Research on Specialized Textbook Publishing Strategies in the New Media Context –Based on Post-Print Publishing Practice of Artificial Intelligence Textbooks

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Abstract

In publishing, textbook planning constitutes engineering-oriented work and a perpetually evolving subject. This paper expounds upon the design, planning, and implementation of systematic textbooks for artificial intelligence majors within the context of emerging engineering disciplines. It sequentially addresses: coordinated investigation, overall planning, and hierarchical design to resolve positioning issues; cross-boundary integration and differentiated design to tackle pedagogical challenges stemming from disciplinary evolution and multidisciplinary intersection; and innovative integrated resource development to alleviate readers' teaching confusion and usage difficulties. By adopting a "user-centered" approach and innovating quality control across subdivided engineering processes, we ensure high-quality publication of specialized textbooks. Textbook planning and publishing necessitate comprehensive information collection through modern technology and scientific research methods, alignment with industry development trends, and enrichment of online and offline product and service models via new technologies, thereby expanding new frontiers for the vigorous promotion of specialized series textbook publishing.

Full Text

Preamble

Research on Professional Textbook Publishing Strategies in the New Media Era: A Case Study of Artificial Intelligence Textbook Publishing

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Abstract: Textbook planning in publishing is an engineering endeavor and a perennially evolving topic. This paper examines the systematic design and implementation of AI specialty textbook series within the context of emerging engineering education. It elaborates on three key aspects: first, coordinated research and hierarchical design to resolve positioning issues; second, cross-disciplinary integration and differentiated design to address teaching challenges arising from rapid professional changes and multidisciplinary intersections; and third, innovative resource integration to resolve pedagogical confusions and practical difficulties for readers. By adopting a "user-centered" approach and implementing quality control across engineering sub-processes, this framework ensures high-quality publication of specialty textbooks. Textbook planning requires comprehensive information gathering through modern technology and scientific research methods, keeping pace with industry trends, and enriching online and offline product-service models with new technologies to expand opportunities for specialty textbook series publication.

Keywords: new media; textbook publishing; artificial intelligence; new technology; online and offline

Introduction

In the new media era, defining the planning and publication of professional textbook series as an engineering task in educational publishing is no exaggeration. The process encompasses numerous complex stages: professional domain research and analysis, planning proposal formulation, product design, author team assembly, initial blind review screening, content production and refinement, interim evaluation, manuscript finalization, the three-review and three-proofreading publication workflow, resource allocation, product launch, and continuous optimization. The intricacy and difficulty of these details rival software project management. Regarding research alone, publishing work places extreme emphasis on integrating industry needs with educational systems—monitoring how industrial development creates new talent demands and standards, understanding current talent cultivation benchmarks and realities in education, while also considering strategic insights from domestic and international research institutions and exemplary practices from foreign universities. Based on systematic research, it is essential to integrate talent demand with cultivation realities to plan and construct systematic professional textbook frameworks and layout three-dimensional resources that support talent development. This paper uses the exploratory practice of AI specialty textbook publishing as a case study to analyze the key elements in creating professional publication series.

In July 2017, the State Council issued the "New Generation Artificial Intelligence Development Plan," elevating AI development to a national strategy. The plan encompassed not only AI-related scientific research and technological methods

but also provided guidance for AI talent cultivation and ethical standards to foster an AI ecosystem. In 2020, the Ministry of Education, National Development and Reform Commission, and Ministry of Finance jointly issued the "Opinions on Promoting Discipline Integration and Accelerating AI Graduate Training in Double First-Class Universities," noting that China still has significant gaps in AI basic theory, original algorithms, high-end chips, and ecosystem development, with cross-disciplinary integration urgently needing deepening and talent cultivation orientation requiring strengthening. The COVID-19 pandemic in 2020 became a "touchstone" for intelligent technologies, validating AI' s true societal value as a crucial driving force in the new round of technological revolution and industrial transformation. In the post-pandemic era, new infrastructure has endowed AI with an entirely new mission.

Following the pandemic, China no longer has any purely "traditional industries" ; every sector has embarked on digitalization and intelligent transformation to varying degrees. AI applications such as big data-based travel tracking systems, electronic community exit permits, contactless shopping and delivery, contactless sterilization and epidemic prevention, smart healthcare, and dark factories have rapidly disrupted existing industries and reshaped public cognition, creating new demands for both the technical skills and quantity of practitioners. From the perspective of overall economic development trends, as information technologies like big data and AI advance at high speed, specialties related to AI, big data, Internet of Things, and industrial robots have remained popular in recent years with increasingly deep cross-integration. The popularity of AI specialties represents both a business opportunity and new requirements for talent cultivation and textbook publishing.

1. Coordinated Research and Clear Positioning

Both academia and industry have urgent needs for AI talent cultivation. How can specialty publishing empower talent development? To address new economic challenges, serve national strategies, meet industry demands, and orient toward future development, the Ministry of Education has actively promoted the construction of "emerging engineering education" since February 2017—a major continuous initiative to deepen engineering education reform [1]. Emerging engineering education is characterized by reflecting contemporary features, multidisciplinary integration, multi-stakeholder participation, and broad scope. Leveraging the role of industry-academia collaborative education, emerging engineering construction requires developing a batch of technology-oriented courses that reflect new technologies and industries such as AI, cloud computing, and big data, as well as cross-disciplinary courses better integrated with specialties, while strengthening integrated information innovation capabilities and engineering practice cultivation [2].

Under the guidance of authoritative bodies such as the Ministry of Education' s Computer Science and Technology Teaching Guidance Committee and Software Engineering Teaching Guidance Committee, Posts & Telecom Press united

with enterprises including Huawei, Arm China, iFLYTEK, Tencent Cloud, and DBAPP Security as collaborative partners. The press organized AI education experts from prestigious universities including Tsinghua University, Peking University, Beihang University, Beijing University of Posts and Telecommunications, and Harbin Institute of Technology to conduct research on over 50 domestic universities and enterprises, as well as foreign research institutions and typical universities. After analyzing AI talent demands and cultivation realities, the team designed a series of products. The AI publishing project team adopted a project-based management model for overall planning. From a hierarchical cultivation perspective, the AI specialty textbook series covers not only the vertical teaching system spanning vocational colleges, application-oriented undergraduate programs, engineering-oriented undergraduate programs, first-class undergraduate programs, and graduate training, but also implements differentiated content design for computer and non-computer specialty cultivation from a disciplinary perspective. Based on thorough research and analysis, the team determined the overall planning of topic selection directions and constructed a pan-AI professional training system including AI fundamentals, machine learning and deep learning, computer vision and perception, natural language understanding and speech semantics, AI applications, robotics and intelligent systems, etc. Systematic textbook construction follows a model of overall planning and hierarchical design to serve the cultivation of AI talents at all levels and categories.

In 2019, the first batch of 35 undergraduate institutions nationwide was approved to offer AI specialties, a year hailed by educators as the inaugural year of AI education in China. By 2020, according to the Ministry of Education' s latest regulations on professional setting management, 180 additional undergraduate institutions and over 170 vocational colleges had established AI specialties, making AI arguably the most popular specialty in China. From 2017 to 2020, among the newly approved majors in the Ministry of Education' s "Higher Vocational Education Professional Record and Approval Results," specialties that consistently ranked in the TOP20 included industrial robot technology, big data technology and application, drone application technology, cloud computing technology and application, and Internet of Things application technology. Regarding specific specialty enrollment, undergraduate AI-related specialties involve intelligent science and technology, artificial intelligence, and robotics engineering, while vocational colleges have added AI technology services. Despite overall planning and hierarchical design, practical teaching needs vary due to differences in student foundations, practical environments, and faculty reserves across institutions. Consequently, AI specialties derived from different professional backgrounds expect differentiated textbooks. AI is a typical cross-disciplinary field intersecting with big data, Internet of Things, electronics, communications, and computer science, requiring meticulous and scientific layout for specialty clusters and course groups. Based on current realities, China' s AI project team deeply analyzed talent cultivation programs at various institutions and levels, then combined specific skill branches demanded by industry devel-

opment to conduct differentiated designs for different professional directions [3]. For instance, computer specialties emphasize algorithm, programming, natural language processing, and computer vision cultivation; communications focus on popular 5G technology, narrowband IoT, and Internet security; robotics specialties emphasize embedded systems, intelligent control, and intelligent application cultivation. In textbook construction and practical teaching activities, student foundations and faculty reserves for AI specialties must be core considerations, and series textbook construction should also adopt differentiated approaches based on these contexts.

3. Innovative Resource Development and Knowledge Space Expansion

Emerging engineering education emphasizes fully leveraging existing case resources and technical resources from renowned enterprises to collaboratively develop technology-oriented courses and corresponding digital resources through school-enterprise cooperation. In recent years, China has attached great importance to educational informatization, with schools and regions organizing various educational activities through online learning spaces to construct ubiquitous learning environments. In 2019, the Ministry of Education issued the "Management Measures for Textbooks in Regular Institutions of Higher Education," proposing in textbook planning to organize the construction of new-form textbooks that deeply integrate information technology with education and teaching, comprehensively utilize multiple media, and feature rich expressiveness [4]. In the same year, the Ministry released the "Notice on Launching the 2019 National Excellent Online Open Course Recognition Work" (hereinafter referred to as the "Notice") to promote the construction and sharing of online open courses in China. This represents a crucial strategy for achieving a "track-changing 超车" in the quality of China' s higher education talent cultivation and an inflection point for video classrooms optimizing educational resources. With the accelerated application of 5G technology and unimpeded network highways, video classrooms, online courses, and resources will receive better infrastructure support and can be popularized more rapidly.

China' s higher education has vigorously promoted the deep integration of modern information technology with teaching, actively guiding students toward online and offline multi-mode learning. In the first half of 2020, affected by the COVID-19 pandemic, students nationwide attended online classes at home, making online learning routine. MOOCs, micro-courses, video open courses, resource sharing courses, and online live courses built by higher education institutions over the years played important roles. However, practical teaching also revealed some problems: high-quality resources remain scarce; many electronic text resources are simply direct conversions from print content; video and teaching courseware quality is not high; lack of overall planning leads to temporarily developed emergency resources with serious duplication, excessive but not refined content, and insufficient standardization. How can we optimize resource supply,

innovate service models, and promote resource sharing from the textbook end?

Based on the above realities, to build a professional textbook series in the AI field, it is necessary to combine more refined hierarchical talent cultivation while implementing differentiated configurations for different reader groups. Whether to emphasize practical content, foundational knowledge, or systematic research content requires positioning and adjustment based on the characteristics of teaching at each level and the goals of talent cultivation for different professional backgrounds. This differentiation also stems from AI being a typical cross-disciplinary field, with specialties such as big data, IoT, electronics, communications, and computer science all intersecting and integrating with it, requiring meticulous and scientific layout for specialty clusters and course groups. Based on current realities, China' s AI project team deeply analyzed talent cultivation programs at various institutions and levels, then combined specific skill branches demanded by industry development to conduct differentiated designs for different professional directions [3]. For instance, computer specialties emphasize algorithm, programming, natural language processing, and computer vision cultivation; communications focus on popular 5G technology, narrowband IoT, and Internet security; robotics specialties emphasize embedded systems, intelligent control, and intelligent application cultivation. In textbook construction and practical teaching activities, student foundations and faculty reserves for AI specialties must be core considerations, and series textbook construction should also adopt differentiated approaches based on these contexts.

4. Quality-Centered Process Control Improvement

The Fifth Plenary Session of the 19th CPC Central Committee made comprehensive arrangements for economic and social development during the 14th Five-Year Plan period and beyond. General Secretary Xi Jinping' s important speech at the session provides strategic guidance for the great rejuvenation of the Chinese nation and the unprecedented global changes. The new situation of building a modern socialist country proposes a new mission to accelerate education modernization. Education modernization is an important cornerstone of socialist modernization, and high-quality educational publishing constitutes an important foundation for education modernization, providing necessary guarantees for accelerating education modernization and constructing an education system needed for building a modern socialist power. The Ministry of Education has also provided important guidance on promoting the construction of an education powerhouse. At the historical intersection of the "Two Centenary Goals" and facing unprecedented global changes, we must further leverage education' s foundational, guiding, and comprehensive role as a national priority and Party' s major project to accelerate education modernization and construct an education system needed for building a modern socialist power. As an important support, educational publishing bears undeniable responsibility for promoting high-quality development.

To implement the Party Central Committee' s decisions and the Ministry of Ed-

ucation' s guidelines, we must adhere to the general principle of seeking progress while maintaining stability, implement new development concepts, and focus on the supply-side structural reform mainline of being "user-centered." By fully utilizing new technologies and models and leveraging technology empowerment advantages, we must deeply implement quality construction in all details of the educational publishing system engineering, blaze new trails in promoting high-quality development, and drive educational publishing quality development through high-quality detail control. Firmly grasping the reform 思路 of innovation, openness, and sharing, we must run new development concepts through the entire process of specialty publishing work and all sub-links of publishing engineering.

Originating from the AlphaGo human-machine match that reignited this wave of AI enthusiasm, the field has experienced 狂热炒作, 泡沫高起, 落地艰难, and challenges in security, privacy, and ethics. In 2020, AI and industry demonstrated unprecedentedly close integration. Against the global anti-pandemic backdrop, AI rapidly responded and deployed in medical care, contactless services, epidemic data management, urban industrial resumption, and other fields, playing key roles and improving overall efficiency in the anti-pandemic war. In the process of AI technology and industry integration development, AI exhibits characteristics of "ubiquitous intelligence" —ubiquitous in infrastructure construction, ubiquitous in more diverse application scenarios and larger-scale audiences, and ubiquitous in more universities accelerating AI specialty construction. Precisely because of this, higher requirements are proposed for talent cultivation in this field, and more challenges are posed for specialized, systematic publishing in this domain. We attempt a "user-centered" supply-side structural reform, exploring the construction of systematic AI specialty textbooks to meet talent cultivation needs, respond to market changes, aim for more inclusive and responsible development, and adhere to the general principle of "coordinated planning and design, authoritative expert guidance, backbone force construction, excellent enterprise support, and ecological resource co-construction." Through stepwise iterative construction of systematic engineering, we continuously explore and practice new development concepts to promote high-quality development and boost the vigorous development of specialty textbook series publication.

[FIGURE:N] *Professional Publishing Iteration Diagram*

Upholding the basic concept of "quality as the core," we combine publishing links with project management models, adjusting publishing process control links into more detailed engineering stages: research and analysis, planning proposals, overall design, author coordination, blind review screening, content production, process evaluation, manuscript finalization, resource development, live preview and release, product launch, teacher training, and continuous optimization. Participants during this period include not only various publishing positions but also efficiently leverage the roles of policy guidance experts, industry technology experts, excellent university teachers, research institution experts, and end users, effectively improving specialty publishing quality. Tak-

ing blind review screening as an example, outlines that pass publisher screening and basic qualification enter a review pool, where a group of experts in the technical field conduct online reviews of the content separately. Which authors wrote which outlines and which experts participated in the reviews remain transparent, creating conditions for objective evaluation and greatly improving the review function. This is an effective method developed through exploration on the path to high-quality publishing development. After preliminary exploration and several publication project practices, controlling details in all publishing links makes high-quality development inevitable.

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Note: Figure translations are in progress. See original paper for figures.