

LOLITA: TAJWEED GAME-BASED LEARNING MEDIA DEVELOPMENT USING THE HANNAFIN AND PECK MODEL

Nazliati

Langsa Islamic State Institute, Aceh
nazliati@iainlangsa.ac.id

Nurhanifah

Langsa Islamic State Institute, Aceh
nurhanifah@iainlangsa.ac.id

Rita Sari

Langsa Islamic State Institute, Aceh
ritasari17@iainlangsa.ac.id

Alfiatunnur

Coventry University London, United Kingdom
Abdurrahma@coventry.ac.uk

Abstract

Tajweed is the science of reading the Qur'an, which is urgently taught to students to avoid mistakes when reading or reciting it. However, learning tajweed is quite complicated. Game-based learning media are very suitable for development, especially for students at the concrete operational stage, to facilitate understanding of tajwid. Therefore, this study was conducted to develop Ludo Lintas Tajweed (Lolita) using the Hannafin and Peck model, which consists of three phases: analysis, design, and development/implementation. The model also emphasizes an iterative approach, which is essential to ensure that the product or programme developed meets users' needs and effectively achieves them. Descriptive analysis was conducted to describe each phase of media development, while percentage analysis was carried out to analyze the media validation from the subject experts and students' responses. The results showed that the development process of Lolita, a game-based learning media, has been in accordance with the Hannafin and Peck phase and is feasible to develop with media validation (88%), content validation (90.7%), language validation (80%), small group validation (100%), and large group validation (98.5%).

Keywords: Game-Based Learning Media, *Tajweed*, *Hannafin* and Peck Model

INTRODUCTION

The emergence of Era 5.0 in education represents a significant shift in teaching and learning methodologies, emphasizing the integration of advanced technologies like artificial intelligence (AI), big data, and the Internet of Things (IoT). This era promotes a balance between technological innovation and human-centric education, focusing on personalized learning and the holistic development of students. However, while these advancements present

opportunities, they also introduce challenges, particularly for primary school children whose developmental needs extend beyond digital learning.

The balance between cognitive and motoric development is crucial for children in primary education. However, in fact, the use of technology among primary-aged children currently has led to a significant increase in technology addiction, at 15-20% in developed countries and 17% in Indonesia^{1; 2}. Research shows that early exposure to digital tools must be managed carefully to avoid potential negative effects on motor skills³, attention spans, social interactions^{4,5; 6}, physical health⁷, mental and emotional health^{8,9}, creative and critical skills. Furthermore, Niemi states that the reliance on screen-based learning can diminish opportunities for physical activities, which are essential for developing coordination, fine motor skills, and sensory integration¹⁰

Based on those problems, Finland, one of the best countries in education, has implemented a policy of reducing the use of technology-based media in primary schools. This policy refers to the essentials of physical play and direct human interaction in developing cognitive and emotional skills during the early years of education. Another factor is Finland's belief in individualized learning, where teachers focus on meeting the unique needs of each child without depending heavily on technology. By minimizing the use of digital tools in primary education, Finnish educators can better observe and support students' natural learning processes, ensuring that technology complements rather than replaces traditional teaching methods. Finland's approach suggests that a balanced and thoughtful integration of technology introduced gradually as students mature can yield better long-term educational outcomes. (Finland Education Hub, n.d.)

Learning from Finland's policies, technology is used only as a complement and not as a replacement for traditional learning, where motor and cognitive development, as well as social development, are still closely monitored. In Indonesia, several schools and organizations have

¹ T. Smith, P., Johnson, D., & Reed, "Global Trends in Technology Addiction among Children.," *Journal of Behavioral Addictions* 12, no. 2 (2023): 234–245.

² A. Kurniawan, "Technology Addiction among Children in Urban Indonesia.," *Pusat Kajian Perlindungan Anak dan Kesejahteraan Keluarga* 8, no. 1 (2022): 45–57.

³ A. Setyawan, F., & Purwanto, "Pengaruh Penggunaan Gadget Terhadap Perkembangan Anak Usia Dini Di Kota Yogyakarta.," *Jurnal Pendidikan Anak* 8, no. (2) (2019): 110–120.

⁴ K. Niemi, H., & Kumpulainen, "The Influence of Digital Tools on the Motoric Development of Primary School Children in Era 5.0.," *Journal of Educational Technology* 34, no. 2 (2023): 123–135.

⁵ Shabnam Bibi and Muhammad Hameed Nawaz, "Effects of Social Media on Students at University Level During Covid-19," *Responsible Education, Learning and Teaching in Emerging Economies* 2, no. 2 (December 2020): 49–57, <https://publishing.globalcsrc.org/ojs/index.php/relate/article/view/1695/1139>.

⁶ M. Green, L., Houghton, S., & Taylor, "Excessive Screen Time and Social-Emotional Development in Children.," *Journal of Child Psychology and Psychiatry* 64, no. 2 (2023): 123–134.

⁷ J. Anderson, M., & Jiang, "Technology Use and Its Consequences among Children and Adolescents.," *Computers in Human Behavior* 122, no. 5 (2021): 106678.

⁸ S. Kim, H., Lee, Y., & Kang, "Technology Addiction in Children: Impacts and Interventions.," *Journal of Child Development* 94, no. 3 (2023): 857–872.

⁹ N. Nurani, "Dampak Negatif Penggunaan Gadget Berlebihan Terhadap Kesehatan Mental Anak Usia Dini.," *Jurnal Psikologi Anak* 5, no. 1 (2021): 45–55.

¹⁰ Niemi, H., & Kumpulainen, "The Influence of Digital Tools on the Motoric Development of Primary School Children in Era 5.0."

started implementing programs to address the issue of technology addiction in children. One such program is the 'No Gadget Day' campaign, held in elementary schools to reduce dependency on technology. An intervention program involving 1,000 elementary school students in Jakarta has proven effective in reducing symptoms of technology addiction and improving children's social development and academic performance.¹¹

Ideally, Learning should be able to develop students' knowledge according to their potential logically and systematically¹². Innovative learning can eliminate boredom and stimulate students' interest in learning. Students interested in learning tend to listen to the teacher's explanation actively. So, interest significantly influences learning activities by fostering a sense of pleasure and encouraging students to learn seriously.

To create a pleasant learning atmosphere in the age of primary education by reducing the touch of advanced technology, it is essential to choose the right learning media, including developing a game-based learning media. Game-based learning provides learners an environment where they can engage in active problem-solving and knowledge construction¹³, deep learning experiences by satisfying their intrinsic motivational needs¹⁴, and enhances student engagement in social elements¹⁵. Students who engaged in game-based learning exhibited significantly improved understanding of key concepts compared to traditional instructional methods.¹⁶

Game-based learning media can be applied to various subjects, such as Tajweed. Tajweed is a branch of science that teaches how to read the Quran. Many students assume Tajweed is a fairly complicated subject, especially for those who need to be more fluent in Arabic¹⁷. Therefore, Tajweed content must be taught to students so that everything is clear when reading and pronouncing it so that it does not change the meaning of the reading. One of the contents in Tajweed is *the rule of meem Sakinah*. The rules of *meem saakinah* are crucial in tajweed as they ensure the correct pronunciation and adherence to the phonetic nuances of Qur'anic recitation¹⁸. These rules, including Ikhfa Syafawi, Idgham Mimi, and Izhār Syafawi, play a significant role in maintaining the integrity of the Qur'anic text and its oral transmission.

Therefore, to help basic students understand Tajweed by creating a fun and interactive atmosphere, tajweed game-based learning media is the best solution to be developed since there are only a few numbers of tajweed game-based learning media available. Thus, this research aimed to develop a tajweed game-based learning media, Lolita, known as Ludo Lintas Tajweed,

¹¹ D. Suryadi, A., Wibowo, R., & Santoso, "Reducing Technology Addiction in Elementary School Children through Intervention Programs.," *Journal of Educational Psychology* 35, no. 2 (2023): 67–80.

¹² Abdul Majid, *Perencanaan Pembelajaran* (Bandung: Remaja Rosdakarya, 2010).

¹³ R. E. Johnson, L., & Mayer, "Constructivist Principles in Game-Based Learning Environments: Active Problem-Solving and Knowledge Construction.," *Journal of Educational Technology* 56, no. 4 (2022): 317–332.

¹⁴ R. M. Deci, E. L., & Ryan, "Game-Based Learning and Intrinsic Motivation: A Self-Determination Theory Perspective.," *Journal of Motivation and Emotion* 47, no. 1 (2023): 12-26.

¹⁵ A. Bandura, "Incorporating Social Elements in Game-Based Learning: Enhancing Student Engagement and Learning Outcomes.," *International Journal of Educational Psychology* 11, no. 3 (2022): 245-259.

¹⁶ R. E. Clark, R. E., & Mayer, "Students' Understanding of Key Concepts in Game-Based Learning Environments.," *Computers & Education* (2022): 178.

¹⁷ Muslim Viska Mutiawani, Maria Ulfa, "Kepo Tajwid: Aplikasi Pembelajaran Ilmu Tajwid Berbasis Web Interaktif," *Indonesia Journal of Applied Informatics* 2, no. 2 (2018): 77–88, <https://jurnal.uns.ac.id/ijai/article/view/20880/pdf>.

¹⁸ ahmad fudholi husni Mubarak, *Muqodimah Al-Jazariah* (Itqan, 2018).

by modifying Tajweed-nuanced ludo games using the Hannafin & Peck model, which consists of three stages: needs analysis, design, development, and implementation¹⁹.

RESEARCH METHODS

The Hannafin and Peck model is one of the development models often used in research and development (R&D), especially in education and instructional design. In this study, the model developed by Michael J. Hannafin and Susan Peck is used to assist the process of developing effective learning programs through an iterative and flexible approach²⁰, user-centred that ensuring the final product is not only technically sound but also practical and usable by the target audience²¹, continuous evaluation enhances the validity and reliability of the final product²², and suitable for diverse development environments, from educational software to training programs²³.

Based on those reasons, the development of Ludo Lintas Tajwid (Lolita) learning media required a three-main phase process that included analysis, design, and development/implementation, followed by a continuous evaluation and revision process at each phase.²⁴

In starting the media development process, needs analysis is used to identify problems or needs and objectives of the learning program to ensure that the learning media developed is appropriate and in accordance with their needs. Hannafin dan Hill states that the needs assessment phase is crucial in aligning the instructional goals with the learners' actual needs, ensuring that the subsequent design and development phases are grounded in real-world requirements²⁵. This study uses observation and interviews to identify the crucial need for media.

In the design phase, the learning strategy, content, media to be used, as well as the structure of the programme will be determined. Clark and Mayer point out that the design phase in the Hannafin and Peck model emphasizes creating a blueprint that integrates instructional strategies with technology, aiming to produce effective and engaging learning experiences²⁶. This study determines the learning content, the learning strategy, and the form of media to be used.

¹⁹ Rabiman Rabiman, Muhammad Nurtanto, and Nur Kholifah, "Design and Development E-Learning System by Learning Management System (LMS) in Vocational Education," *INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH* 9 (2020): 1.

²⁰ M Molenda, *Educational Technology: A Definition with Commentary* (New York: Routledge, 2021), <https://www.routledge.com/Educational-Technology-A-Definition-with-Commentary/Januszewski-Molenda/p/book/9780805858617>.

²¹ (Smith & Ragan, 2020)

²² P. M. Reeves, T. C., & Reeves, *Research and Evaluation for Educational Development Projects* (London: Springer, 2019).

²³ R. M. Branch, *Instructional Design: The ADDIE Approach* (New York: Springer., 2022).

²⁴ Rabiman, Nurtanto, and Kholifah, "Design and Development E-Learning System by Learning Management System (LMS) in Vocational Education."

²⁵ J. R. Hannafin, M. J., & Hill, "The Evolution of Design and Technology in Education," *Educational Technology Research and Development* 69, no. (3 (2021): 577–591.

²⁶ R. E. Clark, R. C., & Mayer, *E-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning* (Hoboken: John Wiley & Son, 2020).

The next phase of the Hannafin and Peck model is development and Implementation. At this phase, the product or program that has been designed begins to be developed and implemented. This development includes developing learning materials, product testing, and training for users or instructors. Product implementation is also conducted to examine how the product functions in a real environment. According to Hannafin and Peck, this phase involves a collaborative process where developers, educators, and content experts work together to ensure that the developed product meets quality standards and effectively achieves learning objectives²⁷. In this study, *Lolita* media is developed and tested by involving 3 subject experts from the State Institute and Islamic religion Langsa in the fields of media display, Indonesian language structure and content, as well as students from Nurul Mubin and Mannatul 'Ilmi Azziziyah students, Langsa, whom will use the product. A total of 30 instrument items were used to test the feasibility of *Lolita* media, including the feasibility of the media display, content, and language.

Table 1. Criteria for Media Feasibility

Criteria	Score	Percentage
Not feasible	1	1-20
Less feasible	2	21- 40
Quite feasible	3	41-60
Feasible	4	61-80
Very feasible	5	81-100

The Guttman scale with 15 statement items determines students' responses after playing *Lolita* media.

Table 2. Guttman Scale

Criteria	Score
Yes	1
No	2

The results of the percentage calculation obtained from subject experts' validators and student responses will then be categorized according to the level of media feasibility.

Evaluation and revision are undertaken at each Hannafin and Peck model stage. The evaluation is conducted to identify the strengths and weaknesses of the developed product or programme. Based on the evaluation results, revisions are made to refine and improve the product. This process is repeated until the product has reached the expected standard. Branch states that continuous evaluation and revision are the hallmarks of the Hannafin and Peck model, ensuring that the final product is optimized for learner engagement and effectiveness²⁸.

²⁷ K. L. Hannafin, M. J., & Peck, *The Design, Development, and Evaluation of Instructional Software* (New York: Macmillan, 1988).

²⁸ Branch, *Instructional Design: The ADDIE Approach*.

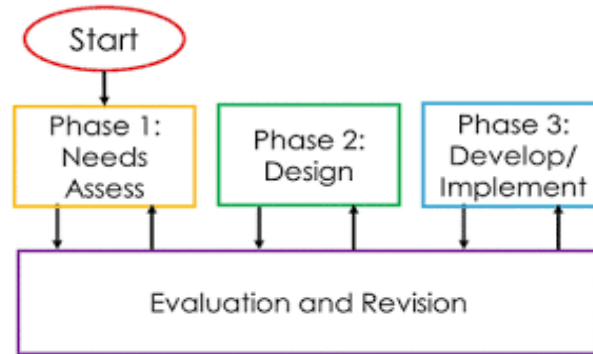


Figure 1. Hannafin & Peck Development Model

RESEARCH RESULT AND DISCUSSION

This study used the Hannafin and Peck instructional development model to determine the Lolita game-based learning media development process. The model design instruction has three phases: needs analysis, design, development, and implementation.

a. Needs Analysis

In this phase, the needs analysis examined includes (1) the knowledge of participants aged 6-12 years old students who have not yet mastered understanding *the rules of meem saakinah*, which should be at that age they already know the rules of *nun saakinah* and *meem saakinah* and have been able to distinguish how to read them when encountering these rules in the Qur'an. (2) The character of students at the average age of 6-12 years is still contented to play, joke with friends, easily feel bored, and lack focus. (3) *meem saakinah* has been taught but still often confuses them. (4) Lack of game-based learning media that supports the learning process (5) to reduce the addiction to technology by encouraging balancing motoric and cognitive skills. (6) The students are still in the operational concrete phase, where students can observe and touch the media directly. (7) Less adopting collaborative learning during the learning process. Based on those problems, the research must create something that covers all student needs. A solution to overcome these problems is to design tajweed game-based learning media.

b. Design

At this stage, the researcher makes a game design by determining the content, namely the rules of *meem saakinah*, media to be used, such as the shape of the game board, game cards, and game procedures.

The content of this game is the rules of *meem saakinah* with the game procedures combining Ludo, monopoly and Halma games. The ludo game lies when the pieces move from one city to another; monopoly here is more about the question cards accompanied by bonuses and penalties, and halma is more about the shape of the triangular game board.

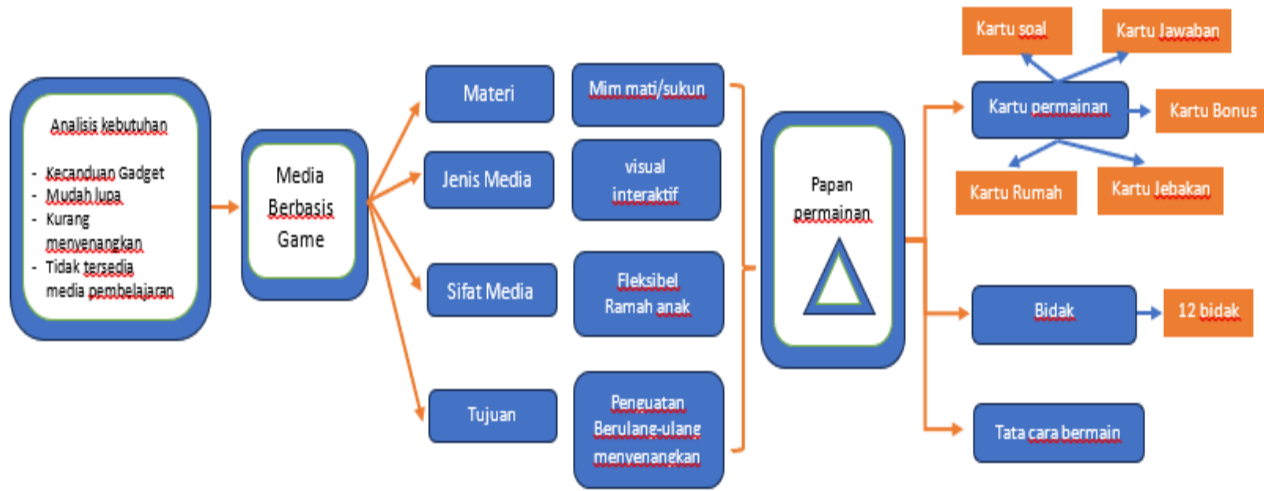


Figure 2. Game-Based Learning Media Design

This game helps students learn and remember the content of *the rules of meem saakinah* because the material presented is repetitive. This game can be played either with the guidance of teachers/parents or peers/independently.

c. Development and Implementation

This stage is the last stage of the Hannafin and Peck model; here, researchers design Lolita media by taking *the rules of meem saakinah* as game content and designing Lolita boards using PicsArt applications, question cards, trap cards, house cards, bonus cards and preparing game procedures. Then, this design is validated by 3 validators who are experts in their fields. The media display is validated by educational technology expert validators, content by Islamic Education expert validators and language structure by Indonesian Language structure experts. All validators are lectures at The State Institute of Islamic Religion Langsa.



Figure 1. Ludo game board display before validation.



Figure 2. Ludo game board display after validation

At the first appearance of the Lolita board display, there is a green triangle display in the centre of the board. After validation, it was changed by placing a picture of the Kaaba in the centre to emphasize Islamic elements and reflect the fifth pillar of Islam.

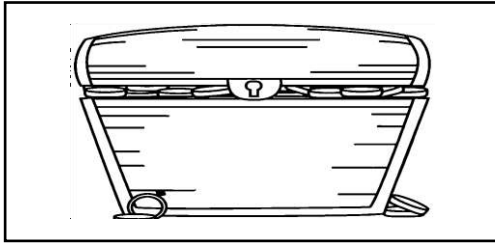


Figure 3. Initial design bonus card



Figure 4. Bonus card after revision



Figure 5: Problem cards of the initial design



Figure 6. Problem cards after revision

Lolita game cards were designed without colour in the initial design, and the images displayed were still very simple. The media display experts suggest designing coloured cards and adjusting the images on the cards to the card's theme to attract students' attention.



Figure 7: Initial design question paper



Figure 8. Question paper after revision

The previous game card's font was Times New Roman, with a writing size 8. Media validators suggested choosing a font type suitable for children's age, such as Comic Sans MS, with a writing size of more than 10 to make it clearer and easier for students to read and add reward words at the bottom of the card to make students more challenged to complete the game. Furthermore, the validator provides suggestions for adding an answer card and putting a number code on the front page of the card that matches the number code on the quiz card so that students can see the right answer to the question obtained.

Table 3. The Validation Result

Validator	Stage 1	Criteria	Stage 2	Criteria
Media display	58%	quite feasible	88%	Very Feasible
Content	86,6%	Feasible	90,7%	Very Feasible
Indonesian Language structure	50%	quite feasible	80%	Feasible

The feasibility of Lolita media is also validated by students as a subject who are playing the game shortly. The validation was gained from small and large groups of Nurul Mubin and Mannatul 'Ilmi Azziziyah students, Langsa.

Table 4. The Validation Result

Validator	Percent age	Criteria
Students' Responses		
Small group	100%	Very Feasible
Big group	98,5%	Very Feasible

The results showed that Lolita media was acknowledged as feasible in the second revision. Regarding media appearance, revisions were made by making game cards more colourful and images that make cards brighter, selecting font types that make writing clear and avoiding upright writing that can make it difficult for students to read directions. The use of the correct Indonesian language structure, according to PUEBI, eliminates ambiguous sentences that confuse students when answering. The results of trials in small groups and large groups were slightly different. It can be seen from the table that the respondents gave a 100% positive response in the small group, while the responses in the large group were 98.5% positive. In the large group, there was a student whose attention was focused on the sound and other objects in other study groups. The less conducive atmosphere where the research was conducted could have been quieter, disturbing the students' concentration in playing. Nevertheless, the students' enthusiasm was very visible in completing the game, so the students asked that the game continue even though the learning time was over.

CONCLUSION

The development of Islamic nuanced Tajweed game-based learning media called Lolita (Ludo Lintas Tajwid) has followed the Hannafin and Peck development model phase that starts from identifying student needs, designing the media that consists of choosing the content which is *the rules of meem saakinah*, design game board, game cards (quiz, answer, trap, house and bonus card) and game procedures and development/implementation phase where *Lolita* is

validated. Lolita answers the needs of students, where the game is tangible, so it can reduce addiction to gadgets and balance children's motoric and cognitive development. It is also in line with the age of children 6-12, which is the operational concrete phase. Lolita can create a fun atmosphere, as seen from the enthusiasm of children when playing, and improve children's social relationships through teamwork, making it easy for students to memorize and understand the content of *the rules of meem saakinah*. Lolita game-based learning media is feasible to develop with media validation (88%), content validation (90.7%), Indonesian language structure validation (80%), small group validation (100%), and large group validation (98.5%).

REFERENCES

- Anderson, M., & Jiang, J. "Technology Use and Its Consequences among Children and Adolescents." *Computers in Human Behavior* 122, no. 5 (2021): 106678.
- Bandura, A. "Incorporating Social Elements in Game-Based Learning: Enhancing Student Engagement and Learning Outcomes." *International Journal of Educational Psychology* 11, no. 3 (2022): 245-259.
- Bibi, Shabnam, and Muhammad Hameed Nawaz. "Effects of Social Media on Students at University Level During Covid-19." *Responsible Education, Learning and Teaching in Emerging Economies* 2, no. 2 (December 2020): 49–57.
<https://publishing.globalcsrc.org/ojs/index.php/relate/article/view/1695/1139>.
- Branch, R. M. *Instructional Design: The ADDIE Approach*. New York: Springer., 2022.
- Clark, R. C., & Mayer, R. E. *E-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning*. Hoboken: John Wiley & Son, 2020.
- Clark, R. E., & Mayer, R. E. "Students' Understanding of Key Concepts in Game-Based Learning Environments." *Computers & Education* (2022): 178.
- Deci, E. L., & Ryan, R. M. "Game-Based Learning and Intrinsic Motivation: A Self-Determination Theory Perspective." *Journal of Motivation and Emotion* 47, no. 1 (2023): 12-26.
- Green, L., Houghton, S., & Taylor, M. "Excessive Screen Time and Social-Emotional Development in Children." *Journal of Child Psychology and Psychiatry* 64, no. 2 (2023): 123–134.
- Hannafin, M. J., & Hill, J. R. "The Evolution of Design and Technology in Education." *Educational Technology Research and Development* 69, no. (3 (2021): 577–591.
- Hannafin, M. J., & Peck, K. L. *The Design, Development, and Evaluation of Instructional Software*. New York: Macmillan, 1988.
- Johnson, L., & Mayer, R. E. "Constructivist Principles in Game-Based Learning Environments: Active Problem-Solving and Knowledge Construction." *Journal of Educational Technology* 56, no. 4 (2022): 317–332.
- Kim, H., Lee, Y., & Kang, S. "Technology Addiction in Children: Impacts and

- Interventions.” *Journal of Child Development* 94, no. 3 (2023): 857–872.
- Kurniawan, A. “Technology Addiction among Children in Urban Indonesia.” *Pusat Kajian Perlindungan Anak dan Kesejahteraan Keluarga* 8, no. 1 (2022): 45–57.
- Majid, Abdul. *Perencanaan Pembelajaran*. Bandung: Remaja Rosdakarya, 2010.
- Molenda, M. *Educational Technology: A Definition with Commentary*. New York: Routledge, 2021. <https://www.routledge.com/Educational-Technology-A-Definition-with-Commentary/Januszewski-Molenda/p/book/9780805858617>.
- Mubarok, ahmad fudholi husni. *Muqodimah Al-Jazariah*. Itqan, 2018.
- Niemi, H., & Kumpulainen, K. “The Influence of Digital Tools on the Motoric Development of Primary School Children in Era 5.0.” *Journal of Educational Technology* 34, no. 2 (2023): 123–135.
- Nurani, N. “Dampak Negatif Penggunaan Gadget Berlebihan Terhadap Kesehatan Mental Anak Usia Dini.” *Jurnal Psikologi Anak* 5, no. 1 (2021): 45–55.
- Rabiman, Rabiman, Muhammad Nurtanto, and Nur Kholifah. “Design and Development E-Learning System by Learning Management System (LMS) in Vocational Education.” *INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH* 9 (2020): 1.
- Ragan, Smith &. *Instructional Design*. Hoboken: John Wiley & Sons, 2020.
- Reeves, T. C., & Reeves, P. M. *Research and Evaluation for Educational Development Projects*. London: Springer, 2019.
- Setyawan, F., & Purwanto, A. “Pengaruh Penggunaan Gadget Terhadap Perkembangan Anak Usia Dini Di Kota Yogyakarta.” *Jurnal Pendidikan Anak* 8, no. (2) (2019): 110–120.
- Smith, P., Johnson, D., & Reed, T. “Global Trends in Technology Addiction among Children.” *Journal of Behavioral Addictions* 12, no. 2 (2023): 234–245.
- Suryadi, A., Wibowo, R., & Santoso, D. “Reducing Technology Addiction in Elementary School Children through Intervention Programs.” *Journal of Educational Psychology* 35, no. 2 (2023): 67–80.
- Viska Mutiawani, Maria Ulfa, Muslim. “Kepo Tajwid: Aplikasi Pembelajaran Ilmu Tajwid Berbasis Web Interaktif.” *Indonesia Journal of Applied Informatics* 2, no. 2 (2018): 77–88. <https://jurnal.uns.ac.id/ijai/article/view/20880/pdf>.