Advances in Curriculum Design & Education
WISDOM ACADEMIC https://doi.org/10.63808/acde.v2i4.578 Volume 2 , Issue 4

Research Article

Digital-Intelligence Empowering Integrated Care and Education for Universal Affordable Childcare: Application Scenarios, Real Challenges, and Promotion Strategies

Longtian Li[1,*],Qimin Cao[1]
[1]Huaiyin Normal University, Huai'an 223300, China
[*]**Correspondence:** Longtian Li, 1103729595@qq.com

© The Author(s) 2026.
This article is published by Wisdom Academic Press Ltd. under a Creative Commons Attribution 4.0 International License. The license permits use, sharing, adaptation, distribution, and reproduction in any medium or format, provided that appropriate credit is given to the original author(s) and the source, a link to the license is supplied, and any modifications are indicated. Unless otherwise stated, all images and third-party materials included in this article are also covered by the same license. For any material not covered by this license, if the intended use is neither permitted by applicable law nor allowed under the license terms, direct permission must be obtained from the copyright holder. To view a copy of this license, please visit http://creativecommons.org/licenses/by/4.0/.

Abstract

Enhancement of universal, affordable childcare through the extension of the kindergarten provision down to two-to-three-year-old toddlers needs balancing among tuition affordability, caregiving safety, and pedagogical quality; therefore, this research explores the application scenarios, challenges, and promotional tactics of digital-intelligence empowerment in this two-to-six age group. Following a two-dimensional theoretical framework in the combination of welfare-value-oriented goals and multi-level operational domains, the qualitative content analysis was performed in 28 policy documents and exemplary pilots (2019–2026), with 246 meaning units identified across 12 categories in axial coding. Coding findings show that the application scenarios (39.8%) involve health and safety caregiving for toddlers without intrusion (document coverage of 82.1%), precise regional demand and supply management (75.0%), cooperative parenting at home and institution, and two-to-six age development monitoring. Nevertheless, the implementation is faced with structural challenges (30.9%), which emanate mainly from financial sustainability challenges with tuition ceilings, deficits in teachers' holistic competencies (care, education, and digitization), intersectoral data silos, and market screen-related misalignment. Resolving such limitations will be informed by evidence-based promotional policies (29.3%) that include municipal public cloud sharing, screenless age-related products specifications, nurturing of teachers before and during service, and minimalist data governance policy. In sum, viewing digital-intelligence as a seamless public welfare scaffold that recognizes early development principles and teacher autonomy will create an enduring path to quality integration services.

Keywords

Digital-intelligence empowerment, Universal affordable childcare, Integrated care and education, Preschool education, Teacher digital competence

1. Introduction

In the face of technological change, the current global trends for ECEC reforms seek structural integration between different age groups in order to achieve a balance among equity of access, children's welfare and quality development, which is not possible without systemic coordination [1]. In response to demographic trends and low fertility rates, the recent Chinese childcare policies have been urging kindergartens to provide more affordable places for two- to three-year-old toddlers, but the problem of regional inequality of resources hinders their ability to fulfill the macro-level requirements [2]. As a result, there emerges a critical dilemma of providing universal integrated facilities, which have to be affordable, safe and qualitatively continuous in their care-education at the same time.

Under the framework of universal integrated childcare environments, digital intelligence empowerment refers to the harmonious integration of regional cloud governance platform, non-invasive Internet of Things (IoT) perception, artificial intelligence-based developmental observation, and digital communication between home and institution. Instead of subjecting infants to early learning from screens, the approach functions as an inconspicuous institutional support system that maximizes the efficiency of macro resource distribution, enhances campus security management, facilitates teachers' professional judgement, and provides scientific guidance for parental upbringing according to developmental laws.

Modern research into data governance in education focuses on the problem of regulatory challenges related to platform accountability and child privacy despite the fact that school-based guidelines do not consider the increased susceptibility of babies and toddlers [3]. The literature review concerning the use of artificial intelligence in early childhood environments proves that there are effective methods of assessing children in class and playing interactively, but existing solutions mostly aim at teaching three- to six-year-olds, not paying attention to the issue of toddler care continuity [4]. Additionally, empirical works dedicated to nurseries and preschool institutions prove the need for structured meals and screen time restriction for toddlers, but such health-related activities are separated from smart institution ecosystems [5]. Studies on the digital competence of preschool teachers show that the use of technology is quite inconsistent, but the complex knowledge about working with toddlers is not considered [6]. In general, existing literature does not take into account the problem of universal affordable costs and does not provide the chain of links from application to implementation.

In response to the aforementioned gaps, this research attempts to explore systematically how the concept of digital intelligence can help achieve universal, affordable and integrated care and education for children aged between two and six. In particular, the current research is going to answer such questions as what application cases can promote precision governance and integrated practice of care-education, what practical problems prevent the sustainable implementation in affordable establishments and what strategies of promotion based on evidence can be used for effective coordination of resources, teachers' skills and data protection. Through this integrated analytical lens, the research aims to inform equitable, safe, and high-quality childcare.

2. Methods

2.1. Research Design and Analytical Framework

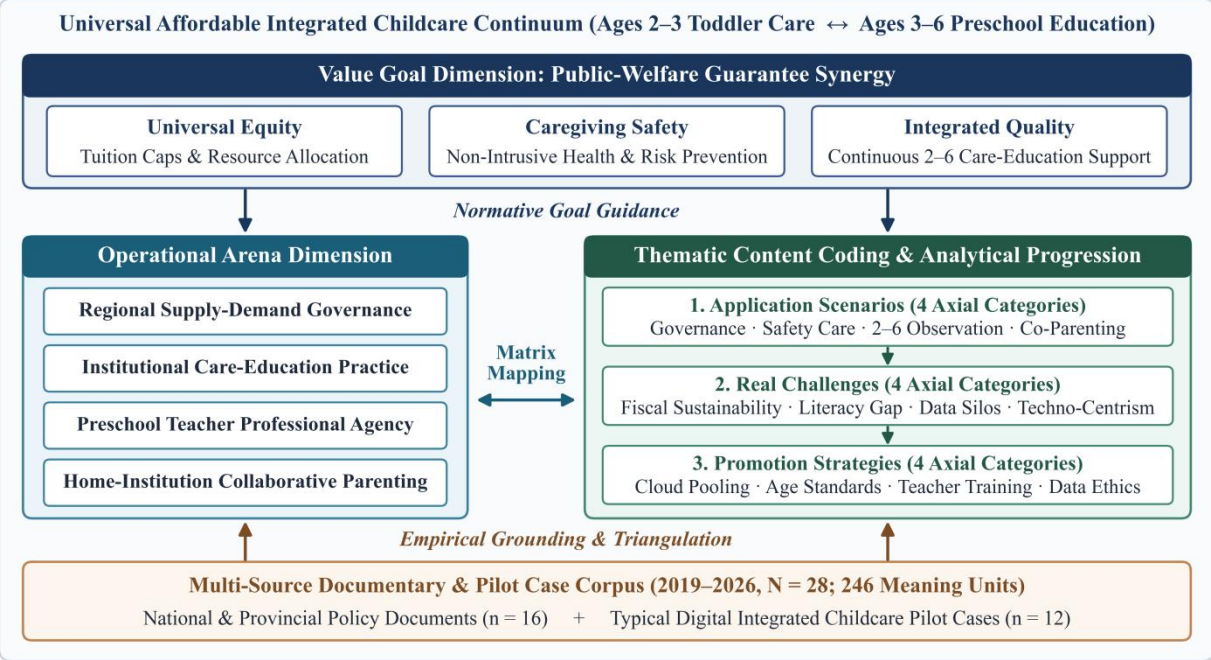
This research project uses the method of qualitative content analysis, which combines the analysis of documents from public policies with the typical regional pilot case analysis to explore how digital-intelligence helps realize universal affordable integrated childcare through macro-mandates and micro-practices. In order to maintain rigor in deductive-inductive research without making unnecessary speculation, a two-dimensional analytical model was developed by linking public welfare value goals of universal equity, caregiving safety, and integrated quality with operational areas covering regional supply-demand management, institutional care-education practice, preschool teacher professional agency, and home-institution partnership parenting.

Grounding operational areas in empirical literature enhances precision in the analytical process on the two-to-six continuum. Particularly, empirical literature on digital pedagogical documentation suggests that automation in recording will affect developmental assessment and might impose constraints on teacher autonomy, thus joint analysis of institutional practice and teacher agency is needed [7]. Similarly, the literature on digital teacher-parent communication suggests that interaction portal facilitates caregiving consistency only when compatible with family needs, thus home-institution partnership becomes an essential analytical area [8]. As shown in Figure 1, cross-linking value goals with operational areas will systematically facilitate coding.

Figure 1

Two-dimensional analytical framework of the study

Advances in Curriculum Design & Education
WISDOM ACADEMIC https://doi.org/10.63808/acde.v2i4.578 Volume 2 , Issue 4



2.2. Data Corpus and Selection Criteria

The publicly accessible and verifiable data set ranges from January 2019 to June 2026 and was sourced from authoritative government websites and scientific collections of empirical data in the aftermath of the foundational state policy on infant-toddler care. Policy documents include central legislative acts and ministry policies, namely State Council General Office policies on care for infants under three and fertility policies, Preschool Education Law of the People's Republic of China, and national educational digitalization policies along with province-specific policy implementation guidelines from trailblazing provinces such as Jiangsu, Zhejiang, Guangdong, and Sichuan. Along with the policy documents, there is also a selection of pilot cases based on official announcements of National Infant and Young Child Care Service Demonstration Cities, provincial smart childcare compendia, and case studies.

The selection process was guided by strict inclusion rules which demanded that each piece be directly related to universal affordable integrated services for children aged two to six years, digital intelligence use in governance and/or care-education processes, and authentic source of information while disallowing commercials, independent preschool instructional software literature and expensive nursery examples. The total number of sources initially found was 63 while the systematic screening revealed 28 sources – 16 policy-related documents and 12 pilot examples. As illustrated in Table 1 below, such a multiple level corpus covers both institutional and practical aspects.

Table 1

Overview of the policy and pilot case corpus (2019–2026)

Corpus Category	Administrative / Practice Level	Documents (n, %)	Coded Units	Representative Authoritative Sources and Coverage

Central Statutory & Policy Texts	National (State Council, NPC, MOE, NHC)	6 (21.4%)	54	State Council Directives ([2019] No. 15; [2024] No. 48); *Preschool Education Law of the PRC* (2024); National Educational Digitalization Plans
Provincial Implementation Plans	Provincial (Jiangsu, Zhejiang, Guangdong, Sichuan)	10 (35.7%)	74	*Jiangsu 14th Five-Year Childcare Plan* (2022); Provincial Fertility Support & Inclusive Toddler-Class Fee Cap Regulations
Regional Smart Governance Cases	Municipal / County Demonstration Zones	6 (21.4%)	56	Municipal cloud supervision, subsidy verification, and 15-minute childcare map cases from *National Demonstration Cities* releases
Institutional Integrated Pilot Cases	Public & Inclusive Private Kindergartens	6 (21.4%)	62	Kindergartens operating downward-extended 2–3-year-old toddler classes in provincial pilot compendia and empirical case reports
Total	Multi-Level Public Corpus	28 (100.0%)	246	24 primary coding texts (214 units) + 4 saturation-verification texts (32 units)

Note. Category percentages may not sum to 100.0% due to single-decimal rounding.

2.3. Coding Procedure and Trustworthiness Assurance

Thematic content analysis was structured and conducted employing NVivo 14 software with three consecutive coding stages with 24 documents used for building the main model and four randomly chosen documents, including two policy documents and two pilot cases, reserved for testing the theory saturation. At the stage of open coding, meaning units were generated in the form of technological application (98 units), practical challenges (76 units), and institutional responses (72 units) through scrutiny at the sentence level of all 28 documents. The constant comparison of meaning units resulted in abstraction of 36 initial concepts. At the stage of axial coding, initial concepts were grouped according to their semantic and functional relationships into 12 subcategories, which were then synthesized through selective coding into the three major thematic pillars presented in Section 3.

Several methodological precautions have been taken to ensure the reliability of coding and interpretive trustworthiness. Before full corpus analysis, two coders with specialization in preschool and teacher education conducted independent coding of a 25% random sub-sample (n=7 documents) based on a common codebook and achieved a coefficient of Cohen's kappa equal to 0.86 that is higher than 0.80 threshold level and shows the high level of inter-coder agreement. Unclear codes in the

whole dataset were clarified in peer-debriefing sessions to achieve a full consensus, and further coding of four reserved documents revealed the absence of any new conceptual categories in addition to the existing 36 concepts, which indicates the theory saturation. Additionally, cross-source triangulation among statutory policy directives, frontline pilot implementations, and empirical literature mitigated single-source reporting bias and ensured grounded analytical validity.

3. Results

3.1. Core Application Scenarios of Digital-Intelligence Empowerment

Thematic coding on the 28-document set yielded 98 meaning units (39.8%) (abstracted out of 14 initial concepts) across four key application cases, including 48 policy units (18 national-level policies and 30 provincial ones) and 50 pilot case units (24 regional pilots and 26 institutional pilot implementations). As presented in Table 2 below, the most common application cases include precision governance for universal supply-demand matching (A_1, 29 units, 75.0% of documents covered) and non-intrusive health and safety caregiving (A_2, 31 units, 82.1% of documents covered). In the domain of regional governance (A_1, 19 policy and 10 case units), municipal demonstration zones use geospatial demographic analysis along with unified online platforms to estimate child care demands of the age group two to six years within a 15-minute community circle. Such platforms help both public and private kindergartens to repurpose classroom capacity towards toddler groups with dynamic monitoring of government-mandated tuition limits and per capita subsidies. In the domain of institutional safety caregiving (A_2, 14 policy and 17 case units), specifically developed for the age group two to three-year-old toddlers, pilot kindergartens utilize contactless morning health check-ups, IoT indoor temperature and air quality sensors, automatic nutrient analysis tools, nap non-wearable respiration monitoring, and perimeter alerts for better health care delivery.

Moving from just physical security, digital intelligence plays an increasingly vital role in ensuring pedagogical continuity and co-parenting in the transition between toddlers and preschools. Continuous observation and development of pedagogical activities in care-and-education (A_3, 18 units from 50.0% of documents, including 6 policy and 12 case units) involve the use by pilot kindergartens of lightweight technologies of voice-to-text and behavioral tagging to help teachers document real life events in daily activities and play. Instead of implementing standardized tests, these records allow for longitudinal two-to-six growth portfolio of sensorimotor, linguistic and socio-emotional development from toddler enrolment to preschool graduation and configure the appropriate environments for play-based education. At the same time, in collaborative home-institutional scientific parenting (A_4, 20 units from 57.1% of documents, including 9 policy and 11 case units), a unified digital portal integrates daily food intake, duration of sleep and emotional transition reports with parents and

provides targeted micro-resources on responsive parenting of zero-to-six children and close perceptual gaps between home and institutional practice.

Table 2

Coding matrix of the 12 axial categories across the three analytical pillars

Selective Pillar	Axial Sub-Category (Code)	Initial Concepts (n)	Docs (n, %)	Policy Units	Case Units	Total Units (%)	Core Representative Indicators in Corpus
3.1 Scenarios *(98 units, 39.8%)*	Precision Supply-Demand Governance (A_1)	4	21 (75.0%)	19	10	29 (11.8%)	GIS demand forecasting; 15-min childcare map; dynamic subsidy audit
	Non-Intrusive Health & Safety Care (A_2)	4	23 (82.1%)	14	17	31 (12.6%)	Smart morning check; IoT microclimate; nutrition ratio; nap monitor
	Continuous 2–6 Observation & Support (A_3)	3	14 (50.0%)	6	12	18 (7.3%)	Voice-assisted play capture; 2–6 growth portfolio; interactive play setup
	Collaborative Home-Institution Parenting (A_4)	3	16 (57.1%)	9	11	20 (8.1%)	Routine feeding/sleep sync; age-graded parenting guidance push
3.2 Challenges *(76 units, 30.9%)*	Fiscal Cost vs. Investment Sustainability (B_1)	3	19 (67.9%)	11	13	24 (9.8%)	Tuition-cap budget squeeze; urban-rural divide; O&M funding deficit
	Teacher Composite Literacy & Burden Gap (B_2)	3	17 (60.7%)	8	14	22 (8.9%)	Under-3 nursing deficit; weak data translation; duplicate upload fatigue
	Cross-Sector Data Silos & Privacy Risk (B_3)	3	13 (46.4%)	10	7	17 (6.9%)	Health-education system barrier; biometric leakage & surveillance risk
	Techno-Centrism & Poor Age Adaptation (B_4)	2	10 (35.7%)	5	8	13 (5.3%)	Transplanted 3–6 screen software; neglect of toddler sensory attachment
3.3 Strategies *(72 units, 29.3%)*	Public Cloud Pooling & Fiscal Guarantee (C_1)	3	18 (64.3%)	15	8	23 (9.3%)	Municipal public cloud base; free inclusive modules; rural O&M subsidy

	Age-Graded Access & Workload Standards (C_2)	3	12 (42.9%)	8	8	16 (6.5%)	Screen-free 2–3 care rule; play-based 3–6 support; single-entry voice tool
	Pre-/In-Service Composite Teacher Training (C_3)	3	14 (50.0%)	12	6	18 (7.3%)	Normal university curriculum reform; tiered care-and-data mentoring
	Cross-Sector Data & Minimalist Ethics (C_4)	2	11 (39.3%)	11	4	15 (6.1%)	Unified 0–6 health-education API; minimum-necessary collection rule
Total	12 Axial Sub-Categories	36	28 (100.0%)	128	118	246 (100.0%)	Closed-loop alignment across Scenarios, Challenges, and Strategies

3.2. Real Challenges in Empowering Universal Integrated Childcare

While pilot explorations were active, coding of the content revealed 76 meaning units (30.9%) of the total number of meaning units from 11 initial concepts, which showed four structural barriers impeding implementation practice, where pilot cases contributed a larger portion of barrier units (42 units, 18 of them were regional and 24 institutional) compared to policy analysis (34 units, 14 central and 20 provincial). One main barrier is the contradiction between universal low cost and sustainability of digital investment (B_1, 24 units out of 67.9% of the total documents, 11 of them were policy and 13 were cases). Operating under severe governmental fees restrictions along with a high ratio of caregiver to child in toddler rooms in inclusive private and rural kindergartens makes these kindergartens financially incapable of funding constant sensor calibration, cloud renewals, and hardware replacement, creating gaps between urban and rural kindergartens and institutions in terms of digital infrastructure. Besides, a structural barrier is associated with the inability of teachers to have composite abilities for toddler care, preschool education, and digital skills (B_2, 22 units out of 60.7% of the total documents, 8 of them were policy and 14 were cases). Preschool teachers reassigned from three-to-six classrooms to toddler classes often lack specialized under-three nursing expertise and pedagogical data literacy, while unintegrated municipal platforms demand repetitive manual uploads across separate portals, triggering digital formalism and occupational burnout.

Moreover, institutional silos and commercial product mismatch also undermine empowerment effectiveness within the two-to-six range. The cross-departmental silo problem and infant-toddler privacy issues (B_3, 17 units across 46.4% of documents, with 10 policy and 7 case units) arise from the administrative separation of health commissions that take care of under-three childcare and education bureaus in charge of three-to-six kindergartens. Incompatible municipal database systems make it

impossible to connect maternal-child immunizations and physical examination information with the developmental portfolio of kindergartens, while omnipresent classroom cameras and biometric terminals increase the danger of leaking sensitive infant data and surveillance. At the same time, commercial techno-centrism and inadequate adaptation (B_4, 13 units across 35.7% of documents, with 5 policy and 8 case units) appear where technology companies directly import the screen-based software from primary schools or the higher grade in preschools.

3.3. Evidence-Based Promotion Strategies for Sustainable Integration

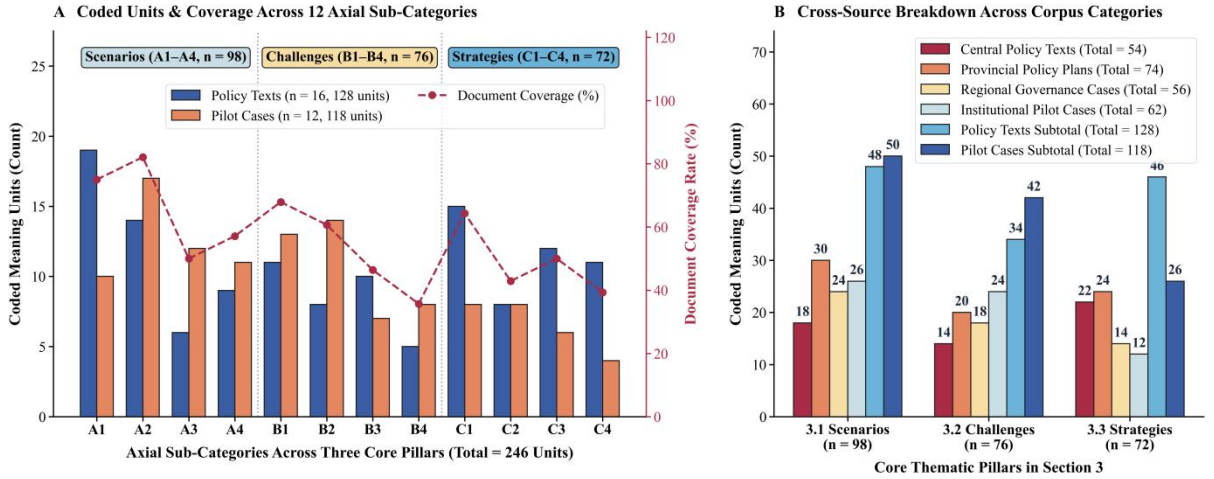
Integration of policy measures and benchmark pilot projects resulted in the identification of 72 meaning units (29.3% of all meaning units – abstractions of 11 initial concepts; 46 policy units representing 22 central and 24 provincial units, as well as 26 case units representing 14 regional and 12 institutional units) associated with four promotion policies countering the barriers. According to Figure 2, government-driven regional cloud pooling and tiered fiscal guarantees (C_1, 23 units covering 64.3% of all documents, including 15 policy and 8 case units) represent the first basic cost sharing tool. Municipalities provide integrated public cloud platforms for childcare that offer free of charge enrollment, health-nutrition, and co-parenting modules for affordable kindergartens, along with maintenance subsidies for rural and constrained institutions. To counteract technocentrism and paperwork burden, age-specific product access requirements (C_2, 16 units covering 42.9% of all documents, including 8 policy and 8 case units) mandate back-end sensing along with front-end screen-free childcare for 2-3-year-olds and play-oriented exploratory support for 3-6-year-olds, as well as use of single-sign-on voice shorthand tools to ease teachers' paperwork burden.

Further sustainable long-term integration requires the development of synchronized human resource development and cross-sectoral governance. The integrated development of teacher literacy (C_3, 18 units from 50.0% of documents, including 12 policy and 6 case units) links the preschool curriculum reform at the normal university with hierarchical work-place training. Benchmarking activities integrate the practices of responsive infant-toddler caregiving, natural behavioral observation, and pedagogical interpretation of data into pre-service practices, developed jointly with the demonstration kindergarten and municipal in-service mentoring, which allows the teacher to transform digitalized records into personalized caregiving practices instead of reporting them. In parallel, cross-sectoral interoperability of data and minimalist ethics governance (C_4, 15 units from 39.3% of documents, including 11 policy and 4 case units) ensures the establishment of data exchange interfaces between health and educational institutions for the smooth transfer of zero-to-six records and minimum-necessary data collection, encryption, and desensitization.

Figure 2

Coded unit distribution and cross-source breakdown across analytical pillars

Advances in Curriculum Design & Education
WISDOM ACADEMIC https://doi.org/10.63808/acde.v2i4.578 Volume 2 , Issue 4



4. Discussion

The dominance of non-invasive physiological monitoring and regional demand-supply balancing within the coded corpus identifies the structure through which digital intelligence restores the balance between equity, safety, and quality in universal integrated childcare. This is supported by macro-econometric evidence that the expansion of universal childcare leads to better health of young children while contributing to previous research by illustrating the mechanism by which non-contact physiological monitoring converts policy coverage into risk reduction among vulnerable toddlers [9]. However, while the detected financial sustainability constraint is consistent with the fact that stringent tuition control hinders quality improvement in low-cost pre-schools, the benchmarking pilot results deviate from conventional cost-quality constraints by providing evidence of reduced governance costs through municipal public cloud pooling [10]. On the other hand, longitudinal development portfolios mechanistically resolve the dichotomy between toddler physical nursing and preschool pedagogy in history.

Cross-source comparisons further explain why the commercial techno-centrism became more visible in institutional front-line instances than in policy documents: profit-motivated suppliers tend to minimize development costs by repurposing the software developed for preschoolers' screen activities for use in toddler classes. The screen-oriented interference violates the guidelines of global public health for screen time, principles of international early childhood digital governance, and Nordic approaches of play-based pedagogy, as these approaches restrict the screen activity during fast-developing sensorimotor and neurodevelopmental processes in toddlers. In line with the empirical evidence indicating that toddlers' well-being in different childcare environments requires teachers' sensitive caregiving behavior, it is proved that algorithms cannot replace human affective attunement [11]. It means that digital-intelligence should stay confined to the invisible environmental scaffolding for the freedom of caregiver's attention to physical contact, secure attachments, and free-play.

WISDOM ACADEMIC https://doi.org/10.63808/acde.v2i4.578 Volume 2 , Issue 4

An empirical asymmetry became evident in high case rates of teacher literacy problems and the prevalence of top-down training mandates, revealing the human dimension of digital formalism. When city platforms insist on fragmented reports and do not develop cross-age pedagogical initiative, re-assigned preschool teachers become nothing more than data entry machines trapped between their unfamiliarity with toddler nursing needs and administrative burden. This is similar to curriculum studies internationally that show preschool teacher education tends to separate digital technologies into a practical skill and keep them outside holistic care and play teaching, despite extending downward enrollment to toddlers under three years old exacerbating the professional dilemma even further [12]. Effective preschool teacher education must consequently transcend isolated software instruction to foster integrated professional judgment synthesizing toddler care sensitivity, developmental psychology, and data-informed reflective practice.

There are several limitations of methodology that need to be taken into account while considering these results. While a qualitative content analysis of 28 authoritative policy documents and benchmark pilot programs can give an accurate depiction of macro-institutional designs and meso-level operation patterns, a potential bias of survivorship in using documented pilot cases might appear due to possible neglect of failures of implementation in undocumented pilot programs of remote and poorly funded kindergartens. It is important to note that documents cannot be used as a direct source for measuring micro-level interaction dynamics in classrooms, physiological reactions of toddlers to stress, and subjective perceptions of all participants involved throughout extended developmental cycles. Future research needs to use stratified sampling techniques for large-scale surveys among preschool teachers and parents in urban and rural inclusion kindergartens to establish predictor sets of competence and privacy concerns.

5. Conclusion

From a two-dimensional content analysis of 28 authoritative policy documents and representative pilot cases (12 axial categories, 246 coded meaning units), this paper provides systematic empirical evidence on the empowerment process of digital-intelligence in universal affordable integrated childcare. As empirical evidence shows, technology utilization (98 units, 39.8%) includes non-invasive toddler safety care giving (82.1% document coverage), regional supply and demand management (75.0%), partnership home and institutional parenting (57.1%), and ongoing two to six development monitoring (50.0%). At the same time, practical progress faces structural challenges (76 units, 30.9%) including affordable financial sustainability (67.9%) and multi-faceted teacher competency issues (60.7%), as well as data silos from different sectors (46.4%) and business screen-centered misalignments (35.7%). To address such barriers, coordinated promotion policies (72 units, 29.3%) include municipal public cloud computing (64.3%), teacher training before and during

employment (50.0%), age-specific screen-free guidelines (42.9%), and minimalist data governance ethics (39.3%).

Both theoretically and practically, it is apparent from the analysis above that the development of universal integrated childcare does not require cost-intensive acquisition of hardware, but rather institutional integration of resources, care delivery practices, and teachers' empowerment. Maintaining public welfare inclusiveness, adhering to early childhood development laws, and empowering preschool teachers' comprehensive professional power offer a practical guide to building a quality zero-to-six integrated care and education public services system.

Acknowledgments

The authors declare that no specific acknowledgments are required.

Author contributions

Not applicable.

Funding

This research was supported by:

(1) 2025 Jiangsu Province Education Science Planning Project: "Research on the Construction of a Guarantee System for High-Quality Development of Preschool Education in Jiangsu Under the Guidance of Equity, Safety, and Quality Synergy" (Project No.: C/2025/01/44, Principal Investigator: Cao Qimin);

(2) 2025 Jiangsu University Philosophy and Social Sciences Research General Project: "Research on the Design and Implementation of Early Childhood Programming Education Under the STEM Concept" (Project No.: 2025SJYB1396, Principal Investigator: Cao Qimin).

Data availability

No data availability statement is required.

Declarations

Conflict of interest

The authors declare that there is no conflict of interest.

Ethics approval

Not applicable.

Consent to participate

Not applicable.

Consent for publication

Not applicable.

Publisher's Note

Wisdom Academic Press Ltd. remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

References

[1] OECD. (2023). *Empowering young children in the digital age* (Starting Strong). OECD Publishing. https://doi.org/10.1787/50967622-en

[2] Wang, S., & Yang, L. (2025). National will in the context of low fertility: Exploring the Chinese childcare policies after the implementation of three-child policy. *Policy Studies, 46*(4), 582–602. https://doi.org/10.1080/01442872.2024.2339889

[3] Day, E., Pothong, K., Atabey, A., & Livingstone, S. (2024). Who controls children's education data? A socio-legal analysis of the UK governance regimes for schools and EdTech. *Learning, Media and Technology, 49*(3), 356–370. https://doi.org/10.1080/17439884.2022.2152838

[4] Su, J., & Yang, W. (2022). Artificial intelligence in early childhood education: A scoping review. *Computers and Education: Artificial Intelligence, 3*, 100049. https://doi.org/10.1016/j.caeai.2022.100049

[5] Huang, Y., Li, L., Zhao, C., Zhong, P., Wang, X., Geng, Y., Meng, N., Wu, Q., & Zhang, Y. (2024). Leveraging nursery and early childhood education institutions for improving feeding and movement behaviours of infants and young children in China. *Journal of Global Health, 14*, 03011. https://doi.org/10.7189/jogh.14.03011

[6] Meng, J., Ouyang, Y., & Wang, C. (2026). Research on the manifestations and key factors of digital competence of China's preschool teachers. *Frontiers in Psychology, 17*, 1888962. https://doi.org/10.3389/fpsyg.2026.1888962

[7] Restiglian, E., Raffaghelli, J. E., Gottardo, M., & Zoroaster, P. (2023). Pedagogical documentation in the era of digital platforms: Early childhood educators' professionalism in a dilemma. *Education Policy Analysis Archives, 31*(137). https://doi.org/10.14507/epaa.31.7909

[8] Chen, J. J., & Rivera-Vernazza, D. E. (2023). Communicating digitally: Building preschool teacher–parent partnerships via digital technologies during COVID-19. *Early Childhood Education Journal, 51*(7), 1189–1203. https://doi.org/10.1007/s10643-022-01366-7

[9] Ren, M. (2024). Preschool and child health: Evidence from China's universal child care reform. *Economics of Education Review, 100*, 102540. https://doi.org/10.1016/j.econedurev.2024.102540

[10] Pei, L. (2025). Improving education quality in Chinese universal private preschools. *International Journal of Early Years Education, 33*(4), 775–796. https://doi.org/10.1080/09669760.2025.2564071

[11] Zhang, M., Cao, H., Zhou, N., Hong, X., & Liu, Q. (2022). Socioeconomic status and caregiving sensitivity among Chinese childcare centre teachers: Adaptive caregiving belief as a mediator and childcare centre type as a moderator. *Early Child Development and Care, 192*(16), 2559–2572. https://doi.org/10.1080/03004430.2022.2027398

[12] Undheim, M., & Ploog, M. (2024). Digital competence and digital technology: A curriculum analysis of Norwegian early childhood teacher education. *Scandinavian Journal of Educational Research, 68*(6), 1105–1120. https://doi.org/10.1080/00313831.2023.2204109