Ceria: Jurnal Program Studi Pendidikan Anak Usia Dini
Volume 14, Number 3, 2025 pages 618-629
P-ISSN: 2301-9905 E-ISSN: 2775-409X
Open Access: https://jurnal.umt.ac.id/index.php/ceria/index

Development of Augmented Reality–Based Learning Media for Introducing the Concept of Land Animals to Improve the Cognitive Abilities of Early Childhood

***Bunga Vania*[1*], *Kanada Komariyah*[2], *Sovia Mas Ayu*[3]**
[1,2,3] Universitas Islam Negeri Raden Intan Lampung
e-mail: *[1]vania.bunga06@gmail.com, [2]komariyahzen77@gmail.com , [3]sovia.masayu@radenintan.ac.id

ARTICLE INFO

Article history:
Received: July 9, 2025
Accepted: August 25, 2025
Available online on: August 31, 2025

Keywords:
Augmented Reality; early childhood; learning media; cognitive ability; land animals

ABSTRACT

This research is important to conduct with the aim of producing teaching materials, namely the development of learning media designed in accordance with the age of children, specifically the development of Augmented Reality–based learning media for introducing land animals to improve the cognitive abilities of early childhood. This study employed the Research and Development (R&D) method with the ADDIE development model developed by Dick and Carey. ADDIE stands for Analysis, Design, Development or Production, Implementation or Delivery, and Evaluation. The subjects of this study were 15 students. The research was carried out at TK Thoyyibah Sukarame Bandar Lampung and TK Bangsa Ratu Bandar Lampung. The results showed that this Augmented Reality media was highly valid, as evidenced by the expert evaluations: material experts scored 90%, language experts 75%, and media experts 94%. Furthermore, the trial results at TK Thoyyibah Sukarame Bandar Lampung

reached 90.83%, and at TK Bangsa Ratu Bandar Lampung 93.33%. Based on these findings, the Augmented Reality media is deemed feasible for use.

Introduction

The learning process in kindergartens still predominantly relies on classical methods such as lectures and books, which are not yet effective in improving the cognitive abilities of early childhood, particularly in recognizing the concept of land animals (Guslinda & Kurnia, 2018). Therefore, innovative technology-based learning media, such as Augmented Reality, is required to make learning more engaging, interactive, and in line with the demands of the times (Rachim et al., 2024; Niningsih et al., 2025). The purpose of this study is to develop a product designed to suit the developmental stage of children, namely Augmented Reality–based learning media for introducing the concept of land animals to improve the cognitive abilities of early childhood.

The benefit of this research is to enhance children's understanding and cognitive abilities in recognizing the concept of land animals through Augmented Reality–based learning media, as well as to provide innovation for teachers in delivering material in a more engaging and effective way (Ritonga et al., 2022; Rahayu et al., 2024).

Previous studies have shown that Augmented Reality–based learning media has significant potential to support the learning process of young children. Atikah et al. (2023) found that the use of this technology can create a more interactive and enjoyable learning

experience. Similarly, Al Hasan et al. (2023) revealed that Augmented Reality is effective in introducing specific objects to children in a more engaging and easily understandable manner. Amin (2021) and Putri & Sya'bandyah (2019) also emphasized that Augmented Reality–based media helps children recognize various animals while fostering learning interest through innovative digital exploration.

These findings demonstrate that the application of Augmented Reality technology is relevant and effective in early childhood education. Therefore, this research is considered important as an effort to improve the quality of learning through media that is not only interactive and enjoyable but also able to optimize children's cognitive development.

Methods

The type of research used in this study is Research and Development (R&D), which aims to develop an interactive learning media product (Okpatrioka, 2023). According to Sugiyono, research and development is a research method used to produce a specific product and to test the effectiveness of that product. To produce a particular product, needs analysis can be carried out using survey methods or qualitative approaches, while to test the effectiveness of the product so that it can be used more broadly, experimental research methods are applied.

The design of this study employed the ADDIE model developed by Dick and Carey (Silitonga et al., 2022). ADDIE stands for Analysis,

Design, Development or Production, Implementation or Delivery, and Evaluation. The sample in this research consisted of 15 kindergarten students from TK Thoyyibah and TK Bangsa Ratu Bandar Lampung. Data collection techniques in this study included validation sheets from media experts, material experts, and language experts to test the feasibility of the product; questionnaires from teachers and students to assess responses and media effectiveness; as well as observation sheets to monitor the learning process.

Data analysis in this study was conducted both quantitatively and qualitatively. Quantitative data in the form of scores from questionnaires and expert validation were analyzed statistically using certain categories, while qualitative data were obtained from suggestions and comments provided by experts and teachers to offer constructive input for improving the developed product.

Results and Discussions

Based on the results of questionnaires distributed to several experts, teachers, and kindergarten students at TK Bangsa Ratu and TK Thoyyibah Sukarame Bandar Lampung, the validity score of the media showed that it was highly valid and feasible to be used in the learning process to introduce land animals to early childhood. The validity of the Augmented Reality media, based on assessments from language experts, material experts, and media experts, indicated that the Augmented Reality–based land animal recognition media is highly

valid for use in learning. Teachers' responses as respondents also showed high levels of interest in the Augmented Reality media. Small- and large-scale trials conducted with students at TK Thoyyibah Sukarame Bandar Lampung and TK Bangsa Ratu Bandar Lampung demonstrated that this media was able to attract attention and increase children's learning interest.

Table 1. Media Expert Assessment

No	Assessment Aspect	Feasibility Percentage
1	Aesthetics	91%
2	Production Technique	93%
3	Presentation	95%

Based on the validation results by media experts in Table 1, it can be seen that Aspect 1 (aesthetics) obtained a percentage of 91% categorized as "Highly Valid." Aspect 2 (production technique) obtained 93% categorized as "Highly Valid," and Aspect 3 (presentation) obtained 95% categorized as "Highly Valid."

Table 2. Material Expert Assessment

No	Assessment Aspect	Feasibility Percentage
1	Pattern recognition	83%
2	Language development	88%
3	Understanding of basic concepts	91%
4	Simple problem solving	100%

From the results of validation by material experts (Table 2), Aspect

1 (pattern recognition) obtained 83% categorized as "Highly Valid," Aspect 2 (language development) obtained 88% categorized as "Highly Valid," Aspect 3 (understanding of basic concepts) obtained 91% categorized as "Highly Valid," and Aspect 4 (simple problem solving) obtained 100% categorized as "Highly Valid."

Table 3. Language Expert Assessment

No	Assessment Aspect	Feasibility Percentage
1	Language use	75%
2	Suitability with EYD*	75%

**EYD = Indonesian Spelling System*

Based on Table 3, the validation by language experts indicated that Aspect 1 (language use) obtained 75% categorized as "Valid," and Aspect 2 (suitability with EYD) also obtained 75% categorized as "Valid."

Graphs of Trial Results

Figure 1. Trial Results of TK Thoyyibah Sukarame Bandar Lampung Students

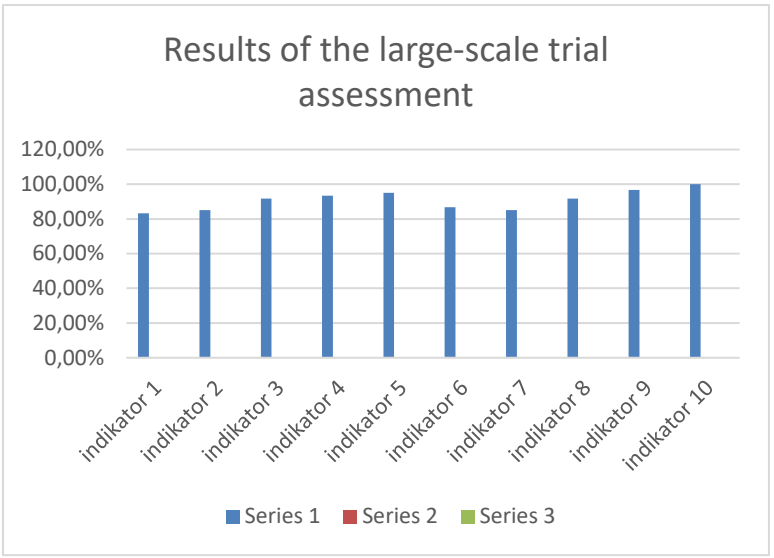
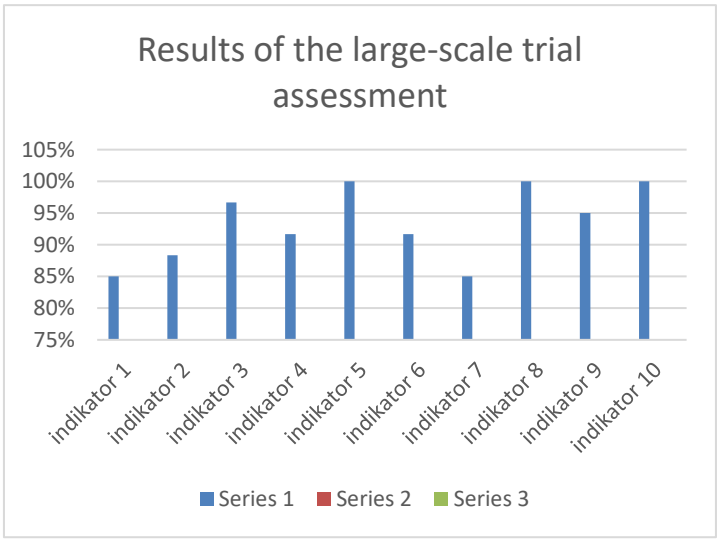


Figure 2. Trial Results of TK Bangsa Ratu Bandar Lampung Students



This study shows that Augmented Reality–based learning media equipped with audio explanations is able to increase children's learning interest and understanding of land animals. This finding is in line with

Piaget's theory, which emphasizes the importance of sensory and cognitive stimulation in children's development. Compared with previous studies that only used visual images without sound, this research integrated audio features that enhanced the effectiveness of the media, making it more attractive and easier for children to understand. This also aligns with the approach to media development that requires product validation and efficiency.

The research findings indicate that the Augmented Reality–based land animal recognition media received a "Highly Valid" category from media experts (94%) and material experts (90%), while language experts rated it "Valid" (75%). In addition, small- and large-scale trials with early childhood learners showed very high levels of attractiveness, with scores of 87.91% and 93.33%, respectively. These results confirm that Augmented Reality media is not only technically and substantively valid but also capable of increasing children's engagement and learning interest.

The increase in children's interest and comprehension through this media is consistent with Piaget's theory of multisensory stimulation in cognitive development. The combination of interactive 3D visuals and explanatory audio made it easier for children to grasp the concept of land animals. This distinguishes the present study from previous ones, which emphasized visual elements without audio support, thus limiting their effectiveness.

This research also supports the findings of Atikah et al. (2023), who demonstrated that AR can create enjoyable and interactive learning experiences. Similarly, it is consistent with Al Hasan et al. (2023), who showed that AR is effective for introducing specific objects to children in an engaging manner. Amin (2022) and Putri & Sya'bandyah (2019) also confirmed that AR-based media for animal recognition fosters children's learning interest and offers innovative digital exploration experiences. Hence, this study strengthens empirical evidence that AR is an appropriate medium to enhance the cognitive abilities of early childhood, particularly in understanding the concept of land animals.

Practically, the findings of this research provide important implications for early childhood educators. The use of AR media can serve as an innovative alternative to overcome the limitations of traditional teaching methods, which tend to be monotonous. Furthermore, this research opens opportunities for the development of similar media covering broader content, such as introducing concepts of the environment, plants, or everyday objects surrounding children.

Conclusion

Based on the results of the research and development carried out, the Augmented Reality–based learning media for introducing the concept of land animals was proven to be feasible for use in early childhood education. Validation from experts showed very good results, with scores of 94% from media experts, 90% from material experts, and

75% from language experts. The trial results, both small and large scale, also fell into the "very interesting" category, with scores above 87%. These findings indicate that the developed media is not only valid in terms of content and technical aspects but also effective in enhancing attractiveness and stimulating children's learning interest.

Furthermore, the use of Augmented Reality provides a learning experience that is more interactive, enjoyable, and aligned with the cognitive developmental needs of young children. Therefore, this media can serve as an innovative alternative for teachers in delivering learning materials more effectively and meaningfully. Future research is recommended to develop similar media with broader material coverage and more varied designs, so that it can address multiple aspects of child development and provide even more engaging and high-quality learning resources.

References

Al Hasan, M. R. S., Amrullah, A., & Widodo, T. (2023). PENGEMBANGAN MEDIA PEMBELAJARAN PENGENALAN IKAN HIAS AIR LAUT MENGGUNAKAN AUGMENTED REALITY BERBASIS ANDROID UNTUK PENDIDIKAN ANAK USIA DINI. In *Prosiding Seminar Nasional Amikom Surakarta* (Vol. 1, pp. 844-856). Retrieved from https://ojs.amikomsolo.ac.id/index.php/semnasa/article/view/36

Amin, S. N. (2022). RANCANG BANGUN APLIKASI AUGMENTED REALITY PENGENALAN HEWAN BERBASIS ANDROID SEBAGAI MEDIA PEMBELAJARAN DIGITAL UNTUK ANAK USIA DINI PADA TK (RA MIN MATARAM). *Skripsi*. Retrieved from https://eprints.unram.ac.id/30436/

Atikah, C., Rusdiyani, I., & Ridela, R. (2023). Pengembangan media pembelajaran berbasis augmented reality pada tema binatang purba untuk meningkatkan kemampuan kognitif anak usia dini kelompok b (5-6) Tahun di TK Tunas Insan Kamil Kota Serang. *JEA (Jurnal Edukasi Aud)*, *9*(2), 89-101. https://doi.org/10.18592/jea.v9i2.9326

Guslinda, & Kurnia, R. (2018). *Media pembelajaran anak usia dini*. Jakad Media Publishing.

Niningsih., Salam, A., & Ramadhan, S. (2025). Penerapan Media Pembelajaran Pengenalan Hewan Berbasis Augmented Reality Untuk Anak Usia Dini Di Tkn 26 Lelamase. *Golden Age and Inclusive Education*, *2*(1). https://doi.org/10.61798/galon.v2i1.275

Okpatrioka, O. (2023). Research and development (R&D) penelitian yang inovatif dalam pendidikan. *Dharma Acariya Nusantara: Jurnal Pendidikan, Bahasa dan Budaya*, *1*(1), 86-100. https://doi.org/10.47861/jdan.v1i1.154

Putri, A. G. M., & Sya'bandyah, F. (2019). Pembuatan Aplikasi Augmented Reality Belajar Mengenal Hewan Ternak Berbasis Android Menggunakan Unity Pada Tk Dharma Kartika. *Infotronik: Jurnal Teknologi Informasi dan Elektronika*, *4*(2), 79-83. https://doi.org/10.32897/infotronik.2019.4.2.262.

Rachim, M. R., Salim, A., & Qomario, Q. (2024). Pemanfaatan augmented reality sebagai media pembelajaran terhadap keaktifan belajar siswa dalam pendidikan modern. *Jurnal Riset Dan Inovasi Pembelajaran*, *4*(1), 594-605. **https://doi.org/10.51574/jrip.v4i1.1407**

Rahayu, S., Tresnawati, D., & Gumelar, A. (2024). Augmented Reality Bilingual Learning Pengenalan Barang dan Binatang untuk Anak TK. *Jurnal Algoritma*, *21*(1), 208–215. https://doi.org/10.33364/algoritma/v.21-1.1547

Ritonga, R. S., Syahputra, Z., Arifin, D., & Sari, I. M. (2022). Pengembangan media pembelajaran smart board berbasis augmented reality untuk pengenalan hewan pada anak usia dini. *Jurnal PG-PAUD Trunojoyo: Jurnal Pendidikan Dan Pembelajaran Anak Usia Dini*, *9*(1), 40-46.

https://doi.org/10.21107/pgpaudtrunojoyo.v9i1.13418

Silitonga, A. I., Hastuti, P., Thohiri, R., & Pulungan, A. F. (2022). Implementasi Addie Model Dalam Pengembangan E-Module Berbasis Case Method. *Sisfo: Jurnal Ilmiah Sistem Informasi*, *6*(2), 101-126. https://doi.org/10.29103/sisfo.v6i2.10298

Sopia, M Royani, Al Hasan, Ajmaluddin Amrullah, Tri Widodo, and Universitas Teknologi Yogyakarta. "Pengembangan Aplikasi Pengenalan Ikan Hias Air Laut Menggunakan Augmented Reality Berbasis Android Untuk Anak PAUD," no. November (2023): 844–56.

Waruwu, M. (2024). Metode penelitian dan pengembangan (R&D): konsep, jenis, tahapan dan kelebihan. *Jurnal Ilmiah Profesi Pendidikan*, *9*(2), 1220-1230. https://doi.org/10.29303/jipp.v9i2.2141