

Transforming Early Childhood Education Management in the Age of Artificial Intelligence: From Crisis Survival to Sustainable Innovation — A Leadership Model Based on Twenty Years of Kindergarten Practice in China

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Abstract

Artificial Intelligence (AI) is reshaping educational systems worldwide, creating both opportunities and challenges for educational leaders. While existing research has largely focused on AI-assisted teaching and learning, limited attention has been paid to how AI can support organizational transformation in early childhood education, particularly within private kindergarten systems facing demographic decline and increasing competition. This study draws upon more than twenty years of kindergarten leadership experience in China, including the establishment and management of multiple kindergarten campuses serving over 20,000 children. Using a practice-based qualitative case study approach, the paper examines how one kindergarten organization navigated two major crises: the COVID-19 pandemic and the subsequent decline in birth rates accompanied by rapid expansion of public kindergarten provision. The study proposes the Human-Centered AI Leadership (HAIL) Model, consisting of five interconnected dimensions: Strategic Digital Leadership, AI-Empowered Teacher Development, Intelligent Family-School Collaboration, Data-Informed Organizational Management, and Holistic Child Development. Findings indicate that AI is most effective when positioned as a tool that enhances human relationships rather than replaces them. The study further demonstrates how AI can reduce operational costs, improve teaching efficiency, strengthen family engagement, support teacher development, and contribute to sustainable organizational transformation. The paper provides practical insights for educational leaders seeking to navigate educational transformation in the age of Artificial Intelligence.

Keywords: Artificial Intelligence; Educational Leadership; Early Childhood Education; Kindergarten Management; Educational Transformation; Human-Centered Education

Introduction

The rapid emergence of Artificial Intelligence (AI) is transforming educational systems around the world. Educational institutions are increasingly adopting AI technologies to support learning, administration, assessment, communication, and organizational decision-making.

However, most discussions concerning AI in education focus primarily on schools and universities. Comparatively little attention has been paid to early childhood education, particularly the leadership and management challenges faced by kindergarten administrators. This issue has become especially important in China, where private kindergartens are experiencing unprecedented pressures resulting from declining birth rates, expanding public kindergarten provision, rising operational costs, and changing parental expectations.

Objectives

As a kindergarten leader who has worked in the field for more than twenty years, it has been personally witnessed the rise, peak, disruption, and transformation of the private kindergarten sector. These experiences provide a unique opportunity to explore how educational leadership can respond to rapid technological and social change.

The Changing Landscape of Chinese Early Childhood Education

Between 2022 and 2026, significant structural changes occurred within the kindergarten sector of Ganzhou City, Jiangxi Province.

Table 1: Changes in Ganzhou Kindergarten Sector (2022–2026)

Indicator	2022	2026	change
Total kindergartens	1,592	1,316	-17.3%
Public kindergartens	605	799	+32.1%
Private kindergartens	987	517	-47.6%
Total enrollment	286,720	267,627	Declining
private Enrollment	159,235	55,329	-65.3%

During this period, private kindergartens lost more than 100,000 enrolled children, while nearly half of all private kindergartens disappeared through closure, merger, or public acquisition. This trend reflects broader demographic and policy changes occurring throughout China. For private kindergarten operators, survival increasingly depends upon innovation, operational efficiency, educational quality, and organizational adaptability.

Methodology

This study adopts a qualitative practice-based case study approach.

The research draws upon:

- Twenty years of educational leadership experience
- Management of eleven kindergartens
- Service to more than 20,000 children and families
- Organizational records
- Teacher training systems
- Parent engagement data
- Digital management systems

The purpose is not merely to analyze AI adoption, but to understand how educational organizations can transform sustainably under conditions of crisis and uncertainty.

Researcher Positionality and Personal Leadership Narrative

For more than twenty years, it has been worked as both an educational entrepreneur and kindergarten leader.

At the peak of operation, my educational organization managed nine kindergartens serving 2,569 children and employing 269 teachers. However, due to declining birth rates and the rapid expansion of public kindergarten provision, four kindergartens were acquired by local governments.

By 2026, only three campuses remained, serving 628 children with 72 teachers.

Table 2: Transformation of the Author's Kindergarten Network (2022–2026)

Indicator	2022	2026
kindergartens	9	3
children	2569	628
Teachers	269	72

This experience fundamentally shaped my understanding of educational transformation.

It has been experienced:

- Industry expansion
- Pandemic disruption
- Demographic decline
- Public sector competition
- Digital transformation
- AI-enabled organizational change

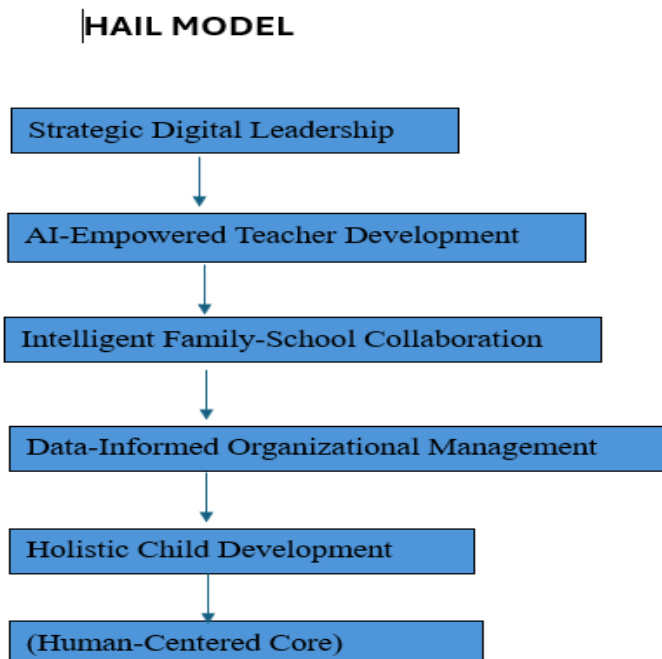
These experiences form the foundation of the Human-Centered AI Leadership Model proposed in this paper.

Analysis

The Human-Centered AI Leadership (HAIL) Model

The HAIL Model identifies five dimensions of successful educational transformation.

Human-Centered AI Leadership (HAIL) Model



Dimension 1: Strategic Digital Leadership

Kindergarten principals must evolve from administrative managers into strategic digital leaders.

Leadership responsibilities now include:

- Digital vision development
- AI implementation planning
- Innovation culture building
- Ethical technology governance

Without leadership transformation, AI adoption remains fragmented and unsustainable.

Dimension 2: AI-Empowered Teacher Development

The organization implemented comprehensive AI training for all principals, teaching directors, and teachers.

Teachers learned to use:

- ChatGPT
- DeepSeek
- Doubao
- Yuanbao
- CapCut AI
- Dreamina AI
- Sponge Music

AI became integrated into:

- Lesson planning
- Growth portfolios
- Classroom activities
- Parent communication
- Educational content production

Teachers reported significant reductions in administrative workload and increased time available for direct interaction with children.

Dimension 3: Intelligent Family-School Collaboration

AI-supported communication systems strengthened family engagement.

Teachers used AI to:

- Generate individualized child reports
- Create personalized birthday songs
- Produce family communication materials
- Generate parent newsletters

Parent satisfaction consistently exceeded 90%.

The findings indicate that AI can enhance relationships when used to support meaningful communication.

Dimension 4: Data-Informed Organizational Management

AI transformed organizational management across multiple campuses.

Administrative systems automated:

- Attendance tracking
- Inventory management
- Payroll support

- Safety inspections
- Meeting documentation
- Performance evaluation

Management workload decreased significantly while operational consistency improved.

Dimension 5: Holistic Child Development

The core principle of the HAIL Model is that AI must serve children's holistic development.

AI can support:

- Documentation
- Communication
- Planning
- Assessment

However, AI cannot replace:

- Emotional attachment
- Empathy
- Play
- Human relationships
- Moral development

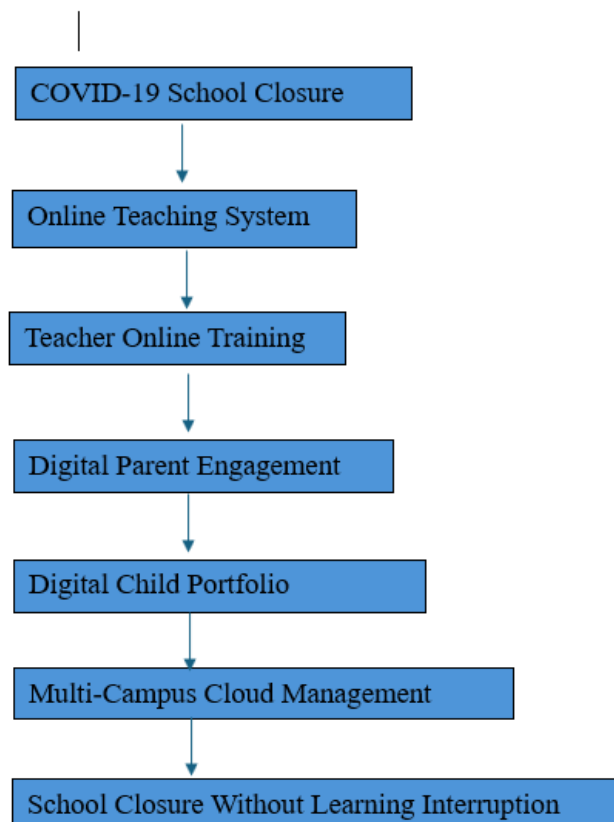
The future of kindergarten education remains fundamentally human-centered.

Case Study One:

Digital Transformation During the COVID-19 Pandemic

During repeated kindergarten closures caused by COVID-19 restrictions, our organization established a comprehensive online education and management system.

COVID-19 Digital Transformation Framework



The system replicated the complete daily kindergarten schedule.

Children participated in:

- Online morning exercises
- Thematic learning activities
- Art and music sessions
- Storytelling activities
- Interactive games
- Family learning projects

Teachers collected photos and videos submitted by parents and integrated them into digital growth portfolios.

At the same time:

- Weekly parent activities were organized online
- Teacher training continued through digital platforms
- Multi-campus management was conducted remotely
- Children's developmental records remained uninterrupted

The organization successfully achieved:

“School Closure Without Learning Interruption.”

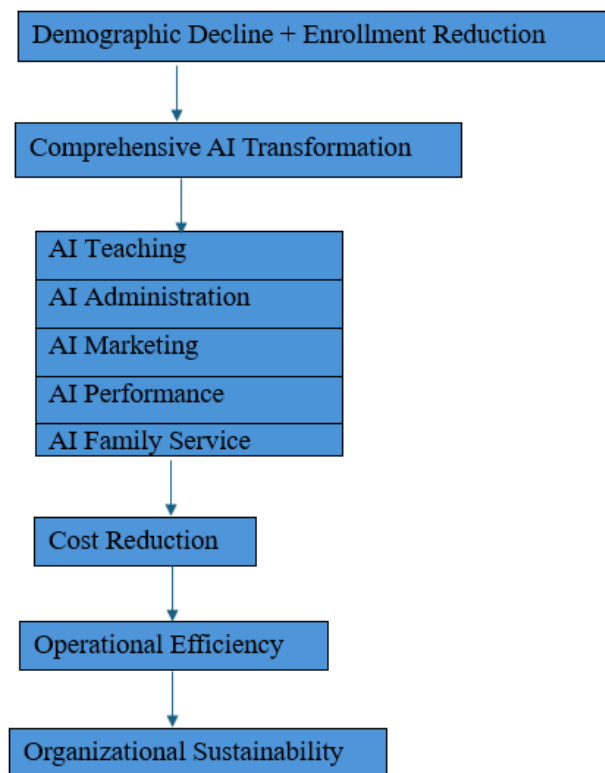
This experience later became the foundation for AI-supported educational management.

Case Study Two

AI Transformation Under Demographic Decline

Following the pandemic, private kindergartens faced a new crisis.

AI-Driven Kindergarten Transformation Framework



Enrollment declined dramatically due to falling birth rates and expanding public kindergarten provision. To remain sustainable, the organization launched a comprehensive AI transformation strategy.

Major initiatives included:

AI Teaching

Teachers use AI for lesson planning, educational resources, growth portfolios, observation records, family communication, and classroom content development.

AI Administration

Voice-to-text systems automatically generate reports, meeting minutes, and operational documentation.

AI Performance Management

Attendance, teaching quality, family engagement, and child development documentation are automatically tracked and analyzed.

AI Recruitment and Marketing

AI-generated content supports daily promotion through TikTok, Xiaohongshu, WeChat, Bilibili, and livestreaming platforms.

AI Family Services

Findings and Discussion

Parents receive automated educational resources, personalized child updates, and 24-hour intelligent consultation support.

Table 3 AI Applications in Kindergarten Management

Area	AI Applications
Teaching	Lesson planning, growth portfolios, observation records
Administration	Meeting minutes, reports, operational documentation
Family Communication	Parent newsletters, birthday songs, child reports
Performance Evaluation	Attendance, engagement, portfolio completion
Marketing	TikTok, Xiaohongshu, WeChat, livestreaming
Safety Management	AI monitoring and behavior recognition
Resource Management	Inventory, purchasing and consumption tracking

The results include:

Table 4 Outcomes of AI Transformation

Indicator	Result
Administrative workload	Reduced by more than 60%
AI-generated videos	More than 90 per month
Parent satisfaction	Above 90%
Referral conversion rate	Above 30%
Staff AI competency	100% staff trained
Digital child portfolios	100% coverage

The findings suggest that AI has become a critical strategic tool for organizational sustainability.

This study challenges technology-centered narratives that portray AI as replacing educators. Instead, AI should be viewed as an amplifier of educational leadership. The HAIL Model demonstrates that successful transformation depends upon balancing:

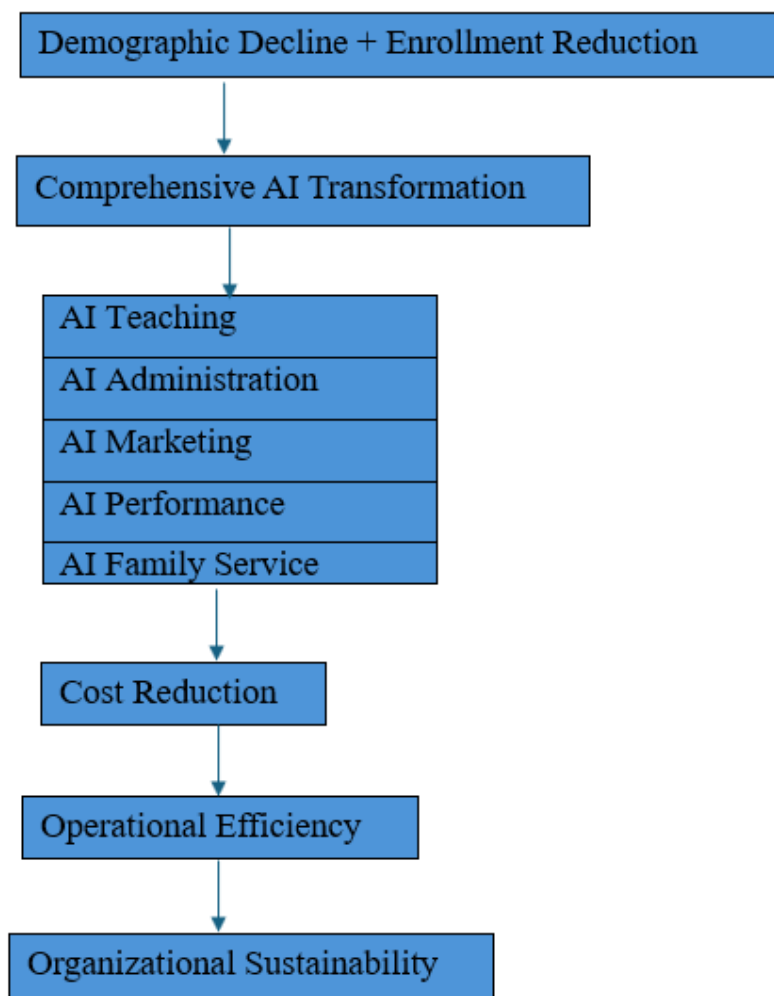
- Technological innovation
- Human relationships
- Educational ethics
- Organizational sustainability

The findings are particularly relevant for private kindergartens facing demographic decline and increasing competition.

Artificial Intelligence is transforming education globally.

However, technology alone cannot solve the challenges facing early childhood education. Drawing upon twenty years of kindergarten leadership experience, this study proposes the Human-Centred AI Leadership (HAIL) Model as a framework for sustainable educational transformation.

AI-Driven Kindergarten Transformation Framework



Conclusion

The experiences documented in this paper demonstrate that AI can:

- Reduce operational costs
- Improve teaching efficiency
- Strengthen family engagement
- Enhance management quality
- Support teacher development

Most importantly, AI can help educational organizations remain sustainable during periods of significant uncertainty.

The future of kindergarten leadership lies not in choosing between technology and humanity, but in integrating both to create more effective, ethical, and child-centered educational environments.

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