Volume 4 Number2(2026)
July-December2026
Page: 1957-1970

ISSN: 3031-2884
EDUJAVARE PUBLISHING
https://edujavare.com/index.php/edujavare

Implementation of Deep Learning-Based Interactive Learning Media in Strengthening the Graduate Profile Dimension (DPL) in Early Childhood Education (PAUD)

Siti Muntomimah[1], Ayu Asmah[2]

[1] PGRI Kanjuruhan University Malang, Indonesia;
[2] PGRI Kanjuruhan University, Malang, Indonesia
*muntomimah@unikama.ac.id, ayuasmah@unikama.ac.id

Article history Submitted: 2026/05/01; Revised: 2026/06/11; Accepted: 2026/09/19

Abstract

This study aims to analyze the implementation of interactive learning media based on deep learning in strengthening the graduate profile dimension in early childhood education (PAUD) in KKG Cluster 2, Pakis District, Malang Regency. This study uses a descriptive qualitative approach with data collection techniques in the form of observation, in-depth interviews, and analysis of learning documents. The results of the study indicate that the use of interactive learning media in learning based on the graduate profile dimension (DPL) is still not optimal. PAUD teachers tend to implement conventional learning with the integration of DPL values that are verbal and routine, under-utilizing media as a pedagogical mediation tool that supports deep learning. The limited understanding of teachers regarding the concept of deep learning, low pedagogical and digital literacy, and the lack of integration of interactive media such as flashcards and character puppets in learning design are the main obstacles to implementation. Nevertheless, teachers demonstrate commitment and readiness to develop innovative learning practices through the KKG forum. The research findings confirm that the use of interactive learning media has strategic potential in encouraging children's cognitive and affective involvement and strengthening the internalization of DPL character values in a contextual and meaningful manner.

Keywords Interactive Learning Media; Deep Learning; Graduate Profile Dimensions; PAUD

INTRODUCTION

Early Childhood Education (PAUD) plays a crucial role in shaping the foundation for students' cognitive, socio-emotional, moral, and character development (Sari & Malik, 2024). During this phase, children enter a golden age, which is crucial for the formation of values, attitudes, and thought patterns in subsequent stages of development (Trenggonowati & Kulsum, 2018). During early childhood, significant developmental acceleration occurs, so the educational process

needs to be directed beyond academic achievement. Education at this stage should also emphasize character building, creativity development, and strengthening life skills. This phase is seen as a crucial period in laying the foundation for lifelong learning while supporting children's holistic well-being (Sari & Malik, 2024). Therefore, the quality of PAUD learning is determined not only by academic achievement but also by a meaningful learning process that instills sustainable character values. This meaningful learning process is highly dependent on the use of interactive learning media, which is an important factor that functions as the primary means for early childhood to understand concepts and values directly according to their developmental stage, in order to prepare early childhood to face the challenges of the 21st century.

Strengthening character has become a strategic agenda of the government through policies outlined in the Graduate Profile Dimensions (DPL) initiated by the Ministry of Primary and Secondary Education (Kemendikdasmen) is a manifestation of the national education goals and a refinement of the Pancasila Student Profile dimensions. In line with the curriculum policy with an in-depth learning approach, strengthening student competencies and character is a top priority through intracurricular and co-curricular learning activities. Regulation of the Minister of Primary and Secondary Education (Permendikdasmen) Number 10 of 2025 concerning Graduate Competency Standards (SKL) states that the graduate profile dimensions (DPL) which include 8 main competencies are designed to shape the character and readiness of students in the future. The DPL includes faith and piety, citizenship, critical reasoning, creativity, collaboration, independence, health, and communication. At the PAUD level, the implementation of these values cannot be separated from the use of learning media that can mediate children's learning experiences in a concrete way, so that character values are not only conveyed normatively, but are experienced through meaningful learning activities (Rizal et al., 2022; Widyastuti, 2022).

One relevant approach to support the implementation of interactive learning media based on DPL is through a deep learning approach. Deep learning in the educational context is not interpreted as artificial intelligence technology, but rather as a learning approach that emphasizes in-depth understanding, interconnectedness between concepts, reflection, and active student involvement in the learning process. This approach encourages students to go beyond memorization, but to understand meaning, relate experiences, and build values internally. The deep learning approach requires the support of interactive learning media that allows children to explore, role-play, and simple reflection, so that the learning process does not stop at routine activities, but encourages children's cognitive and affective involvement (Dwijantie, 2025; Fatmawati, 2025; Nurlailah & Julkifli, 2025).

The implementation of interactive learning media based on DPL through a deep learning approach is highly dependent on the pedagogical competence of PAUD teachers. Teachers must not only understand the character concepts in DPL

but also be able to design, implement, and evaluate learning media that integrate character values comprehensively into children's learning activities (Meila et al., 2025). Various findings indicate that PAUD teachers still face challenges in translating the concept of interactive learning media based on deep learning into daily learning practices, particularly in selecting strategies and media appropriate to the world of children. Research by Hardiyanti & Alwi (2022) and Winarti et al. (2022) shows that the majority of PAUD educators in Indonesia still face limitations in mastering basic technology, including the use of laptops and word processing software, especially artificial intelligence-based technology. This condition is a major obstacle in utilizing digital technology to support learning, which indirectly affects teachers' ability to design lessons based on the deep learning approach. In line with these findings, an international study by Zawacki-Richter et al. (2019) revealed that the implementation of AI in education often fails to run optimally due to a lack of attention to educators' preparedness and their strategic role in learning activities. Meila et al.'s (2025) study revealed that more than 60% of early childhood education (PAUD) units in the study area, both on and off Java, lack adequate computer equipment and even have limited access to reliable internet. This digital infrastructure gap in the education sector is a global issue that demands long-term investment commitment and the formulation of appropriate and targeted policies (OECD, 2021). However, the main challenge in the context of early childhood education lies not solely in mastering advanced technology, but rather in teachers' ability to select and utilize interactive learning media that are simple, contextual, and appropriate to children's developmental characteristics.

These conditions were also found among the Early Childhood Education (PAUD) teachers who are members of the Teacher Working Group (KKG) Cluster 2 in Pakis District, Malang Regency. Although the teachers have sufficient teaching experience, the implementation of deep learning-based instruction has not been optimal. Learning oriented towards DPL values still tends to be delivered normatively and verbally, and has not been integrated into meaningful, exploratory, and reflective play activities. Furthermore, the use of learning media that supports the internalization of DPL values, such as creativity, independence, and critical reasoning, is still limited. This condition indicates that the main problem is not only related to the availability of learning media, but also to the pattern of media utilization, which has not been optimally directed to support deep learning-based learning and strengthen the values of the graduate profile dimensions.

Teachers' limited conceptual understanding of deep learning and their lack of skills in integrating DPL values into learning activities are contributing factors to this situation. However, the use of a deep learning approach supported by appropriate learning media, such as character flashcards and character puppets, has the potential to help teachers package character-based learning in a more concrete, contextual way, and in accordance with the characteristics of early childhood. These media enable children to learn through stories, role-playing, and social interactions, so that

character values are not only introduced but also directly experienced (Margaretha et al., 2024). However, research specifically examining DPL-based learning through deep learning for early childhood teachers is still relatively limited, particularly in the context of teacher working groups at the local level. Most studies focus more on elementary and secondary education levels, thus not fully reflecting the challenges and needs of implementation in early childhood education.

Based on the description, this study aims to analyze the implementation of interactive learning media oriented to the values of the graduate profile dimensions based on deep learning in PAUD teachers who are members of KKG Gugus 2, Pakis District. This study is expected to provide an overview of teacher understanding, the applied learning media practices, and the challenges faced in integrating interactive learning media based on DPL through a deep learning approach, so that it can become the basis for developing higher quality PAUD learning and oriented towards character building of children from an early age.

METHODS

This research uses a qualitative approach with a case study design, because it focuses on the implementation and utilization of interactive learning media such as flashcards, character puppets, and visual media in supporting deep learning-based learning in Strengthening Graduate Profile Dimensions (DPL). The case study was chosen because it allows researchers to understand in depth the context, process, and dynamics of the use of interactive learning media based on deep learning applied by PAUD teachers in the Teacher Working Group (KKG) Gugus 2 community environment of Pakis District, which has certain characteristics and learning conditions.

The research subjects consisted of PAUD teachers who actively participated in the KKG Cluster 2 activities in Pakis District and were involved in the planning and implementation of learning that integrated DPL values. The selection of subjects was carried out by purposive sampling by considering the teachers' involvement in the use of interactive learning media and its relevance to the research focus. The object of this research is the practice of utilizing interactive learning media in the PAUD learning process, which includes teachers' understanding of the DPL concept and the deep learning approach, the forms and patterns of learning media use, and the challenges faced in integrating these media into early childhood learning activities.

Data collection was conducted through in-depth interviews, observations, and documentation studies. In-depth interviews were used to explore teachers' understanding of the DPL concept, the deep learning approach, and their experiences in designing and utilizing interactive learning media. Observations were conducted to obtain a direct overview of the use of interactive learning media in learning activities, both in the context of KKG activities and learning practices in

PAUD units. Documentation studies included a review of teaching modules, learning tools, examples of media used, KKG activity minutes, and other supporting documents relevant to the implementation of DPL-based learning.

Data analysis was conducted thematically using an interactive analysis model (Miles et al., 2014), which includes data reduction, data presentation, and conclusion drawing and verification. Data obtained from various sources were analyzed continuously to identify key themes related to the use of interactive learning media, DPL-based learning practices through a deep learning approach, and the challenges of its implementation in the context of early childhood education (PAUD).

FINDINGSAND DISCUSSION

Pakis District has a Teacher Working Group (KKG) Cluster 2, which oversees several early childhood education units, including Muslimat NU Kindergartens 1, 3, 4, 11, 15, 17, 22, and 31, as well as Adawiyah Kindergarten and Akademika Kindergarten. This KKG serves as a professional collaboration space for PAUD teachers to design, discuss, and reflect on the use of learning media, particularly interactive learning media oriented towards strengthening the character of early childhood. In general, teachers in these institutions are highly dedicated and have considerable experience in teaching early childhood. However, initial observations indicate that the use of interactive learning media in PAUD learning practices is still limited. This learning pattern does not optimally encourage children's involvement in critical, exploratory, and reflective thinking processes, which are the main characteristics of deep learning-based learning. This condition indicates a gap between teachers' teaching experience and the use of interactive learning media in DPL-based learning through a deep learning approach.

The results of the study indicate that the understanding of PAUD teachers in KKG Cluster 2, Pakis District, regarding the deep learning approach in relation to the use of interactive learning media is still relatively low. Most informants do not yet fully understand the concept of deep learning in the context of early childhood education, especially in relation to the role of media as a means of exploring values and meaningful learning experiences. This approach is still perceived as a new concept that is not yet fully understood both in terms of pedagogical principles and its application through learning media. Teachers also experience difficulties in linking the deep learning approach with strengthening the character of DPL through the use of media. The integration of DPL values in learning has not been carried out systematically through media-based activities, but is still limited to the explicit introduction of values through routine activities without the support of a process of

reflection and in-depth exploration.

Observations show that DPL-based learning in the KKG Cluster 2 environment in Pakis District is generally carried out through daily habits and activities, such as praying, singing, following class rules, and simple thematic activities, with limited use of learning media. These practices contribute to the formation of children's basic attitudes, but do not fully reflect contextual and reflective media-based learning. Learning media has not been optimally utilized to help children connect character values with real-life experiences. Teachers still experience difficulties in designing media-based activities that encourage value exploration and reflection with children. This condition is reflected in teacher discussion and reflection activities in the KKG forum, as shown.

This study found that limited learning media and resources are one of the main obstacles in implementing interactive learning media based on deep learning in strengthening character formation in DPL values. Learning media such as character puppets, flashcards, educational props, and supporting books are not yet adequately available in most PAUD institutions that are members of the KKG Cluster 2 in Pakis District. This limitation has resulted in a lack of interactive and contextual learning experiences. Although some teachers have used puppets and flashcards in learning, their utilization has not been optimal to support character strengthening. Media is more often used as a visual aid to attract children's attention or introduce vocabulary, rather than as an interactive medium for exploring values through stories, role-playing, or discussion. As a result, learning-based still relies more on verbal methods, while strengthening the affective and psychomotor domains through concrete experiences is still limited. In fact, the implementation of learning using flashcards and character puppets in the deep learning approach in early childhood education does not only focus on academic teaching, but also on holistic character development.

One way to implement learning using flashcards and character puppets in a deep learning approach to early childhood education that also plays a role in holistic character development is by integrating DPL values in exploration and reflection-based learning as shown in table 1 below.

Table 1. Application of DPL Character Values in Deep Learning through Flash Cards and Character Puppets

DPL Character Values	Application of Flashcards and Character Dolls in Deep Learning
Divinity and Piety	introduced through puppet stories that show attitudes of prayer, gratitude, and helping each other, so that children learn moral and

DPL Character Values	Application of Flashcards and Character Dolls in Deep Learning
	spiritual values in a concrete way.
Citizenship	instilled through flashcards with pictures of national figures, flags, and traditional clothing, so that children know and love the diversity of Indonesian culture.
Critical Reasoning	Through flashcards on the theme of diversity, children are invited to analyze the causes of problems and find solutions that respect differences.
Creativity	through activities such as drawing characters or creating stories from flashcards, which stimulate imagination and innovation
Collaboration	designing stories together or playing puppet shows, practicing communication and cooperation
Independence	developed through role-playing activities using puppets, where children make their own decisions and complete simple challenges
Health	Through character puppets, discussion stimuli are provided about the causes of stomach aches, encouraging children to understand the logical relationship between cleanliness and physical health.
Communication	Through flashcards with pictures of various emotions (happy, sad, angry), children are used to choose and show their feelings to character dolls, practicing the ability to identify and convey emotional states (effective communication).

Figure 1. Implementation of interactive media in strengthening DPL

The use of interactive, deep learning-based learning media to strengthen DPL demonstrates conceptual alignment with the Sustainable Development Goals (SDGs), particularly the fourth goal, "Quality Education." Learning media serves as a

pedagogical instrument that enables the contextual internalization of character values from an early age. Examples of learning media used by teachers in their teaching practices can be seen in Figure 2.

Figure 2. Interactive Learning Media in Early Childhood Education Learning Practices

Analysis of lesson planning documents indicates that teachers experience difficulties in designing reflective and exploratory activities based on interactive learning media. The Daily Learning Implementation Plans (RPPH) tend to be linear and tightly structured, so media such as flashcards and character puppets are only included as aids, not as centers for value exploration and reflection activities. Teachers are not yet accustomed to designing open-ended questions or media-based play scenarios that stimulate critical thinking in children and help connect learning experiences with DPL values.

The educational background of teachers, most of whom hold a Diploma 2 or Bachelor's degree in Early Childhood Education (PAUD), has not been matched by adequate access to innovative pedagogical training that emphasizes the design and use of interactive learning media. The training teachers receive is still dominated by technical-administrative aspects, thus not equipping them with the competencies to integrate media, both conventional and digital, into DPL-based learning. This condition is exacerbated by the low digital literacy of some teachers, which limits the development and meaningful use of technology-based learning media. As a result, the use of digital media and technology in DPL-based learning remains very limited.

Although early childhood education teachers demonstrate a commitment to professional development, interviews indicate that this commitment has not yet been fully translated into the systematic use of interactive learning media. Most teachers still need guidance in utilizing media as a pedagogical tool integrated with a deep learning approach, rather than simply a visual aid. The KKG forum serves as a strategic space for transforming this professional commitment into more reflective

and meaningful media-based learning practices.

The results of this study reveal that the policy of strengthening the Pancasila Education Program (DPL) has not been accompanied by a clear implementation strategy, particularly in the provision and utilization of interactive learning media as a means of internalizing values in early childhood. This finding aligns with the study by Cahyaningrum and Diana (2023), which shows that the Pancasila strengthening project in early childhood education is still in its early stages and requires more comprehensive support, particularly in improving teacher capacity and providing relevant learning materials. Conceptually, character education in early childhood is ineffective if positioned as a stand-alone subject; it must be integrated into all daily learning activities (Wiyani, 2013). This situation emphasizes the need for a more holistic and sustainable implementation strategy for strengthening the Pancasila Education Program (DPL).

Furthermore, this study found that most early childhood education (PAUD) teachers still employ a transmissive learning approach, where DPL values remain a priority in shaping children's character. Learning experiences involving DPL are not fully correlated with activities that can build children's knowledge. This learning pattern indicates that character education is still understood as a process of transferring values, rather than as a process of constructing meaning. Effective character education, however, demands an approach rooted in meaningful learning experiences, not simply the delivery of normative information (Nurhadi & Izzuddin, 2025). Meaningful learning positions children as active subjects involved in the process of exploration, reflection, and construction of understanding of values. The intervention in this study, through the use of interactive media such as flashcards and character puppets, is aimed at encouraging a shift in learning practices from a passive approach to more substantial learning engagement (Abdullah & Sadiah, 2025; Nurhadi & Izzuddin, 2025).

Learning media is a crucial factor in supporting the internalization of values in early childhood. Research by Novitasari et al. (2023) revealed that the use of flashcards that visualize DPL values allows children to recognize value concepts concretely and repeatedly, thus facilitating understanding. Meanwhile, Anggraini & Putri (2019) demonstrated that role-playing activities mediated by character puppets, including kamishibai and simple wayang puppets, provide space for children to explore socio-emotional aspects through embracing specific roles. Learning media designed according to the context and developmental stage of children have proven more effective in instilling character values than conventional, verbalistic approaches (Darihastining et al., 2020).

The results of this study can also be explained through the perspective of Vygotsky's cognitive development theory, which emphasizes that learning occurs optimally when children are in the zone of proximal development (ZPD), a condition in which children can develop their abilities with the help of adults or more competent peers (Vygotsky, 1978). In the context of early childhood character

education, the principle of scaffolding is realized through the use of interactive learning media, such as flashcards and character puppets, which function as pedagogical mediation tools. This media allows teachers to gradually guide children in building an understanding of values through social interactions and meaningful play experiences. The scaffolding approach applied consistently in this study indicates an indication of contributing to a deeper understanding of values according to teacher perceptions and learning observations (Carranza-Pinedo & Diprossimo, 2025; Lei & Bakar, 2025; Rahman, 2024).

Furthermore, this study uses the new pedagogies for deep learning framework operationalized through the use of interactive learning media as a means of active child involvement. The integration of character puppets and flashcards allows for the creation of more meaningful learning relationships through value exploration, reflective discussions, and contextualized direct experiences. The implementation of deep learning in this study is realized through the integration of direct experiences using character puppets and flashcards, reflective discussions, and value exploration in the context of children's daily lives in line with (Kurniawati et al., 2025; Rahmat et al., 2025). The results of the study indicate that this approach is able to encourage children's cognitive and affective engagement more comprehensively.

The successful implementation of character education in Early Childhood Education (DPL) through deep learning is also significantly influenced by the quality of teacher professional development. This study identified that one-time, informative training is insufficient to generate sustainable changes in learning practices. This finding is reinforced by the study by Aprilia et al. (2025), which emphasized that teacher professional development will be more effective if carried out sustainably, collaboratively, and integrated within a real-life teaching context. Therefore, mentoring programs and collective reflection within the KKG forum need to be strengthened as a strategy for developing early childhood teachers' professional development. Furthermore, this study also found that the digital literacy level of early childhood teachers in the research cluster needs to be improved. The use of technology as a learning medium remains limited, even though the digital environment offers various opportunities for innovation in early childhood education. The results of research by Novitasari & Fauziddin (2022) indicate that the digital literacy of early childhood educators is generally below expected standards, particularly in the development and use of digital learning content. Similar findings were presented by Putra et al. (2023), who identified a positive relationship between digital literacy and teacher pedagogical competence. This shows that improving digital competency is an important agenda in the professional development of PAUD teachers and requires a planned and sustainable training program.

This study has several limitations that require attention. The limited scope of the study to the Group 2 Teacher Training Group (KKG) in Pakis District, Malang Regency, means the results cannot be directly generalized to a broader context.

Furthermore, the relatively short duration of the intervention limits the study's ability to measure the long-term impact of the use of deep learning-based interactive learning media in strengthening DPL. This study also used a qualitative-descriptive approach, so the causal relationship between the intervention and learning outcomes cannot be confirmed empirically. Therefore, further research is recommended using an experimental design with a broader scope and involving the measurement of children's character development in the medium to long term.

CONCLUSION

The results of the study indicate that interactive learning media based on deep learning in strengthening DPL in the KKG Cluster 2 environment in Pakis District has not been optimally implemented. Early childhood education is still dominated by conventional approaches, where DPL values are mostly conveyed verbally and through routine habits, without the support of media that can facilitate children's learning experiences in a reflective, exploratory, and contextual manner. Teachers' limited conceptual understanding of deep learning, difficulties in designing reflective activities, and the lack of integration of interactive learning media such as flashcards and character puppets into learning designs are the main factors hindering the internalization of DPL values. Learning media in existing practices is still positioned as an aid, not as a pedagogical mediation that directs children's cognitive and affective engagement. Nevertheless, the commitment and openness of early childhood teachers to develop innovative learning practices through the KKG forum indicates strong potential for strengthening the implementation of DPL-based learning. This potential can be optimized through ongoing professional mentoring that emphasizes the development of interactive media-based learning designs, improving teachers' pedagogical and digital literacy, and providing learning media that explicitly supports meaningful deep learning in early childhood education.

REFERENCES

Abdullah, MS, & Sadiah, E. (2025). The role of digital multimedia in character education at elementary schools. The Journal of Academic Science, 2(3), 811–822. https://doi.org/10.59613/3tby5722

Anggraini, W., & Putri, AD (2019). Application of Role Playing Method in Developing Cognitive Skills of 5-6 Year Old Children. JECED: Journal of Early Childhood Education and Development, 1(2), 104–114. https://doi.org/10.15642/jeced.v1i2.466

Aprilia, EF, Wulan, S., & Nurjannah, N. (2025). Trends and Challenges in the Professional Development of Early Childhood Education Educators: A

Literature Review. Murhum: Journal of Early Childhood Education, 6(1), 1257–1274. https://doi.org/10.37985/murhum.v6i1.1384

Carranza-Pinedo, V., & Diprossimo, L. (2025). Scaffolding and individuality in early childhood development. Topoi, 44(2), 491–503. https://doi.org/10.1007/s11245-024-10155-3

Darihastining, S., Aini, SN, Maisaroh, S., & Mayasari, D. (2020). The Use of Audio-Visual Media Based on Local Cultural Wisdom in Early Childhood. Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 5(2), 1594–1602. https://doi.org/10.31004/obsesi.v5i2.923

Dwijantie, JS (2025). Deep Learning Approach in Early Childhood Education: Building Deep Understanding for Early Childhood. Edukasiana: Journal of Educational Innovation, 4(3), 1238–1246. https://doi.org/10.56916/ejip.v4i3.1666

Fajri, N., & Rivauzi, A. (2022). Character Building for Students Through Classroom-Based Character Education. Jurnal Eduscience, 9(1), 134–142. https://doi.org/10.36987/jes.v9i1.2548

Fatmawati, I. (2025). Transforming History Learning with Digital-Based Deep Learning for Gen Z. Revorma: Journal of Education and Thought, 5(1), 25–39. https://doi.org/10.62825/revorma.v5i1.140

Hardiyanti, WE, & Alwi, NM (2022). Analysis of Early Childhood Education Teachers' Digital Literacy Skills during the COVID-19 Pandemic. Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 6(4), 3759–3770. https://doi.org/10.31004/obsesi.v6i4.1657

Kurniawati, AB, Haenilah, EY, Nawangsasi, D., Syafrudin, U., & Pradini, S. (2025). Training in Designing Deep Learning-Based Learning for Early Childhood Education Teachers. BERBAKTI: Journal of Community Service, 2(1), 43–49.

LS Vygotsky, M. C. (1978). Mind in Society: Development of Higher Psychological Processes. LS Vygotsky, Michael Cole.

Lei, W., & Bakar, K. A. (2025). Language scaffolding strategies based on Vygotsky's zone of proximal development in early reading education: A cross-cultural comparison. Forum for Linguistic Studies, 7(6), 967–984.

Margaretha, R., Marshanda, E., & Sulistiana, H. (2024). Improving Early Childhood Character Through Outdoor Learning at RA Al-Biruni. JUPENSAL*: Journal of Universal Education*, 1(2), 182–190.

Meila, VEF, Sarah, RN, & Hardiana, A. (2025). Towards Adaptive Learning in Early Childhood Education: Challenges of Implementing Deep Learning in the Indonesian Context. Tunas Cendekia: Journal of Early Childhood Education Study Program, 8(2), 93–101. https://doi.org/10.24256/tunascendekia.v8i2.7258

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). Qualitative Data Analysis: A Methods Sourcebook. SAGE Publications.

Novitasari, N., Alfatur Rosyida, E., Maslakah, S., Azkiyya, C., & Shofiyana, A. (2023). Flashcard Making Training to Develop Early Childhood Education Teachers' Creativity in Teaching. Murhum: Journal of Early Childhood Education, 4(1),

245–258. https://doi.org/10.37985/murhum.v4i1.142

Novitasari, Y., & Fauziddin, M. (2022). Analysis of Digital Literacy of Educators in Early Childhood Education. Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 6(4), 3570–3577. https://doi.org/10.31004/obsesi.v6i4.2333

Nurhadi, MDA, & Izzuddin, DA (2025). Implementation of character education through experiential learning program in Society 5.0 era. Journal of Transformative Pedagogies on Multidisciplinary Education, 1(2), 10–13.

Nurlailah, N., & Julkifli, J. (2025). Deep Learning Strategy in Developing Critical Reasoning Character Based on Pancasila Student Profile. DIKSI: Journal of Educational and Social Studies, 6(2), 273–278. https://doi.org/10.53299/diksi.v6i2.2120

OECD. (2021). OECD Digital Education Outlook 2021: Pushing the Frontiers with Artificial Intelligence, Blockchain and Robots. OECD Publishing.

Putra, AE, Rohman, MT, Linawati, L., & Hidayat, N. (2023). The Influence of Digital Literacy on Teachers' Pedagogical Competence. Murhum: Journal of Early Childhood Education, 4(1), 201–211. https://doi.org/10.37985/murhum.v4i1.185

Rahman, L. (2024). Vygotsky's zone of proximal development of teaching and learning in STEM education. International Journal of Engineering Research & Technology, 13(8), 389–394. https://doi.org/10.5281/zenodo.18137951

Rahmat, M., Rohmatin, A., Nurfadilah, SS, Mulyati, E., Rohimah, S., Wawan, C., & Latipah, L. (2025). Strengthening Early Childhood Conceptual Abilities through the Deep Learning Approach at Al-Fathanah Early Childhood Education. Educational Innovation and Early Childhood, 2(4), 117–127. https://doi.org/10.61132/inpaud.v2i4.766

Rizal, M., Najmuddin, N., Iqbal, M., Zahriyanti, Z., & Elfiadi, E. (2022). Competence of Early Childhood Education Teachers in Implementing the Pancasila Student Profile in Driving Schools. Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 6(6), 6924–6939. https://doi.org/10.31004/obsesi.v6i6.3415

Sari, PN, & Malik, LR (2024). Implementation of P5 Project-Based Learning in Early Childhood Education. PrimEarly: Journal of Elementary and Early Childhood Education Studies, 7(2), 267–277. https://doi.org/10.37567/primearly.v7i2.3383

Sari, WN (2021). Character Education through Social Studies Learning. PESHUM: Journal of Education, Social and Humanities, 1(1), 10–14. https://doi.org/10.56799/peshum.v1i1.6

Trenggonowati, DL, & Kulsum, K. (2018). Analysis of Optimizing Factors for the Golden Age of Early Childhood: A Case Study in Cilegon City. Journal of Industrial Services, 4(1). https://doi.org/10.36055/jiss.v4i1.4088

Widyastuti, A. (2022). Implementation of the Pancasila Student Profile Strengthening Project in the Early Childhood Education Independent Curriculum. Referen, 1(2), 189–203. https://doi.org/10.22236/referen.v1i2.10504

Winarti, W., Nurhayati, S., Rukanda, N., Musa, S., Jabar, R., & Rohaeti, EE (2022). Analysis of Early Childhood Education Teachers' Digital Competence in

Managing Online Learning for Early Childhood. Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 6(6), 5621–5629. https://doi.org/10.31004/obsesi.v6i6.3111

Zawacki-Richter, O., Marín, VI, Bond, M., & Gouverneur, F. (2019). Systematic Review of Research on Artificial Intelligence Applications in Higher Education. International Journal of Educational Technology in Higher Education, 16(1). https://doi.org/10.1186/s41239-019-0171-0