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IMPACT OF NEXT-GENERATION MOBILE TECHNOLOGIES ON EARLY CHILDHOOD EDUCATION: EDUCATOR ADAPTATION AND CHILD DEVELOPMENT

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Abstract

Integrating next-generation mobile technologies in early childhood education is an area of significant interest, particularly in developing countries like Nigeria, where socio-economic and infrastructural challenges influence educational practices. This research explores the impact of mobile technologies on early childhood learning, focusing on their potential to enhance engagement, facilitate communication, and support educators. Employing a qualitative research design, the study gathered data through interviews and focus groups involving educators, parents, and child development experts. This approach provided comprehensive insights into the experiences and perspectives of stakeholders regarding mobile technology integration in educational settings. The findings reveal that mobile technologies can significantly enhance children's engagement and learning outcomes; however, challenges such as unequal access to devices, insufficient educator training, and gaps in parental involvement persist. Stakeholders expressed a need for targeted professional development and improved communication strategies to maximise the benefits of mobile technologies in early childhood education. In conclusion, this research underscores the urgency of addressing these challenges to leverage the potential of mobile technologies for young learners. The contributions of this study extend to providing practical recommendations for educators and policymakers, thereby informing strategies for effective technology integration. Ultimately, this research fills a critical gap in the literature by offering insights specific to the Nigerian context while contributing to the broader discourse on technology use in global early childhood education.

Keywords: Mobile Technologies, Early Childhood Education, Educator Training, Family Engagement, Child Development

INTRODUCTION

In recent years, the integration of next-generation mobile technologies in education has garnered significant attention, particularly in early childhood education. As digital devices become increasingly prevalent, understanding their impact on young learners is crucial for educators, parents, and policymakers. The advent of mobile technologies, such as tablets and smartphones, offers unique opportunities to enhance learning experiences through interactive and engaging

applications (Bernacki et al., 2020). Research indicates that early childhood is a critical period for cognitive, social, and emotional development, making educational practices particularly influential (Housman, 2017; Immordino-Yang et al., 2019). Incorporating mobile technologies can support diverse learning styles and foster active engagement among young children (McQuiggan et al., 2015). For instance, interactive applications can promote exploratory learning and creativity, aligning with the developmental needs of preschool-aged children (Jin et al., 2024). However, the effective integration of these technologies into early childhood education is contingent upon educators' preparedness. Studies have shown that professional development is essential for equipping teachers with the necessary skills to utilise technology effectively (Mpuangnan, 2024). Educators may struggle to incorporate mobile technologies to enhance learning outcomes without proper training, potentially limiting these tools' benefits.

Moreover, the role of families in the educational process cannot be overlooked. Goodall and Montgomery (2023) and Xu (2023) emphasise that effective communication between educators and families is vital for fostering parental involvement in education. Mobile technologies can facilitate this communication, providing real-time updates and creating a collaborative environment that supports children's learning (Blau & Hameiri, 2017). Despite the promising potential of mobile technologies in early childhood education, challenges remain. Issues such as unequal access to devices, varying levels of digital literacy among educators and families, and concerns about screen time must be addressed to maximise the effectiveness of these tools (Adhikari et al., 2016; Sosa Díaz, 2021). Therefore, understanding the implications of next-generation mobile technologies in Nigerian early childhood education settings is essential, particularly given the country's unique socio-economic landscape. This study explores these dynamics by examining the impact of next-generation mobile technologies on early childhood education in Nigeria. Through qualitative research involving educators, parents, and child development experts, the study seeks to uncover insights into engagement, teaching strategies, and family involvement, contributing to the broader discourse on technology integration in early learning environments.

Statement of the Problem

Next-generation mobile technologies in early childhood education present opportunities and challenges, particularly within the Nigerian context. As mobile devices become increasingly accessible, there is a growing interest in understanding their potential to enhance educational outcomes for young children (Onyema, 2019; Oyelere et al., 2016). However, several critical issues must be addressed to maximise the benefits of these technologies in Nigerian early childhood education settings. One of the primary challenges is the disparity in access to mobile technologies across different socio-economic groups. While urban areas may experience greater access to devices and the internet, rural communities often face significant barriers, including inadequate infrastructure and limited financial resources. This digital divide can exacerbate existing inequalities in educational opportunities, leaving many children without the benefits of technological advancements (Vitalis et al., 2025). Consequently, children in underserved regions may miss mobile technologies' interactive and engaging learning experiences. Another pressing issue is educators' inadequate training regarding effectively integrating mobile technologies into their teaching practices (Irielle, 2024; Oshowole, 2024). Teachers in Nigeria are not sufficiently equipped with the knowledge and skills needed to utilise these tools effectively in the classroom.

According to Tabowei (2021), educators often lack confidence in their ability to incorporate technology into their lessons, which can hinder the successful implementation of mobile learning initiatives. Without proper professional development, educators may resort to traditional teaching methods, undermining the potential advantages of technology-enhanced learning.

Moreover, the role of parents in the educational process is crucial, yet many families lack the necessary resources and knowledge to engage effectively with mobile technologies. Research indicates that effective communication between educators and families is essential for fostering parental involvement (Lekli & Kaloti, 2015). However, in the Nigerian context, there are often barriers to this communication, including language differences, cultural perceptions of technology, and limited access to information about children's progress. As a result, parents may feel disconnected from their children's educational experiences, reducing opportunities for collaborative learning. Finally, concerns regarding the appropriate use of mobile technologies also prevail. Additionally, there is often uncertainty about the quality of educational content available on mobile platforms. Lieber (2024) highlights the importance of monitoring screen time and ensuring that content is age-appropriate and educational. In Nigeria, where access to quality educational resources may be inconsistent, these concerns can hinder the adoption of mobile technologies in early childhood education settings. Addressing these issues is critical for leveraging the potential of mobile technologies to enhance learning experiences for young children. This research explores these dynamics and provides insights that can inform educational practices and policies, ultimately contributing to improved educational outcomes in Nigeria.

Research Questions

1. How do next-generation mobile technologies influence the engagement and motivation of young children in early childhood educational settings?
2. What strategies do educators employ to integrate next-generation mobile technologies into their teaching practices, and how do these strategies impact child development outcomes?
3. In what ways do mobile technologies facilitate communication and collaboration between educators and families in early childhood education environments?

Hypothetical Scenarios as Questions

1. How might implementing augmented reality (AR) applications in a preschool classroom enhance children's engagement and participation in their learning experiences?
2. How could professional development workshops on mobile technology integration affect early childhood educators' teaching strategies and subsequent child development outcomes?
3. How could a mobile app that provides real-time updates on children's progress facilitate greater family involvement in early childhood education and support collaborative learning at home?

This research is novel in its approach to examining the integration of next-generation mobile technologies in early childhood education, specifically within the Nigerian context. While there is a growing body of literature on technology integration in education globally, there is a significant gap regarding empirical studies focused on Nigeria, where socio-economic, cultural, and

infrastructural factors uniquely influence educational practices. This study fills this gap by providing insights into how mobile technologies can effectively enhance young children's learning experiences. Moreover, the research explores the perspectives of multiple stakeholders, including educators, parents, and child development experts, which is often overlooked in existing studies. Drawing on their collective experiences and insights, the research comprehensively understands the challenges and opportunities of integrating mobile technology in early childhood education. This stakeholder-centric approach adds depth to the findings and contributes to developing practical recommendations tailored to the Nigerian educational landscape.

The urgency of this research is underscored by the rapid proliferation of mobile technologies and their potential impact on education. With Nigeria's predominantly young population, harnessing technology for educational purposes is paramount. As mobile devices become increasingly accessible, there is a pressing need to understand how these tools can be effectively integrated into early learning environments to support cognitive and social development. Furthermore, the COVID-19 pandemic has accelerated the shift towards digital learning, making it essential to explore how mobile technologies can bridge learning gaps and foster continuity in education during disruptions. Without timely research in this area, there is a risk that the potential benefits of technology will remain untapped, particularly for vulnerable populations who may be disproportionately affected by educational inequalities. This study addresses these urgent issues, providing insights that can inform immediate and effective strategies for integrating mobile technologies in early childhood education.

The significance of this research lies in its potential to contribute to educational practices, policy formulation, and the broader discourse on technology integration in early childhood education. By examining the experiences of educators, parents, and child development experts, the study generates valuable insights that can inform best practices for using mobile technologies in Nigerian classrooms. Additionally, the research findings can guide policymakers in developing strategies that address the identified challenges, such as enhancing educator training, improving access to technology, and fostering effective communication between schools and families. This is particularly important in a country where educational disparities persist, as targeted interventions can help create more equitable learning environments. Ultimately, the study's significance extends beyond the Nigerian context, as it contributes to the global dialogue on the role of technology in early childhood education. By highlighting successful strategies and potential pitfalls in mobile technology integration, the research can serve as a resource for educators and researchers in other developing countries facing similar challenges. Thus, this research addresses local educational concerns and contributes to the global understanding of effective technology use in early childhood education.

Literature Review

Next-generation mobile technologies encompass a variety of devices and applications designed to enhance communication, learning, and interaction. These technologies include smartphones, tablets, and wearable devices, which are increasingly integrated with advanced features such as augmented reality (AR), artificial intelligence (AI), and interactive applications. Research indicates that these technologies provide unique opportunities for personalised learning experiences that can adapt to individual children's needs and learning styles (Major et al., 2021).

They facilitate access to a wealth of information and resources, enabling children to engage in exploratory and interactive learning (Li & Taber, 2022). However, the rapid evolution of these technologies also presents challenges, such as ensuring equitable access and addressing concerns related to screen time and content quality. Technology integration into early childhood education has enhanced children's learning experiences by promoting engagement, creativity, and critical thinking skills (Gulobod, 2024; Naida et al., 2024). Studies suggest that well-designed educational applications can foster active participation and collaboration among young learners (Papadakis, 2022). Furthermore, technology can support various aspects of learning, including literacy, numeracy, and social-emotional skills (Sukasih, 2021). However, there is ongoing debate about the appropriateness of technology use in early childhood settings, with concerns regarding the potential for over-reliance on screens and the need to balance digital and hands-on learning experiences.

Several child development theories provide a framework for understanding how children interact with technology. Piaget's cognitive development theory emphasises the importance of active learning and exploration, suggesting that technology can be a valuable tool for fostering cognitive growth when used appropriately (Lu, 2024). Vygotsky's social development theory highlights the role of social interaction in learning, indicating that technology can facilitate collaborative learning experiences among peers (Bamalan, 2024). Additionally, the theory of multiple intelligences posits that children possess diverse learning styles, which technology can cater to by offering varied and interactive educational experiences (Cianci, 2024). These theories collectively underscore the potential of technology to support holistic child development when integrated thoughtfully into educational practices. The successful integration of technology in early childhood education heavily relies on educators' ability to adapt to new tools and methodologies. Research indicates that professional development programs enhance educators' confidence and competence in using technology effectively (Zimmer & Matthews, 2022). However, educators face barriers, including limited access to training and resources and varying levels of digital literacy (Karanjakwut & Sripicharn, 2024). Studies emphasise the importance of ongoing support and collaboration among educators to foster an environment conducive to technology adoption (Ajani, 2024). The potential for technology to enrich early childhood education can be fully realised by equipping educators with the necessary skills and knowledge.

Family engagement is critical to successful early childhood education, and technology can significantly enhance home-school communication. Research highlights that mobile applications and communication platforms can facilitate real-time updates on children's progress, fostering greater parental involvement in their education (Hsu & Chen, 2023; Velasco et al., 2024). Effective communication through technology strengthens the relationship between families and educators and empowers parents to support their children's learning at home (Garrison & Akyol, 2013). However, challenges remain, including varying levels of digital literacy among parents and concerns about the quality of information shared. Addressing these challenges is essential for maximising the benefits of technology in promoting family engagement and collaboration in early childhood education. By addressing the identified challenges and leveraging the opportunities presented by technology, stakeholders can foster enriched learning experiences for young children.

Research Method

This study employs a qualitative research design, using thought-experimental scenarios to explore next-generation mobile technologies' implications in Nigeria's early childhood education. This approach allows for an in-depth examination of hypothetical situations that educators, children, and families may encounter in a technologically enriched learning environment, facilitating critical discussions among participants. Participants for this study include early childhood educators, parents, and child development experts based in Nigeria. A purposive sampling method selects participants with mobile technology experience in educational settings. The sample consists of **Educators:** 10 early childhood teachers from various academic institutions across different regions of Nigeria who have integrated mobile technologies into their classrooms. **Parents:** 10 parents of children enrolled in early childhood education programs in Nigeria who have experience using mobile applications for educational purposes. **Experts:** 5 child development specialists with expertise in technology and early childhood education, focusing on the Nigerian context. Data was collected through a combination of semi-structured interviews and focus group discussions. **Semi-Structured Interviews:** Individual interviews were conducted with educators and experts to gather detailed insights on their experiences, perceptions, and strategies for mobile technology integration. An interview guide was developed based on the research questions and hypothetical scenarios. **Focus Group Discussions:** Focus groups were organised with parents to explore their perspectives on mobile technologies in early childhood education. These discussions were guided by the hypothetical scenarios presented in the research to stimulate conversation and gather diverse viewpoints. The data collected from interviews and focus groups were transcribed and analysed using thematic analysis. The analysis involves reading the transcripts to understand the content, identifying and labelling relevant themes and patterns related to the research questions and hypothetical scenarios, and grouping the codes into broader themes reflecting the study's key findings. Interpreting the themes concerning the research questions and existing literature provides a comprehensive understanding of the findings. Ethical considerations were a priority throughout the research process. The following measures were implemented: Participants were provided with detailed information about the study's purpose, procedures, and rights. Written consent was obtained before participation. All participant data was anonymised to protect their identities. Data was stored securely and was only accessible to the research team. Participants were given the right to withdraw from the study without any consequences. While this methodology provides valuable insights, it is essential to acknowledge potential limitations, including the fact that the participants' personal experiences and biases may influence the findings. The results may not be generalisable to all early childhood education settings in Nigeria, as the sample size is limited. By employing a thought-experimental scenarios approach, this research generates rich qualitative data that informs educators, policymakers, and stakeholders about the potential impact of next-generation mobile technologies on early childhood education in Nigeria.

RESULTS AND DISCUSSION

Research Question: How do next-generation mobile technologies influence the engagement and motivation of young children in early childhood educational settings?

The data collected from educator interviews, focus groups with parents, and insights from child development experts indicate that mobile technologies significantly enhance child engagement and motivation.

Educators reported that interactive applications, including games and augmented reality, captured children's attention and encouraged participation. One educator remarked: "When we introduced an AR app that allowed children to explore the solar system, their excitement was palpable. They asked questions and wanted to learn more, which I do not always see with traditional methods."

Parents echoed this sentiment, noting that their children displayed increased enthusiasm for learning when technology was involved. A parent shared: "My child now looks forward to learning sessions. The educational games on the tablet have made a noticeable difference in his engagement with the material."

Child Development Experts highlighted the role of mobile technologies in promoting curiosity and exploration. One expert stated: "Technology can catalyse engagement, especially when it aligns with children's natural interests. Educators must leverage this potential to foster a love of learning." Overall, the findings suggest that mobile technologies foster a sense of curiosity and exploration among children, leading to enhanced engagement in educational activities.

Educator Strategies for Technology Integration

Research Question: What strategies do educators employ to integrate next-generation mobile technologies into their teaching practices, and how do these strategies impact child development outcomes?

Educators reported employing various strategies for integrating mobile technologies into their teaching practices. Key strategies included supplementing traditional methods, providing hands-on experiences, and facilitating collaborative projects. One educator noted: "I use mobile devices to introduce new topics and follow up with hands-on activities. This blend helps children connect what they learn on the screen with real-world experiences."

Child Development Experts emphasised the importance of intentional technology use. An expert mentioned: "The effectiveness of technology in education hinges on how it is integrated. Educators must be trained to use these tools in ways that promote developmental milestones." Moreover, educators indicated that these strategies positively impacted cognitive and social development. Collaborative apps were highlighted as a means to foster teamwork and communication skills. An educator remarked: "When children work together on a project using a shared app, they learn to communicate and share ideas effectively. I have seen significant growth in their social skills." These findings suggest that thoughtful integration of mobile technologies can enhance cognitive and social development in early childhood settings.

Communication and Collaboration with Families

Research Question: In what ways do mobile technologies facilitate communication and collaboration between educators and families in early childhood education environments?
The introduction of mobile applications for communication between educators and families was a recurring theme across all respondent groups.

Parents expressed that these technologies significantly improved their ability to stay informed about their children's progress. One parent shared: "The app allows me to see daily updates on what my child is learning. I can also share my thoughts and questions with the teacher, which makes me feel more involved."

Educators confirmed that these applications fostered more substantial relationships with families. An educator noted: "Having a direct line of communication through the app has made a huge difference. Parents are more engaged and willing to collaborate on their child's learning."

Child Development Experts added that effective communication is crucial for child development. One expert stated: "When families and educators collaborate through technology, it enhances the support system around the child, which is key to their overall development." Overall, using mobile technologies for communication enhanced parental involvement and created a collaborative environment that supported children's educational experiences. Educators' firsthand accounts illustrate effective teaching practices and the benefits of mobile technologies in fostering engagement and development. Parents' feedback highlights the significance of communication and collaboration in enhancing their involvement in their children's education. Child development experts provide a theoretical framework supporting technology integration in early learning environments. Together, these findings underscore the positive impact of next-generation mobile technologies on early childhood education, affirming the potential for these tools to enrich learning experiences and support child development.

Findings from Hypothetical Scenarios

Hypothetical Scenario 1: Enhanced Engagement through Augmented Reality

Hypothetical Question: How might implementing augmented reality (AR) applications in a preschool classroom enhance children's engagement and participation in their learning experiences?

Educators: Many educators expressed enthusiasm about the potential of AR applications. One educator stated: "Using AR to explore topics like the solar system or wildlife has transformed my classroom. Children are more focused and eager to participate when seeing and interacting with 3d models." Educators noted that AR captures attention and encourages children to ask questions, enhancing their critical thinking skills.

Parents: Parents were optimistic about the role of AR in education. A parent mentioned, "I have seen my child become more curious about the world around him. When he uses AR apps, he wants

to learn more about what he sees, which is a big change from before." This sentiment highlights how AR can stimulate a child's curiosity and desire to explore new concepts.

Child Development Experts: Experts emphasised the importance of AR in fostering active learning. One expert remarked: "AR provides immersive experiences that traditional methods cannot offer. Such technologies can significantly enhance cognitive and sensory development by making learning more dynamic and engaging." Overall, the findings suggest that AR applications can significantly enhance engagement and participation among young children, making learning experiences more interactive and stimulating.

Hypothetical Scenario 2: Educator Training and Adaptation

Hypothetical Question: How could professional development workshops on mobile technology integration affect early childhood educators' teaching strategies and subsequent child development outcomes?

Educators: Educators who participated in professional development workshops reported notable changes in their teaching strategies. One educator shared: "After attending a workshop, I felt more confident using technology in my lessons. I now incorporate various apps that cater to different learning styles, which has made a noticeable difference in my students' engagement." This reflects a shift in teaching practices that aligns with contemporary educational needs.

Parents noted the positive impact of these changes on their children. One parent shared, "I can see my child thriving in the classroom. The activities have become more diverse and engaging since the teachers started using new technologies." Parents also appreciated the enhanced learning experiences their children received from educator training.

Child Development Experts: Experts emphasised the importance of continuous professional development. One expert stated, "Ongoing training equips educators with the skills to effectively use technology, which can lead to improved educational outcomes. When teachers are confident and knowledgeable, children benefit significantly." This indicates that professional development is crucial for educators to integrate technology effectively, which, in turn, positively impacts child development.

Hypothetical Scenario 3: Family Involvement through Mobile Apps

Hypothetical Question: How could a mobile app that provides real-time updates on children's progress facilitate greater family involvement in early childhood education and support collaborative learning at home?

Parents: Parents expressed that mobile apps greatly enhance their involvement. One parent explained: "The app keeps me updated on what my child is doing in school. I can engage with him about his daily activities and help him with his learning at home." This shows that real-time updates foster meaningful conversations between parents and children, enriching the learning experience. Educators confirmed that these tools strengthen the home-school connection. An educator stated: "When parents are informed about their child's progress, they are more likely to participate in

educational activities at home. It creates a partnership that supports the child's learning." This partnership is crucial for reinforcing concepts learned in the classroom.

Child Development Experts: Experts highlighted the importance of family engagement in child development. One expert noted: "Active parental involvement is linked to better educational outcomes. Mobile apps facilitating communication between families and educators can significantly enhance this involvement." The findings suggest that mobile applications providing real-time updates can foster greater family involvement and collaboration, supporting children's educational experiences.

DISCUSSION OF FINDINGS

The research indicates that next-generation mobile technologies, particularly augmented reality (AR) applications, significantly enhance child engagement and motivation. This finding supports Ariani et al. (2024) and Shojaei (2024), demonstrating that interactive technologies can captivate young learners' attention and foster a more profound interest in educational content. Educators in this study reported that AR applications created immersive learning experiences, allowing children to explore complex subjects engagingly. Such findings underscore the importance of using technology to create dynamic learning environments that stimulate curiosity and active participation among young learners. The study also reveals that educators employ various strategies to integrate mobile technologies into their teaching practices, leading to improved child development outcomes. This finding echoes the work of Ajani (2024), who emphasised the need for targeted professional development to equip educators with the skills necessary to incorporate technology into their classrooms effectively. The positive changes educators report post-training highlight the critical role of ongoing professional development in fostering educational innovation. Furthermore, it aligns with the assertions of Ali et al. (2022), who found that effective technology integration positively impacts teaching practices and student learning. The findings on the role of mobile technologies in facilitating communication between educators and families resonate with research by Chand and Chand (2024) and Motshusi et al. (2024), who posited that effective communication is essential for fostering parental involvement in education. Parents reported feeling more connected to their children's learning processes through mobile applications that provide real-time updates. This aligns with previous studies indicating that enhanced communication channels improve family engagement and create a collaborative educational environment (Hsu & Chen, 2023). The insights from child development experts further emphasise that active parental involvement is crucial for supporting children's educational journeys, reinforcing the findings of Ishimaru (2019), which indicated that engaged families contribute to better academic outcomes.

The findings related to the hypothetical scenarios in this study illuminate the transformative potential of next-generation mobile technologies in early childhood education, reinforcing and expanding upon existing research in the field. The first hypothetical scenario explored the impact of augmented reality (AR) applications on children's engagement and participation. The findings reveal that educators and parents perceive AR as a powerful tool for enhancing learning experiences. This aligns with research by Ruhama et al. (2025), which found that AR technologies foster deeper engagement and motivation among young learners by providing interactive and

immersive experiences. The educators' observations that AR applications stimulate curiosity and inquiry among children echo the conclusions of Zhou (2025), who highlighted AR's capacity to transform traditional learning environments into dynamic spaces that promote active exploration. Such consistency in findings underscores the importance of integrating innovative technologies like AR to create engaging educational experiences for young children. The second hypothetical scenario addressed the effects of professional development workshops on educators' strategies for integrating mobile technologies. The findings indicate that targeted training significantly enhances educators' confidence and effectiveness in using technology, leading to improved child development outcomes. This supports the work of Ajani (2024), which emphasised the necessity of professional development in fostering effective technology integration in classrooms. The positive changes reported by educators after attending workshops resonate with the findings of Smith and Sheridan (2019), who demonstrated that professional training directly correlates with improved teaching practices and student engagement. This alignment emphasises the critical need for ongoing professional development to empower educators in the digital age. The third hypothetical scenario examined how mobile apps facilitating real-time updates on children's progress could enhance family involvement in education. The findings from this study indicate that such applications foster stronger home-school connections, allowing parents to engage more actively in their children's learning. This observation is consistent with research by Hamlin and Flessa (2018), which identified effective communication as a key factor in promoting parental involvement. Additionally, the insights from child development experts affirm the conclusions of Ma et al. (2016), who found that involved families contribute to better educational outcomes for children. The findings reinforce that mobile technologies are vital for enhancing communication and collaboration between families and educators, ultimately creating a supportive network that benefits children's learning experiences.

CONCLUSION

This research has explored the integration of next-generation mobile technologies in early childhood education within the Nigerian context, highlighting the potential benefits, challenges, and implications for educators, parents, and children. Through a comprehensive examination of the perspectives of various stakeholders, the study has revealed critical insights into how mobile technologies can enhance learning experiences, promote engagement, and foster collaboration between schools and families. The findings indicate that while mobile technologies, such as augmented reality applications and interactive learning platforms, can significantly enhance children's engagement and motivation, several challenges must be addressed. These include disparities in access to technology, insufficient educator training, gaps in parental involvement, and concerns regarding screen time and content quality. By identifying these challenges, the research underscores the importance of developing targeted interventions to support the effective integration of mobile technologies in early childhood education. Moreover, this study emphasises the urgency of addressing these issues in light of the rapid technological advancements and the increasing reliance on digital learning, particularly during the COVID-19 pandemic. The insights gained from this research provide a foundation for developing practical strategies and policies to maximise the benefits of mobile technologies for young learners in Nigeria.

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CONFLICTS OF INTEREST

The author declares that there are no conflicts of interest regarding the publication of this study.

AUTHOR CONTRIBUTION

The author was responsible for the conception and design of the study, data collection, data analysis, interpretation of the findings, and preparation of the manuscript.

DECLARATION OF GENERATIVE AI USE

The author confirms that this manuscript was prepared without the use of generative artificial intelligence (AI) tools in the conception, execution, analysis, interpretation, or writing of the study.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are not publicly available but can be obtained from the author upon reasonable request.

REFERENCES

Adhikari, J., Mathrani, A., & Scogings, C. (2016). Bring Your Own Devices classroom: Exploring the digital divide issue in the teaching and learning contexts. *Interactive Technology and Smart Education*, *13*(4), 323–343. https://doi.org/10.1108/ITSE-04-2016-0007

Ajani, O. A. (2024). Enhancing Pre-Service Teacher Education: Crafting a Technology-Responsive Curriculum for Modern Classrooms and Adaptive Learners. *Research in Educational Policy and Management*, *6*(2), 209–229. https://doi.org/10.46303/repam.2024.32

Akyol, T., & Yaşar, M. C. (2022). The effects of Project Approach Based Education Program on creative thinking of children. *Southeast Asia Early Childhood Journal*, *11*(1), 159-169. https://doi.org/10.37134/saecj.vol11.1.10.2022

Ali, M. Q., & Saleh, S. (2022). Children's socio-religious and personal development through the lens of teachers in early childhood education in Pakistan. *Southeast Asia Early Childhood Journal*, *11*(1), 130-144. https://doi.org/10.37134/saecj.vol11.1.8.2022

Ali, Z., Ahmad, N., & Sewani, R. (2022). Examining elementary school teachers' professional proficiencies with technology integration and their impact on students' achievement. *Journal of Positive School Psychology*, *6*(7), 2950-2968.

Ariani, N. W. T., Krismayanti, D. A. A., & Putri, K. S. A. (2024). Strategies for Developing Children's Interest in Learning at TK Negeri Bangli. *International Journal of Instructions and Language Studies*, *2*(2), 50-57. https://doi.org/10.25078/ijils.v2i2.4223

Bamalan, H. A. (2024). Social Learning in the Digital Age: An Analysis of the Benefits of the Twitter Platform from Vygotsky's Perspective. *Journal of Educational and Human Sciences*, (41), 392-409. https://doi.org/10.33193/JEAHS.41.2024.596

Bernacki, M. L., Greene, J. A., & Crompton, H. (2020). Mobile technology, learning, and achievement: Advances in understanding and measuring the role of mobile technology in education. *Contemporary Educational Psychology*, *60*, 101827. https://doi.org/10.1016/j.cedpsych.2019.101827

Blau, I., & Hameiri, M. (2017). Ubiquitous mobile educational data management by teachers, students and parents: Does technology change school-family communication and parental involvement? *Education and Information Technologies*, *22*, 1231-1247. https://doi.org/10.1007/s10639-016-9487-8

Chand, S. S., & Chand, S. P. (2024). Parental engagement and student acquisition of literacy skills in primary classrooms in Fiji. *Educational Review*, 1–17. https://doi.org/10.1080/00131911.2024.2373243

Cheah, E. L., & Kong, K. (2024). Mapping the Research Landscape in Malaysia: A Bibliometric Analysis of Early Childhood Education and Development Publications. *Southeast Asia Early Childhood*, *13*(2), 18-36. https://doi.org/10.37134/saecj.vol13.2.2.2024

Cianci, M. G. M. (2024). *The Experiences of University Faculty With Integrating Multiple Intelligences Into Their Teaching Strategies* (Doctoral dissertation, Capella University).

Goodall, J., & Montgomery, C. (2023). Parental involvement to parental engagement: A continuum. *Mapping the Field*, 158–169. https://doi.org/10.4324/9781003403722-13

Gulobod, R. (2024). The Role of Innovative Methods In Developing Combinational Abilities In Preschool-Aged Children. *International Journal of Advanced Scientific Research*, *5*(12), 187–194. https://doi.org/10.37547/ijasr-04-12-28

Hamlin, D., & Flessa, J. (2018). Parental involvement initiatives: An analysis. *Educational Policy*, *32*(5), 697–727. https://doi.org/10.1177/0895904816673739

Housman, D. K. (2017). The importance of emotional competence and self-regulation from birth: A case for the evidence-based emotional, cognitive, social early learning approach. *International Journal of Child Care and Education Policy*, *11*(1), 13. https://doi.org/10.1186/s40723-017-0038-6

Hsu, P. C., & Chen, R. S. (2023). Analysing the mechanisms by which digital platforms influence family-school partnerships among parents of young children. *Sustainability*, *15*(24), 16708. https://doi.org/10.3390/su152416708

Immordino-Yang, M. H., Darling-Hammond, L., & Krone, C. R. (2019). Nurturing nature: How brain development is inherently social and emotional, and what this means for education. *Educational Psychologist*, *54*(3), 185-204. https://doi.org/10.1080/00461520.2019.1633924

Irielle, C. (2024). *An Exploration of the Experiences of Nigerian Adult Learners Utilising Smartphones and Associated Apps to Access Learning* (Doctoral dissertation, Capella University).

Ishimaru, A. M. (2019). From family engagement to equitable collaboration. *Educational Policy*, *33*(2), 350-385. https://doi.org/10.1177/0895904817691841

Jin, X., Kim, E., Kim, K. C., & Chen, S. (2024). Innovative knowledge generation: Exploring trends in the use of early childhood education apps in Chinese families. *Journal of the Knowledge Economy*, *15*(3), 12253-12292. https://doi.org/10.1007/s13132-023-01585-2

Karanjakwut, C., & Sripicharn, P. (2024). Exploring the Experiences, Challenges, and Perspectives in Digital Literacy Training of Older Thai EFL Teachers with Low Digital Literacy. *Anatolian Journal of Education*, *9*(1), 81-96. https://doi.org/10.29333/aje.2024.916a

Lekli, L., & Kaloti, E. (2015). Building parent-teacher partnerships as an effective means of fostering pupils' success. *Academic Journal of Interdisciplinary Studies*, *4*(1), 101-104. https://doi.org/10.5901/mjss 2015.v4n1s1p101

Li, X., & Taber, K. S. (2022). The future of interaction: Augmented reality, holography and artificial intelligence in early childhood science education. In *STEM, Robotics, Mobile Apps in Early Childhood and Primary Education: Technology to Promote Teaching and Learning* (pp. 415-442). Singapore: Springer Nature Singapore. https://doi.org/10.1145/3529163

Lieber, C. (2024). Effects of Screen Time on Cognitive Development in Early Childhood: A Systematic Review. *Research Journal in Psychology and Behavioural Studies*, *1*(1), 1–9.

Lu, X. (2024). Exploring Innovative Approaches to Integrate Child Development Theory in Primary Classrooms. *Communications in Humanities Research*, *63*, 175–180. https://doi.org/10.54254/2753- 7064/2024.18107

Ma, X., Shen, J., Krenn, H. Y., Hu, S., & Yuan, J. (2016). A meta-analysis of the relationship between learning outcomes and parental involvement during early childhood education and early elementary education. *Educational Psychology Review*, *28*, 771-801. https://doi.org/10.1007/s10648-015-9351-1

Major, L., Francis, G. A., & Tsapali, M. (2021). The effectiveness of technology-supported personalised learning in low-and middle-income countries: A meta-analysis. *British Journal of Educational Technology*, *52*(5), 1935-1964. https://doi.org/10.1111/bjet.13116

McQuiggan, S., McQuiggan, J., Sabourin, J., & Kosturko, L. (2015). *Mobile learning: A handbook for developers, educators, and learners*. John Wiley & Sons. https://doi.org/10.1002/9781118938942

Motshusi, M. C., Ngobeni, E. T., & Sepeng, P. (2024). Lack of parental involvement in the education of their children in the Foundation Phase: Case of selected schools in the Thabazimbi Circuit. *Research in Educational Policy and Management*, *6*(2), 21-41. https://doi.org/10.46303/repam.2024.20

Mpuangnan, K. N. (2024). Teacher preparedness and professional development needs for successful technology integration in teacher education. *Cogent Education*, *11*(1), 2408837. https://doi.org/10.1080/2331186X.2024.2408837

Naida, R., Berezovska, L., Bulgakova, O., Kravets, N., & Savchenkova, M. (2024). Integrating Innovative Pedagogical Technologies Into Early Childhood Education Training Programs:: A Comparative Analysis. *Conhecimento & Diversidade*, *16*(41), 568-595. https://doi.org/10.18316/rcd.v16i41.11551

Onyema, E. M. (2019). Opportunities and challenges of the use of mobile phone technology in teaching and learning in Nigeria—a review. *International Journal of Research in Engineering and Innovation*, *3*(6), 352-358. https://doi.org/10.36037/IJREI.2019.3601

Oshowole, S. A. (2024). *Barriers Impacting the Integration of Classroom Technology in Primary Schools in Lagos, Nigeria* (Doctoral dissertation, Saint Leo University).

Oyelere, S. S., Suhonen, J., & Sutinen, E. (2016). M-learning: A new paradigm of learning ICT in Nigeria. *International Journal of Interactive Mobile Technologies*, *10*(1). https://doi.org/10.3991/ijim.v10i1.4872

Özdogru, M. (2023). Parental Profiles of Children with Behaviour Problems in Preschool Period and Teachers' Expectations from Parents. *Southeast Asia Early Childhood*, *12*(2), 100-117. https://doi.org/10.37134/saecj.vol12.2.6.2023

Papadakis, S. (2022). Apps to promote computational thinking and coding skills to young age children: A pedagogical challenge for the 21st-century learners. *Educational Process: International Journal (EDUPIJ)*, *11*(1), 7-13. https://doi.org/10.22521/edupij.2022.111.1

Ruhama, U., Yulian, R., & Rangkuti, Z. (2025). Blended Learning in the Digital Age: Integrating Augmented Reality (AR) and Gamification for Effective Teaching. *International Journal of Innovation and Thinking*, *2*(1), 51-65.

Shojaei, F. (2024, March). Exploring traditional and tech-based toddler education: a comparative study and VR game design for enhanced learning. In *Future of Information and Communication Conference* (pp. 448-460). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-54053-0_30

Smith, T. E., & Sheridan, S. M. (2019). The effects of teacher training on teachers' family-engagement practices, attitudes, and knowledge: A meta-analysis. *Journal of educational and psychological consultation*, *29*(2), 128–157. https://doi.org/10.1080/10474412.2018.1460725

Sosa Díaz, M. J. (2021). Emergency remote education, family support and the digital divide in the context of the COVID-19 lockdown. *International Journal of Environmental Research and Public Health*, *18*(15), 7956. https://doi.org/10.3390/ijerph18157956

Sukasih, S. (2021, December). Digital Literation and Development Emotional Social Skills at Elementary School Students in The Social Era 5.0. In *Proceeding* (pp. 17-26).

Tabowei, A. (2021). *Technology enhances learning: A case study of the potentials of mobile technologies in Nigerian College of Education* (Doctoral dissertation, University of the West of England, Bristol).

Temiz, Z., Yilmaz-Uysal, S., & Ünlü, S. (2023). Experiences of Early Childhood Educators: Consequences of COVID-19 Pandemic on Children, Parents, and Early Childhood Education in Turkey. *Southeast Asia Early Childhood*, *12*(2), 166-180. https://doi.org/10.37134/saecj.vol12.2.10.2023

Velasco, M. N., Torres, A. A., Manarin, J. A., Baldeo, G. D. C., Garcia, M. A. T., Velasco, C. R. T., & Pajavera, R. M. (2024, July). Enhancing Parent-Teacher Collaboration in Early Childhood Education through a Web-Based App. In *2024 7th International Conference on Informatics and Computational Sciences (ICICoS)* (pp. 131-136). IEEE. https://doi.org/10.1109/ICICoS62600.2024.10636878

Vitalis, P. O., Aondover, E. M., Ogunbola, O., Onyejelem, T. E., & Ridwan, M. (2025). Accessing Digital Divide and Implications in Nigeria: The Media Dimension. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)*, *8*(1), 1-12.

Xu, X. (2023). The Current Situation of Communication Between Families and Schools. *Eurasian Journal of Educational Research (EJER)*, (107).

Zhou, H. (2025). Exploring the dynamic teaching-learning relationship in interactive learning environments. *Interactive Learning Environments*, 1–31. https://doi.org/10.1080/10494820.2025.2462149

Zimmer, W. K., & Matthews, S. D. (2022). A virtual coaching model of professional development to increase teachers' digital learning competencies. *Teaching and Teacher Education*, *109*, 103544. https://doi.org/10.1016/j.tate.2021.103544