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The Value Implications of Collaborative Education Among Families, Schools, and Communities in Preschool Education Empowered by Digital Technologies Realistic Dilemmas and Practical Paths

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Abstract: Digital technology empowers home-school-community collaborative education in preschool education, representing a new direction for paradigm innovation in the digital era and a key driver for advancing high-quality preschool development[1]. In this process, digital technology plays a pivotal role in enhancing collaboration efficiency, strengthening consensus on co-education concepts, improving stakeholder interaction effectiveness, and optimizing institutional implementation mechanisms, thereby continuously refining the collaborative education ecosystem. However, current home-school-community collaboration still faces practical challenges such as fragmented value recognition, inadequate coordination among stakeholders, insufficient policy implementation, and lack of technical application ethics guidelines. To effectively address these issues and promote deeper integration of digital technology with collaborative education, the study proposes optimization strategies from multiple dimensions: Conceptual Guidance: Establishing digital co-education awareness, consolidating value consensus, and solidifying the ideological foundation for collaborative education; Capacity Building: Enhancing digital literacy cultivation, strengthening stakeholder capabilities, and improving collaborative education outcomes; Institutional Support: Establishing diversified institutional frameworks, refining operational mechanisms, and providing robust support for collaborative education; Platform Optimization: Developing standardized digital platforms, purifying educational environments, and creating safe, orderly collaborative education ecosystems.

Keywords: Preschool education; Digital technology; Home-school-community-early childhood education collaboration

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1. Introduction

In an era of technological innovation and deep integration of data elements, the widespread adoption of digital tools and educational resources has become a vital support for optimizing teaching practices and enhancing the efficiency of educational management systems. To maximize educational synergy among families, kindergartens, and communities, it is essential to leverage data resources for informed decision-making, break down information barriers between households,

preschools, children, and local communities, and fully harness the positive impact of digital technologies. By improving communication efficiency, optimizing resource allocation, expanding collaborative education approaches, and promoting information interoperability, we can better serve the comprehensive development and healthy growth of young children.

2. The Value Logic of Collaborative Education among Families, Schools, and Communities in Preschool Education Empowered by Digital Technology

2.1. Building consensus on collaborative education and broadening pathways for concept dissemination

In the context of digital transformation, collaborative education among preschool institutions, families, and communities requires all stakeholders to rationally recognize the educational value and application boundaries of digital technologies, thereby pooling collective efforts through leveraging strengths and mitigating weaknesses. Digital technology provides efficient pathways for disseminating collaborative education concepts and building consensus. Firstly, it enhances communication efficiency by overcoming spatial and temporal limitations of offline educational campaigns, enabling rapid dissemination of scientific parenting principles and collaborative methods through digital platforms to unify educational philosophies. Secondly, it expands coverage through intelligent information delivery systems, utilizing micro-lectures and online courses to popularize parenting knowledge and foster consensus among stakeholders regarding children's developmental rights. Thirdly, it innovates educational scenarios[2] by breaking physical space constraints, creating virtual learning environments, integrating social resources into kindergarten education, and forming multidimensional digital education communities.

2.2. Optimize interactive mechanisms to enhance communication response efficiency

Digital technologies can break down information barriers among families, kindergartens, and communities through data integration, intelligent analysis, and real-time interaction, facilitating tripartite collaboration that transitions from fragmented communication to efficient coordination. Firstly, by leveraging multidimensional data collection and analysis of young children, developmental characteristics can be precisely characterized, enabling the creation of personalized educational plans with targeted delivery to enhance the precision of home-kindergarten-community collaboration. Secondly, integrated digital collaboration platforms overcome spatial and temporal constraints, achieving real-time synchronization of growth data, instant resource sharing, and rapid issue feedback to establish closed-loop interactions. Simultaneously, emergency response channels are established to ensure swift multi-party responses during safety and health emergencies. Thirdly, digital platforms further expand collaboration depth and scope by allowing parents to monitor children's in-kindergarten status and participation in activities in real time, promoting deep integration between community resources, kindergarten education, and family parenting practices. This fosters resource interoperability, activity connectivity, and service sharing across stakeholders.

2.3. Enabling institutional implementation and strengthening collaborative governance capabilities

The orderly implementation of collaborative education among communities, kindergartens, families, and society requires a kindergarten-centered approach with multi-stakeholder participation, where robust coordination mechanisms serve as critical safeguards. The Family Education Promotion Law, Preschool Education Law, and related policy documents have clearly defined responsibilities: parents as primary educators, kindergartens as leading institutions, and communities as support providers. Digital technologies can significantly enhance policy implementation and collaborative governance efficiency. Firstly, digital collaboration platforms enable integrated resource allocation, policy formulation, and process monitoring by education authorities. Real-time evaluations and dynamic supervision based on platform data drive stakeholder accountability, fostering a streamlined collaborative governance framework[3]. Secondly, big data and AI technologies standardize educational data management, enable precise assessment of policy effectiveness, and optimize

institutional designs and coordination mechanisms according to practical needs, creating a closed-loop governance system encompassing "policy formulation → implementation → execution → feedback → refinement".

3. Real Challenges in Collaborative Education among Families, Schools, and Communities for Preschool Education Empowered by Digital Technologies

3.1. Insufficient recognition of collaborative education value and discrepancies in conceptual understanding

Shared values and aligned objectives form the essential cognitive foundation for effective collaborative education among families, kindergartens, and communities. As distinct environments for early childhood development, these three entities exhibit significant differences in educational resources, value orientations, and practical approaches. Families, relying on emotional bonds and kinship ties, often prioritize short-term educational outcomes influenced by cultural capital and social class dynamics. Some families, affected by the trend of early education intensification, even equate preschool education with rote knowledge transmission, demonstrating pronounced individualistic tendencies. Kindergartens, as specialized educational institutions, adopt a lifelong development approach focusing on coordinated progress across five key domains: physical health, language development, social skills, scientific literacy, and artistic cultivation, reflecting standardized national educational guidelines. Communities, as regional living communities, emphasize social adaptation and public awareness development, embodying collective societal aspirations. Discrepancies in value perceptions among these three parties may disrupt collaborative education chains and undermine educational synergy. Therefore, it is imperative to prioritize holistic child development and moral education as fundamental principles, consolidate value consensus among families, kindergartens, and communities, and reconstruct conceptual foundations for collaborative preschool education in the digital era.

3.2. Inadequate coordination among multiple stakeholders, with room for enhancing overall linkage efficiency

Families, kindergartens, and communities form a collaborative education ecosystem for preschool education, where communication mechanisms, coordination channels, and platform support directly impact collaborative effectiveness. Current tripartite collaboration still faces significant challenges: First, prominent communication barriers exist among stakeholders. Differences in cultural backgrounds, professional attributes, digital literacy, and educational philosophies among parents, teachers, and community workers often lead to communication gaps and barriers. Second, inefficient data flow. Limited platform functionalities hinder real-time sharing of children's developmental data collected at home and community settings, resulting in delayed information transmission and fragmented coordination that causes multi-party participation gaps and delayed collaboration[4]. Third, traditional collaboration methods prove ineffective. Current home-kindergarten communication primarily relies on home visits, parent-teacher meetings, and routine online interactions, which have narrow coverage and low engagement rates, leaving families with limited access to community parenting support. Fourth, evident resource and time constraints. Although kindergartens actively organize collaborative activities, limited manpower, material resources, and time costs often prevent achieving desired outcomes. These issues collectively lead to loose coordination and insufficient integration among families, kindergartens, and communities, severely hindering the overall improvement of collaborative education effectiveness.

3.3. Insufficient implementation of relevant policies and still weak operational support mechanisms

Establishing a collaborative education framework led by kindergartens, supported by families, and reinforced by society has become a crucial strategic initiative for advancing high-quality education development. The collaborative education mechanism guidelines jointly issued by the Ministry of Education and thirteen other departments have clearly defined responsibilities and coordination relationships among stakeholders, providing essential policy guidance for home-

kindergarten-community collaboration in early childhood education. However, practical implementation still faces challenges such as misaligned role perceptions and inadequate execution among families, kindergartens, and communities, resulting in functional imbalances characterized by passive parental supervision, excessive kindergarten involvement, and passive community participation. Root causes include ambiguous responsibility boundaries among stakeholders and underdeveloped cross-departmental coordination mechanisms with interest alignment systems. Additionally, collaborative education activities often exhibit temporary, fragmented, and non-standardized characteristics, lacking established routine operational frameworks. Meanwhile, digital technology-enabled institutional designs, guidance standards, and support mechanisms for collaborative education remain incomplete, failing to fully leverage digital support capabilities and hindering both policy implementation effectiveness and systemic optimization of educational systems.

3.4. Insufficient application standards for digital technologies, with urgent need to strengthen ethics and risk prevention measures

The current home-school-community collaborative education model has become increasingly reliant on digital tools such as intelligent platforms, data analytics, and AI-assisted systems. However, ethical standards and risk management frameworks in technology application remain significantly inadequate. Firstly, there is a lack of ethical guidelines regarding data collection and privacy protection. Platforms often operate without clear boundaries or authorization mechanisms for collecting children's behavioral data and family privacy information, making it difficult to effectively safeguard the rights to information and privacy of both children and guardians. Secondly, algorithmic recommendations exacerbate disparities in educational resource distribution. While algorithms can meet personalized parenting needs, they are susceptible to factors like family economic conditions and parental education levels, leading to resource allocation favoring advantaged groups. Thirdly, technological rationality undermines emotional interaction in education. Some platforms reduce multifaceted, warm home-school-community interactions into standardized, formulaic information exchanges, replacing authentic communication with fixed templates and quantitative metrics, thereby squeezing out space for emotional engagement and humanistic care.

4. Practical Approaches to Collaborative Education in Preschool Education by Integrating Home, School, and Community with Digital Technology Empowerment

4.1. Deepening the Concept of Digital Collaborative Education and Building a Multi-stakeholder Synergy Framework

To advance collaborative education mechanisms among families, kindergartens, and communities in the digital era, it is essential to clarify core issues such as collaborative value, content, and methods, with value consensus serving as the critical prerequisite for effective implementation. Currently, stakeholders in digital education still face cognitive discrepancies and divergent demands, hindering the establishment of stable collaborative frameworks. To address this, consensus should be built through three key approaches: First, strengthen policy guidance and supervision. National authorities should expedite top-level design for digital technology-enabled collaborative education, while local education departments develop tailored implementation plans and evaluation standards based on regional realities. Routine supervision should ensure policy implementation, alongside promoting exemplary cases and establishing experience-sharing platforms to enhance participation motivation. Second, deepen professional support and theoretical leadership. Universities, research institutions, and professional organizations should intensify theoretical exploration and practical studies on digital co-education, conduct science outreach and advisory services in kindergartens and communities, and improve digital literacy among parents, teachers, and community workers. Collaboration with tech enterprises is crucial for platform development, data management, and technological application support. Third, implement diversified collaborative digital skills training. By integrating resources from education systems, women's federations, academic institutions, research organizations, and tech companies, regular training programs should be provided to frontline educators.

Emphasis should be placed on cross-sectoral collaboration, case study observations, and practical skill development to strengthen operational capabilities and foster cooperative awareness, laying a solid conceptual and technical foundation for collaborative education.

4.2. Enhancing Digital Literacy to Improve Collaborative Education Outcomes

Digital literacy serves as the foundational competency for digital transformation in collaborative education among families, kindergartens, and communities. The "Teacher Digital Literacy" guidelines issued by China's Ministry of Education in 2022 clearly define core components including digital awareness, technical application skills, practical implementation capabilities, social responsibility, and professional development, providing a scientific and unified framework for cultivating and evaluating teachers' digital literacy[5]. In the digital era, individuals equipped with robust digital skills, collaborative awareness, and information discernment abilities can proactively engage in public affairs and educational collaboration. Therefore, comprehensively enhancing digital literacy across all stakeholders and establishing a collaborative education digital capability system has become a critical task in preschool education digital transformation. First, improving digital literacy among early childhood educators. Kindergartens and education authorities should take primary responsibility by conducting regular specialized training programs based on the "Teacher Digital Literacy" standards, developing compatible digital tools and support platforms, and guiding teachers to enhance technical application, data analysis, and collaborative education capabilities in practice. Second, strengthening digital competencies among community workers. Government and education departments should refine digital literacy cultivation mechanisms for community personnel through specialized training and skill competitions to improve their digital service capabilities, providing stable support for collaborative education. Finally, advancing parental digital literacy. Leveraging platforms such as parent schools, family education guidance centers, and parent committees, kindergartens and communities should jointly deliver accessible digital parenting guidance to help parents effectively utilize digital tools in educational participation. More importantly, all stakeholders should adhere to the principle of child-first, prioritize the cultivation of early childhood digital literacy, and collaboratively establish a safe, appropriate, and systematic digital enlightenment environment for young children. This holistic enhancement of digital literacy will solidify the effectiveness of collaborative education[6].

4.3. Strengthen diversified institutional safeguards and improve collaborative operation mechanisms

The standardized operation of collaborative education mechanisms among families, kindergartens, and communities in early childhood education requires multi-stakeholder coordination and systematic safeguards. Under government-led coordination, it is essential to effectively integrate resources from educational administrations, women's federations, committees for the care of the next generation, universities, research institutions, and technology enterprises. This involves dismantling interdepartmental policy and technical barriers to establish cross-sector collaboration frameworks. Simultaneously, families, kindergartens, and communities must develop coordinated implementation plans and operational procedures aligned with children's developmental needs, institutional teaching practices, and local resource endowments. First, strengthen top-level design guidance. Develop comprehensive policy documents leveraging digital technologies to empower collaborative education, clarifying guiding principles, development objectives, core tasks, and implementation pathways while scientifically defining responsibilities among families, kindergartens, and society. Second, improve institutional architecture. Establish vertically integrated systems spanning national macro policies to local implementation guidelines and institutional operational plans, focusing on child development, teacher professional growth, and digital governance in kindergartens. Horizontally, enhance multidimensional frameworks including accountability assessments, comprehensive evaluations, information sharing, communication mechanisms, volunteer services, and family education guidance to create a comprehensive institutional support system. Third, solidify implementation safeguards. Governments and relevant departments should prioritize digital-enabled collaborative education in key policy agendas, strengthen organizational leadership and interdepartmental coordination, increase funding allocations and resource allocation. Mainstream media should actively promote policy initiatives, practical achievements, and exemplary cases to foster a

societal ecosystem supporting digital collaborative education[7].

4.4. Establishing a Digital Collaborative Platform to Foster a Healthy Educational Ecosystem

Digital collaboration platforms serve as the core vehicle for home-school-community collaborative education in preschool education. Current mainstream digital platforms for collaborative education still face shortcomings in resource integration, functional optimization, and information security. Urgent efforts are needed through platform upgrades and standardized management to achieve resource co-construction and sharing, thereby enhancing collaborative education quality. Specifically, three key measures should be implemented: First, strengthen database development and resource integration. Gather professional expertise to develop high-quality collaborative education resources, including online courses, family education guidance materials, community educational resources, and exemplary practice cases, categorized by functional modules to improve resource accessibility. Improve early childhood information management systems by establishing data collection and sharing mechanisms for child development metrics such as behavioral performance, physical fitness assessments, and mental health indicators, ensuring timely synchronization across home, school, and community stakeholders. Second, enhance platform management and digital security safeguards. Strictly implement data protection requirements, adopting multi-factor authentication for sensitive data like children's personal information and family privacy, with differentiated access permissions based on user roles and responsibilities. Third, improve platform humanization and stakeholder engagement. Refine data access authorization mechanisms to empower families and communities in data governance, establish multi-party collaborative data governance models, and involve parents and community representatives in platform decision-making to ensure transparent and efficient data sharing. Expand platform communication features with non-structured interaction formats like video calls, voice messages, and open feedback systems, while incorporating real-time expert consultations to ensure digital technologies serve educational purposes rather than replacing human emotional interactions.

5. Epilogue

Against the backdrop of educational digital transformation, the collaborative education model in preschool education is embracing new development opportunities while facing numerous challenges. Driven by the deep integration of digital technologies, the home-school-community collaborative education system for preschool education continues to improve. However, issues such as insufficient coordination among stakeholders and non-standardized technology application remain to be addressed, necessitating the organic integration of educational value and technological empowerment.

Disclosure statement

The author declares no conflict of interest.

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