

International Journal of Learning, Teaching and Educational Research
Vol. 25, No. 7, pp. 668-688, July 2026
<https://doi.org/10.26803/ijlter.25.7.30>
Received Apr 20, 2026; Revised Jun 16, 2026; Accepted Jun 22, 2026

Leadership for Safe Digital Early Learning Environments: Cyber Behaviour Management and Mental Well-being in Early Childhood Education

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Abstract. The accelerated adoption of digital technology in early childhood education presents both promising learning opportunities and significant concerns regarding children's cyber behaviour and mental health. While educational technologies involving AI are increasingly incorporated into early childhood education, little research has focused on the role of early childhood educational leadership in cyber behaviours and children's mental health outcomes. This paper investigates the role of educational leadership in fostering a secure, ethically grounded, and emotionally nurturing digital learning environment for young children. The study is grounded in Bronfenbrenner's ecological systems theory and transformational leadership theory, which informed a qualitative interpretive case study design. Participants included five preschool leaders, 10 teachers, and two parent representatives from Malaysian private early childhood education centres, engaged through semi-structured interviews. Thematic analysis revealed six principal themes: balanced technology use, emotional regulation, policy gaps, ethical mediation, leadership support for well-being, and collaborative digital culture. The findings demonstrate that educational leadership is crucial in associating schools, families, and institutional policies to mitigate digital risks and enhance children's socio-emotional well-being. The study suggests a Digital Humanistic Leadership Framework, which combines four key components: ethical governance, teacher professional capacity, family engagement, responsible digital practices, and socio-emotional well-being of the children in early childhood, to promote sustainable and effective digital transformation in early childhood education. The model has implications for policy development, leadership preparation, and the development of environments for learning that are safe and developmentally appropriate for digital learning.

Keywords: cyber behaviour; early childhood education; ecological systems theory; educational governance; mental well-being

Citation:

Shorouk, A., Taddese, E. T., Nalliah, M., & Benlahcene, A. (2026). Leadership for Safe Digital Early Learning Environments: Cyber Behaviour Management and Mental Well-being in Early Childhood Education. *International Journal of Learning, Teaching and Educational Research*, 25(7), 668–688. <https://doi.org/10.26803/ijlter.25.7.30>

1. Introduction

In the modern world, early childhood development occurs in environments where screens, algorithms, and intelligent technologies significantly shape their growing cognitive, affective, and social domains. The incorporation of digital tools in early childhood education (ECE) brings not only opportunities but also challenges. Technology has the potential to support differentiated learning by allowing instructional content and pacing materials to be differentiated based on each child's current abilities, making it more responsive to the zone of proximal development than existing learning resources (Paul et al., 2023).

For the purposes of this research, AI-driven digital technologies are defined as ECE technologies that include intelligent or adaptive components to assist teaching, learning, assessment, and classroom management, including adaptive learning apps, intelligent educational platforms, automated feedback systems and digital learning tools that tailor children's learning experiences. Therefore, the study examines the role of AI within the wider context of digitally mediated

educational practices, rather than focusing on AI as a standalone technological innovation.

Digital tools enable educators and parents to track their children's growth trends in real time, cross-check observations, and adjust the pedagogical approach (Hatzigianni et al., 2023). These tools encourage creativity, agency, and collaboration among children. When implemented thoughtfully, they accomplish this through interactive storytelling, open-ended media creation, and constructional play (Emi et al., 2024; Hou et al., 2025; Taddese et al., 2025). In contrast, without becoming selective about how to use it, Verma (2025) emphasised that exposure to online risks, inappropriate content, and uncontrolled interactions may result in anxiety, stress, and emotional instability in young children.

Xi et al. (2025) and Capatina et al. (2024) also claimed that children's access to uncontrolled digital interactions, content, and exposure to cyberbullying can adversely affect their self-esteem and social adaptation. Studies have also shown that excessive screen time is associated with adverse developmental consequences such as screen addiction (Gottschalk, 2019), loss of face-to-face communication (Strouse & Ganea, 2017), anxiety associated with surveillance, and exposure to inflammatory content in young children (Livingstone & Blum-Ross, 2020).

A study by Harverson et al. (2025) also recognised a negative relationship between psychological well-being, behavioural regulation, quality of parent-child relationships, and long screen time, supporting the idea that less screen time can enhance socio-emotional and relational development. These studies suggest that unregulated exposure to digital environments in early childhood can interfere with basic developmental mechanisms that underlie mental health and social competence. Therefore, educational leadership is needed in this evolving digital environment, particularly in ECE. In this regard, effective leadership goes beyond the use of digital technologies to the development of a responsible digital culture based on child protection, ethical use, and emotional literacy (Nalliah et al., 2025).

Consequently, leaders should strike a wise balance between innovation and caution, since digital tools are designed to support, not undermine, children's mental health and well-being. Furthermore, evidence suggests that institutions with proactive, reflective, and ethically sensitive leaders reduce students' exposure to the dangers of online activities and promote mental health through systematic, organised digital citizenship programmes (Ghavifekr & Rosdy, 2015; Verma, 2025).

In Malaysia and other developed countries, the introduction of technology-based learning systems in preschools has been enhanced as part of broader educational digitalisation programmes. National policy initiatives such as the Malaysia Education Blueprint (2013–2025) and the Digital Education Transformation Roadmap highlight the need to expose learners to technology at an early age in order to develop future-ready learners. However, despite these national initiatives, educators and school leaders are often insufficiently prepared to

address the psychological and ethical implications associated with technology use among preschool children aged three to six years. The gap highlights the importance of developing leadership models that systematically incorporate child-centred ethical concerns, mental health sensitivity, and family engagement into digital transformation policy systems.

Building on these considerations, it is both timely and essential to examine how educational leaders can direct cyber behaviour management and support the well-being of children in the rapidly evolving digital landscape of early childhood settings. Existing research has predominantly explored digital technology integration, educational leadership, and children's socio-emotional well-being as distinct areas of investigation. However, little attention has been paid to the roles of educational leadership, AI-enabled digital practices, ethical governance, cyber behaviour management, and the mental well-being of children in ECE, especially in the Malaysian context.

To address this gap, the present study draws on Bronfenbrenner's ecological systems theory (Bronfenbrenner, 1979) and transformational leadership theory (Bass & Riggio, 2006) to examine how early childhood leaders shape institutional policies, influence teachers' digital practices, and engage families in creating safe, inclusive, and emotionally supportive digital environments. Through a qualitative interpretive case study in Malaysian preschools, the study proposes a Digital Humanistic Leadership Framework that integrates ethical governance, teacher capacity, family engagement, responsible digital practices, and children's socio-emotional well-being to support sustainable digital transformation in ECE. The following research questions guided the study:

1. How do ECE leaders interpret their role in managing the influence of AI-enabled digital technologies on young children's mental health and cyber behaviour?
2. How do educational leaders navigate institutional governance and policy implementation to promote ethical and developmentally appropriate use of AI-enabled digital technologies in ECE?
3. How can educational leadership frameworks be extended to support the mental wellness and ethical use of AI among young students?

1.1 Theoretical Framework

Bronfenbrenner's ecological systems theory provides a holistic framework for the digital age, highlighting how intersecting systems influence a child's development within the microsystems of their immediate family and school and the digital culture as the macrosystem. This study is based on a theoretical integration of ecological systems theory and the transformational theory of leadership. The combination of ecological systems theory and the transformational theory of leadership provides a multidimensional interpretive perspective on how leadership is extended to support the mental wellness and ethical use of AI among young students in ECE. Bronfenbrenner's ecological systems theory (1979) permits examination of the interactions between diverse levels of the environment, such as direct microsystems, including classrooms and family, and

more distant ecosystems and macrosystems, including the impact of digital infrastructure and society in general, that interact to shape the social paths and affective states of small children (Tudge et al., 2009). Also, Bronfenbrenner's theory situates the child within an interwoven web of environmental systems, including immediate contexts, such as family and classroom, institutional and policy frameworks, and cultural and technological forces. This ecological perspective can be used to examine the co-construction of children's cyber behaviour and emotional health as a result of the dynamic interactions between these nested systems. As an illustration, digital infrastructure, school technology policies, and parental practices all influence how young learners are exposed to and cognitively construct online spaces.

Educational leaders play strategic roles as agents of influence and alignment across various systems, providing coherence between an institution's values, teacher practice, and family engagement in the digital realm (Hasanah & Yusoff, 2024). This highlights that children's cyber behaviour and mental health cannot be viewed in isolation from the broader relational, institutional, and cyber systems (Elsayary et al., 2024). Consistent with this, transformational leadership theory (Bass & Riggio, 2006) provides insight into the behaviour and belief systems of school leaders.

This theory shows how progressive leaders could encourage change, develop professionally, and create ethical, emotionally intelligent, and digitally viable learning environments. It also explains how emotionally smart and visionary leaders might encourage ethical conduct, exemplify responsible online behaviour, and foster the psychological safety of both learners and teachers. In the current study, leadership is understood as the process of mobilising and harmonising ecological systems. Also, leaders are understood as a means of ensuring balance in systems, so that technological integration can promote cognitive and social growth without compromising emotional well-being.

The synthesis of these two theories provides the study with an operationalisation of leadership as an ecological connector and transformational agent within the digital learning ecosystem. This positive synthesis guides the qualitative design by outlining interview guidelines, thematic examination, and interpretive coding along three key axes: (a) how educational leadership practices can drive mental well-being by using digitally responsive pedagogies; and (b) the extent to which institutional and policy environments empower or restrain the moral foundation of technology usage in preschool institutions. The operationalisation of the theoretical framework was carried out during the research.

The focus on child-family-school interactions and institutional interactions, derived from Bronfenbrenner's ecological systems theory, guided the construction of interview questions, as did transformational leadership theory for questions on leadership practices, ethical decision-making, teacher support, and organisational change. These theoretical concepts were used as analytical lenses to organise codes into larger categories and as a conceptual framework for understanding the relationships between codes in the analysis of the data. Finally,

this theoretical synthesis not only provides a conceptual map for understanding the phenomena under study but also offers a critical framework for using leadership strategies to maintain balanced, humane, and developmentally appropriate digital learning environments in early childhood learning.

2. Literature Review

Digital technologies are increasingly used in early childhood education (ECE), and, consequently, leadership has shifted from an administrative role to one of strategic direction that ensures children's safety, well-being, and ethical engagement in digital spaces. The literature shows a consensus that leadership is significant to the success of technology integration, but there are conflicting views on the nature and extent of the role. Some perspectives view digital leadership as a mechanism for organisational innovation and teaching quality, while others see the leader's role in ensuring the socio-emotional development of children and protecting them from digital dangers as more significant than advancing technology.

Recent empirical evidence shows that digital leadership positively affects institutional quality and teaching effectiveness. For instance, Syarifudin and Muttaqin (2025) showed that a strategic management approach combined with digital leadership and the application of a play-based learning approach to using technology had significant effects on improving educational quality. Likewise, Belano and Aclao (2025) stated that school leaders support safe digital learning by role-modelling ethical technology use, providing teacher professional development, and ensuring equitable access to technology. The results highlight the role of leadership as a facilitator of digital transformation in educational institutions.

On the other hand, some studies disagree, arguing that leadership effectiveness cannot be measured by technological implementation or organisational performance measures. Hazegh (2020) highlighted that relational leadership remains incredibly important, as trust, collaboration, and relational skills are more important than the technological skills of an early childhood educator. This shift underscores the value of building strong, trusting relationships as a foundation for effective teaching and learning. Similarly, Heikkinen et al. (2024) pointed out that capacity building of leaders in the early childhood sector is not systemic and that organisational structures are not optimal, implying that building leadership capability is as important as investing in technology to successfully transform the early childhood sector.

Leadership enables the implementation of emotionally responsive digital pedagogies, such as digital storytelling, interactive learning apps, and media-based play, that foster creativity and social collaboration among children. A study by Alotaibi (2024) found that young children's social-emotional development can be enhanced to a moderate-to-significant extent through game-based digital learning, especially when the latter is mediated by reflective and empathic educators. Leaders who promote experimentation and invest in professional development indirectly support children's emotional outcomes by empowering

their teachers. However, internal factors such as work overload and external environmental factors, such as poor infrastructure and technical support deficiencies, may limit even great leaders.

These opposing results show the need for digital innovation to be accompanied by pedagogical and relational leadership skills, which are essential to prevent failure in producing sustainable educational outcomes. Issues related to digital technology and children's well-being are also debated in the literature. Under the right circumstances, technology can promote children's overall development, as digital literacy has been shown to positively affect mental health and school readiness, with the effect mediated by psychological resilience (Meng et al., 2023).

Studies on cyber behaviour, on the other hand, emphasise developmental risks associated with early digital exposure and the necessity for intentional adult involvement to promote safe online behaviours among children (Edwards et al., 2018). His findings clearly illustrate that the influence of digital technologies on education is intricately linked to strong leadership, supportive pedagogical practices, and effective institutional governance. When these components are well coordinated, the benefits become more evident. Emerging research often focuses on digital citizenship, technological innovations, or instructional leadership, without necessarily establishing connections among ethics in governance, cyber behaviour management, and children's mental well-being within a cohesive leadership framework.

Although existing literature recognises the importance of family-school partnerships and responsible technology use, few studies investigate how educational leaders respond to and manage technology, teacher use, and parental involvement to create emotionally safe technological environments for young children. Consequently, the current body of knowledge remains fragmented, as leadership, digital technology, children's cyber behaviours, and mental health are predominantly studied in isolation.

Furthermore, empirical qualitative evidence specific to ECE in Malaysia is still limited, particularly regarding AI-powered educational environments and ethical governance through AI leadership. In light of these gaps, the present study explores the role of educational leaders in bridging institutional policies, family engagement, digital practices, and children's socio-emotional well-being, using Bronfenbrenner's ecological systems theory and transformational leadership theory to enrich the theoretical and practical understanding of leadership within the context of digitising ECE.

3. Methodology

The current study is a qualitative case study conducted using an interpretative approach to investigate how educational leaders in early childhood settings manage the convergence of AI, cyber behaviour, and the mental well-being of children. The research targets a sample of ECE centres in Malaysia that have integrated AI-enabled and digitally supported educational technologies into their teaching and administrative practices. These technologies encompass adaptive

learning applications, intelligent educational platforms, automated feedback systems, and digital learning environments designed to personalise instruction and promote children's engagement under the supervision of educators and school leaders. Examples include intelligent tutoring applications, gamified learning platforms, and computer-assisted classroom monitoring (Luckin et al., 2016).

A case study is deemed the most appropriate methodology given the complexity of leadership practices, institutional policies, and contextual dynamics as they manifest in real-world settings (Babchuk, 2016). The research design provides a detailed, contextualised understanding of how leaders in ECE balance institutional requirements, family systems, and policy frameworks to establish ethically responsible, developmentally appropriate, and secure online learning environments for young children.

3.1 Participants

Participants were selected through purposive sampling, using individuals with personal experience using digital leadership methods that influence the well-being of children in ECE. The study was carried out in three private ECE centres in Selangor, Malaysia, with all schools having introduced the use of AI-based and digitally assisted educational technologies for teaching and management purposes. The centres chosen are active in digital learning programmes and have leadership in place for integrating technology. The sample group included five preschool principals or head teachers who were familiar with technology integration and institutional governance, 10 early childhood educators across different age groups and professional responsibilities, and two parent representatives who also served as digital coordinators.

They provided information on the home-school collaboration and digital communication practices. This multi-actor composition enabled a multi-level interpretation of leadership dynamics in the ECE ecosystem. The sample is sufficiently large to adhere to the principles of qualitative research, but it focuses on depth rather than breadth of representation (Patton, 2015). Qualifying factors included at least three years of teaching experience, leadership, active involvement with digital learning technologies, and a willingness to participate in semi-structured interviews. All subjects were given pseudonyms (e.g. Principal A, Headteacher B, and Parent C) to protect ethical principles and participant confidentiality.

3.2 Data Collection and Data Analysis

Semi-structured interviews were conducted between 24/06/2025 and 01/08/2025 with preschool principals and head teachers to obtain data on leadership practices, policy implementation, and ethical considerations in technology use. The set principles of thematic analysis (Braun & Clarke, 2006) were used in the data analysis of the semi-structured interviews. Every interview was audiotaped with permission, transcribed in full, and reread several times to ensure familiarity with the data and to safeguard the context and interpretive characteristics of the participants' narratives. The analysis began with open coding, identifying important statements in transcripts without predefined categories. Codes, based

on participants' answers, formed patterns and were clustered into groups representing similar concepts. After the initial coding, 48 open codes were reviewed, compared, and collapsed into 15 subcategories, then into six themes, using constant comparative analysis. The criteria for deciding on code refinement and theme development included conceptual similarity, participant frequency, and consistency with the theoretical framework. These clusters were evaluated using the ecological systems theory and transformational leadership theory, which helped to interpret leadership practices across systemic levels such as the family, institutional, and policy.

This method revealed how ethical digital practices and concerns about children's and educators' mental well-being are negotiated within overlapping ecological systems. After initial coding, themes were developed through constant comparison to ensure they reflected diverse participants' experiences. Thematic maps visually linked codes, subthemes, and categories, highlighting leadership mediation, teacher well-being practices, and systemic challenges. Cross-checking with raw data increased accuracy. Ultimately, the themes formed a coherent narrative that addressed the research questions and clarified the role of technology-centred leadership in mental health within the Malaysian ECE context.

3.3 Trustworthiness of the Study

The study employed strategies to ensure the trustworthiness of the qualitative findings, in line with Guba's criteria for credibility, transferability, dependability, and confirmability (Guba, 1981). Credibility was bolstered by repeated access to and numerous readings of interview transcripts and by triangulation of viewpoints from early childhood leaders, teachers, and parent representatives. This multi-participant approach enabled the comparison and validation of emerging themes across different stakeholder groups.

Dependability was achieved through an open audit trail that tracked the coding process, theme development, and decision analysis during the study. Confirmability was achieved through reflexive interpretation, in which the researchers analysed the data critically, questioned their own assumptions and interpretations, and sought to reduce the risk of bias. In addition, thick descriptions of the research context and participants were included to allow transferability and for the reader to assess the applicability of the results to other similar educational contexts.

3.4 Ethics Considerations

Ethical approval for this study was obtained from the Institutional Ethics Committee of Unitar International University on 10 June 2025. The study was reviewed and approved under approval number AJU1245/2025. All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and national research committees and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Participation in the study was voluntary, and written informed consent was obtained from all participants prior to data collection. Participants

were assured of the confidentiality and anonymity of their responses and were informed of their right to withdraw from the study at any time without penalty.

4. Results

4.1 ECE Leaders' Views on Technology, Mental Health, and Cyber Behaviour

Participants consistently described technology as an influential yet contradictory force in ECE. They recognised the potential of the same to improve creativity, literacy, and engagement, while cautioning against emotional and behavioural risks. The following are some interview quotes regarding ECE leaders' attitudes towards technology, mental health and cyber behaviour.

Principal A pointed out the imperative role of adult mediation:

"Technology is being introduced in the life of every child, including preschoolers, and the use of technology relies solely on how it is being ushered. She reported that academic exposure at home cannot be controlled and often leads to sleep, attention, and social interaction difficulties, so leadership that would bridge the school home gap by educating parents and supervising their activities is necessary."

Likewise, **Principal B** stated, *"Technology is a two-sided sword, that can bring creativity though it also leads to heightened emotional sensitivity and dependency in the children."* This was repeated by **Teacher C** who noted that children were extremely enthusiastic about digital games; however, a long screen time could at times cause them to lose patience in group activities.

The findings seem to suggest that successful leadership balances digital and socio-emotional controls. With the help of leaders who are structured in their guidance and offer emotional support, digital tools that have the potential to distract children can be turned into triggers for learning and collaboration. **Parent D** admitted that they trusted the school and their recommendations about what platforms are safe and suitable. When the principal arranged a parent meeting concerning cyber wellness, it transformed the way households oversaw devices at home.

In Bronfenbrenner's view of the mesosystem, these interactions are examples of how leadership is a link between institutional practices and family behaviour as a way of ensuring consistency in the digital experiences of children in various environments. Leaders can therefore be considered ecological connectors who use strategies of educational leadership to create concord in values and habits that will ensure the emotional stability of children and teach responsible digital behaviours.

4.2 Governance of AI Exposure in Early Childhood Settings

Participants generally discussed AI through their experiences with AI-enabled digital learning applications and technology-supported educational platforms rather than standalone AI systems. Their perceptions, therefore, reflected the practical implementation of intelligent digital technologies within everyday preschool learning environments. AI combinations and ethical frameworks remain underdeveloped. **Principal E** elaborated that *"the digital learning policy has*

started to be drawn by our institution, which involves responsible use of technology, but AI is a new frontier to us." She also mentioned that the school checks every application prior to its use to ensure that it does not gather personal information or ads. Correspondingly, **Principal A** stated that *"we do not have an AI-specific policy yet, but we adhere to national policies concerning the safety of the digital environment. We signed a Responsible Use Agreement with parents, which elaborates the possibility of sharing children's work or data online."*

Although these measures are pointers to initial attempts to control digital exposure, the participants admitted that the policies were implemented in a reactive and not a strategic manner. **Teacher F** expressed that he was unsure of the integration of AI, saying that he was advised to *"screen all digital content prior to usage in the classroom. Nevertheless, I believe we should have better education about the way AI works and what threats it poses to young learners."*

The parents were confused and curious. According to **Coordinator G**, *"some parents feel that AI implies robots teaching the kids, whereas others hold the view that it is already in our learning apps."* This shows that there is a communication barrier among leadership, teachers, and families concerning the nature and implications of AI in education. These governance gaps are based on the exosystem perspective; institutional policies that indirectly affect the lives of children through teachers and parental mediation have a digital impact. In this regard, educational leadership implies more than the enforcement of policies, as ethical interpretation requires leaders to transfer abstract digital safety standards into developmentally resonant and rational measures that will guarantee data privacy, fairness, and well-being.

4.3 Educational Leadership for Ethical AI and Student Mental Wellness

The participants expressed a common vision of leadership as central to addressing the ethical and emotional implications of technological practice in ECE. **Principal B** claimed that models of leadership must transfer beyond administrative oversight to emotional leadership. She said, *"We must develop digital empathy in the teaching personnel, so that they are able to not only be proficient in the key advantages of technology but also to identify the emotional effect it has on children."* **Principal E** told us that his leadership team developed the habit of including indicators of well-being in their digital curriculum review. He described how each digital initiative is now assessed based on whether it contributes to collaboration, reflection, or mindfulness, and in doing so, has reconceptualised well-being as more of a directed result from incidental than a quantifiable technique of pedagogy.

The teachers reinforced the importance of supportive leadership. **Teacher H** said that *"when leaders attend to educators' emotional well-being, teachers will be able to deal with the technology more efficiently and would be able to teach children to control their emotions"*. This finding points to an indirect but essential connection between teacher well-being and emotional health and well-being in children, and it may seem that leadership approaches that invest in teacher morale and professional capability lead to healthier classroom climates in which technology application is more ethically informed and capable.

Regarding the parental side, **Parent D** supported those leadership models that incorporate home-school partnership: *"Leaders should establish bridges between school and home concerning ethical AI utilisation."* When leadership models are designed with the family as one of their pillars, ethical practice will be a collective obligation and not an issue exclusively in the school. Together, these results indicate an aspect of leadership which works through vision, empathy, and relational trust.

As explained in the context of Bronfenbrenner's macrosystem, leadership becomes a moral and cultural element that influences institutional and family responses to technology. Leaders who are empathic, ethically conscious, and govern collaboratively provide environments that can be theorised as digital humanistic leadership, a model that combines technological innovation with emotional and ethical awareness in early childhood contexts. Table 1 presents the related details.

Table 1: Thematic Framework with Supporting Excerpts

Theme (2-5 words)	Related Codes / Subthemes	Supporting Excerpts from Transcript
1. Guided and Balanced Technology Use	Guided Technology Use; Structured Digital Supervision; Unregulated Exposure Risks; Dual Nature of Technology; Digital Emotional Dependency	<i>"Technology has become part of every child's life, even in preschool, but I believe its impact depends entirely on how it is guided. When children use tablets with structured supervision, we see improvements in focus and engagement" (Principal A). "I see technology as a double-edged sword. On one hand, it develops creativity and early literacy, but on the other, it increases emotional sensitivity" (Principal B).</i>
2. Emotional Regulation in Digital Learning	Screen Time Frustration; Leadership Digital Mediation; Cyber Wellness Education; Parental Reliance on Leadership	<i>"Children are very excited about digital games, but prolonged screen time sometimes makes them less patient with group activities. We have to guide them back to real-world interaction" (Teacher C). "When the principal organised a parent session on cyber wellness, it really changed how families supervise children's device use at home" (Parent D).</i>
3. Institutional and Policy Gaps	Emergent Digital Policy; AI Policy Gap; Ethical App Evaluation; Data Protection Practice; AI Knowledge Deficit	<i>"Our institution has begun to outline a digital learning policy that includes responsible use of technology, but AI is still new territory for us" (Principal E). "Teachers are encouraged to review all digital content before classroom use ... Still, I feel we need clearer training on how AI actually works and what risks it brings to early learners" (Teacher F).</i>

Theme (2–5 words)	Related Codes/ Subthemes	Supporting Excerpts from Transcript
4. Leadership as Ethical Mediator	Leadership Policy Translation; Parental Consent Policy; AI Concept Confusion; Teacher-Led Content Screening	<i>"We don't yet have an AI-specific policy, but we follow national guidelines on digital safety. We have a 'Responsible Use Agreement' signed by parents that explains how children's work or data might be shared online" (Principal A). "Some parents think AI means robots teaching children, others believe it's already used in our learning apps. I think the school should develop a communication plan to explain how AI is used" (Parent Coordinator G).</i>
5. Transformational Support for Well-Being	Emotional Leadership Approach; Cultivating Digital Empathy; Teacher Wellness Impact; Leadership Support	<i>"Leadership frameworks should move beyond administrative supervision to emotional leadership. We need to cultivate digital empathy in our schools" (Principal B). "When leaders care about our emotional well-being, we can handle technology better and help children balance their emotions" (Teacher H).</i>
6. Collaborative Ethical Digital Culture	Home-School Ethical Bridge; Parental AI Awareness; Collaborative Ethical Framework; Well-Being Integration Strategy; Mindful Digital Pedagogy	<i>"Leaders should create bridges between school and home when it comes to ethical AI use. Parents need clear guidance on how AI tools influence children's privacy and development" (Parent D). "Our leadership team has started to embed well-being indicators into our digital curriculum review" (Principal E).</i>

5. Discussion

The results of this study shed light on how educational leadership supports the mental wellness and ethical use of technology, including AI, among early childhood students in ECE. Informed by Bronfenbrenner's (1979) ecological systems theory and transformational leadership theory (Bass & Riggio, 2006), this study situates Malaysian ECE leaders' voices within a broader academic dialogue on ethical digital integration and socio-emotional well-being in early learning settings. Six interconnected themes emerged: regulated and balanced technology use, emotional regulation in digital education, institutional and policy deficiencies, leadership as an ethical intermediary, transformative support for well-being, and a collaborative ethical digital culture.

5.1 Guided and Balanced Technology Use

Participants uniformly stressed the need for adult mediation of technology in early childhood environments. This aligns with Paul et al. (2023) and Hatzigianni et al. (2023), who showed that technology makes differentiated learning and formative assessment possible when educators control students' engagement. In contrast, exposure lapses were specifically linked to attention problems and

emotional irritability, which were tracked through peer interactions outside the home environment. These results are consistent with those of Verma (2025) and Heffler et al. (2024), who associated unsupervised screen time with emotional instability and dysregulated sensation. Leadership is also an ecological safeguard between the microsystem of the child and family and the mesosystem of the school environment, helping ensure the stability and consistency of digital experiences, which Navarro (2022) identifies as essential to healthy digital development.

This finding extends prior literature by suggesting that the effectiveness of digital technology in ECE depends less on the technology itself than on the quality of leadership governing its implementation. While Syarifudin and Muttaqin (2025) and Belano and Aclao (2025) emphasised digital leadership as a driver of educational quality and safe technology use, the present findings demonstrate that leadership also serves as an ecological mechanism that balances innovation with children's emotional protection through coordinated school-family practices.

5.2 Emotional Regulation in Digital Learning

The data show that leaders and educators view digital learning environments as emotionally challenging, which is often highlighted by the increased levels of affective instability, lack of patience, and increased levels of psychological dependence caused by prolonged exposure to digital environments. This finding is consistent with studies by Ventouris et al. (2021) and Livingstone and Blum-Ross (2020), which confirmed that time spent on a computer screen increases affective responsiveness in young children. Such emotional dysregulation has particular saliency in the field of early childhood learning, as young learners at this stage of development are still developing overarching self-regulatory mechanisms; therefore, they are more susceptible to overstimulation and affective saturation.

This interpretation further advances the ongoing discourse concerning the developmental impacts of digital technologies. While Meng et al. (2025) posited that digital literacy may enhance children's well-being when complemented by psychological resilience, the current findings suggest that these advantages are dependent on emotionally responsive leadership and consistent adult mediation. This underscores the perspective that leadership functions as a protective ecological element rather than solely an administrative role within digitally mediated learning contexts. These findings further indicate that leadership mitigates emotional risks through intentional cyber wellness programmes that strengthen consistency between school and home environments.

The example of the principal-led programmes aimed at educating educators and parents illustrates how leadership is an emotional regulation system that does not respect institutional or family boundaries. The interventions fill the communicative gap between school and home, creating uniformity in expectations, routines, and responsiveness to digital technology, which strengthens the ability of children to regulate their emotions in different

situations. The results align with the findings of Ramos et al. (2023), who also visualised leadership in ECE as a praxis based on emotional literacy, ethical sensitivity, and digital empathy instead of technical competence. Leadership can be understood as a mesosystemic stabilising force that comprises educators, families, and institutional values. This type of leadership strengthens the emotional state of educators during times of technological change and enhances their skill in modelling self-regulation, eventually helping to develop a more emotionally sustainable digital learning experience among young children.

5.3 Institutional and Policy Gaps

The participants' concerns about the existence of AI-related policies and the ethics of applying such technologies highlight broader governance deficiencies in the exosystem. Ghavifekr and Rosdy (2015) argue that fragmented institutional policy structures and a lack of adequate AI literacy significantly hamper leaders' roles in managing the digital transformation process. These findings align with those of Mogoale et al. (2025), who argued that policy ambiguity undermines ethical leadership and increases the risk of abuse, inequity, and injustice in digital learning environments. In contrast to previous studies, which focused more on policy ambiguity, the current results suggest that leadership capacity is itself a governance problem. This finding confirms Heikkinen et al. (2024), who stated that, in addition to technological infrastructures, leadership preparation and organisational ability are essential for sustainable digital transformation in ECE.

5.4 Leadership as Ethical Mediator

The results highlight the mediating value of school leaders in the mediation process between institutional regulation and parental awareness, as per Bronfenbrenner's theory. To achieve the process of creating abstract policy into concrete practice, principals made responsible use of agreements and oriented parents towards the working capabilities of artificial intelligence. This accords with Ramos et al. (2023), who demonstrated that ethical principles foster collective responsibility among staff and families in order to promote digital citizenship. Accordingly, leadership mediation in ecological systems links across macro-level policy talk and what children do at the micro-level in classrooms and homes.

This result extends Bronfenbrenner's ecological approach by showing how educators' practice and family engagement intersect with institutional policy across multiple layers. Leadership thus becomes an ecological connector, which transforms moral values into developmentally appropriate digital practices. This interpretation is consistent with Hazegh (2020), who argued that relational leadership provides the foundation for sustainable educational change through trust and collaboration.

5.5 Transformational Support for Well-Being

The results revealed that leadership, such as empathy, intellectual stimulation, and individual consideration, has a significant positive effect on teachers' confidence and emotional strength towards e-pedagogy. This is consistent with Yang and Du (2024), who found that leadership could reduce teacher burnout by

enhancing emotional self-efficacy. When educators feel supported by their colleagues, they are better able to scaffold children's digital interactions, paralleling Alotaibi (2024), who reported that game-based digital learning experiences for children resulted in more positive socio-emotional outcomes when teachers facilitated this. This is consistent with Rizzo et al. (2025), who associated neurological and behavioural equilibria in young children with guided technology use and emotionally responsive teaching environments. The results enrich the transformational leadership theory by providing additional insights into how transformational leadership indirectly affects children's well-being by increasing teachers' confidence, emotional resilience, and ability to manage digital learning experiences.

5.6 Collaborative Ethical Digital Culture

Lastly, the ethical digital culture based on collaboration demonstrates how leadership can make ecological systems compatible through a shared vision, trust, and open communication. The results emphasise the necessity of engaging parents in the process of discussions about the ethical use of technology, including AI. This confirms Bronfenbrenner's macrosystem perspective, which highlights the role of cultural norms, institutional values, and societal beliefs in children's development. In line with this argument, Ramos et al. (2023) argue that ethical digital leadership is an undertaking that requires a group effort grounded in care, empathy, and shared responsibility, rather than a single administrative position.

These studies indicate that digital cultures in early childhood flourish optimally when leaders promote collaborative governance and inculcate moral, cultural, and institutional objectives across connected ecosystems. The current study differs from those that view digital leadership as a digital integration strategy by conceptualising collaborative ethical digital culture as a shared governance process that includes digital leaders, teachers and families. This expanded way of thinking helps bring together the new idea of a Digital Humanistic Leadership Framework, which encompasses ethical responsibility, emotional health, and ecological cooperation in the context of technology, including AI-supported ECE.

6. Conclusion

The results of the current study indicate that school leaders can shape children's digital experiences through developing positive environments that allow children to regulate their emotions, engage in ethical behaviours, and use technology, including AI, in ways that are appropriate for them, based on Bronfenbrenner's ecological systems theory and transformational leadership theory.

The results also suggest that digital technologies can pose learning and emotional risks, depending on the quality of leadership practice and family guidance. Competent leaders make technology a creative, collaborative, and meaningful learning environment, encourage responsible use, and build collaborative and supportive relationships with parents. Meanwhile, inadequate supervision and unsupervised online time can make children more prone to emotional and behavioural issues.

The study also provides valuable insights into the qualities of leadership needed to develop teachers' confidence and competence to teach ethically, such as empathy, intellectual stimulation, and individualised support. These leadership practices have the potential to establish emotionally positive learning environments in which technology is not merely used for teaching, but for children's learning needs.

Besides, the study emphasises that there is a key gap in ECE education governance when it comes to AI. While institutional policies on digital safety are available, effective institutional advice on the ethics of AI, data privacy, transparency of algorithms, and age-appropriateness is limited. The study highlights the importance of providing educational leaders with tools to implement broad policy directions in context-sensitive ways to meet children's well-being needs and encourage responsible digital innovation. The study advances the concept of digital humanistic leadership, which takes an ethical and collaborative approach to leadership, incorporating technology while emphasising care, trust, and shared responsibility. The study offers a more comprehensive perspective on leadership in AI-supported ECE and provides policymakers and researchers with guidance for future policy development and research.

Overall, the current research is adding new theoretical knowledge to Bronfenbrenner's (1979) ecological systems theory and transformational leadership theory in the context of AI in ECE. It suggests the Digital Humanistic Leadership Framework as an integrative perspective on educational leadership as an ecological and ethical connector for institutional governance, teacher professional capacity, family engagement, responsible digital practices, and children's socio-emotional well-being. This conceptualisation extends and builds on prior research by elevating the notion of technology integration to that of sustainable digital transformation in the early education context and a focus on the human.

7. Implications of the Study

The study has important implications in the field of educational leadership, policy, professional teacher development, and research. The main theoretical contribution of this study is the co-construction of the Digital Humanistic Leadership Framework, which combines ethical governance, teacher professional capacity, family engagement, responsible digital practices, and the socio-emotional well-being of children in a single ecological approach to leadership.

The proposed framework differs from previous studies that primarily examined technology integration and educational leadership as separate constructs and conceptualises educational leadership as an ecological and ethical bridge connecting digital innovation, institutional governance, and child development. This combination of Bronfenbrenner's ecological systems theory and transformational leadership theory helps to enrich the theories and offers a holistic approach to digital change in ECE that is sustainable, ethical, and people centred.

The results also support the primary role of transformational and ethically responsible leadership, focusing on a combination of emotional intelligence, digital literacy, and moral rationality. Empathy can empower leaders to create a digital culture rooted in balance, rather than distract teachers and students, and transform technology from a potential problem into an opportunity for creativity and cognitive growth. At the policy level, the findings emphasise the need for clear national and institutional frameworks governing AI in ECE, such as child data privacy, algorithmic fairness, and written informed parental consent. The views of leadership ought to be reflected in policy formulation to align macro-level requirements with micro-level classroom realities.

To develop teachers, digital emotional competence and reflective practice should be included in the list of professional learning, which confirms the connection between teacher well-being and children's socio-emotional regulation. Likewise, family involvement must be institutionalised through workshops and communication platforms that will encourage a common understanding of what is ethically acceptable use of technology. This will align with the ecological perspective of Bronfenbrenner on interconnecting systems that influence the development of a child.

Lastly, the study highlights the need for longitudinal and comparative research to examine the long-term effects of ethical digital leadership on teacher competence, organisational culture, and children's mental well-being. Implications suggest that leaders in the digital age should be technologically knowledgeable, ethically grounded, and humanistic, capable of balancing technological innovation with children's developmental and emotional needs in their approach, thereby enabling early childhood innovations that contribute to cognitive and emotional growth.

8. Limitations of the Study

The qualitative approach used in this study is an interpretative case study with a small purposive sample comprising preschool leaders, teachers, and parent representatives working in privately owned kindergartens in Selangor, Malaysia. Although this method allowed for in-depth exploration of experiences, the results are context-specific and cannot be statistically generalised to all ECE environments.

Future studies could employ multisite or mixed methods approaches to investigate if views are consistent and make the findings more generalisable. In addition, semi-structured interviews were the only source of data collection, which could have led to subjectivity and social desirability bias, as the participants might have idealised institutional practices. To make triangulation more effective and enhance the validity of the setting, the use of classroom observations, document analysis, and focus groups in subsequent research would provide stronger triangulation.

Another constraint is associated with the rapid development of digital technologies, especially the introduction of AI in early education. The results are

a point in time in an ever-changing environment, and it is essential to focus on longitudinal research to investigate adjustments in leadership practices in response to technological and policy changes. Lastly, ethical limitations did not allow direct involvement of children, which restricted what they learned about their experiences with digital media and emotional regulation. Future studies may use approaches that focus on children, such as visual ethnography, play-based interviews, or digital storytelling, to include children's perspectives in assessing the ecological effects of leadership choices.

9. Conflict of Interest

The authors declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

10. Acknowledgements

The authors declared that generative AI was used in the creation of this manuscript. The authors used a generative AI tool (Grammarly) to assist with language editing and clarity of expression. Specifically, this AI tool was used to improve the language and enhance the readability of the text. This AI assistant was employed to enhance the linguistic quality of the manuscript, including grammar, style, and clarity of expression. After using this tool, the authors reviewed and revised the content as necessary. The paper remains an accurate representation of the authors' work and intellectual contributions.

11. Funding

The author(s) declared that financial support was received for this work and/or its publication. The authors sincerely thank Ajman University for financial support for this study.

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