

A Case Study of AI-Based Human-AI Collaboration in Reading Promotion within University Libraries

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Abstract: This study investigates the application of Generative AI (GenAI) in human-AI collaborative reading promotion within Chinese university libraries, addressing the paradigm shift from 'resource pushing' to 'demand response.' Utilizing a case study methodology, it analyzes practices from libraries including Harbin Institute of Physical Education, Shijiazhuang University, and Shenyang University of Technology to examine AI's role across the entire activity chain: planning, resource provision, service implementation, and effect evaluation. The research finds that mature collaboration models exhibit a three-dimensional structure of 'technology empowerment, librarian leadership, and reader co-creation,' where the organic integration of intelligent tools and professional expertise enhances service coverage and engagement. However, the study also identifies persistent challenges, including technical immaturity and data security risks. It concludes by proposing strategic countermeasures—such as optimized technology selection, specialized talent cultivation, and robust system construction—to provide a practical reference for advancing intelligent reading promotion in the academic library sector.

1. Introduction

With the deepening implementation of the "National Reading Action Implementation Plan for Teenage Students," university libraries, as core positions in campus culture construction, see the quality of their reading promotion work directly impacting the effectiveness of building a "scholarly campus." Currently, Generation Z constitutes the main body of university readers, and their reading demands exhibit significant characteristics of personalization, fragmentation, and interactivity. The traditional periodic activity model centered around "World Book Day" struggles to meet the need for normalized and precise reading services. Breakthroughs in Generative AI technology provide technical support for this transformation of reading promotion. In this context, the human-AI collaboration model, by integrating the efficiency advantages of AI with the professional value of librarians, constructs a new relationship of "machines empowering services, librarians creating value," becoming an inevitable choice for innovation in university library reading promotion. Domestic research on AI and library reading promotion began around 2018. Early studies mostly focused on analyzing the prospects of technology application. Zheng Jilai et al., based on the 5W communication model theory, proposed that GenAI could reconstruct the promotion framework

from four levels: reading resources, platforms, spaces, and services, and validated the model's effectiveness using the China University of Mining and Technology Library as a case study. Liu Qiong et al. [1]. constructed an AIGC-empowered smart service framework for reading promotion, achieving intelligent extension of service scenarios through the deployment of a virtual digital human "Librarian Assistant" [2].

In the dimension of human-AI collaboration, related research has gradually shifted from technical introduction to mechanism discussion. Some scholars point out that the core of human-computer collaboration lies in constructing a closed-loop model of "problem identification - service mapping - service implementation - effect verification," where librarians play an irreplaceable role in demand interpretation and service calibration. Cui Lele proposed optimization paths for the promotion model from five dimensions—smart facilities, resources, platforms, etc.—emphasizing that the improvement of librarians' technical literacy is key to achieving human-AI collaboration [3].

Existing research has confirmed the application value of AI technology in reading promotion, but shortcomings remain: case studies often focus on single institutions, lacking cross-institutional comparative analysis. This paper, by integrating practical information published on the official websites and WeChat public accounts of multiple university libraries, focuses on analyzing the implementation mechanisms of human-AI collaboration.

2. The Connotation and Theoretical Basis of Human-AI Collaborative Reading Promotion in University Libraries

2.1 Core Concepts

Generative Artificial Intelligence (GenAI) refers to artificial intelligence technology capable of generating innovative content like text, images, and audio by learning from massive datasets. Its core feature is "creation rather than just analysis." GenAI possesses core capabilities such as content generation, natural language interaction, and multimodal processing, enabling a shift from "passive response" to "active service." Typical applications include chatbots and content generation tools, serving as the technical carrier for current reading promotion in university libraries [4].

Human-AI Collaboration here refers to the organic cooperation model between librarians and AI systems based on their respective advantages. In the context of reading promotion scenarios, it manifests specifically as: AI primarily undertaking repetitive, data-intensive tasks (such as resource screening, user profile building), while librarians focus on professional, creative work (such as reading guidance, activity planning), forming a service community with complementary functions [5].

AI-empowered Reading Promotion refers to the systematic reconstruction of reading promotion resources, channels, and forms supported by AI technology, achieving a transition from "unified supply" to "precise matching," from "one-way dissemination" to "two-way interaction," and from "offline dominance" to "full coverage" [6].

2.2 Theoretical Basis

This paper is primarily guided by the 5W Communication Theory and the Precision Service theoretical framework, explaining how AI empowers and facilitates human-AI collaboration in carrying out reading promotion work. The 5W Communication Theory, proposed by Lasswell—the "Who (says) What (to Whom) (in) Which Channel (with) What Effect" model—provides a framework for analyzing reading promotion. GenAI technology can optimize each dimension: identifying the "To Whom" through user profiles, optimizing the "Says What" through content generation, expanding the "Channel" through multimodal interaction, and ultimately enhancing the

communication effect. The core of Precision Service theory lies in configuring service resources guided by user needs. The human-machine collaboration model collects multimodal user data (reading history, interaction behavior, etc.) through AI, which is then interpreted by librarians to form precise service plans, constructing a closed loop of "data collection - demand identification - service provision - effect feedback," solving the "mismatch between supply and demand" problem in traditional promotion [1].

3. Case Analysis of Typical Human-AI Collaborative Reading Promotion in University Libraries

Case information mainly comes from primary sources such as activity notices and summary reports published on the official library webpages and WeChat public accounts, ensuring authenticity and timeliness. A shortcoming of the case analysis involved in this paper is that, due to limited collected information, it is not possible to fully evaluate the effectiveness of the reading promotion activities carried out.

3.1 Case Selection and Basic Information

This paper selects representative practices from 6 university libraries as case samples, covering different levels of institutions and regions, which is shown in Table 1.

Table 1 Basic information of the sample cases

| University Name | Core Project | Technology Application | Service Platform |
|---|---|---|-----------------------------------|
| Harbin Institute of Physical Education | "AI Reading · Shared Knowledge" Points Competition | Bokan AI Book Garden Intelligent Task System | WeChat Public Account |
| Shijiazhuang University | "Tang Breeze Brushing Volumes · Reading Encounters Mountains and Rivers" Reading Season | AI Librarian, AI Content Generation Tools | Official Website + Public Account |
| Shenyang University of Technology | "AI Companion Reading Non-Stop" Cloud Activity | Personalized Recommendation AI System | Official Website + Public Account |
| Nanning Normal University | AI Librarian "Nanning Normal University Turing" Service | Multimodal Interactive Large Language Model | WeChat Public Account |
| Guangdong Vocational College of Technology and Business | Three-Dimensional Linkage AI Promotion Model | Intelligent Customer Service, AI Creation Tools | Full-domain Platform |
| Xi'an University of Architecture and Technology | "HI Ignites the Scholarly Fragrance · AI Empowers Classics" Book Review Contest | "Core Classics" AI-assisted System | Mini-program + Public Account |

3.2 In-depth Case Analysis

3.2.1 Resource Provision Dimension: AI-empowered Content Production and Precise Matching

In traditional reading promotion, resource recommendations often rely on librarian experience, leading to issues like limited coverage and insufficient personalization. The human-AI collaboration model optimizes resource supply through "AI preliminary selection + librarian fine selection."

Harbin Institute of Physical Education Library created the "Bokan AI Book Garden" platform. The AI system automatically filters high-quality e-books in areas like sports rehabilitation and

sports humanities based on the characteristics of a sports-oriented university, and generates personalized recommendation lists based on user data such as reading duration and check-in frequency. Librarians focus on resource quality control, forming professional teams to conduct secondary reviews of AI-recommended titles, ensuring content complies with academic standards and reader needs [7].

Nanning Normal University's AI Librarian "Nanning Normal University Turing" further achieves deeper resource services. Integrated with domestic large language model technology, this system can not only recommend books based on academic interests but also provide value-added services like thesis assistance and AI translation, combining resource recommendation with academic support. Librarians monitor the recommendation effectiveness through the backend and regularly update the resource tagging system to continuously optimize recommendation accuracy [8].

3.2.2 Activity Operation Dimension: Human-Machine Collaborative Full-Process Management

The planning, execution, and feedback of reading promotion activities involve a large number of transactional tasks. The intervention of AI technology can significantly improve operational efficiency, while the professional ability of librarians ensures the educational value of the activities.

Shijiazhuang University, during its three-month reading season activity, built a dual-drive operation model of "AI + Librarian." In the planning stage, AI analyzed reader activity data from the past three years, identifying that "creative" and "competitive" activities had the highest participation rates, providing decision-making references for librarians; during the execution stage, the "AI Librarian 2.0" handled repetitive tasks like inquiry response and registration statistics, allowing librarians to focus on organizing core activities like the "AI Prose Poetry Collection" and thematic book exhibitions; in the feedback stage, AI automatically generated activity data reports, and librarians, combined with feedback from reader forums, formed a summary plan containing 12 improvement suggestions [9].

Shenyang University of Technology's "AI Companion Reading Non-Stop" summer activity demonstrates the advantages of a lightweight human-AI collaboration model. The library did not undertake large-scale system development but integrated a mature AI recommendation module via its public account, allowing readers to obtain book lists by inputting reading preferences. The core work of librarians involved setting up incentive mechanisms (such as second classroom credits, custom prizes) and content guidance (such as daily reading topic recommendations), achieving service extension at minimal cost [10].

3.2.3 Reader Interaction Dimension: Technology-driven Enhancement of Engagement

Enhancing reader engagement is a core goal of reading promotion. AI technology enriches interaction forms and lowers participation barriers, creating possibilities for deep reading experiences, while librarian guidance prevents the formalization of technology application.

Xi'an University of Architecture and Technology's "AI Empowers Classics" book review contest innovatively introduced a "human-AI co-creation" model. Readers could use the "Core Classics" mini-program to access book summaries and generate mind maps with AI assistance, reducing the difficulty of writing; simultaneously, librarians organized online workshops to guide readers on how to use AI tools appropriately rather than relying on them, emphasizing the originality and thoughtfulness of the reviews [11].

Guangdong Vocational College of Technology and Business's "Three-Dimensional Linkage" model constructed a full-scenario interaction system. Through AI tool support for diverse practices like reading poster design, AI music, and AI novel creation, and with intelligent customer service

answering creative questions in real-time, librarians were responsible for organizing cross-disciplinary training and work evaluation, forming a complete chain of "tools - service - incentives" [12]. This model transformed readers from "passive readers" to "active creators." The original content output from the activity, after screening, was displayed in the library lobby, further amplifying the promotion effect.

3.2.4 Service Extension Dimension: Omni-channel Smart Service Network

Breaking through time and space constraints is key to improving the quality and efficiency of reading promotion. The human-AI collaboration model achieves service ubiquity through "AI full coverage + librarian key support."

Nanning Normal University's "Nanning Normal University Turing" adopted a deployment method of "WeChat Public Account embedding + multimodal interaction," supporting both text and voice interaction, providing 24/7 uninterrupted service. For routine inquiries (like loan rules, database usage), AI can respond immediately; for complex needs (like thesis topic suggestions, specialized resource integration), the system automatically transfers to the corresponding subject librarian, achieving efficient division of labor where "simple tasks are handled by machines, complex problems are handled by experts."

Harbin Institute of Physical Education extended service scenarios through an "AI task system." Readers in the "Bokan AI Book Garden" could not only read but also complete expansion tasks generated by AI (such as case analysis of sports-related books, opinion discussion). Task outcomes, after initial evaluation by AI, received commentary and feedback from librarians. This model extended reading services from "inside the library" to "the cloud," and from "reading itself" to "thinking and expression."

4. Characteristics of the Human-AI Collaborative Reading Promotion Model

Through the analysis of the typical cases from the above 6 universities, the following characteristics can be summarized into 4 types.

Pragmatic Orientation in Technology Selection: The sample universities all avoided the misunderstanding of "technology for technology's sake," prioritizing mature technologies highly compatible with reading scenarios. For example, Shijiazhuang University and Nanning Normal University adopted lightweight transformation methods like "existing platform + AI module," while Harbin Institute of Physical Education directly introduced the mature "Bokan AI Book Garden" system, all achieving service upgrades at low cost, reflecting a "demand-oriented, fit-for-purpose" logic in technology choice.

Precise Positioning of the Librarian's Role: In the human-AI collaboration system, the librarian's role transforms from "service provider" to "service designer," "quality controller," and "value guide." This is specifically manifested in: planning activity frameworks, setting service standards, and guiding readers in the proper use of AI tools. Their core value lies in solving non-standardized, creative problems that AI cannot handle.

Closed-loop Construction of Service Processes: All cases formed a closed-loop process of "data collection - AI analysis - librarian decision-making - service implementation." AI is responsible for the full collection of data and preliminary analysis, while librarians are responsible for interpreting the essential needs behind the data and formulating service strategies.

Digital Innovation in Incentive Mechanisms: The sample universities integrated AI technology with incentive systems, such as: Harbin Institute of Physical Education's reading points, Shenyang University of Technology's credit rewards, and Shijiazhuang University's points mall. By automatically recording reading behaviors and converting them into incentive credentials through

AI, readers' willingness for continuous participation was significantly enhanced.

5. Challenges in Human-AI Collaborative Reading Promotion

Overall, at the technical application level, many universities can recommend professional books to some extent, but there is a gap between the recommended books and the actual professional needs. Furthermore, it is currently often impossible to achieve precise matching with readers' reading interests, or to provide one-to-one pushes of reading lists or e-books. Secondly, at the AI usage level, on one hand, the use of AI is still in the exploratory stage, and there is a lack of personnel with mature AI literacy; on the other hand, for reading promotion copywriting, the authenticity of AI-generated content needs verification by librarians, requiring manual review. Content involving ideology requires manual control. These are tasks that AI cannot accomplish alone and require human-AI collaboration. Additionally, at the data security level, the application of AI technology relies on the collection of large amounts of user data, including reading history, personal preferences, and interaction content, posing privacy leakage risks. Some universities have issues with irregular data management, such as: not clearly informing users of the scope of data use, lacking data encryption measures. At the service quality level, attention must also be paid to the tendency of weakening human warmth. Over-reliance on AI technology may lead to "cold" services. For example, the standardized responses of AI librarians, while efficient, lack emotional resonance, with some readers complain that "the answers are accurate but lack human touch." Meanwhile, the homogenized content recommended by AI may solidify readers' preferences, forming "information cocoons," which contradicts the diversified goals of reading promotion.

6. Optimization Paths and Countermeasure Suggestions

6.1 Building an Adaptive Technical Support System

First, libraries should select technical solutions based on their institutional characteristics and reader needs, adhering to the principle of building a demand-oriented technical support system. For instance, science and engineering universities can focus on AI retrieval tools for academic resources, while liberal arts universities can strengthen AI-assisted systems for classic reading, avoiding blindly pursuing the technological forefront. It is recommended to adopt a "modular access + progressive upgrade" model to reduce technology application risks. Second, establish a multi-system data integration mechanism. Educational and research institutions should promote the data connection between AI service systems, library management systems, and resource databases, unify data standards, and achieve a comprehensive construction of user profiles. For example, integrating loan history, database access records, and AI interaction content for analysis can improve recommendation accuracy. Furthermore, technical guarantee mechanisms should be improved. Libraries should sign detailed service agreements with technology suppliers, specifying fault response times; on the other hand, they should establish an in-house technical team responsible for daily maintenance and simple fault handling to ensure service continuity.

6.2 Cultivating a Composite Talent Team

University libraries can regularly conduct "AI Basic Application" training for general librarians, covering content such as the use of intelligent tools and data interpretation; provide advanced "AI Service Design" training for key librarians, cultivating activity planning and technology integration capabilities; establish human-AI collaboration working groups composed of librarians, technical personnel, and subject teachers, where librarians are responsible for demand mining, technical

personnel for technology implementation, and subject teachers for content review, forming a synergistic mechanism that complements strengths.

6.3 Improving Data Security and Protection Systems

University libraries should strive to standardize data management processes. For example: formulate "Artificial Intelligence Service Data Management Specifications," clarify the scope of data collection (only data related to reading services), purpose of use (limited to reading promotion), and publicize them through channels like public accounts, obtaining user authorization. Educational and cultural institutions need to adopt technical means such as encrypted storage and access control to ensure data security. Additionally, they need to strengthen risk early warning: regularly conduct data security and copyright risk inspections, establish risk ledgers, and promptly rectify identified issues to prevent risks.

6.4 Balancing Technical Efficiency and Human Warmth

First, libraries need to optimize AI service design. This includes: incorporating humanistic elements into AI response systems, such as holiday greetings and personalized recommendation language; implementing an "AI initial screening + librarian follow-up" model for complex needs, ensuring services are both efficient and warm. University library management departments shall avoid the "information cocoon" effect: librarians under their jurisdiction should regularly intervene in AI recommendation algorithms, actively pushing interdisciplinary and diversified resources; these departments shall organize offline activities like reading sharing sessions and thematic salons to break the blocking of online reading. Furthermore, they shall strengthen value guidance in services: they can utilize AI tools to assist in activities like classic reading and the study of red documents, such as using AI to recreate historical scenes or analyze classic texts, while librarians provide ideological guidance, achieving the unity of technological empowerment and value.

7. Conclusion

Through the analysis of practical cases from 6 university libraries, this paper reveals the core logic and practical paths of AI-based human-AI collaborative reading promotion in university libraries. The research finds that human-AI collaboration is not simply a technical overlay, but rather centers on reader needs, achieving precision, efficiency, and depth in reading promotion through the functional complementarity of AI technology and librarian services. A mature collaboration model should feature pragmatic technology use, professional librarians, closed-loop processes, and digital incentives, effectively expanding promotion coverage, enhancing reader participation, and improving library service efficacy.

Simultaneously, the research also indicates that current human-AI collaborative reading promotion still faces practical challenges such as technical immaturity, shortage of talent with AI literacy, and data security concerns. Solving these problems requires systematic optimization from multiple dimensions including the technical system, talent team, and institutional construction, seeking a balance between efficiency and quality, technology and humanity.

With the continuous development of AI technology, human-AI collaborative reading promotion in university libraries will present three major trends: first, the deep application of multimodal interaction, creating immersive reading experiences through various forms like voice, images, and virtual reality; second, the precise upgrade of personalized services, transitioning from "interest recommendation" to "demand prediction" based on large language model technology, proactively responding to readers' potential needs; third, the extensive development of cross-library

collaboration, achieving resource sharing and service coordination through the interconnection of AI systems among university libraries within a region.

University libraries should seize the opportunities presented by technological development, adhere to the philosophy of "technology empowerment, humanity casting the soul," continuously deepen the innovation of human-AI collaboration models, and make reading promotion a crucial support for enhancing students' comprehensive literacy and building a scholarly campus.

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