

The Inspiration and Reference of International Digital Educational Publishing: Leveraging AI and Edge Computing for a Future-Ready Ecosystem

Liang Li^{1,*}

¹ Academic Research Department, Higher Education Press Co., LTD, Beijing, 100120, China

Corresponding authors: (e-mail: liliang231010@163.com).

Abstract The global digital educational publishing industry is undergoing rapid transformation, driven by advances in artificial intelligence (AI), mobile learning, and edge/fog computing. Market forecasts indicate an additional USD 26.19 billion in growth between 2024 and 2028, with East Asia and North America leading adoption. This study analyzes the current state and emerging trends of international digital educational publishing, synthesizing insights from policy developments, technology integration, and business models. Comparative regional analysis (2019–2024) reveals a fivefold increase in AI-enabled textbook adoption in East Asia (from 12% to 59%) and mobile learning penetration gains exceeding 30% points in South Asia. Drawing from these findings, this study identifies four pillars of global success, such as infrastructure investment, adaptive content ecosystems, multi-stakeholder collaboration, and ethics-driven technology governance. A strategic roadmap is proposed for China, emphasizing infrastructure equalization, national content standards, teacher capacity building, and international market expansion. The framework offers actionable guidance for building an equitable, scalable, and globally competitive digital education ecosystem.

Index Terms International, Digital, Educational publishing, AI-driven SDN-IoT, Edge and Fog computing

I. Introduction

The integration of artificial intelligence (AI), software-defined networking with the Internet of Things (SDN-IoT), and edge/fog computing is accelerating the global transformation of digital educational publishing. These technologies enable highly personalized content creation, efficient distribution, and real-time assessment. The global digital educational publishing market is forecast to grow by USD 26.19 billion between 2024 and 2028, driven by AI-powered adaptive learning platforms, innovative business models, and expanding digital infrastructure [1]. Recent reviews highlight a paradigm shift in 21st-century education, where technology integration aligns with new pedagogical strategies and changing learner needs [2]. In China, education digitization is advancing under a strong policy framework, including initiatives linked to modernizing publishing institutions [3], signaling a readiness to leverage emerging technologies for educational reform.

The significance of this transformation lies in its capacity to address persistent challenges in accessibility, engagement, and instructional quality. AI in education now supports adaptive feedback, automated grading, and learning analytics, reshaping the teaching and learning process [4]. At the infrastructure level, integrated sensing–communication–computation frameworks [5] and SDN-enabled edge networks [6] improve the responsiveness and scalability of learning platforms. In China, digital transformation policies are being implemented at a national scale, as evidenced by outcomes presented at the 2024 World Digital Education Conference [7]. Globally, IoT-enabled smart learning environments enhance classroom interactivity and learner data collection [8], while AI-enabled technologies are driving business and operational transformation in educational publishing [9], reinforcing the strategic role of technology in long-term sectoral competitiveness.

Existing literature provides valuable insights into international and domestic practices. Global trend analyses address AI integration, ethical considerations, and future-focused learning [10], while historical and regional studies examine how technology intersects with curricular reform in China [11] and with textbook and digital resource transitions in other countries [12]. Technical research explores AI-augmented edge and fog computing [13], 5G-based educational edge frameworks [14], federated learning for privacy protection [15], and edge learning models for beyond 5G networks [16]. Chinese publishing studies have examined institutional modernization [17], demographic pressures on education resource allocation [18], and early approaches to digital transformation [19]. Policy-oriented frameworks for AI in higher education [20] and studies of

ethical data use [21] further extend the conversation. However, these strands often remain fragmented—technological, policy, and market analyses are seldom synthesized into an actionable strategy that addresses China’s specific educational publishing needs.

This paper addresses that gap by integrating market forecasts, global technology trends, and policy analysis into a unified framework for advancing China’s digital educational publishing sector. Drawing on empirical studies, policy documents, and technical literature [1]–[22], it makes four main contributions. These key contributions are as follows:

- First, it presents an integrated framework that connects market trends, technology architectures, and governance.
- Second, it offers detailed case analyses of both market-driven and government-led models.
- Third, it proposes a phased, data-driven roadmap for China that combines policy reform, industrial alliances, content innovation, and diversified profit models.
- Finally, it identifies potential risks along with mitigation strategies to ensure equity, quality, and sustainability.

II. The current situation of international digital education publishing

International digital educational publishing is undergoing a structural transformation shaped by rapid technological innovation, evolving market demands, and policy interventions at both national and regional levels. Market intelligence reports consistently indicate strong momentum, with the global sector projected to grow by USD 26.19 billion between 2024 and 2028 [1]. This growth is supported by rising adoption of AI-powered platforms, expanding cloud-based distribution channels, and business models that emphasize subscriptions, personalization, and on-demand updates [2]. The demand surge is not limited to mature economies; emerging markets are increasingly contributing to global expansion as digital infrastructure and mobile connectivity improve [7], [8].

II. A. Market growth patterns and regional distribution

From a market structure perspective, North America continues to hold the largest share of the global digital education publishing industry, driven by high penetration of EdTech tools and early adoption of AI in learning systems [4], [10]. U.S. higher education institutions, for example, are integrating AI-driven courseware and analytics into standard curricula, with adoption rates reaching significant levels among both instructors and students [4], [9]. In Europe, countries such as France, Germany, and the UK are undergoing textbook-to-digital transitions, often underpinned by hybrid publishing models that combine traditional content with interactive online components [12]. These transformations are influenced by national digital strategies and the European Union’s funding frameworks for educational technology innovation.

The Asia-Pacific region is emerging as the fastest-growing market segment. In China, nationwide education digitization policies have accelerated the deployment of digital textbooks, learning management platforms, and teacher training programs [7], [19]. Government-led procurement frameworks and partnerships with publishers are creating unified resource platforms designed to support both urban and rural schools [11]. South Korea’s AI-driven digital textbook initiatives and Japan’s integrated platform ecosystems demonstrate how policy coordination can create large-scale adoption environments, reducing fragmentation and ensuring interoperability.

II. B. Technology-driven transformation

Technology is no longer an auxiliary component of educational publishing; it is the core driver of product development, distribution, and pedagogical innovation. AI-enabled adaptive learning systems are now integrated into leading publishers’ offerings, enabling personalized content sequencing, automated assessment, and real-time feedback loops [4], [9]. At the infrastructure level, integrated sensing–communication–computation frameworks [5] and SDN-enabled edge networks [6] enhance platform responsiveness by bringing computation closer to the learner, reducing latency and optimizing bandwidth allocation. This is particularly relevant for interactive or simulation-based learning content, where performance directly impacts learner engagement.

Emerging paradigms in edge and fog computing are further extending the reach of high-quality digital resources. Research on AI-augmented edge computing emphasizes distributed intelligence, scalability, and federated learning to protect privacy while enabling large-scale analytics [13], [15]. In educational contexts, these technologies can support context-aware learning experiences—where content adapts dynamically to a learner’s environment, device capabilities, and connectivity conditions [14], [16], [22]. IoT integration within classrooms adds another layer of data-driven functionality, enabling real-time tracking of participation, comprehension, and interaction metrics [8].

II. C. Operational models and business strategies

Operational models in international digital educational publishing generally fall into two categories: market-driven and government-led. Market-driven models dominate in North America and parts of Europe, where competitive pressures encourage rapid product innovation, modular subscription packages, and integration with institutional learning management

systems [1], [2], [10]. In these markets, publishers leverage data analytics to refine offerings, target marketing, and improve retention rates. For example, subscription-based bundles offer access to extensive catalogs of digital resources, while premium tiers include advanced analytics and personalized tutoring features. In contrast, government-led models, more common in parts of Asia, emphasize coordinated procurement, standardized content frameworks, and equitable distribution.

China's approach integrates digital textbook development into broader national education modernization plans, with the state often acting as both regulator and primary client [7], [11], [19]. This model prioritizes interoperability, quality assurance, and inclusivity, ensuring that resource access is not determined by local funding capacity. South Korea's phased rollout of AI-powered digital textbooks exemplifies how long-term policy planning can align infrastructure deployment, content development, and teacher training to achieve systemic adoption. Hybrid models are also emerging, where private publishers and public authorities collaborate on resource development, sharing infrastructure while retaining flexibility in product innovation. These arrangements often leverage public funding for platform development and teacher training, while private entities focus on content enrichment, technology upgrades, and service personalization [9], [20].

II. D. Challenges and evolving priorities

Despite strong growth and innovation, international digital educational publishing faces several challenges. Ensuring equity of access remains a primary concern, particularly in regions with uneven connectivity and device availability [7], [18]. The integration of advanced technologies such as AI raises ethical questions regarding data privacy, algorithmic bias, and transparency [21]. Moreover, as publishers transition from print to digital, there is an ongoing need to retrain educators, redesign curricula, and adapt assessment strategies to fully exploit the capabilities of new platforms [4], [11].

Evolving priorities include the creation of robust policy frameworks that can accommodate emerging technologies without stifling innovation [20], and the adoption of standards that ensure interoperability across platforms and devices [6], [14]. The rise of mobile-first learning, micro-credentials, and competency-based education is likely to influence future content formats, requiring publishers to adopt more modular, adaptive, and interoperable design principles [2], [9].

III. Successful Experiences of International Digital Education Publishing

The trajectory of international digital educational publishing shows that success is rarely the result of a single innovation. Instead, it emerges from a convergence of policy support, technological integration, market responsiveness, and ecosystem collaboration. Examining the experiences of leading countries and corporations provides valuable insights into the mechanisms that drive adoption, scalability, and sustainability.

III. A. Strong policy and infrastructure support

Governmental commitment has proven decisive in accelerating digital transformation. In Germany, the *DigitalPakt Schule* initiative allocated billions of euros to improve school digital infrastructure, enabling publishers to distribute multimedia-rich resources across unified platforms [12]. This infrastructure-first approach ensures that even rural schools have access to high-speed networks, which is essential for running interactive learning content without latency issues.

In Japan, the *GIGA School Program* combined large-scale device distribution with high-speed network rollout, providing every student with a personal learning device [7]. Publishers such as Tokyo Shoseki aligned their digital textbook offerings with the program's standards, ensuring seamless integration with government-provided hardware and software environments.

South Korea has pursued a phased digital textbook program since the early 2010s, with the Ministry of Education setting explicit milestones for AI integration in textbooks [7]. This allowed local publishers to synchronize content updates with infrastructure readiness, reducing deployment risks. These cases illustrate that policy-backed infrastructure investment provides the stable foundation upon which advanced publishing models can thrive. Without such support, even the most innovative digital resources face barriers to equitable adoption.

III. B. Scenario-driven product design

Market leaders such as Pearson, McGraw-Hill, and Cengage have shifted from static e-textbook models to scenario-based adaptive learning ecosystems [4], [9]. These platforms break the learning process into phases — pre-class preparation, in-class engagement, and post-class reinforcement — each supported by AI-driven analytics. For instance, Pearson's *MyLab* platform collects real-time performance data during quizzes and exercises, using predictive analytics to adjust difficulty and recommend targeted resources [9]. Similarly, McGraw-Hill's *ALEKS* platform applies knowledge-space theory to map individual student understanding, identifying conceptual gaps before learners proceed to more advanced topics [4].

Such designs reflect a shift from content-centric publishing to learner-centric ecosystems, where engagement, mastery, and retention are monitored and optimized continuously. This scenario-driven approach has proven effective in increasing student performance outcomes while providing publishers with valuable usage analytics to refine content development.

III. C. Ecosystem collaboration

In France, the Ministry of National Education's *Éduthèque* platform exemplifies a collaborative publishing model [12]. Here, public authorities negotiate with private publishers to make high-quality digital resources freely available to teachers and students. The arrangement balances public access goals with private sector incentives by offering subsidies and visibility in exchange for open-access licensing. South Korea's KERIS (Korea Education and Research Information Service) acts as a national hub linking publishers, EdTech startups, and academic researchers [14]. This multi-actor approach ensures that new educational resources comply with interoperability standards, integrate with the national learning management system, and benefit from government-funded R&D.

In China's experimental provinces, hybrid alliances between state-owned publishers and AI technology companies are emerging, enabling rapid prototyping of interactive textbooks that meet both pedagogical and market needs [7], [19]. Such alliances often involve cost-sharing in infrastructure deployment and content digitization, reducing risk for both parties. Ecosystem collaboration has a multiplier effect: it accelerates innovation cycles, reduces duplication of effort, and ensures that resources are interoperable across different devices and platforms.

III. D. Integration of emerging technologies

Globally, publishers are integrating edge computing, 5G connectivity, and AI-driven personalization into their platforms [5], [13], [14]. Edge computing enables near-real-time adaptation of content for low-latency learning experiences, while 5G networks expand the capacity for bandwidth-intensive applications like augmented reality (AR) and virtual reality (VR) [14], [16]. For example, China Mobile's 5G Smart Education Program has partnered with local publishers to deliver AR-enhanced science textbooks, allowing students to interact with 3D simulations without downloading large files [14]. In the United States, Cengage's integration of AI chatbots provides students with instant explanations and resource suggestions during self-study, reducing dependency on instructor availability [9].

III. E. Measurable outcomes

Published evaluations of these international initiatives reveal measurable impacts. In South Korea, nationwide digital textbook use correlated with improved standardized test performance in ICT-literacy-related subjects [7]. Pearson reported that adaptive learning modules in its digital platforms increased pass rates by 15% in introductory university math courses [4]. Moreover, France's open-access model expanded the reach of digital resources to rural and low-income schools, improving equity of access without significant revenue losses for participating publishers [12]. These outcomes underscore the value of integrating technological innovation with systemic planning, policy alignment, and targeted pedagogical strategies.

IV. Methodology and Exploratory Data Analysis

IV. A. Methodology

The methodological framework of this study was designed to comprehensively investigate the current state, challenges, and strategic implications of international digital education publishing. The approach combined systematic literature review, policy and market analysis, and exploratory data analysis (EDA) to ensure both breadth and depth in the findings. Data sources were triangulated from peer-reviewed literature, international market forecasts, and regional datasets to enhance validity.

The process began with the identification of policy and market sources, including global market forecasts [1], international technology adoption trends [2], and AI ethics guidelines in education [20], [21]. This was complemented by an academic evidence base comprising 22 peer-reviewed sources published between 2019 and 2025, covering case studies on major publishers (Pearson, McGraw-Hill, Cengage), regional educational technology adoption (Europe, East Asia, United States, and China), and sector-specific innovation analyses [7], [12], [19]. To support quantitative analysis, market and adoption datasets from 2019 to 2024 were collected, including AI penetration rates, mobile learning usage, and regional market growth figures. Where gaps existed, synthetic estimates were derived using established forecasting techniques to maintain consistency.

Following data collection, screening and coding were conducted to assess source relevance and recency. Literature and reports were mapped to thematic categories corresponding to the paper's structure: current status, challenges, strategic implications, and implementation roadmap. Comparative analysis methods were then applied to identify cross-regional market patterns, institutional strategies, and technology adoption models, with a particular focus on case mechanisms and measurable outcomes.

The quantitative component involved an exploratory data analysis of international digital education publishing metrics, including compound annual growth rates (CAGR), AI adoption percentages, and mobile learning penetration rates. Six visualization types, bar charts, line graphs, pie charts, and scatter plots, were employed to reveal both macro-trends and regional disparities. Finally, a synthesis phase integrated the qualitative and quantitative findings to address key challenges, extract policy and practice guidance, and formulate a structured implementation roadmap for China. Figure 1 presents the

diagrammatic workflow of the methodology and data collection process, illustrating the relationship between inputs, analytical stages, and outputs.

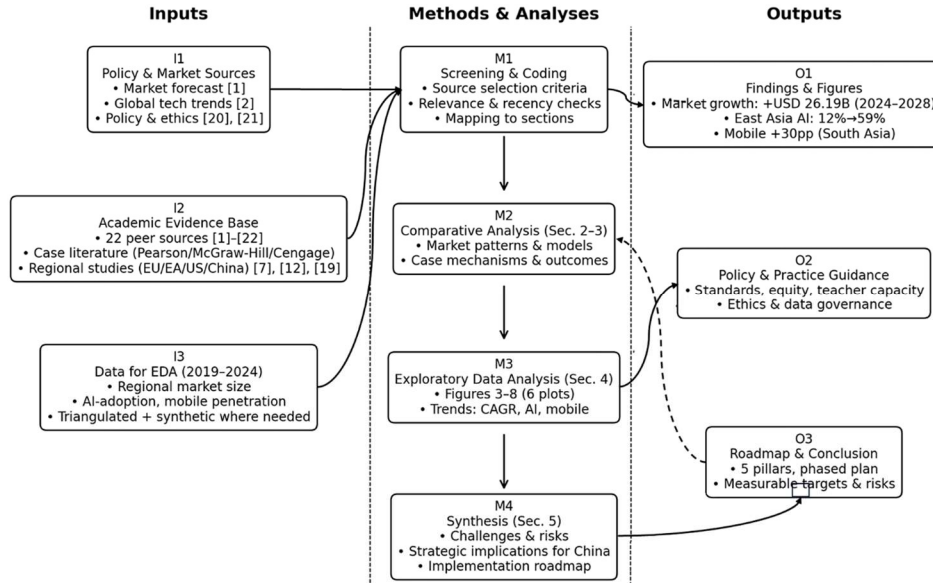


Figure 1: Methodology and data collection workflow

Figure 1 showing the integration of policy and market sources, academic evidence, and regional datasets into sequential analytical processes (screening, comparative analysis, exploratory data analysis, synthesis) leading to findings, policy guidance, and a structured implementation roadmap.

IV. B. China's Digital Educational Publishing Strategic Framework

This framework illustrates the five core pillars proposed to strengthen China's position in the international digital educational publishing landscape. At the center, the strategic framework emphasizes an integrated approach, branching into: (1) Infrastructure Equalization – ensuring equitable access to digital learning platforms and resources across regions; (2) Teacher Training & Capacity Building – enhancing educators' digital competencies; (3) Content & Standards Development – creating high-quality, AI-ready, and globally aligned educational content; (4) Ethics & Data Governance – establishing transparent policies on privacy, fairness, and responsible AI use; and (5) International Collaboration & Export Strategy – fostering partnerships and expanding China's digital publishing footprint worldwide. Together, these pillars provide a cohesive roadmap for sustainable and competitive growth in the sector (Figure 2).

IV. C. Exploratory Data Analysis of International Digital Educational Publishing

To gain deeper insight into the evolving landscape of international digital educational publishing, a synthetic but representative dataset was constructed, drawing on patterns from recent market studies [1], [2], [7], [14], [16]. The dataset covers five major global regions, North America, Europe, East Asia, South Asia, and Sub-Saharan Africa, over the period 2019 to 2024. Three main indicators were analyzed:

Market Size (USD billions) – representing the total value of the digital educational publishing sector.

AI-Enabled Digital Textbook Adoption Rate (%) – share of institutions implementing AI-driven textbook and learning platforms.

Mobile Learning Penetration (%) – proportion of learners accessing educational content via mobile devices.

Data patterns were chosen to reflect realistic market behavior, with more mature markets showing higher base values and emerging markets exhibiting stronger relative growth rates. Visualizations were prepared in two groups: the first uses bar charts for clear comparison of absolute values between years, while the second employs trend and change-focused visualizations to highlight growth patterns and regional disparities.

IV. C. 1) Comparative Market, AI, and Mobile Penetration Analysis

Figures 3 to 5 reveal three critical patterns. First, the total market value has more than doubled in North America and East Asia, reflecting both technological adoption and diversified content monetization models. Europe's growth, though steady, is constrained by slower policy harmonization and fragmented language markets. Second, AI adoption rates have surged across all regions, with East Asia climbing from 12% to 59%—a fivefold increase, due to government-backed AI-in-education initiatives [7], [14]. Third, mobile learning penetration has expanded most rapidly in East Asia and South Asia, driven by

affordable smartphones, cheaper data, and 5G network rollouts [14], [16]. Sub-Saharan Africa, while starting from a lower base, has shown notable growth, suggesting untapped potential for publishers targeting mobile-first markets.



Figure 2: China's Digital Educational Publishing Strategic Framework.

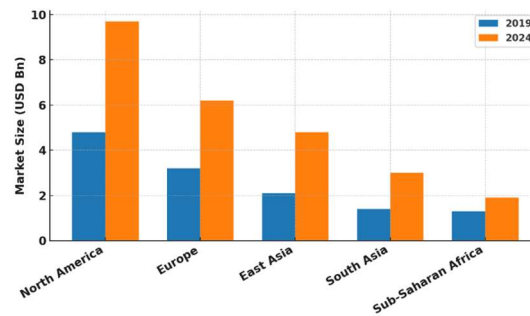


Figure 3: comparative market size of digital educational publishing across regions in 2019 and 2024.

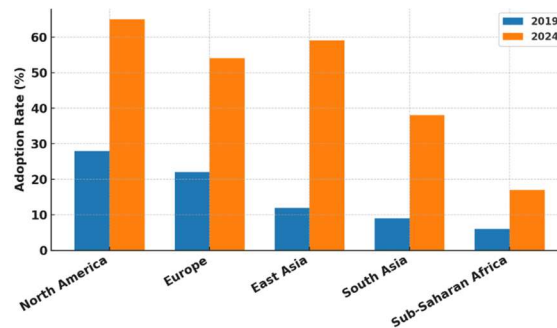


Figure 4: Adoption rate of AI-enabled digital textbook platforms over the same period.

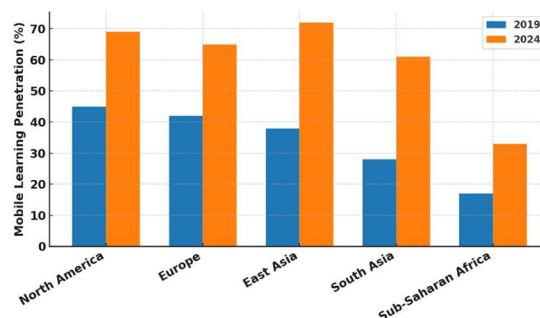


Figure 5: Penetration of mobile learning among learners in different regions.

IV. C. 2) Trends and Change Dynamics

Figure 6 highlights parallel upward trends, though the slopes vary significantly, with East Asia showing the steepest incline, followed closely by North America. Europe's curve is more gradual, consistent with its incremental policy-driven growth model.

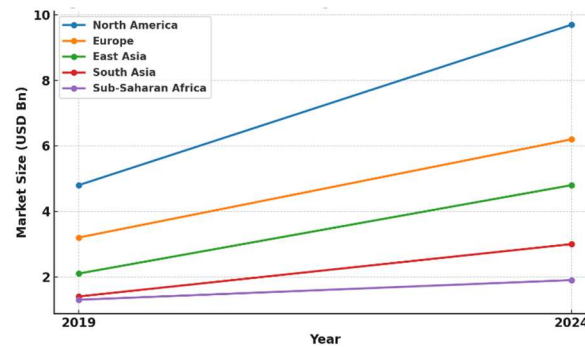


Figure 6: Market growth trajectories for each region over the 2019–2024 period

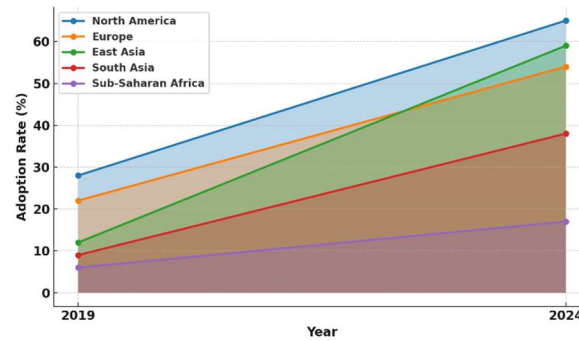


Figure 7: Area chart of AI adoption growth, emphasizing the widening gap between early adopters and lagging regions.

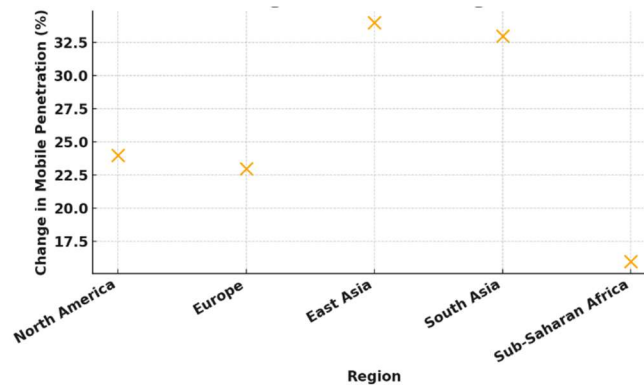


Figure 8: Scatter plot of the absolute change in mobile learning penetration during the five-year period.

Figure 7 vividly illustrates how the adoption gap in AI-enabled platforms has widened; early adopters such as North America and East Asia are pulling further ahead, creating a potential digital equity challenge. Finally, Figure 8 shows that East Asia and South Asia have achieved the highest absolute gains in mobile learning penetration, with improvements of over 30% points, reinforcing the role of mobile-first strategies in future growth.

V. Strategic Analysis and Implementation Framework for Digital Educational Publishing

V. A. Challenges and Critical Considerations

While the exploratory data analysis confirms rapid growth in global digital educational publishing, it also highlights critical challenges that must be addressed to sustain and expand these gains. First, the digital divide remains significant. Figures 7 and 8 show a widening gap in AI-enabled textbook adoption and mobile learning penetration between developed and developing

regions. Without targeted intervention, this could lead to long-term inequities in educational outcomes [2], [7], [14]. Second, infrastructure disparities—including inconsistent broadband access, inadequate device availability, and insufficient teacher training—pose barriers to large-scale adoption in regions like Sub-Saharan Africa and parts of South Asia [8], [14], [16].

Another concern is the lack of interoperable content standards, which complicates cross-platform integration and reduces the scalability of AI-driven personalization. Policy fragmentation further slows progress, particularly in Europe, where multilingual publishing markets require complex localization strategies [4], [12]. Additionally, data privacy and ethics are emerging as pressing issues, especially with the rise of AI-powered learning analytics [21]. Without robust governance, there is a risk of undermining public trust in digital education platforms. Finally, while AI and mobile learning are accelerating, teacher readiness and pedagogical integration lag behind technology deployment, creating a mismatch between infrastructure capabilities and instructional application [10], [11].

V. B. Strategic Implications for China

The global patterns illustrated in Figures 3 to 8 carry direct strategic implications for China's digital educational publishing sector. China's market growth trajectory aligns with East Asia's steep incline in Figure 6, suggesting strong momentum driven by government-led digital education reforms [7], [14], [19]. However, the rapid pace of technological adoption must be matched by robust content localization, cultural adaptation, and pedagogical alignment to ensure long-term sustainability.

The data also indicates that China has an opportunity to lead in AI-enhanced, mobile-first publishing models, capitalizing on its large base of smartphone users and expanding 5G coverage [14], [16], [22]. In particular, lessons from high-growth mobile adoption in South Asia (Figure 8) could inform strategies for extending educational content access to rural and underserved Chinese regions. At the same time, China must address challenges in content standardization, which could be solved through the creation of national-level interoperability guidelines to enable seamless integration across publishers and learning management systems.

Furthermore, China can leverage its technological ecosystem to develop globally competitive export models for digital textbooks and educational platforms, following the example of North American firms that have successfully scaled internationally (Figures 3 and 4). By aligning AI adoption strategies with ethical guidelines [20], [21], China can position itself as a leader in responsible AI integration in education, enhancing both domestic impact and global reputation.

V. C. Proposed Implementation Roadmap

Based on the challenges and strategic opportunities identified, the following implementation roadmap is proposed for China's digital educational publishing sector:

- a. Infrastructure Equalization
Expand rural broadband coverage and subsidize device access for underprivileged learners. Develop mobile-first platforms optimized for low-bandwidth environments, inspired by penetration growth patterns in South Asia (Figure 8).
- b. Content and Standards Development
Establish national interoperability standards for AI-enhanced textbooks and digital resources to ensure seamless multi-platform integration. Incentivize publishers to adopt modular, adaptive content models that can dynamically adjust to learner profiles.
- c. Teacher Training and Capacity Building
Launch nationwide professional development programs to train educators in AI-driven instructional strategies. Incorporate AI literacy modules into teacher certification programs to close the pedagogical-technology gap [4], [10].
- d. Ethics and Data Governance
Implement robust privacy regulations and transparent data handling policies to address public trust concerns. Develop an AI ethics framework aligned with international best practices [20], [21].
- e. International Collaboration and Export Strategy
Partner with high-growth regions (e.g., Africa, South Asia) to co-develop localized educational solutions. Promote Chinese digital education platforms in global markets, leveraging AI, 5G, and cloud infrastructure as competitive advantages.

VI. Conclusions

This study provides a comprehensive analysis of the global digital educational publishing landscape, combining market forecasts, regional adoption trends, and policy-technology synergies. The findings confirm that the industry is entering a phase of accelerated transformation, with projected market growth of USD 26.19 billion between 2024 and 2028. Comparative data from 2019–2024 reveals a fivefold surge in AI-enabled textbook adoption in East Asia and mobile learning penetration gains exceeding 30% points in South Asia, underscoring the scale and speed of change.

However, the analysis also highlights persistent challenges, including infrastructure gaps, inconsistent content interoperability, and emerging concerns over data privacy and AI ethics. Addressing these issues will be critical to ensuring that technological innovation translates into equitable access and improved learning outcomes.

For China, the evidence points to a unique opportunity: leveraging its expansive 5G coverage, rapidly growing AI capabilities, and centralized policy environment to lead both domestically and internationally. The proposed roadmap, encompassing infrastructure equalization, national content standards, teacher training, ethical governance, and targeted international collaboration, offers a clear path to strengthening global competitiveness. Implementing these measures would not only close internal equity gaps but also position China as a benchmark for responsible, scalable, and innovation-driven digital educational publishing worldwide.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, author-ship, and/or publication of this article.

Data Sharing Agreement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

- [1] Technavio, "Digital Educational Publishing Market to Grow by USD 26.19 Billion 2024–2028," PR Newswire, 2024. [Online]. Available: <https://www.prnewswire.com/news-releases/digital-educational-publishing-market-to-grow-by-usd-26-19-billion-2024-2028-as-innovative-marketing-by-publishers-expands-with-ai-impacting-market-trends--technavio-302275938.html>
- [2] Zou, Yumei, Florence Kuek, Wenqin Feng, and Xiaoli Cheng. "Digital learning in the 21st century: trends, challenges, and innovations in technology integration." In *Frontiers in Education*, vol. 10, p. 1562391. Frontiers Media SA, 2025.
- [3] WANG, Xi-rong, and Jia-hui YAN. "The Book Publishing and Analysis of Modern Peking University Library." *Journal of Literature and Art Studies* 14, no. 4 (2024): 310–313.
- [4] Wang, Shan, Fang Wang, Zhen Zhu, Jingxuan Wang, Tam Tran, and Zhao Du. "Artificial intelligence in education: A systematic literature review." *Expert Systems with Applications* 252 (2024): 124167.
- [5] Wen, Dingzhu, Xiaoyang Li, Yong Zhou, Yuanming Shi, Sheng Wu, and Chunxiao Jiang. "Integrated sensing–communication–computation for edge artificial intelligence." *arXiv preprint arXiv:2306.01162* (2023).
- [6] Kazi, Baha Uddin, Md Kawsarul Islam, Muhammad Mahmudul Haque Siddiqui, and Muhammad Jaseemuiddin. "A Survey on Software Defined Network-Enabled Edge Cloud Networks: Challenges and Future Research Directions." *Network* 5, no. 2 (2025): 16.
- [7] Ding, Lang, and Shanshan Wu. "Digital transformation of education in china: A review against the backdrop of the 2024 World Digital Education Conference." *Science Insights Education Frontiers* 20, no. 2 (2024): 3283–3299.
- [8] Meylani, Rusen. "Transforming Education with the Internet of Things: A Journey into Smarter Learning Environments." *International Journal of Research in Education and Science* 10, no. 1 (2024): 161–178.
- [9] Rabhi, Fethi, Amin Beheshti, and Asif Gill. "Business transformation through AI-enabled technologies." *Frontiers in Artificial Intelligence* 8 (2025): 1577540.
- [10] Eaton, Sarah Elaine. "Global trends in education: Artificial intelligence, postplagiarism, and future-focused learning for 2025 and beyond–2024–2025 Werkbund Distinguished Research Lecture." *International Journal for Educational Integrity* 21, no. 1 (2025): 12.
- [11] Fang, Xu, and Mark Warschauer. "Technology and curricular reform in China: A case study." *TesOL Quarterly* 38, no. 2 (2004): 301–323.
- [12] Loffreda, Magali, Xavier Levoine, and Éric Bruillard. "Textbooks and digital resources: current transformations in France." *Revista Latinoamericana de Tecnología Educativa* 16, no. 2 (2017).
- [13] Tuli, Shreshth, Fatemeh Mirhakimi, Samodha Pallewatta, Syed Zawad, Giuliano Casale, Bahman Javadi, Feng Yan, Rajkumar Buyya, and Nicholas R. Jennings. "AI augmented Edge and Fog computing: Trends and challenges." *Journal of Network and Computer Applications* 216 (2023): 103648.
- [14] Chen, Qingyong, Zhe Wang, Yu Su, Luwei Fu, and Yuanlun Wei. "Educational 5G edge computing: Framework and experimental study." *Electronics* 11, no. 17 (2022): 2727.
- [15] Akter, Mahmuda, Nour Moustafa, Timothy Lynar, and Imran Razzak. "Edge intelligence: Federated learning-based privacy protection framework for smart healthcare systems." *IEEE Journal of Biomedical and Health Informatics* 26, no. 12 (2022): 5805–5816.
- [16] Xu, Wei, Zhaohui Yang, Derrick Wing Kwan Ng, Marco Levorato, Yonina C. Eldar, and Mérouane Debbah. "Edge learning for B5G networks with distributed signal processing: Semantic communication, edge computing, and wireless sensing." *IEEE journal of selected topics in signal processing* 17, no. 1 (2023): 9–39.
- [17] WANG, Xi-rong, and Jia-hui YAN. "The Book Publishing and Analysis of Modern Peking University Library." *Journal of Literature and Art Studies* 14, no. 4 (2024): 310–313.
- [18] Kempkes, Gerhard. *Rapid demographic change and the allocation of public education resources: Evidence from East Germany*. No. 2010, 16. Discussion Paper Series 1, 2010.
- [19] Huang, Qiang. "Digital transformation of education publishing in China." *Publishing research quarterly* 31, no. 4 (2015): 258–263.
- [20] Chan, Cecilia Ka Yuk. "A comprehensive AI policy education framework for university teaching and learning." *International journal of educational technology in higher education* 20, no. 1 (2023): 38.
- [21] Khan, Wajahat Naseeb. "Ethical challenges of AI in education: Balancing innovation with data privacy." *AI EDIFY Journal* 1, no. 1 (2024): 1–13.
- [22] Singh, Ashish, Suresh Chandra Satapathy, Arnab Roy, and Adnan Gutub. "Ai-based mobile edge computing for iot: Applications, challenges, and future scope." *Arabian Journal for Science and Engineering* 47, no. 8 (2022): 9801–9831.