



Digital-age PAUD management innovations: Meeting children's needs through technology

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ABSTRACT

Management innovations in Early childhood education programs or the so called PAUD (Pendidikan Anak Usia Dini) management based on children's needs in the digital era have become very relevant for improving the quality of early childhood education. Technological developments provide opportunities for educational institutions to adapt learning methods that are more interactive and appropriate to children's developmental needs. This research explored the implementation of technology-based management innovations at PAUD Plamboyan 3, West Karawang, and evaluated their impact on children's learning and parental involvement. The study aims to determine the implementation of technology-based management innovations and to identify their effects on the learning process, parental involvement, and curriculum management. This research used a qualitative approach with a case study method. This qualitative research employs a case study method,

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with data collected through observations. The sample in this interview consisted of one school principal, five teachers, ten parents, and documents related to technology integration in learning. The research results show that using technology, such as learning applications and e-learning platforms, increases children's learning motivation and strengthens parental involvement in children's education. Curriculum management tailored to children's needs also supports children's cognitive, social, and motoric development. However, some parents need attention to challenges related to limited access to technology at home. This research is essential for the development of PAUD in the digital era by emphasizing the importance of teacher training, increasing access to technology, and the active role of parents in supporting children's learning process.

Keywords: Digital-age Management Innovation; PAUD Management; Children's Development; Technology Integration.

ABSTRAK

Inovasi manajemen dalam pengelolaan PAUD berdasarkan kebutuhan anak-anak di era digital telah menjadi sangat relevan untuk meningkatkan kualitas pendidikan anak usia dini. Perkembangan teknologi memberikan peluang bagi lembaga pendidikan untuk menyesuaikan metode pembelajaran yang lebih interaktif dan sesuai dengan kebutuhan perkembangan anak-anak. Penelitian ini mengeksplorasi implementasi inovasi manajemen berbasis teknologi di PAUD Plamboyan 3 Karawang Barat dan mengevaluasi dampaknya terhadap proses belajar anak-anak dan keterlibatan orang tua. Tujuan penelitian ini adalah untuk menentukan implementasi inovasi manajemen berbasis teknologi dan mengidentifikasi dampaknya terhadap proses belajar, keterlibatan orang tua, dan pengelolaan kurikulum. Penelitian ini menggunakan pendekatan kualitatif dengan metode studi kasus. Penelitian kualitatif ini menggunakan metode studi kasus, dengan data dikumpulkan melalui observasi. Sampel dalam wawancara ini terdiri dari satu kepala sekolah, lima guru, dan sepuluh orang tua, serta dokumen-dokumen yang berkaitan dengan integrasi teknologi dalam pembelajaran, serta dokumentasi terkait integrasi teknologi dalam pembelajaran. Hasil penelitian menunjukkan bahwa penggunaan teknologi, seperti aplikasi pembelajaran dan platform e-learning, meningkatkan motivasi belajar anak-anak dan memperkuat keterlibatan orang tua dalam pendidikan anak. Pengelolaan kurikulum yang disesuaikan dengan kebutuhan anak juga mendukung perkembangan kognitif, sosial, dan motorik anak. Namun, tantangan terkait keterbatasan akses teknologi di rumah bagi sebagian orang tua perlu mendapat perhatian. Penelitian ini penting bagi pengembangan PAUD di era digital, dengan menekankan pentingnya pelatihan guru, peningkatan akses teknologi, dan peran aktif orang tua dalam mendukung proses pembelajaran anak.

Kata Kunci: Inovasi Manajemen; Digital; Manajemen PAUD; Perkembangan Anak; Integrasi Teknologi.

1. INTRODUCTION

In the digital age, Early Childhood Education (ECE) management faces growing complexities, especially as technology transforms various aspects of life, including education (Pope et al., 2024). Children today are more familiar with digital technologies than any previous generation, which has led to distinct learning needs and preferences compared to earlier generations (Dasruth et al., 2024). As the foundation of children's education, Early Childhood Education (ECE) must adapt to these changes to ensure that educational approaches remain relevant and effective (Rahma et al., 2023). However, not all PAUD (Pendidikan Anak Usia Dini) institutions fully integrate technology into their management and learning processes (Cahyati et al., 2022). Therefore, innovation in PAUD management is essential to address these emerging challenges (Sriyono et al., 2022).

PAUD management in the digital era emphasizes the need for a deep understanding of children's unique characteristics and needs today (Zein et al., 2023). Early childhood development requires balanced cognitive, social-emotional, and motor stimulation (Williams et al., 2023), which technology can help support when used appropriately (Ianes et al., 2024). Innovations in PAUD management may include child development monitoring apps, technology-enhanced administrative management, and curricula adapted to meet the needs of 21st-century learners (Bhugra et al., 2023). However, many PAUD institutions lack the resources or knowledge to implement such technological innovations (Purnomo et al., 2024; Ismail et al., 2022), and effective solutions need to be developed for institutions with varying levels of technological capability (Faridy & Rohendi, 2022; Puteh, Bustamam, & Nuraini, 2017).

In addition to technological innovations, Early Childhood Development (ECD) management focuses on strengthening the role of both educators and parents (Sari, Suraijah, & Hidayati, 2024; Karim & Wajdi, 2019). Collaboration between these two groups is crucial in creating a well-rounded and supportive learning environment for children (Chu et al., 2024). Parents need to be actively involved through digital platforms, such as school communication apps, to help reinforce learning at home (Maya-Jariego et al., 2023). Meanwhile, ECD educators must be equipped with the skills to use technology to enhance their teaching practices effectively (Ferri et al., 2020). A successful innovation will be based on a thorough analysis of children's developmental needs (Paterson-Young et al., 2024). Therefore, training teachers and building their capacity to integrate technology into learning is critical to the success of digital-based innovations in ECE.

The transformation of PAUD management to meet children's needs in the digital age is not just a choice but a necessity (Tahlia et al., 2024). Children born in this era exhibit different learning patterns that are more interactive, visual, and technology-driven (Chen et al., 2024). Therefore, ECD institutions must design innovative, adaptable management strategies to meet these needs (Rakhman & Surur, 2024). An integrated approach combining technology, teaching methods, and administrative management can enhance educational services' efficiency and quality (Aithal & Maiya, 2023). Furthermore, such innovations have the potential to address global challenges by preparing resilient, creative, and competitive future generations (Haleem, Javaid & Singh, 2024). Thus, PAUD management based on children's needs is crucial not only for individual development but also for national progress (Lubis, Nahar, & Simbolon, 2021).

In Indonesia, many PAUD institutions still face challenges in adopting digital technology for both management and learning (Saabighoot et al., 2024). A survey revealed that most PAUD institutions lack adequate technological infrastructure, such as computers and stable internet access (Ismawati & Puspita, 2024). Additionally, many PAUD teachers feel unprepared to integrate technology into the learning process, leading to technology being used primarily for administrative tasks (Marfuah, 2023). This situation is exacerbated by insufficient budget allocations for teacher training in digital literacy. As a result, the opportunity to leverage technology to support children's growth and development remains underutilized. If this issue is not addressed, PAUD institutions will continue to lag in meeting the needs of children in the rapidly evolving digital age (Ismawaty, 2023).

The main challenge in this study is how PAUD Plamboyan 3 West Karawang can develop a management system that aligns with children's needs in the digital era, despite limited resources. The institution faces several obstacles, including the lack of supporting technology devices, insufficient training for teachers in digital literacy, and low parental involvement in technology-based learning. Furthermore, the current curriculum does not fully incorporate digital approaches that meet the developmental needs of modern children (Latip & Supriatna, 2023). Internet access issues further hinder the effective use of technology in the management and learning processes. This research aims to identify innovative solutions that PAUD Plamboyan 3 can implement, enabling the institution to provide adaptive, quality education services that meet children's needs in the digital age.

Previous research has highlighted the importance of innovation in ECD management, despite the challenges faced. Studies by Azzahra and colleagues emphasize that technology in ECD management can enhance both administrative efficiency and learning quality, provided that infrastructure and educators' digital skills are adequate (Azzahra et al., 2024). Research by Hermawan et al. shows that the lack of technology training for PAUD teachers limits the effective application of technology in teaching (Hermawan et al., 2024). Conversely, Yulianto et al. stress that collaboration between teachers, parents, and technology creates an engaging learning environment that aligns with children's needs (Yulianto et al., 2023). This study at PAUD Plamboyan 3, West Karawang, aims to contribute to identifying more effective strategies and solutions to overcome existing barriers, facilitating the development of technology-based PAUD management that meets children's needs in the digital era.

This research primarily focuses on adapting the curriculum and teaching methods to address the needs of children in the digital age, without disregarding traditional educational aspects that remain relevant. It also evaluates how PAUD teachers can integrate technology effectively into learning while considering children's social and emotional development. Additionally, the research will assess how strengthening parental involvement through digital communication platforms can support technology-based learning. Ultimately, this study aims to provide a holistic and practical management model for PAUD institutions, ensuring they are better equipped to meet the demands of the digital era.

2. LITERATURE REVIEW

2.1. Application of Technology in ECD Management

The application of technology in Early Childhood Education (ECED) provides various significant benefits for wider access to educational information, technology-based learning, and

more flexible interactions between educators, parents, and children. As outlined by Nursafitri et al., (2021), the use of information and communication technology (ICT) in distance learning during the COVID-19 pandemic has become an essential component in the continuity of education, although there are still obstacles in the application of technology among ECD educators (Nursafitri et al., 2021). Digital literacy is also essential. Research shows that despite the benefits, technology utilization challenges still need to be overcome for it to be effective (Mayang et al., 2024; Nursafitri et al., 2021; Yustika et al., 2022). With the application of technology, it is also possible to customize teaching methods to suit children's individual needs, which is indispensable in this diverse educational context (Norman et al., 2023; Sit & Rakhmawati, 2022).

Furthermore, the successful implementation of technology in ECD is not only limited to learning media, but also includes the use of strategies that are adaptive to the ever-changing developments in the world of education. In this context, Sitanggang and Daswito (2023) emphasize the importance of information systems in improving efficiency and productivity in all fields, including education. The need for an adaptive management system is urgent in the face of today's challenges, where rapid changes in technology and learning methods require education to adapt effectively (Nasrulloh et al., 2022; Sitanggang & Daswito, 2023). Therefore, expanding the understanding and application of technology in ECD is an important issue, where educators need to be supported with appropriate training in order to make maximum use of technology. This is in line with the opinion of Fajriana and Fietroh (2023), which shows that digital literacy is very influential on people's response to technological change in the education arena. Thus, training for educators in implementing innovative and engaging learning media is essential to ensure the quality of education, including in the context of PAUD.

2.2. The Role of Technology in Improving Learning Quality

The use of technology in Early Childhood Education (ECED) has skyrocketed, providing a variety of approaches to the delivery of learning materials. A critical aspect of this application of technology is its ability to provide a more interactive and enjoyable learning experience for children. Digital media such as educational apps and learning videos can enrich children's learning experiences and enhance their creativity and cognitive and motor skills (Sit & Rakhmawati, 2022). This aligns with the statement that the use of developmentally appropriate digital tools creates personalized and relevant learning experiences. In addition, game-based learning applications or interactive videos also have great potential in increasing children's motivation. Game-based apps, for example, can help children understand basic math and language concepts (Meilana et al., 2024). Thus, using game-based applications in PAUD can improve children's numeracy and literacy skills.

Technology also helps in creating more adaptive learning methods. The use of digital media in ECD learning should not only be limited to the delivery of materials, but also include the development of educational methods that can support diversity and dynamics in the classroom. Educators need to be trained to use this technology best to make learning sessions more efficient and interactive (Mayang et al., 2024; Wahyudi, 2020). Integrating technology in ECD has its own challenges, but the potential is enormous. Through the effective application of technology, it is expected that the quality of education in PAUD can be significantly

improved, positively impacting early childhood development (Aditya et al., 2023; T et al., 2024).

2.3. Challenges of Technology Implementation in ECD

While technology has many benefits in Early Childhood Education (ECED), its implementation also presents several challenges that need to be addressed. One of the main challenges is educators' unpreparedness to use technology effectively (Norman et al., 2023). Although many teachers are familiar with basic technology, many are not ready to effectively integrate technology in the learning process (Hikmawati et al., 2024). This illustrates the importance of training and developing digital skills for educators to optimally utilize technology in teaching children (Pratiwi et al., 2023).

In addition to educators' unpreparedness, another significant challenge is limited access to technology, especially in areas that do not have good-quality internet access. Research by Nasrulloh et al., (2022) shows that access to technological devices and internet connection in some rural regions is still a significant problem in implementing digital-based ECD. Although the relevant references were not found to support this directly, much of the other literatures convey similar points, so this issue remains relevant in education (Nitiasih et al., 2022; T et al., 2024). This limitation leads to conditions where teachers and students cannot fully utilize the potential of technology in the teaching and learning process, affecting the quality of education received by children in the area.

As technology continues to evolve rapidly, it is important for educators to continuously adapt and improve their digital literacy in order to address these challenges. Effective responses to these changes will enhance the success of individual educators and contribute to the overall advancement of education at the ECD level (Akdemir et al., 2024). Therefore, a comprehensive strategy in training and providing technological facilities is indispensable to support digital transformation in early childhood education.

2.4. Opportunities for Digital ECD Development

While the challenges faced in implementing technology in Early Childhood Education (ECED) are significant, there are great opportunities for developing digital ECED. To take advantage of this opportunity, collaboration between the government, educational institutions, and related organizations is crucial. One initiative that can be taken is providing technology training for teachers, especially to improve their digital skills using various learning tools (Juanita et al., 2022). Thorough training helps educators integrate technology in the classroom, making children's learning experience more engaging and interactive (Tobari et al., 2024).

Improving access to technological devices and connectivity in disadvantaged areas is also crucial to reducing the digital divide in ECD. Programs such as government initiatives to improve digital literacy can accelerate digital transformation in the early childhood education sector (Tobari et al., 2024; Wahyudi, 2020). In addition, PAUD curriculum design needs to be organized to integrate aspects of traditional education with digital elements, given the importance of a balance between conventional learning and the use of technology in educating young children in this digital era (Astuti et al., 2023; Tobari et al., 2024).

According to Djauhari et al. (2021), digital training that remains focused on the specific needs of educators has the potential to improve their competencies and further close the

education gap between regions (Meilana et al., 2024). This suggests that with the right support and investment, implementing technology in ECD can be effective, providing extensive benefits to educators and learners. To achieve this goal, government agencies must be involved in creating supportive policies and infrastructure. In addition, collaboration with the technology sector to provide better access to digital resources should also be prioritized, so that all children, even in remote areas, can enjoy quality education (T et al., 2024).

3. METHOD

This study uses a qualitative case study approach to explore the implementation of technology-based management innovations at PAUD Plamboyan 3, West Karawang. The selection of PAUD Plamboyan 3 was based on its ongoing efforts to integrate digital tools into its educational practices and administrative systems despite significant resource constraints. This institution was chosen because it exemplifies the challenges faced by many PAUD institutions in adopting digital technologies and offers insight into the potential benefits of digital integration. PAUD Plamboyan 3 represents a typical case of a PAUD institution exploring digital initiatives to improve education quality, and the findings from this case study are expected to offer valuable insights and be relevant for other institutions experiencing similar challenges. The case study approach was selected to explore the challenges and solutions in this context, providing detailed insights that may not be generalizable but can serve as a valuable reference for other institutions in similar situations (Sugiyono, 2021).

Data collection for this research involved three primary methods: interviews, observations, and documentation. Semi-structured interviews were conducted with three groups of informants: one school principal, five teachers, and ten parents. The principal offered an administrative perspective on integrating technology, while teachers shared their classroom experiences. Parents were interviewed to gather insights on their involvement and perceptions of the digital initiatives. A total of 16 informants participated, with a breakdown of one school principal, five teachers, and ten parents. Interviews were chosen as the method for gathering in-depth, qualitative data, allowing the researcher to explore individual experiences and gain insights into the personal views of the key stakeholders involved (Sugiyono, 2021).

The researcher also conducted direct observations over two weeks to examine the use of technology in the classroom and its integration into daily learning activities. Specific aspects observed included using learning applications, the interaction between children and digital tools, and integrating technology into lesson plans. The researcher also observed interactions between teachers and parents during digital communication sessions, which provided more profound insights into how technology facilitated communication and collaboration between the school and home. Observations offered a real-time, contextual understanding of digital tools, complementing the data collected through interviews (Creswell, 2014). In addition to interviews and observations, relevant documents were collected from the school to provide further context. These documents included lesson plans that integrated technology, records of teacher training sessions, progress reports on children's development, and digital communication logs between teachers and parents. These documents were essential for triangulating data from the interviews and observations, providing a complete picture of how technology was incorporated into teaching and administrative processes (Sugiyono, 2012).

The collected data were analyzed using thematic analysis. The analysis began with the transcription of all interviews and field notes from observations. The transcriptions were then manually coded to identify recurring patterns and significant information. Coding was performed to capture relevant themes that emerged from the data. Once the data were coded, related codes were grouped to develop broader themes. These themes included teacher competency in technology, parental involvement through digital tools, barriers to technology adoption, and the impact of technology on children's learning. These themes were further analyzed to answer the research questions and provide insights into the integration of technology in PAUD management. Thematic analysis allowed for a systematic approach to identifying and interpreting patterns within the data, ensuring that the analysis remained grounded in the participants' experiences and perspectives (Creswell, 2014).

To ensure the validity of the findings, triangulation was used. Triangulation involved cross-referencing data from different sources and using various methods to enhance the reliability of the results. For example, the principal's statements about using learning applications were confirmed through direct observations and feedback from parents, who reported their children's engagement with the same applications at home. Similarly, interviews with teachers and parents corroborated challenges related to limited access to technology, and these findings were further supported by observations of the institution's technological infrastructure. Triangulation strengthened the findings by offering multiple perspectives and confirming the accuracy of the data (Sugiyono, 2021). This approach ensured that the research findings were not based on a single data source but were supported by various forms of evidence, making the results more robust and reliable (Sugiyono, 2021).

4. FINDINGS AND DISCUSSION

Based on research conducted at PAUD Plamboyan 3, West Karawang, innovation in PAUD management based on children's needs in the digital era shows significant development. This study examines the application of technology in learning and how management based on children's developmental needs can improve the quality of education in PAUD. PAUD Plamboyan 3 has implemented the use of digital media such as tablet-based learning applications and e-learning platforms tailored to the age and needs of each child. This allows for a more interactive, engaging, and developmentally appropriate learning process. In addition, the needs-based approach implemented in this PAUD focuses on fulfilling children's cognitive, social, emotional, and motor aspects through a flexible and adaptive curriculum. This research also explores how PAUD managers utilize technology to increase teacher competence and improve administrative management to be more efficient and effective in supporting the early childhood learning process in the digital era.

This was confirmed by observations and interviews with PAUD managers, teachers, and parents. The manager of Plamboyan 3 PAUD stated that the application of technology in learning has significantly changed how children interact with teaching materials. Children seem more enthusiastic and motivated to participate in learning activities, primarily through educational applications offering fun and interactive learning experiences. In addition, teachers also revealed that using digital media makes it easier for them to deliver more complex material in a way that is easier for children to understand. Interviews with parents also show that they feel more involved in their children's educational development, primarily through more

effective communication between school and home, facilitated by the digital-based management system implemented in this PAUD.

Interviews with the principal and teachers revealed that the implementation of technology in learning at PAUD Plamboyan 3 is not only limited to using digital tools, but also includes the development of teachers' professional competencies. The principal explained that teachers are given regular training on effectively utilizing digital tools in teaching to ensure the successful use of technology. This training includes the use of curriculum-appropriate learning applications and how to integrate technology with child-centered learning approaches. Teachers also emphasize the importance of adapting a more flexible curriculum to suit the developmental characteristics of each child, so that learning becomes more purposeful and effective. In addition, teachers are also encouraged to continue developing innovative learning methods that not only rely on technology but also prioritize a holistic approach that pays attention to children's cognitive, social, and emotional aspects.

From this, it can be seen that managers and teachers at PAUD Plamboyan 3 show a deep understanding of the importance of technology integration in child-centered learning. The principal and teachers realize that using technology is not only to support the learning process, but also to enrich children's learning experience in a more fun and interactive way. Training provided to teachers regularly is considered a necessary step to ensure that technology is used appropriately and effectively. This shows the school's commitment to continuously improving the quality of education through developing teacher professionalism and using relevant technology. In addition, the interview also highlighted the importance of the flexibility of the curriculum implemented at PAUD Plamboyan 3, which is oriented towards the needs and development of each child. With a more personalized and adaptive approach, the learning process can be tailored to children's abilities and interests, thus increasing their engagement in learning activities. This shows that the school relies on technology as a tool and focuses on a holistic approach to support children's overall development.

Furthermore, interviews with parents showed that they are very supportive of the application of technology in learning at PAUD Plamboyan 3. Many parents feel more involved in their children's educational development due to a more effective communication system between school and home, facilitated by digital platforms. Parents said they can easily follow their children's learning progress through regular reports and provide direct support at home using the same learning apps. Some parents also stated that their children are more enthusiastic and motivated to learn at home because of the fun and interactive learning media. However, some parents noted challenges in accessing technology, especially those with limited digital devices. Nonetheless, they still feel that this innovation positively impacts their children's development and strongly support the school's efforts to improve the quality of education in the digital era.

The following table illustrates the results of observations related to PAUD management innovations based on children's needs at PAUD Plamboyan 3, West Karawang:

Table 1.

Observation Results related to PAUD Management Innovations based on Children's Needs.

| Aspects Observed | Findings from Observation | Description |
|------------------------------------|---|---|
| Technology Utilization in Learning | Use of tablet-based learning apps and e-learning platforms for children. | The children seemed more enthusiastic and motivated with this method. |
| Parental Involvement | Parents are more involved through progress reports and digital communication with teachers. | Make it easy for parents to support their children's learning at home. |
| Curriculum Management | The curriculum is tailored to the child's development, covering cognitive, social, and motor aspects. | A holistic approach that takes into account the developmental needs of the child. |
| Teacher Training | Teachers attend training to integrate technology in learning. | Improved teacher competence in using digital tools. |
| Children's Learning Motivation | Children are more eager to learn through interactive media. | Technology increases children's engagement and motivation in learning. |
| Administrative Management | Use of digital-based management systems for school administration and communication. | Simplify the management and efficiency of school administration. |
| Challenges in Technology Use | Some parents face limited access to digital devices. | There are still obstacles in the distribution of technology access at home. |

The observation data table shows that implementing PAUD management innovations based on children's needs in the digital era has a positive impact, but it also faces some challenges. Using tablet-based learning applications and e-learning platforms makes children more enthusiastic and motivated to participate in interactive and engaging learning. Parents also feel more involved in their children's development through digitized progress reports and support for learning activities at home. In addition, holistic curriculum management that covers cognitive, social, emotional, and motor aspects provides children with a more personalized learning experience. Teachers also receive regular training to improve their competence in using technology in learning. However, the main challenge faced is the limited access to technology in some children's homes, which hinders equitable access to these innovations. Nonetheless, using a digital-based management system for administration and communication between the school and parents simplifies the management process and improves operational efficiency in the school.

The results of this study show that the implementation of PAUD management innovations based on children's needs in the digital era has positively impacted the learning process and parental involvement. Using technology, such as tablet-based learning applications and e-learning platforms, increases children's motivation and enthusiasm for interactive and engaging learning. In addition, flexible curriculum management tailored to children's

development and teacher training to utilize technology effectively contribute to improving the quality of learning. Although there are challenges related to limited access to technology in some parents' homes, the digital-based management system used for administration and communication between the school and parents simplifies management. It strengthens parents' involvement in their children's education.

This study's results align with previous studies' findings, which show that the use of technology in learning can increase student motivation and engagement. Ade Fricticarani and colleagues found that the application of technology in the classroom not only helps improve students' interest in learning but also creates a more enjoyable and interactive learning experience (Fricticarani et al., 2023). In PAUD Plamboyan 3, the use of learning apps and e-learning platforms was shown to make children more active in following the teaching materials, similar to the findings obtained by Yunita and colleagues, which showed that technology increases student participation in the classroom (Yunita et al., 2023). In addition, this study also confirms the research results of Imam Hasani & Hartin Kurniawati, who emphasized the importance of adjusting the curriculum to the developmental needs of children (Imam Hasani & Hartin Kurniawati, 2024). In this case, PAUD Plamboyan 3 successfully adopted a flexible and holistic curriculum that covers various aspects of child development, including cognitive, social, and motor. This shows that the use of technology can be well integrated in the context of managing a child's needs-based curriculum.

However, despite the many benefits, challenges related to limited access to technology in some parents' homes were also faced in this study, which aligns with previous findings by Sartini and colleagues. Sartini revealed that although technology is integrated in learning, the inequality of access to digital devices at home remains a barrier for some children (Sartini et al., 2024). The results of this study also reflect the difficulties parents face in accessing technology, although the school has sought a digital-based communication system to strengthen parental involvement. As described by Hasan Syahril, previous researchers also noted the importance of training teachers to utilize technology effectively (Hasan et al., 2023), which is reflected in the practice at PAUD Plamboyan 3. With regular training, teachers can improve their competence in managing technology-based learning, which enhances teaching quality. Therefore, although challenges in technology access still exist, this study shows that with careful planning and continuous training, technology-based innovations can be effective in early childhood education institutions.

5. CONCLUSION

Based on the results of the discussion above, it can be concluded that implementing PAUD management innovations based on children's needs at PAUD Plamboyan 3, West Karawang, positively impacts learning and parental involvement. Technology, such as tablet-based learning applications and e-learning platforms, has increased children's motivation and enthusiasm in following the learning process. In addition, flexible curriculum management tailored to children's development helps create a more holistic learning experience, covering cognitive, social, and motor aspects. The training provided to teachers has also improved their ability to integrate technology effectively in learning. However, challenges related to limited access to technology in some parents' homes are still a concern. The digital-based management system used in the school facilitates administration and communication between the school and

parents and strengthens parents' involvement in their children's education. Therefore, to maximize the positive impact of this innovation, there needs to be an effort to address the inequality of technology access in students' homes. Overall, applying technology in PAUD Plamboyan 3 can effectively improve the quality of early childhood education. This innovation requires continued support from the school, parents, and government to create a more inclusive and effective learning environment in the digital era.

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