joyful learning, as described below.

Field observations over two meetings demonstrated that the use of AI-based digital media (Wordwall and Animated Drawing) contributed to the creation of joyful learning experiences. During the use of Wordwall, the children were enthusiastic as they tapped on the pictures of professional tools displayed on the screen. The AI system providing "correct/incorrect" audio feedback did not make the children afraid of making mistakes. Instead, they laughed, repeated the activity, and tried again.

When Animated Drawing was used, the children showed expressions of amazement ("wow") as they watched their drawings come to life and move. They sat in an orderly manner, waited for their turn, and remained focused until the end of the session. These behavioral patterns align with the indicators of joyful learning in early childhood education, namely: not being afraid of making mistakes, experiencing joy during the learning process, and genuinely enjoying the learning experience.

Interviews with the Class A1 teacher, Mrs. Siti Nizaroh, S.Pd, revealed that AI-based digital media made the learning process more dynamic and engaging. The teacher stated:

> "The children are willing to try. They are not afraid of making mistakes. They even laugh at their own mistakes and ask to try again."

This indicates that digital media reduces psychological pressure on children during learning activities. The principal of TK Assurur, Mrs. Umayaroh, S.Pd, also emphasized:

> "I rarely see the children this engaged during regular lessons. When AI is used, the class becomes more active and all children are involved."

This statement reinforces the idea that AI-based technology facilitates a learning atmosphere aligned with early childhood education principles—meaningful and joyful learning experiences.

Documentation in the form of photos, videos, and screen recordings taken during the use of Wordwall and Animated Drawing showed children's cheerful expressions—smiling, laughing, clapping, and actively commenting on the images displayed. Additionally, documentation of children's drawings uploaded to the Animated Drawing application (e.g., stethoscopes, faces, animals) demonstrated that children were involved in the process of "making a product," rather than merely completing worksheets.

This documentation proves that the learning experience was not only cognitive but also fostered positive emotions, encouraged expressive confidence, and built pride in their work consistent with the core principles of joyful learning in early childhood education.

DISCUSSION

The results of the study indicate that AI-based learning enhances engagement, motivation, and strengthens children's creativity and imagination. The **Animated Drawing**

and **Wordwall** media facilitate joyful learning aligned with the characteristics of early childhood learners. The implementation of AI-based learning using Animated Drawing and Wordwall at TK Assurur Kedungjambe has strong potential to increase young children's engagement and motivation. With consistent use and more intensive training, the school may produce stronger empirical evidence to support the sustainable use of this technology.

Based on the findings from class A1 at TK Assurur Kedungjambe, it can be understood that the implementation of AI-based digital media through the Wordwall and Animated Drawing platforms has contributed significantly to creating joyful learning. These findings align with the concept of *Joyful Learning* by the Ministry of Education (Kemendikbudristek) which states that joyful learning is characterized by the following indicators (Kemendikdasmen, 2025):

1) Children Learn Happily / Joyfully

   In the context of early childhood learning, positive emotions such as joy and enthusiasm are prerequisites for optimal learning (Bhakti, Ghiffari, & Salsabil, 2019). In class A1 at TK Assurur, the use of AI-based digital media allowed children to learn through play—such as with Wordwall and Animated Drawing—so children appeared happier, more active, and enjoyed the learning process. This cheerful atmosphere aligns with the joyful learning concept emphasized by the Ministry of Education, which states that learning should be enjoyable (Kemendikdasmen, 2025a).

2) Children Are Actively Involved

   Children's active involvement—both *hands-on* and *minds-on*—is an important indicator of joyful learning (Apandi, 2024). At TK Assurur, children were not merely listening to the teacher but directly tapping picture cards on Wordwall, taking turns, drawing using Animated Drawing, and even presenting their illustrated works. This active engagement supports the view that learning should be interactive and participatory, consistent with research that active learners tend to have higher motivation and learning outcomes (Elias Blinkoff a, Kimberly T. Nesbitt b, Roberta Michnick Golinkoff c, 2023).

   In this indicator, the AI-based digital media used at TK Assurur (Wordwall and Animated Drawing) were displayed not only through a laptop but also on an Interactive Flat Panel (IFP), enabling children to directly touch the large screen to choose answers, drag objects, and click symbols. This allowed children to become *active learners*, not passive viewers. With Animated Drawing, children could point at the screen and see their drawings come to life, eliciting expressions of excitement, curiosity, and pride. Thus, the combination of AI + IFP enabled physical, cognitive, and emotional engagement consistent with Joyful Learning principles.

3) Meaningful / Contextual Learning

   Learning is considered meaningful when the material relates to children's real-life experiences, making it easier to understand, remember, and apply (Nur & Farooq, 2023). In class A1, the theme "family professions and their tools" was highly relevant to children's daily lives, such as tools used by doctors, chefs, or construction workers. This relationship between content and children's personal experiences reflects strong

contextual learning, in accordance with joyful learning principles emphasizing meaningful learning *(BBPMP, 2025)*.

4) Safe and Comfortable Learning Environment

A physically and psychologically safe learning environment allows children to explore freely without fear of making mistakes. The literature states that a nurturing and pressure-free classroom is essential in joyful learning (BBPMP Provinsi Jawa Tengah KEMENDIKDASMEN, 2025). In class A1, the teacher appreciated children's efforts rather than focusing solely on results. When children made incorrect choices on Wordwall, the teacher provided scaffolding instead of criticism. While using Animated Drawing, children were free to express themselves without rigid monitoring. This environment helped create enjoyable and safe learning.

5) Freedom to Choose and Express

Opportunities for children to choose what and how they learn are central to joyful learning. Early childhood literature shows that giving children freedom to choose activities, explore, and express themselves creatively increases motivation and ownership of learning (NAEYC, 2025). In this study, children were given the freedom to choose any type of professional tool to draw using Animated Drawing. This reflects autonomy and creativity, showing that learning was not teacher-driven alone but partially controlled by the children themselves.

6) Teachers as Facilitators Providing Positive Support

The teacher's role in joyful learning shifts from being the sole instructor to being a facilitator who encourages curiosity, supports exploration, and gives positive feedback. Studies state that supportive, dialogic teacher–child interactions focusing on process are more effective than authoritarian teaching (Mulyana, Tetep, & Widyanti, 2023). At TK Assurur, the teacher (Ms. Anis, S.Pd) asked questions such as, "Which profession uses this tool?" or "Why did you choose this picture?" to engage children cognitively. The teacher also gave praise and guided children gently when they struggled in Wordwall not scolding them. Thus, the teacher acted as a facilitator supporting enjoyable, active, and meaningful learning.

Increased child engagement during learning indicates that AI-based media can create a more engaging and interactive learning atmosphere. Young children naturally learn through curiosity and play. Observations showed an increase in the percentage of children who were active, participative, and enthusiastic after using AI media. This aligns with constructivist learning theory, which states that children learn more effectively when directly involved in meaningful experiences. Therefore, the presence of moving animations (Animated Drawing) and educational games (Wordwall) provides learning experiences consistent with the principle of *learning through play*.

This aligns with research by (Af'idah, 2024) which found that Wordwall has significant potential to increase motivation among young children. Additionally, interactive Wordwall games can serve as a new form of early literacy learning (Supiani, S., Haryati, A., & Sari, 2024) especially when designed with gamification for early literacy development (ages 5–6).

Meanwhile, the findings show that Animated Drawing–based learning can train and develop children's sensory abilities as they are directly involved in producing animations through AI assistance. This aligns with the findings of (Yuliana, Lusiana, Ramadhanyaty, Rahmawati, & Anwar, 2022) which describe how animation media design (visual communication) can support motivation and sensorimotor development in early childhood.

AI-based learning using the Animated Drawing by Meta platform at TK Assurur Kedungjambe also proved effective in enhancing children's creativity and imagination. The children's works showed various nuances and themes, demonstrating freedom and diversity in selecting what they wished to draw. These findings align with research by (Rachmawati, D., & Kurniawati, 2023) which concluded that interactive animation media can improve imagination and creativity in early childhood.

CONCLUSION

Based on the research conducted at TK As-Surur Kedungjambe during the first semester of the 2025/2026 academic year, it can be concluded that the implementation of Artificial Intelligence (AI)-based learning through the use of the Animated Drawing and Wordwall websites has produced significant positive impacts on various aspects of early childhood development. Specifically, within the context of thematic learning using the joyful learning approach as outlined by the Ministry of Education and Culture (Kemendikbud Dikdas, 2025), the use of AI-based digital media (Wordwall and Animated Drawing) displayed through the Interactive Flat Panel (IFP) at TK As-Surur Kedungjambe has proven effective in creating joyful learning experiences for children in Group A1.

This effectiveness is demonstrated through: 1) children learning in an enthusiastic and joyful atmosphere, 2) children actively participating—not only watching but also touching, selecting, dragging, and presenting their work, 3) learning becoming more meaningful as the themes relate directly to children's real-life experiences (e.g., family professions), 4) the classroom becoming a safe and comfortable environment as the teacher provides support rather than pressure, 5) children having the freedom to choose and express themselves, and 6) teachers acting as facilitators who encourage dialogue and exploration.

Thus, the integration of AI and interactive media through the IFP is not only visually appealing but also supports the core principles of joyful learning, allowing the learning process to become more optimal, warm, meaningful, and aligned with the learning characteristics of young children.

Overall, AI-based learning using Wordwall and Animated Drawing has proven effective in fostering active, creative, and enjoyable learning. These media support not only cognitive and affective aspects but also contribute to the holistic development of children's social and motor skills. Therefore, the implementation of AI media such as Animated Drawing and Wordwall is highly suitable for continuous use in early childhood education settings as an innovative strategy to realize 21st-century learning that is joyful, interactive, and child-centered.

BIBLIOGRAPHY

Af'idah, Z. (2024). Penerapan media Wordwall dalam meningkatkan motivasi belajar anak usia dini. *Jurnal Pendidikan Anak Usia Dini Nusantara*, *5*(1).

Apandi, I. (2024). Bagaimana Implementasi 3 Pilar Deep Learning dalam Pembelajaran. *Balai Besar Penjaminan Mutu Pendidikan*, 1–7. Retrieved from https://www.bbpmpjabar.id/bagaimana-implementasi-3-pilar-deep-learning-dalam-pembelajaran/

BBPMP. (2025). Penerapan Kurikulum Merdeka melalui Pembelajaran Mendalam. *BBPMP Provinsi Jawa Tengah*, 1–7. Retrieved from https://bbpmpjateng.kemendikdasmen.go.id/penerapan-kurikulum-merdeka-melalui-pembelajaran-mendalam/

BBPMP Provinsi Jawa Tengah KEMENDIKDASMEN. (2025). *Pembelajaran Paud Dengan Pendekatan Deep Learning Melalui Media Loose Parts Berita Terbaru : BAGIKAN :* 1–7.

Bhakti, C. P., Ghiffari, M. A. N., & Salsabil, K. (2019). Joyful Learning: Alternative Learning Models to Improving Student's Happiness. *Jurnal VARIDIKA*, *30*(2), 30–35. https://doi.org/10.23917/varidika.v30i2.7572

Elias Blinkoff a, Kimberly T. Nesbitt b, Roberta Michnick Golinkoff c, K. H.-P. (2023). Investigating the contributions of active, playful learning to student interest and educational outcomes. *Acta Psychologica*, *238*. https://doi.org/https://doi.org/10.1016/j.actpsy.2023.103983

Katharina J. Rohlfing, Eugenia Wildt, Tolksdorf, N. F. (2025). Language Learning with Media and Technology in (Early) Childhood. *Dziecinstwo Literatu i Kultura*, 1–3. Retrieved from http://scioteca.caf.com/bitstream/handle/123456789/1091/RED2017-Eng-8ene.pdf?sequence=12&isAllowed=y%0Ahttp://dx.doi.org/10.1016/j.regsciurbeco.2008.06.005%0Ahttps://www.researchgate.net/publication/305320484_SISTEM_PEMBETUNGAN_TERPUSAT_STRATEGI_MELESTARI

Kemendikbudristek. (2023). *Panduan Implementasi Teknologi Digital dalam Pembelajaran PAUD*. Jakarta: Direktorat PAUD.

Kemendikdasmen. (2025a). Pembelajaran Mendalam. *NASKAH AKADEMIK PEMBELAJARAN MENDALAM Menuju Pendidikan Bermutu Untuk Semua*, hal 47.

Kemendikdasmen. (2025b). Penguatan Kompetensi Guru untuk Pendekatan Deep Learning. *Kementerian Pendidikan Dasar Dan Menengah*, 29–32.

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook*. SAGE Publications.

Mulyana, E., Tetep, & Widyanti, T. (2023). Implementasi Joyful Learning Dalam Pembelajaran IPS Di Masa Adaptasi Kebiasaan Baru. *Dedikasi : Jurnal Pengabdian Kepada Masyarakat*, *2*(1), 213–221. https://doi.org/10.53276/dedikasi.v2i1.34

Mutmainnah, M., Caroline, N., & Margawati, M. (2025). Penggunaan AI sebagai Media Pembelajaran pada Pendidikan Anak Usia Dini. *Jurnal Kridatama Sains Dan Teknologi*, *7*(01), 62–70. https://doi.org/10.53863/kst.v7i01.1491

NAEYC. (2025). *Kekuatan Pembelajaran yang Menyenangkan di Awal Masa Kanak-kanak*.

19–20.

Nafi'ah, J., & Faruq, D. J. (2025). Conceptualizing Deep Learning Approach in Primary Education: Integrating Mindful, Meaningful, and Joyful. *Journal of Educational Research and Practice*, *3*(2), 225–237. https://doi.org/10.70376/jerp.v3i2.384

Nasution, M. & Silalahi, N. (2021). Pemanfaatan Kecerdasan Buatan dalam Dunia Pendidikan. *Jurnal Teknologi Dan Pembelajaran*, *9*(2), 45–52.

Novitasari,Nurul. Anik Nurul Nur'Aini, T. A. R. (2025). *TRANSFORMASI LITERASI ANAK USIA DINI MELALUI MEDIA DIGITAL : STUDI DI TK PKK 1 BANGILAN*. *06*(01), 1–15.

Nuni Yuniawati, T. M. (2025). PEMANFAATAN ARTIFICIAL INTELLIGENCE (AI) DALAM MENGEMBANGKAN KECERDASAN EMOSIONAL ANAK USIA DINI MELALUI MEDIA DIGITAL. *Jurnal Anak Bangsa*, *4*(2), 261–274. https://doi.org/10.46306/jas.v4i2 p-ISSN:

Nurnaningsih, S. M., & Mohammad Salehudin. (2025). Transformasi Pendidikan Anak Usia Dini melalui Media AI: Sebuah Pendekatan Inklusif. *Indonesian Journal of Early Childhood: Jurnal Dunia Anak Usia Dini*, *7*(1), 156–165. https://doi.org/10.35473/ijec.v7i1.3615

Pratama, R., & Sugihartono, T. (2022). Media Digital Interaktif dalam Meningkatkan Minat Belajar Anak TK. *Jurnal Pendidikan Anak Usia Dini*, *6*(1), 12–20.

Rachmawati, D., & Kurniawati, L. (2023). Penggunaan animasi interaktif untuk meningkatkan imajinasi dan kreativitas anak usia dini. *Jurnal Pendidikan Anak Indonesia*, *7*(1), 11–20.

Rahman, T., . Y., & Nurani, Y. (2024). Enhancing Early Childhood Literacy through Game-Based Interactive Digital Media Development. *International Journal of Religion*, *5*(11), 2598–2608. https://doi.org/10.61707/7cprvh13

Supiani, S., Haryati, A., & Sari, D. (2024). Pengembangan media Wordwall berbasis gamifikasi untuk meningkatkan literasi permulaan anak usia dini. *Jurnal Golden Age PAUD UHO*, *11*(2), 145–158.

Suyadi. (2020). *Teori Pembelajaran Anak Usia Dini dalam Perspektif Pendidikan Islam*. Yogyakarta: Deepublish.

Yuliana, Y., Lusiana, F., Ramadhanyaty, D., Rahmawati, A., & Anwar, R. N. (2022). Penguatan Moderasi Beragama pada Anak Usia Dini sebagai Upaya Pencegahan Radikalisme di Masa Pandemi Covid-19. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *6*(4), 2974–2984. https://doi.org/10.31004/obsesi.v6i4.1572