

# Empowering Educational Publishing Through Exploration and Practice of Digital Intelligence

Yunsheng Feng

China Education Publishing & Media Group Ltd., Beijing 100073, China

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**Abstract** The integration of digital intelligence can significantly empower and drive innovation in educational publishing. Therefore, it is important to explore comprehensive transformation strategies that address every stage and aspect of educational publishing and instructional services. China Education Publishing & Media Group Ltd. (CEPMG) has been at the forefront of exploring the application of artificial intelligence (AI) within this field, yielding notable results. As a case study of the CEPMG's efforts in promoting digital transformation and employing next-generation AI to empower educational publishing and media, this paper summarizes practical achievements, analyzes current situation, and outlines strategic directions to provide valuable insights for advancing digital transformation in the education sector.

**Keywords** education, publishing, digitalization, transformation, artificial intelligence (AI)

## 1 Introduction

As the global economy evolves, the rapid advancements in knowledge and technology have led to new and heightened demands for talent cultivation. Traditional education methods, however, have increasingly shown limitations in their ability to address the needs for personalized, diverse, and lifelong learning. The rise of information technologies is driving profound changes across all sectors of society, and education is no exception. The emergence of technologies such as Big Data, artificial intelligence (AI), and virtual reality (VR) has provided robust technical support for educational innovation. These advancements have made it possible for individuals to access high-quality educational

resources anytime and anywhere, which not only reshapes the future landscape of education but also influences its direction. While challenges exist, the opportunities are even greater.

Nowadays, educational digitalization is increasingly embraced as a key strategy to improve the quality and competitiveness of educational systems. This shift toward digitalization has become an inevitable trend, presenting both new opportunities and challenges, and making education more equitable, efficient, and personalized. Fully recognizing the impact of digitalization on educational publishing, China Education Publishing & Media Group Ltd. (CEPMG) adheres to the principles of “innovation prioritizing, content oriented, applicability reigns, and service paramount.” CEPMG implements strategies centered on digital integration and innovation-driven approaches, while strategically planning and executing with high quality. CEPMG is also actively exploring and researching the application of AI in education and educational publishing, continually enhancing its digital capabilities. Over time, CEPMG has shifted its core focus from simply providing content and resources to delivering comprehensive content, services, and solutions.

## 2 CEPMG's Practical Achievements in Educational Digitalization

Since the launch of the National Strategic Action for Education Digitalization (Ministry of Education of the People's Republic of China, 2022), CEPMG has accelerated its efforts in digital transformation and upgrades with the principles of supporting educational digitalization, meeting the needs of teachers and students, and aligning with its own development objectives. CEPMG actively undertook and participated in the construction of the Smart Education of China platform, and has since implemented over 30 key digital projects on transformation and upgrade projects,

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Yunsheng Feng (✉)

E-mail: gaopeng@cepmg.com.cn

significantly contributing to National Strategic Action for Education Digitalization.

### **2.1 | Forward-Thinking and Strategic Planning**

Recognizing digital integration as a key development strategy by accurately assessing the new circumstances and tasks at this new stage of development, CEPMG has issued an implementation guideline for promoting digital transformation and upgrading, clearly defining the guiding philosophy, fundamental principles, key tasks, and supporting measures. Also under design is the *Three-Year Action Plan for High-Quality Advancement of Digital Development* in CEPMG to accelerate its digital transformation and intelligent upgrades, which aligns with the National Strategic Action for Education Digitalization and supports the Construction of a Powerful Nation of Education. Furthermore, CEPMG has established the AI Technology Application Laboratory, which focuses on strengthening research and application of AI technologies, improving the effectiveness of educational services, elevating the quality of digital publishing, actively fostering industry–university–research collaboration, promoting academic exchanges, and increasing the conversion rate of scientific research achievements.

### **2.2 | Creating a High-Quality Digital Textbook System across All Disciplines and Academic Stages**

Recognizing the trends and characteristics of digitalization, networking, and intelligence, CEPMG has developed standardized digital content and technical standards, established a science-based publishing and management process for digital textbooks, and strengthened the capabilities of digital textbook teams, thereby creating a high-quality digital textbook system that covers all disciplines and academic stages. CEPMG has also developed new digital textbooks that leverage advanced technologies such as AI, knowledge graph, and VR, systematically integrating them into educational and instructional practices, thereby empowering both textbook research and development as well as innovation in educational services. To further support this initiative, CEPMG has established an intelligent creation system designed to facilitate textbook development, optimize contents, and enhance overall quality.

### **2.3 | Enhancing Digital Applications and Services in Basic Education**

Committed to integrated research and development, CEPMG has optimized its supporting resources development mechanism and systematically formulated

development strategies to create and publish multi-level, multi-scenario, and multi-format products. Significant progress has been made in upgrading and transforming its entire range of digital offerings. To date, CEPMG has developed over 100,000 supporting course resources and has attracted more than 100 million registered users. Furthermore, by understanding the specific features of each discipline and emphasizing practicality, applicability, and effectiveness, CEPMG has successfully delivered high-quality, user-friendly, and convenient products. These products cover 234 textbooks in use across all disciplines in primary and secondary schools, serving over 30 million users. CEPMG has also established procedures and standards for the processing and production of electronic textbooks, ensuring the timely delivery of high-quality educational resources for the Smart Education of China platform for primary and secondary schools.

### **2.4 | Strengthening Educational Resources and Service Platforms for Higher Education**

CEPMG has developed and managed the Smart Education of China Higher Education platform, successfully shifting from being resource-centered to user-centered. This initiative includes the establishment of smart classrooms, virtual simulation laboratories, and virtual teaching and research sections to create a smart learning environment. Additionally, mobile learning scenarios have been developed to continuously enhance the accessibility and sharing of high-quality educational resources. CEPMG also manages a platform known as iCourse, which leverages AI to facilitate human–computer collaborative instructional services, offering course videos with advanced features such as digital human and AI-driven personalized teaching assistants. Several other platforms have also been established, including one for digital textbook operation, one for digital course cloud publishing, and another for new format textbooks. These platforms are designed to provide high-quality services and solutions for integrated publishing, resource supply, instruction process management, and evaluation. CEPMG has also developed international service platforms such as “iResearch” and “iTextbook,” introducing top-tier e-textbooks and cutting-edge academic articles to cater to the diverse needs of university teachers, students, and researchers for foreign-language literature.

### **2.5 | Enhancing Educational Resource and Service Platforms for Vocational Education**

Leveraging resource banks, online open courses, and

knowledge mapping projects, to empower the Intelligent Center of Vocational Education (ICVE), CEPMG has been continuously promoting the extensive use of the ICVE platform, and significantly supporting its development, management, and maintenance. To date, the platform has trained over 3 million high-quality digital resources for vocational education, launched by features such as sections as the “Craftsman’s Spirit” and “Luban Workshop” sections; the “ICVE Questions” intelligent Q&A assistant that provides personalized learning experiences with tools such as video segmentation, subtitle generation, synchronous translation, content summarization, and intelligent responses; and the vocational education entrance examination service platform, designed to support students in passing their entrance exams with its comprehensive five-in-one model that integrates learning, exercises, exams, tests, and assessments, thereby greatly improving the quality and effectiveness of vocational education.

## 2.6 | Empowering Teachers’ Professional Development

By integrating several platforms, including the “Teacher Online Training Platform,” the “PEP Teacher Training Service Platform,” the “Higher Education Institutions Teacher Online Training Center,” the “Vocational Education Online,” the “Teacher Professional Development Research Platform,” and the “Key Textbook Website,” CEPMG has established comprehensive training and service platforms for teachers across all academic levels. These platforms have hosted over 5,000 experts and scholars, including academicians from the Chinese Academy of Sciences and the Chinese Academy of Engineering, as well as recipients of the National Teaching Achievement Award. To date, more than 18,000 courses have been offered, benefiting a cumulative total of 45 million teachers.

## 2.7 | Developing Application Service Platforms for Ideological and Political Education

CEPMG has firmly advanced the development of a resource platform to support unified textbooks of three disciplines (Morality and Laws, Chinese, and History), an online platform for college students, and a mental health guidance platform. A digital map and management platform was also established for practical instruction, integrating over 4,700 practice training bases nationwide. In addition, CEPMG has strategically deployed content resources, continuously enhanced its data-driven approach, and leveraged digital technologies to create a comprehensive education model that engages all members, processes, and aspects of the

organization, leading to the development of a dynamic promotion model that integrates websites, self-media, and new media. At the same time, CEPMG has established an intelligent protection and control system for campus security, ensuring a scientific, smart, and efficient approach to campus security management.

## 2.8 | Advancing the Digitalization, Clusterization, and Internationalization of English Academic Journals

Focusing on interdisciplinary research in digital technologies and education, CEPMG has established the journal *Frontiers of Digital Education* to support digital education and technological innovation. To further elevate its academic publishing, CEPMG has launched the “Top Climbing Program” to develop leading English academic journals, the “Foundation Consolidating Program” to create clusters of high-level English academic journals, and the “Platform Building Program” to enhance service platforms for scientific research literature resources. According to the *Frontiers Journals* website ([Higher Education Press, 2024](#)), CEPMG has successfully integrated upstream and downstream supply chains, effectively connected with high-level international databases, and developed a refined platform for the full-cycle publishing of journals. CEPMG has continuously enhanced the functionalities of the SOCOLAR platform, strengthened support services for academic and scientific research, and explored the formulation of evaluation standards for academic literature that align with China’s national context, so as to gradually build an international academic resource service platform characterized by extensive resources, a wide range of disciplines, and robust research support capabilities.

## 2.9 | Developing the Next-Generation AI Growth Engine

CEPMG has established the AI Technology Application Laboratory and the Key Laboratory for “Intelligence Plus” Education and Integrated Publishing Innovation and Applications to enhance technical collaboration and accelerate the transformation of research outcomes. Consolidated are the CEPMG’s extensive, green, and high-quality educational and instructional content and resources by leveraging core technologies from leading enterprises to develop a large model specifically tailored to the educational system’s characteristics and designed to meet multi-layered business needs. This model supports a wide range of applications, including educational instruction, editing and content creation, content review, intelligent publishing, marketing planning, and knowledge mapping. At present, 19

major specialized intelligent agents have been trained to provide subject-specific intelligent Q&A, effectively addressing users' needs for diverse professional knowledge.

### 2.10 | Enhancing Cybersecurity Protection Capabilities

CEPMG has developed a manageable and controllable security system, established a unified security center, issued a task list for cybersecurity efforts, standardized cybersecurity workflows, and improved technical security mechanisms to ensure the safe and stable operation of its platforms. The data security management measures are also implemented to strengthen data security and personal information protection, reinforce copyright safeguards, continuously monitor public opinions, and regularly conduct security risk screening.

## 3 Trend Analysis of Educational Digitalization

The government directive to “step up R&D and application of Big Data and AI, launch an AI Plus initiative, and build digital industry clusters with international competitiveness” ([The State Council of the People's Republic of China, 2024](#)) underscores the growing emphasis on digitalization. Education, as a fundamental pillar influencing the country's current and future political, economic, and social development, is vital and irreplaceable in driving digital transformation.

### 3.1 | Digitalization in Educational System

Strategically, educational digitalization has permeated every aspect of the educational system. From building infrastructure to implementing “Internet + Education” and intelligent education initiatives, and further establishing the Smart Education of China platform, China has systematically promoted educational digitalization, consistently introducing Chinese solutions. With the effective collection and in-depth mining of data, realistic and virtual spaces are advancing together, enabling comprehensive digital transformation in education and supporting the full development of diverse educational and instructional applications. Notably, since the launch of the National Strategic Action for Education Digitalization in 2022, the pursuit of high-quality digital education has become essential for advancing education in the new era. This includes integrating high-quality online resources into the national instructional system, promoting scenario-

based and immersive learning experiences, and enhancing intelligent instructional evaluation and management. The great potential of digital technologies has also been fully harnessed in the education sector. In particular, the emergence and application of next-generation AI technology have not only provided robust support and technical assurance for exploring pathways for educational innovation, reshaping education models in the new era and fostering high-quality educational development, but have also brought about considerable risks and challenges.

### 3.2 | Progress in Education and Technology

With a transformative perspective, every leap forward in education throughout human history has coincided with major technological and industrial changes. Traditional education models have struggled to adapt to the demands of the new era. Therefore, digitalization is poised to significantly shape the future of education. The deep integration of the latest digital technologies in education has facilitated knowledge sharing and accelerated innovation, while the use of data resources and algorithms has improved decision-making capabilities. Educational digitalization fully embraces individualized learning and equal access to education, accelerating the development and application of high-quality educational resources. This approach promotes equitable educational development, improves the accessibility of education, and builds a new educational system tailored to individual development and lifelong learning for all. It also establishes digital, intelligent, and personalized applications throughout the entire educational process, addressing diverse learning needs, driving comprehensive changes in educational concepts, instructional methods, and governance, and will ultimately create a new educational ecosystem.

### 3.3 | Digital Educational Resources and Platforms

In practice, the deep integration of digital technologies into education has led to the continuous availability of high-quality digital educational resources and diverse digital platforms, as well as the continuous enrichment of digital curriculum system. Leveraging the rapid advancement of VR and related technologies, educational activities are increasingly breaking free from the limitations of the physical world. In the future, learners will be able to transcend geographical and cultural boundaries, enabling learning exchanges across time and space. First, in terms of pedagogy, digital technologies shall be leveraged to create digital learning environments and innovative learning experiences. By collecting and analyzing instructional data, it is

practical to conduct more scientific evaluations and improve students' learning outcomes through more efficient use of educational resources. Second, in terms of research, digital technologies will contribute to creating an environment conducive to disciplinary research. This approach will help break down existing barriers between disciplines, foster the growth and diversification of knowledge, and support the development of foundational, emerging, and cross-disciplinary fields. Third, in terms of management, digital technologies shall be leveraged to advance educational and research management services, aiming for greater precision, personalization, and efficiency, thereby comprehensively enhancing the effectiveness of service delivery and supporting measures.

## 4 Future Work Plans

Educational digitalization is a long-term endeavor that requires balancing the patience for sustained effort with the urgency to make the most of every moment. While it is essential to develop long-term strategies, we must also focus on accomplishing the tasks at hand. To ensure the effectiveness of our efforts, we must systematically and scientifically understand the key features and guiding principles of our work. In the future, CEPMG will continue to support the National Strategic Action for Education Digitalization by deepening digital transformation and upgrades, and accelerating the development of innovation-driven capabilities, thereby effectively shifting our competitive advantages from leading content to digital-driven development.

### 4.1 | Embrace Digital Development to Meet New Demands of Educational Reform

Vigorously promoting educational digitalization is a key trend in educational development, a prerequisite for achieving high-quality educational development, and an essential step in transforming both educational and instructional reforms. The Transforming Education Summit convened by the United Nations has identified digital transformation in education as one of its five key priority areas for actions. In response, CEPMG will continue to champion educational digitalization, with a focus on the digital and intelligent development of educational publishing and media, aiming to support the high-quality development of education. We will also align with the National Strategic Action for Education Digitalization, actively embrace change, consistently invest resources, and continuously deliver high-quality products and services to strengthen CEPMG's digital

brand in educational publishing and provide digital solutions for education sector.

### 4.2 | Fully Leverage Unique Strengths and Explore New Ideas for Innovative Development

CEPMG has extensive educational publishing resources that provide comprehensive support for educational development; high-quality educational products tailored to diverse learning needs; authoritative editorial teams that ensure content is scientific, systematic, professional, and adaptable; strong research and development capabilities that drive cutting-edge research and innovation in education, providing up-to-date theoretical and practical support for educational development; and diverse and personalized services to help teachers improve their instruction and cater to the specific needs of various learning groups. Moving forward, we will fully leverage, utilize, and consistently maintain these strengths to secure our leadership and prominent position across all areas, including research, technology, service, and market presence within the education sector and the publishing and media industry.

Digitalization is indispensable for the high-quality development of education. However, CEPMG currently still faces challenges in copyright protection, development security, technological advancements, and talent cultivation. To address these challenges, we are committed to actively exploring and innovating, aiming to achieve breakthroughs in concepts, management, technology, and collaboration. We will refine the standards and technical benchmarks for developing educational resources, advance technologies for copyright protection and security, and proactively foster both internal and external collaborations. Additionally, we will explore the use of AI, deepen data integration, conduct regular specialized training and projects, and strengthen talent cultivation and team building. We will also establish an innovation mechanism that tolerates trial and error, encouraging innovation and allowing for failures. Our goal is to comprehensively elevate the digitalization of educational publishing to a new level.

### 4.3 | Establish a Balanced Approach to Create a New Model for the Coordinated Development of Educational Publishing Digitalization

#### 4.3.1 Resources and Technologies

High-quality resources are the cornerstone of digital intelligence development. We will enhance resource integration and sharing, stringing together scattered "pearls" into a cohesive "necklace" to fully leverage the

multiplier and spillover effects. We will also prioritize advanced technology research, harness the core driving force of these technologies, and achieve dynamic integration between resources and technologies, thereby creating practical applications that address the needs of teachers, students, and all sectors of society. Furthermore, emphasizing collaboration, CEPMG will leverage the strengths of all participants in this field to jointly advance educational digitalization with strong momentum. By optimizing resource quality with digital technologies, we can attract more collaborative efforts with high-quality resources, continuously enhancing the appeal of our content, the impact of our services, and the competitiveness of our technologies, ultimately fostering a positive cycle of coordinated development and mutual promotion.

#### *4.3.2 Development and Security*

Security forms the foundation of development, while development reinforces security. It is essential to prioritize security as our foremost concern, while also focusing on high-quality development as our primary task. Therefore, CEPMG will integrate security considerations into every aspect and phase of our operations, ensuring that the baseline for secure development is consistently maintained. However, new technologies such as AI act as both catalysts for development and potential sources of risk. Consequently, we will stay vigilant regarding risks related to privacy protection, algorithmic security, infrastructure security, and the long-term viability of these technologies. Collaborative efforts are also necessary to ensure the safe and sustainable integration of AI in education.

#### *4.3.3 Reforms and Innovation*

As revolutionary and cutting-edge technologies advance, the demand for digital products and services continually evolves. Users now expect higher levels of functionality, convenience, and security. In response, CEPMG will adopt a long-term vision, maintain flexibility, and ensure integration to elevate our offerings from simply providing services to delivering exceptional services. We will fully acknowledge the long-term nature of digitalization, aligning our mindset, actions, and working methods with the demands of this new development stage. To keep pace with the digital era, drive reforms through innovation, and proactively address the crisis of knowledge, we will seize opportunities for innovative development, break away from traditional dependencies, and think outside the box, focusing on forward-looking strategies and actively planning digital projects that are both highly revolutionary and strategically oriented.

#### *4.3.4 Quality and Effectiveness*

CEPMG will formulate development plans aimed at contributing to the construction of a powerful nation of education. It is essential to maintain the dynamic integration of quality and effectiveness, actively introduce and integrate resources, strengthen technological cooperation and innovation, promote the conversion and application of achievements, and continuously absorb high-quality resources and advanced technologies from various dynamic sources. Therefore, we will adopt an integrated collaborative innovation approach, enhancing communication and cooperation at the management level while intensifying practical collaboration at the business level. Our focus will be on advancing industrial cooperation in next-generation AI technology, leveraging our respective strengths to amplify the combined impact, thereby fostering a development environment of mutual effort and shared success. Our ultimate goal is to internalize external experiences, tailor CEPMG's strategies, and maximize overall benefits, continuously improving the quality and effectiveness of educational digitalization efforts.

### **4.4 | Remain Dedicated to Publishing and Discover New Strengths for Sustainable Development**

#### *4.4.1 Serve the Development of the Smart Education of China Platform*

We will fully commit to safeguarding and supporting the platform's development, operation, and ongoing iterative upgrades. Additionally, we will enhance our capabilities by seizing the significant opportunity to contribute to the national platform's development. Leveraging the platform's role as a primary promotion channel, CEPMG will improve resource quality, expand availability, optimize structure, diversify formats, and strengthen resource scrutiny. CEPMG will also deepen collaboration in resource development and sharing, continuously consolidating and enhancing strengths in content production and aggregation. Furthermore, we will continue to empower the platform through AI-powered iterative upgrades, developing a range of intelligent tools to support educational scenarios such as lesson preparation, classroom interaction, and homework checking. These efforts will ultimately elevate the platform's intelligent service capabilities.

#### *4.4.2 Accelerate the Development and Application of Digital Textbooks*

Digital textbooks are vital for enabling large-scale, personalized instruction and are key to achieving talent cultivation goals. CEPMG will focus on its core responsibilities and main businesses, expediting the development of digital textbooks. The aim is to produce

high-quality digital textbooks that “uphold morality and stimulate intellect.” We will also identify the right directions and establish clear priorities in the new era of digital textbook development. We will continue to support this initiative with advanced technological services, providing diverse presentation formats such as scenario-based, competence-driven, and AI-enhanced modes. We will endeavour to digital textbooks that are more adaptable, intelligent, customized for teaching and convenient for learning.

#### 4.4.3 Implement Actions to Enhance and Improve the Quality of Digital Platforms

CEPMG will elevate the application and service quality of digital platforms at all academic stages, contributing to the comprehensive development of students and the high-quality development of education. Our focus will be on enhancing intelligent innovation capabilities, with strong support for digital textbooks, intelligent publishing, ideological and political services, journals, language and writing resources, knowledge graph and international academic resource platforms. Additionally, we will expand the scope and depth of our contributions to educational development. We will also fully leverage data to inform and drive management decisions, strategically planning and promoting digital projects that effectively cater to real needs. Our goal is to enhance overall management efficiency and effectiveness, transforming data resources into valuable assets.

#### 4.4.4 Proactively Address Challenges of Next-Generation AI

We will gain a deep understanding of technology characteristics, development trends, and the latest research insights, ensuring comprehensive preparedness in mindset adaptation, talent reserve, technological advancement, and structural support. Our efforts will focus on strengthening intrinsic growth, proactively pursuing research in new technologies, deepening collaborations and exchanges, and closely monitoring key demands, including the development of large educational models, related applications, and intelligent educational and instructional solutions. Furthermore, thought leveraging CEPMG’s quality digital resources and technological expertise, we will explore key project development and actively promote the creation and application of editing, instructional, and learning assistants. We will also focus on continuously accumulating high-quality corpus resources, establishing a sustainable operational framework, and progressively building a comprehensive, high-quality, and technologically advanced educational and instructional corpus. This corpus will be efficiently utilized in large model training, enabling the application of AI in educational contexts. Our focus will be on developing more

intelligent, personalized, and diverse instructional solutions, accelerating the implementation of specific practices and applications, and facilitating the transition from networked and digital instruction to intelligent learning models. Through these efforts, we aim to establish new competitive advantages in educational services.

## 5 Conclusions

Through a case study on digital transformation, this paper highlights CEPMG’s proactive efforts and achievements in educational digitalization. By implementing forward-thinking strategies and strategic planning, CEPMG has developed a high-quality digital textbook system encompassing all disciplines and academic stages, expanded digital applications and services across various educational sectors, and supported the development of platforms aimed at enhancing teachers’ professional competence and ideology and politics. Furthermore, CEPMG has advanced the development of English academic journals, created a next-generation AI growth engine, and strengthened cybersecurity protection capabilities.

Despite the progress in educational publishing digitalization, significant challenges remain, such as copyright protection, privacy security, technological advancements, and talent cultivation. Looking ahead, CEPMG will closely align with the National Strategic Action for Education Digitalization, clearly define its strategic direction, and leverage its strengths to overcome these challenges. It is also crucial for CEPMG to carefully balance resources with technology, development with security, reform with innovation, and quality with effectiveness. CEPMG should prioritize four key areas, including the development of the Smart Education of China platform, and ensure these initiatives are implemented in a determined, progressive and effective manner. Furthermore, it is vital to stay vigilant and proactive in addressing the opportunities and challenges presented by AI technology, ensuring that the digitalization of educational publishing becomes more equitable, efficient, and personalized.

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