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Scientific and Social Research

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Luyao Zhang

Exploration and Practice of the Integrated Medical and Nursing Model with Chinese Medicine Characteristics

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Abstract: With the aging of the population, traditional medical and elderly care models are no longer able to meet the growing health service needs of the elderly. As an innovative health management model, the Traditional Chinese Medicine (TCM) integrated medical and elderly care model aims to provide comprehensive health management services for the elderly by leveraging TCM's unique holistic approach, syndrome differentiation and treatment, and preventive treatment, combined with modern integrated medical and elderly care service models. This article explores the background, construction, empirical research, challenges, and solutions to this model, as well as future optimization and promotion strategies.

Keywords: Traditional Chinese medicine; Integration of medical care and elderly care; Population aging; Health services

Online publication: September 9, 2025

1. Introduction

1.1. Research background

1.1.1. The challenges of an aging society

As the global population ages, health issues facing the elderly are becoming increasingly prominent. In an aging society, the elderly population's demand for medical care, elderly care, health management, and other services continues to grow, which poses a severe challenge to the traditional medical and elderly care model. How to provide comprehensive, effective, and convenient health management services for the elderly has become an urgent problem to be solved in today's society ^[1].

1.1.2. Limitations of traditional medical and elderly care models

The traditional medical model focuses on the diagnosis and treatment of diseases, but often neglects the overall

health and quality of life of the elderly. Furthermore, the traditional elderly care model focuses primarily on daily care and lacks professional medical support. This separate medical and elderly care model is no longer able to meet the growing health service needs of the elderly ^[2-3].

1.1.3. The potential of the integrated medical and nursing model with Chinese medicine characteristics

Traditional Chinese medicine (TCM), a treasure of the Chinese nation, possesses a unique theoretical system and therapeutic approaches. In the management of elderly health, TCM emphasizes a holistic approach, syndrome differentiation and treatment, and preventive treatment, creating a natural fit with the modern integrated medical and nursing model. Therefore, establishing a TCM-specific integrated medical and nursing model is of great significance for improving the health management and quality of life of the elderly ^[4-5].

1.2. Research significance

This study aims to provide more comprehensive and personalized health management services for the elderly by deeply exploring the construction and implementation of a TCM-specific integrated healthcare and nursing model. Furthermore, this study will help promote the application and development of TCM in modern integrated healthcare and nursing models, providing theoretical support and practical guidance for relevant policy formulation and implementation.

2. Construction of a traditional Chinese medicine-based integrated medical and nursing model

2.1. Theoretical framework and concept integration

Establishing a TCM-specific integrated healthcare and nursing model requires theoretical integration and innovation. While the fundamental theories of TCM emphasize the integrity and balance of the human body, geriatric medicine emphasizes the physiological, psychological, and social changes that occur with aging. Therefore, the theoretical framework of a TCM-specific integrated healthcare and nursing model should integrate TCM's holistic concepts, syndrome differentiation and treatment, and the principles of preventing illness before it occurs, while also incorporating the research findings of geriatric medicine to create a health management model that is both TCM-specific and adaptable to the elderly population ^[6-8].

2.2. Service content and process design

The integrated medical and nursing model with TCM characteristics should include multiple services, including TCM diagnosis and treatment, rehabilitation nursing, nutritional diet, and psychological counseling. By incorporating TCM dietary therapy concepts and techniques such as acupuncture and massage, personalized health management plans can be provided for the elderly. Furthermore, the design of service processes should emphasize convenience and continuity, ensuring that the elderly can easily access various services ^[9-11].

2.3. Innovation in interdisciplinary integration

One of the innovations of the TCM-inspired integrated medical and nursing model lies in its deep interdisciplinary integration. Beyond traditional Chinese medicine and geriatrics, it also requires integrating theories and practices from fields like nursing, nutrition, and psychology. This interdisciplinary integration

can provide more comprehensive and precise health management services for the elderly^[12-15]. For example, in nutrition, TCM dietary therapy concepts can be combined with modern nutritional research to develop personalized meal plans for the elderly. In nursing, TCM's holistic approach to health care can be combined with modern nursing techniques to provide comprehensive nursing services.

3. Empirical research on the integrated medical and nursing model with Chinese medicine characteristics

3.1. Research methods and process

This study employed a combination of literature review, empirical research, and interdisciplinary approaches. First, by systematically collecting research data on Traditional Chinese Medicine (TCM) and the integration of healthcare and elderly care, the authors sought a comprehensive understanding of the current status and research trends of TCM applications in this area across different countries and regions. Second, the authors selected representative healthcare and elderly care institutions or communities for field research, collecting data through questionnaire design, interview outlines, and observation records. Finally, the authors conducted qualitative and quantitative analyses of the collected data to explore the effectiveness, advantages, and challenges of the TCM-specific healthcare and elderly care integration model in practical application.

3.2. Empirical research results

Through empirical research, the authors have found that the traditional Chinese medicine (TCM) integrated healthcare and nursing model offers significant advantages in elderly health management. Specifically, this model can improve elderly health, slow the aging process, enhance quality of life, and reduce disease incidence. Furthermore, this model can promote social engagement and well-being among seniors, increasing their life satisfaction and well-being.

However, in practical application, the TCM-inspired integrated medical and nursing model faces challenges, including cultural adaptability, limitations of TCM treatments, resource allocation issues, and insufficient government policy and regulatory support. These issues have, to a certain extent, limited the model's promotion and application.

4. Challenges and solutions to the integrated medical and nursing model with traditional Chinese medicine characteristics

4.1. Challenges

4.1.1. Cultural adaptability issues

The TCM-integrated medical and nursing model faces the challenge of cultural adaptability in its practical application. Due to differences in cultural background and medical systems in different regions, TCM is not widely accepted and recognized in some areas. This has, to a certain extent, limited the promotion and application of the TCM-integrated medical and nursing model^[16].

4.1.2. Limitations of traditional Chinese medicine treatment

While traditional Chinese medicine (TCM) treatments offer unique advantages, they also have limitations. For example, the effectiveness of TCM treatments is often affected by a variety of factors, including the elderly's

physical condition, cultural background, and level of acceptance. Furthermore, TCM treatments lack unified standards and norms, making it difficult to quantify and promote their effectiveness in clinical practice.

4.1.3. Resource allocation issues

The effective implementation of the TCM-inspired integrated healthcare and nursing model requires a large number of highly qualified TCM professionals. However, there is a current shortage of TCM practitioners, particularly in the field of geriatric care. This has hindered the popularization of some TCM services among the elderly, hindering the promotion and application of the TCM-inspired integrated healthcare and nursing model.

4.1.4. Insufficient support from government policies and regulations

Government policy and regulatory support are crucial for the promotion and application of the integrated healthcare and nursing model of Traditional Chinese Medicine. However, current government policy support and regulatory safeguards for traditional Chinese medicine remain insufficient. For example, policies related to pricing and reimbursement for traditional Chinese medicine services remain incomplete, impacting accessibility and affordability.

4.2. Solutions and countermeasures

4.2.1. Strengthen the popularization and promotion of traditional Chinese medicine knowledge

To increase the visibility and recognition of traditional Chinese medicine (TCM), people need to strengthen the popularization and promotion of TCM knowledge. Through lectures, free clinics, and other activities, people can educate the elderly about basic TCM knowledge and treatment concepts. At the same time, people should leverage media and social media platforms for extensive publicity to enhance TCM's visibility and influence.

4.2.2. Improving the construction of the traditional Chinese medicine service system

In order to improve the TCM service system, it is necessary to strengthen the construction of the TCM service network. By increasing the number of TCM service institutions and expanding the coverage of TCM services, the accessibility and affordability of TCM services can be improved. At the same time, the training and management of TCM service personnel should be strengthened to improve their professional quality and service level ^[17].

4.2.3. Policy support and regulatory protection

The government should introduce relevant policy support and regulatory safeguards to provide strong guarantees for the promotion and application of the integrated medical and nursing model of TCM. For example, policies such as pricing and reimbursement for TCM services should be formulated to improve their accessibility and affordability, and relevant standards and norms for TCM services should be established to ensure their quality and safety.

4.2.4. Optimizing the treatment model of integrating traditional Chinese and Western medicine

To promote the coordinated development of Traditional Chinese Medicine (TCM) and Western medicine, it is necessary to optimize the integrated treatment model. By strengthening communication and collaboration between TCM and Western medicine and developing personalized treatment plans, we can ensure that TCM and Western medicine complement and synergize with each other during treatment. At the same time, researchers should strengthen research and exploration into the integration of TCM and Western medicine to promote their

deep integration and development.

5. Optimization and promotion strategies for the integrated medical and nursing model with Chinese medicine characteristics

5.1. Optimization of service content

In order to improve the service quality of the integrated medical and nursing model with Chinese medicine characteristics, it is necessary to optimize the service content. Specifically, people can increase the service items in Chinese medicine diagnosis and treatment, rehabilitation nursing, nutritional diet, etc., according to the actual needs of the elderly. At the same time, people should focus on the provision of personalized services and formulate personalized health management plans based on the physical condition, cultural background, and other factors of the elderly ^[18].

5.2. Optimization of service processes

To improve the efficiency of the integrated medical and nursing model with TCM characteristics, service processes need to be optimized. Specifically, measures such as streamlining service processes and reducing wait times can be taken to improve the convenience and consistency of services. Furthermore, communication and collaboration should be strengthened throughout the service process to ensure that seniors can conveniently access various services.

5.3. Design of service standardization model

To promote the standardized development of TCM-inspired integrated healthcare and nursing care models, a service standardization model needs to be designed. Specifically, standards and specifications for TCM services can be formulated to clarify requirements for service processes and quality. At the same time, the promotion and application of service standardization models should be strengthened to ensure that TCM-inspired integrated healthcare and nursing care models can achieve uniform standards and specifications across different regions and institutions.

5.4. Regionally differentiated promotion strategies

Due to regional differences in cultural backgrounds and medical systems, it is necessary to develop regionally differentiated promotion strategies. Specifically, tailored promotion plans can be tailored to the specific circumstances of each region. For example, in areas with abundant medical resources, efforts can be made to strengthen the integration of Traditional Chinese Medicine (TCM) and Western medicine; in areas with relatively limited medical resources, efforts can be made to prioritize the popularization and promotion of TCM services.

5.5. Policy support and government advocacy

The government should introduce relevant policy support and advocacy to provide strong guarantees for the promotion and application of the TCM-integrated healthcare model. For example, relevant policies for TCM services should be formulated, and publicity efforts for the TCM-integrated healthcare model should be increased. At the same time, supervision and management of the TCM-integrated healthcare model should be strengthened to ensure its standardized and orderly development ^[19–20].

6. Conclusion and outlook

This study, through an in-depth exploration of the construction and implementation of a TCM-specific integrated healthcare and nursing model, found that this model offers significant advantages in elderly health management. However, in practical application, this model also faces challenges and issues. To promote the sustainable development of this model, efforts are needed to strengthen the popularization and promotion of TCM knowledge, enhance the TCM service system, provide policy support and regulatory safeguards, and optimize integrated TCM and Western medicine treatment models.

In the future, with the increasing aging of the population and the continuous advancement of medical technology, the integrated medical and nursing model of traditional Chinese medicine will usher in even broader development prospects. At the same time, it is necessary to strengthen interdisciplinary research and collaboration to promote the deep integration and development of Traditional Chinese Medicine and modern medicine^[19–20]. It is believed that in the near future, the integrated medical and nursing model of Traditional Chinese Medicine will become a significant force in the field of elderly health management, contributing further wisdom and strength to the health and well-being of the elderly.

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The authors declare no conflict of interest.

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Security Tools Based on Large Language Models

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Abstract: This article focuses on the field of security tools based on large language models (LLMs), systematically reviewing the core products, security strategies, and technical solutions launched by leading US technology companies and research teams in 2024. In June 2024, OpenAI released its security strategy for large language models and a user data protection plan. The former established a multi-dimensional protection system covering infrastructure, sensitive data/model weight protection, and model review, while the latter enhanced privacy protection by giving ChatGPT users the right to choose how their data is used and by default restricting the use of some data for training purposes.

Keywords: Large language model; SAFE verification tools; Data security; Threat detection

Online publication: September 9, 2025

1. Introduction

In recent decades, with AI's rapid advancement, Large Language Models (LLMs) have become a core focus driving natural language processing breakthroughs. Recent years have seen their research advance significantly via academia-industry collaboration, with ChatGPT as a key milestone—its human-like text generation gained wide attention and sparked discussions on reshaping human-computer interaction.

LLMs' technical evolution deeply influences the AI community. Breaking traditional language limits, they revolutionize AI algorithm development, shifting from task-specific small models to general large-scale pre-training, opening new research avenues. The application of large language models (LLMs) is expanding, but they also pose risks such as harmful outputs, data leakage, and "jailbreak attacks." The research on security tools is of crucial significance. It can filter out harmful content, prevent vulnerabilities, and ensure the compliance of information in critical fields such as healthcare and finance; it can also suppress model hallucinations and strengthen the data security defense line, providing core support for the safe implementation and large-scale application of LLMs in various industries. In this paper, we mainly explored the core contents and individual characteristics of several security tools for large language models, in order to promote the development of large language models towards a safer and more efficient direction.

2. Security tools based on large language models

2.1. Data security protection for users of OpenAI's large language models

On June 6, 2024, the US-based OpenAI publicly disclosed its security strategy for large language models, providing technical references for the public to understand the model development process. The disclosed content includes:

- 1) In terms of basic security architecture, Azure EntraID, which provides various management services such as identity authentication and access protection, will be integrated with the internal identity verification and authorization control framework to achieve secure verification of session creation, identity authentication, and abnormal logins.
- 2) In terms of workload orchestration, Google's open-source container platform Kubernetes will be used to coordinate, manage, and protect workloads, and for tasks with higher risks, gVisor, an open-source product from Google, will be used for running.
- 3) In terms of sensitive data protection, authorization for storing, managing, and researching sensitive data will be granted through keys, and role-based access control will be adopted to limit access to data, while access management services will be used to achieve flexible customization of access permissions.
- 4) In terms of model weight protection, the resources related to model weights will be stored in OpenAI's internal network, and the flow of sensitive data will be controlled at the exit, and access to accounts involving sensitive model weights will require multiple approvals.
- 5) In terms of model review and testing, security tests will be conducted through internal and external "security red teams" to evaluate existing security standards, study security systems and security measures, etc.

On June 13, 2024, OpenAI released the user data security protection plan for large language models ^[1]. OpenAI stated that although user data can help improve the performance of its existing models, it also understands those users who do not want OpenAI to utilize their personal data ^[2]. To protect the data privacy of these users, OpenAI proposed relevant protection measures, including:

- 1) Free and enhanced versions of ChatGPT users can choose in the settings whether to use their conversations as training data;
- 2) In ChatGPT, users can select "temporary chat records", and their data will not be used for training OpenAI's models;
- 3) The company does not use API, ChatGPT Enterprise, and ChatGPT Team user data for model training by default.

2.2. Microsoft Copilot for Security

Copilot for Security is a product combining large language models and threat intelligence released by Microsoft (**Figure 1**). It integrates threat intelligence data, algorithm models, and cloud computing capabilities, assisting analysts in generating efficient analysis results ^[3]. The main functions of Copilot for Security include:

- 1) Utilizing the reasoning ability of the large language model to reconstruct attack paths and output visualized attack paths;
- 2) Incorporating a rich set of predefined analysis strategies, such as malware analysis and general event analysis;
- 3) Limiting the logical reasoning ability of the large language model within specific scenarios through the form of Promptbook scripts, reducing misleading answers caused by knowledge "hallucinations";

- 4) Generating security reports based on the semantic understanding and integration capabilities of the large language model, enhancing the friendliness of human-computer interaction;
- 5) Achieving data compliance through a series of methods, ensuring that user data is not used to train the model, and reducing the possibility of data leakage in the large language model.

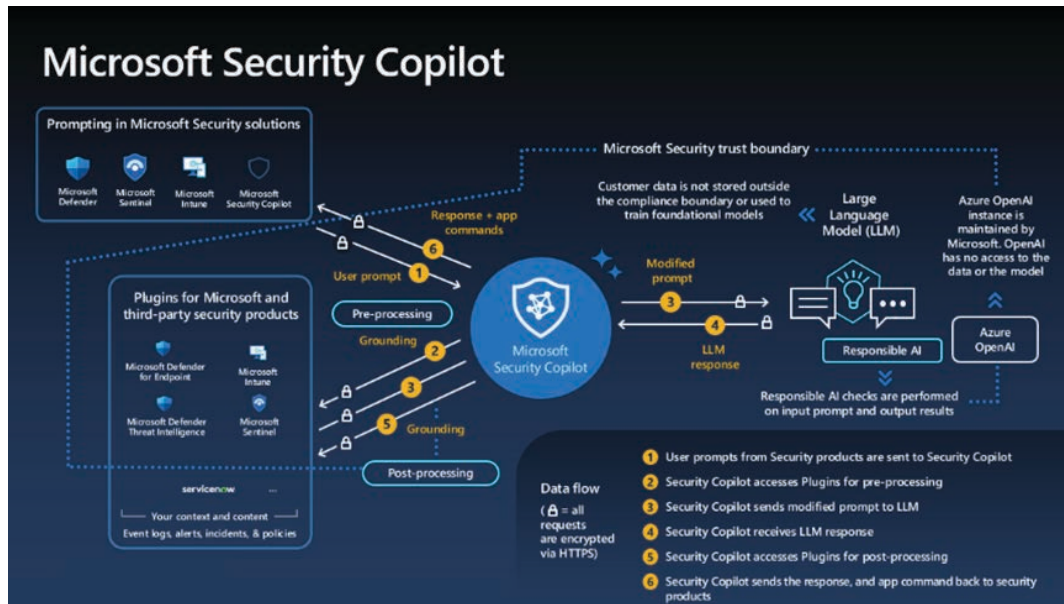


Figure 1. Basic information of Copilot for Security

On April 1, 2024, Microsoft officially released Copilot for Security (International Edition) globally. This is the first independent generative artificial intelligence solution in the global information security field, which can help security and IT professionals comprehensively understand security situations, take actions faster, and enhance team professional skills.

Copilot for Security processes over 78 trillion large-scale security signals every day and combines large language models and security-specific models to provide deep insights for enterprises and guide users' subsequent actions. Copilot for Security can help security and IT professionals strengthen their skills, collaborate more effectively, understand security situations more comprehensively, and respond faster. In the official release version, Copilot for Security includes the following new features:

- 1) Customized instruction manual (Promptbook), supporting customers to create and save a series of natural language instructions for daily security work.
- 2) Knowledge base integration (preview version), enabling users to integrate Copilot for Security with business logic and execute according to their own step-by-step guidelines.
- 3) Connecting from Defender EASM to custom external attack surfaces to identify and analyze the latest information on the external attack surface risks of the organization.
- 4) Microsoft Entra audit logs and diagnostic logs, providing other suggestions for security investigations or IT problem analysis (involving audit logs related to specific users or events), and summarizing in natural language.
- 5) Usage reports, providing suggestions through dashboards on how teams use Copilot to help teams discover more optimization opportunities.

2.3. The security AI workbench platform of Google Cloud Company

The US-based Google Cloud Company mainly empowers its product lines through large language models to enhance the intelligence level in various business domains. The Security AI Workbench released by Google Cloud is the industry's first scalable platform supported by the Google security large model Sec-PaLM (**Figure 2**) [4]. This platform aims to utilize artificial intelligence to enhance threat detection and analysis, and to respond to and prevent new threats by providing reliable, relevant, and actionable intelligence. The main functions of Security AI Workbench include:

- 1) Virus Total Code Insight: Using the Sec-PaLM model to analyze the behavior of malicious scripts and identify potential threats;
- 2) Mandiant Breach Analytics for Chronicle: Combining Google Cloud and Mandiant threat intelligence to conduct contextual and timely responses to activity vulnerabilities within the user environment;
- 3) Assured OSS: Utilizing large language models to incorporate more open-source software (OSS) packages into the OSS vulnerability management solution;
- 4) Mandiant Threat Intelligence AI: Based on Mandiant's vast threat map, using the Sec-PaLM large language model to help customers quickly find, summarize, and respond to relevant threats;
- 5) Chronicle AI: Supports searching for billions of security events and can interact with the results, ask follow-up questions, and quickly generate detection results;
- 6) Security Command Center AI: Can convert complex attack diagrams into understandable human language, including affected assets and solutions. In addition, it will provide an AI-based risk summary for Google Cloud's security, compliance, and privacy check results [5].

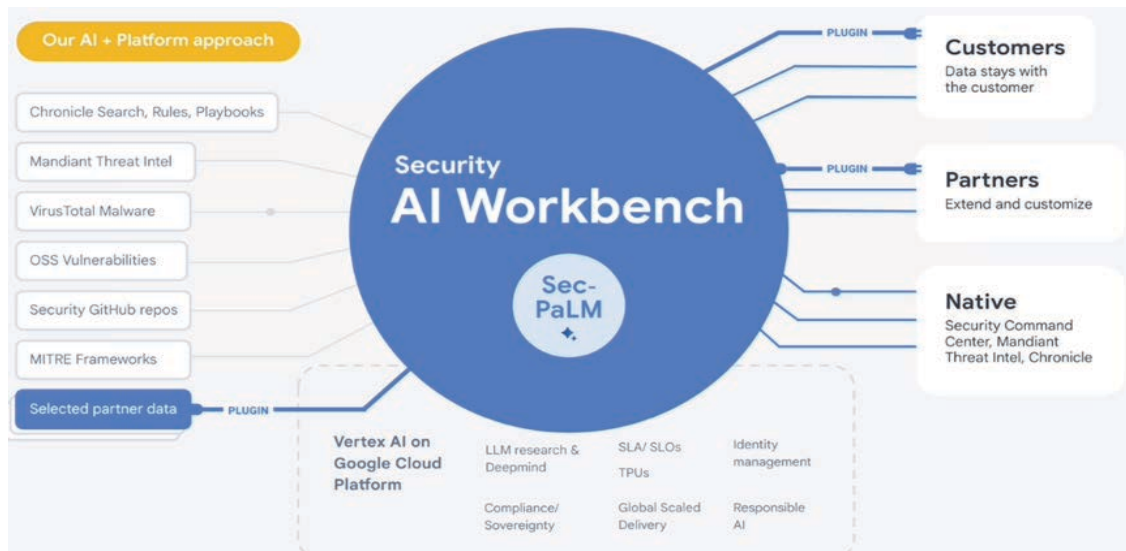


Figure 2. Basic information about the security AI workbench

Google Cloud claims that this Security AI Workbench model has been fine-tuned for security use cases and combines Google's powerful security intelligence (such as Google's visibility into threat situations and Mandiant's first-hand intelligence on vulnerabilities, malware, threat indicators, and hacker behavior patterns). Google believes that this security artificial intelligence workbench can effectively address the three major challenges in cybersecurity: threat overload, cumbersome tools, and talent shortage [6].

2.4. Google's Frontier Safety Framework

On May 17, 2024, the artificial intelligence team of Google's subsidiary DeepMind launched an artificial intelligence safety framework called the Frontier Safety Framework, which is used to detect risks in artificial intelligence models (**Figure 3**)^[7]. It claims to be able to actively identify “the artificial intelligence capabilities that may cause significant risks in the future”, and point out to researchers “at which levels the relevant models may be exploited by hackers.”

This framework is a set of protocols, emphasizing the importance of identifying and mitigating potential risks during the development of artificial intelligence models, aiming to actively identify the artificial intelligence capabilities that may cause serious harm in the future, and establish mechanisms for detecting and mitigating risks. It is introduced that the 1.0 version of Frontier Safety Framework released by DeepMind mainly includes three key capabilities, namely:

- 1) The ability to identify the threshold of serious harm that the model may have;
- 2) Regularly evaluating the model to detect when these key threshold values are reached;
- 3) When the model reaches the early warning assessment, activate the mitigation plan.

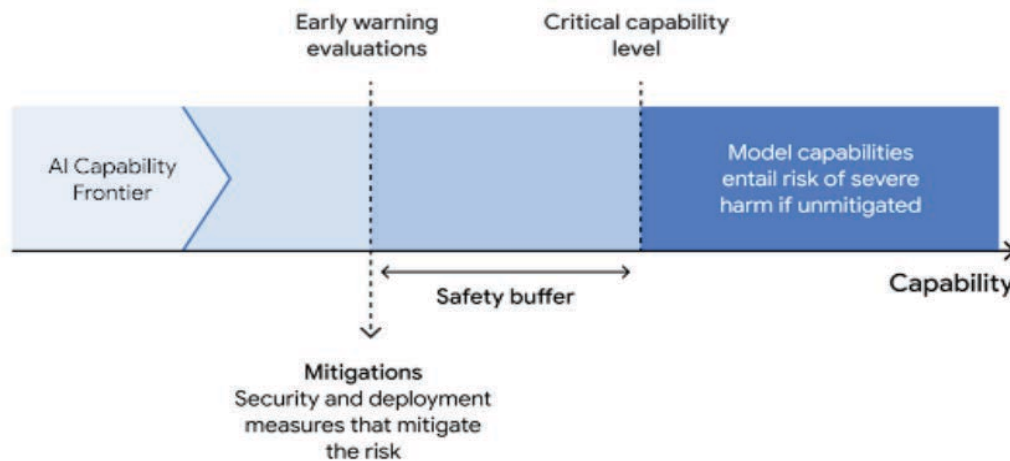


Figure 3. The relationship between the Frontier Safety Framework and three key capabilities

Meanwhile, this framework also proposes two mitigation measures:

- 1) Preventing model weight leakage;
- 2) Limiting access to and expression of key capabilities during deployment.

DeepMind research indicates that the most likely areas where the capabilities of future large language models will pose serious risks are autonomy, biosecurity, cybersecurity, and machine learning research and development. This framework also proposes key capability thresholds for these four areas.

DeepMind stated that the company “has been constantly pushing the boundaries of artificial intelligence”, and the models developed by the company have changed their perception of the possibilities of artificial intelligence. Although the company believes that future artificial intelligence technologies will bring valuable tools to society, they also realize that the risks of related artificial intelligence technologies may have a devastating impact on society, so they are gradually enhancing the security and controllability of the models.

Currently, DeepMind is still developing the Frontier Safety Framework. In the future, DeepMind will

collaborate with other companies, academia, and legislators to improve this framework, and plans to officially launch it in 2025.

2.5. Google's SAFE verification tool

The illusion problem of the generated answers by large language models has always been a concern in the industry, hindering the deployment and production of large language models in real scenarios. In April 2024, the artificial intelligence team of Google's DeepMind, in collaboration with researchers from Stanford University, published a research paper titled "Long-form factuality in large language models." The researchers conducted an in-depth exploration of long-form factual questions and conducted a comprehensive assessment of the performance of language models in long-form factual matters. The research team released a new prompt dataset called LongFact, which is used for benchmarking long-factual content in large language models, including 2,280 guiding questions covering 38 different topics. The research team also launched an artificial intelligence fact verification tool called SAFE (Search-Augmented Factuality Evaluator). Both LongFact and SAFE have been open-sourced on GitHub.

The 2,280 high-quality guiding questions included in the LongFact dataset originated from multiple authoritative sources such as Wikipedia and news reports. Through dual checks of automated screening and manual review, the questions were ensured to be able to test the depth of the model's knowledge while avoiding factual errors or subjective biases. Thus, LongFact became a solid foundation for measuring the long-factual nature of language models.

The SAFE tool, based on large language models, can analyze, process, and evaluate long responses generated by chatbots to verify the accuracy and authenticity of the responses. The implementation steps include splitting the answers into individual items to be verified, correcting each item, and then comparing it with Google search results. Additionally, the tool will also check the relevance of each fact to the original question.

The innovative evaluation method of SAFE utilizes the language model itself and its interaction with Google's search engine to automatically evaluate whether each knowledge point generated by the model is accurate, relevant, and can be self-consistent. Different from traditional methods that rely on manual judgment or only focus on superficial correctness, SAFE can verify the accuracy of the facts generated by the model in real-world scenarios and detect the model's ability to generate meaningful information by leveraging Google search.

On the LongFact dataset, researchers conducted benchmark tests on a total of 13 language models from four series (Gemini, GPT, Claude, PaLM-2). The results showed that larger language models typically performed better in long-factual matters. SAFE was consistent with human judgment results 72% of the time and received higher recognition in 76% of randomly selected 100 controversial cases. Moreover, SAFE was more than 20 times more efficient than hiring an artificial annotation team, demonstrating its effectiveness as an efficient means for evaluating the long-factual nature of large language models.

3. Conclusion

Overall, the current security tools based on large language models have demonstrated strong capabilities and significant value in multiple fields^[8]. From a functional perspective, these tools cover multiple key aspects of security protection, such as OpenAI's security strategy which builds a multi-dimensional model and data security protection system, Microsoft Copilot for Security which implements efficient analysis functions such as attack path reconstruction and security report generation, Google Security AI Workbench which has significant advantages

in threat detection and intelligence utilization, and Frontier Safety Framework and SAFE tools which provide solutions for the two key pain points of AI model risk detection and factual assessment of generated content.

In terms of data security and compliance, all companies attach great importance to it and take various measures to protect user data privacy, such as restricting data usage for model training, encrypting data transmission and storage, etc., effectively reducing the risk of data leakage^[9]. From an industry impact perspective, these tools not only enhance the work efficiency and skill level of security professionals, helping enterprises better cope with security threats, but also provide an important direction for the intelligent development of the information security field, promoting the standardized application and innovative development of generative artificial intelligence in the security field. In the future, with the continuous improvement of related frameworks and iterative upgrades of tools, combined with multi-party cooperation, security tools based on large language models will play a greater role in ensuring network security and responding to emerging threats.

Disclosure statement

The authors declare no conflict of interest.

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EU Industrial Policy: Essentials and Prospects

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Abstract: Faced with challenges such as the restructuring of the European security order, declining economic competitiveness, and insufficient innovation leadership, the EU has begun to actively implement industrial policies. It leverages government intervention measures to ensure the security of industrial and supply chains, focuses on developing key green and digital industries, and protects and develops the single market, thereby safeguarding economic security and advancing strategic autonomy. The EU's industrial policies have achieved initial results, and it will rely more on industrial policy tools in the future. However, the EU's industrial policies are confronted with controversies over legitimacy and effectiveness, and it still needs to address challenges such as multi-level governance, fiscal constraints, and insufficient innovation.

Keywords: EU; Industrial policy; Government intervention; Economic security

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1. Introduction

This paper analyzes EU industrial policies since the mid-2010s, arguing that against the backdrop of geopolitical resurgence and great-power competition increasingly focusing on industrial rivalry, the role of government intervention in EU industrial policies has become highly prominent. The EU proactively guides industrial transformation through government intervention measures, with policy priorities including ensuring economic security by strengthening industrial and supply chain resilience, enhancing overall economic competitiveness by developing green and digital industries, and, in this process, promoting and developing the single market to boost the EU's economic sovereignty and strategic autonomy. Under the leadership of the new European Commission, the EU will attach greater importance to the role of industrial policies and gradually enrich relevant tools such as fiscal incentives, market protection, and legal norms. However, it faces dual controversies over policy legitimacy and effectiveness, and policy outcomes are feared to fall short of expectations.

2. Key tenets of EU industrial policy

Since the mid-2010s, the role of industrial policy instruments at both EU and member state levels has grown

increasingly salient within the economic sphere. Notably, under the impetus and tacit approval of the European Commission led by Ursula von der Leyen (since 2019), industrial policy initiatives at both tiers have expanded substantially, emerging as a pivotal driver of industrial structural transformation across the EU. The incoming European Commission (2024–2029) underscores the criticality of industrial policy and state intervention in attaining economic security and fostering technological innovation. Its industrial policy framework seeks to enhance industrial competitiveness by leveraging the single market’s comparative advantages, fortifying innovation leadership, and realizing climate neutrality alongside economic security ^[1]. To this end, relevant policies are primarily oriented toward three interrelated dimensions.

2.1. Emphasis on supply chain security

The EU has intensified financial support for domestic industries. For instance, the EU provides support and guidance to domestic industries through the “Important Projects of Common European Interest” (IPCEI). IPCEI constitutes a key instrument of the EU’s industrial strategy. To date, the European Commission has approved 10 comprehensive IPCEI projects, covering value chains related to batteries, cloud and edge computing, health, hydrogen, and microelectronics, creating favorable conditions for these projects to obtain dual financial support from both the EU and member states ^[2].

Meanwhile, the EU also employs policy tools such as anti-subsidy measures to protect the development of domestic industries. For example, in accordance with the provisions of the *Foreign Subsidies Regulation* (FSR), for foreign enterprises that receive “foreign subsidies” in investment and participation in government procurement and thereby distort competition in the EU single market, the EU requires them to declare the subsidy situation and has the right to initiate subsidy investigations. Based on the investigation results, it can even require enterprises to withdraw from investment and procurement projects.

The EU also attaches importance to leveraging international cooperation to avoid vulnerability risks caused by geopolitical factors. In fields such as energy, semiconductors, and critical raw materials, the EU actively advocates “de-risking” and promotes cooperation with so-called “like-minded” partner countries to enhance the resilience of industrial and supply chains. For example, in the field of critical raw materials, to reduce excessive dependence on a single country, the EU has introduced the *Critical Raw Materials Act*, increased the extraction of important raw materials such as lithium and graphite within the EU, and established a “Critical Raw Materials Club” to ensure the security of raw materials in the process of green and digital transformation.

2.2. Advancing green and digital sectors

Since 2023, the EU has promulgated such policy documents as the *Green Deal Industrial Plan (GDIP) for the Net-Zero Age* and the *Net-Zero Industry Act*. In February 2025, the European Commission unveiled the *Clean Industrial Deal (CID): A Joint Roadmap for Competitiveness and Decarbonisation*, further articulating its commitment to fostering localized production of clean technology products. Through policy synergies in domains including mobilizing public-private investments, mitigating external reliance on raw materials, facilitating international collaboration, and ensuring social equity, the EU endeavors to emerge as a global pacesetter in sustainable development ^[3]. Between 2015 and 2024, the “new three” industries— encompassing photovoltaic products, electric vehicles, and lithium batteries— received no less than €25.2 billion in fiscal subsidies at the EU level and €40.3 billion at the member state level.

In the realm of digital sectors, the EU accords priority to constructing a digital innovation ecosystem,

striving for global leadership in technological innovation, industrial advancement, and digital governance. In recent years, it has introduced a suite of policy instruments, including the EU *Digital Compass 2030*, the *European Data Strategy*, the *White Paper on Artificial Intelligence*, and the *Chips Act*, which collectively create enabling conditions for the development of digital industries from the perspectives of funding, service provision, and regulatory frameworks. In the domain of digital norms, building upon the *General Data Protection Regulation* (GDPR), the EU has successively enacted legal instruments such as the *Data Act*, the *Data Governance Act*, and the *Artificial Intelligence Act*. These establish technical standards and regulatory protocols for data transmission, the research and development of large AI models, and other related activities. Additionally, through the *Digital Services Act* and the *Digital Market Act*, it regulates the conduct of digital giants, thereby consolidating the EU's discourse power in global digital governance.

2.3. Developing the single market

Since the mid-2010s, the EU has attached greater importance to safeguarding the order of the single market through integrated legislative and regulatory coordination. For instance, subsidies provided by member states to the new energy vehicle industry must be pre-reviewed by the European Commission to ensure that such subsidies are directed toward technological research and development rather than merely protecting domestic enterprises. This prevents member states from seizing market share through excessive subsidies, which could lead to the fragmentation of the single market. Funding and project support at the EU level have also injected momentum into industrial development within the single market. Since 2018, the European Commission has approved state aid for at least one comprehensive IPCEI each year. To date, the total amount of approved state aid and expected private investment in research and development for nine comprehensive IPCEIs has exceeded €91 billion, a level of investment comparable to the EU's "Horizon Programme."

In recent years, the EU has successively responded to multiple public crises, such as the COVID-19 pandemic and the energy crisis. In response, the European Commission has established dedicated emergency tools, focusing on monitoring the operation of supply chains for strategic goods and services, and retaining the authority to require member states to prioritize the production of goods in short supply. These measures ensure the free flow of key goods and services during crises ^[4].

3. Prospects for EU industrial policy

Despite advantages such as a unified single market and high policy predictability, the EU confronts challenges regarding policy legitimacy and effectiveness. Amid escalating geopolitical uncertainty and intensified global industrial competition, sustaining efficient implementation of industrial policies remains a formidable endeavor for the EU.

3.1. Enabling conditions for EU industrial policy advancement

To avoid marginalization in global value chains, the EU must augment industrial policy support to enhance technological innovation and industrial competitiveness. Recent geopolitical shifts have destabilized the EU's long-standing commitment to a "liberal international order." Perceptions of de-globalization, geopolitical crises, and eroding economic competitiveness persistently drive EU industrial interventionism. Notably, the U.S. *Inflation Reduction Act* under the Biden administration acted as a critical catalyst for strengthened EU

intervention of industrial policy ^[5]. Internally, structural adjustment pressures in traditional sectors—steel, chemicals, automotive manufacturing—necessitate digital and green transitions. Industrial policies thus serve as mechanisms to redirect resources toward transformative industries, accelerating upgrading for sustainable development.

Expanding policy instruments enhances cross-EU coherence and coordination, facilitating scaled policy implementation. The EU will deploy tools such as Horizon Europe (2025–2027), the European Fund for Strategic Investments (EFSI), and “Erasmus+” to mobilize public-private investment in strategic sectors, leveraging R&D and innovation for industrial renewal. Ursula von der Leyen’s proposal for a permanent EU joint debt-issuance mechanism aims to institutionalize long-term strategic investment and crisis response capacity, optimizing industrial policy efficacy.

The EU will further unleash the advantages of the single market, integrate resources through policy guidance, and enhance industrial competitiveness. The *2025 Annual Single Market and Competitiveness Report* outlines measures to narrow innovation gaps, advance decarbonization, develop circular economies, and fortify supply chain resilience—all to boost economic competitiveness ^[6]. A robust R&D and industrial base, coupled with a vibrant SME ecosystem, provides foundational support for intra-bloc resource integration via industrial policy.

3.2. Legitimacy controversies surrounding EU industrial policy

EU-level industrial policies face controversies over democratic legitimacy and lack a robust institutional framework backing. Ideologically, the EU’s legitimacy hinges predominantly on the “market myth”, with societal consensus broadly skeptical of government intervention. Far-right parties, adhering to a “national priority” core narrative, oppose supranational coordination of industrial policies, advocating for the redirection of resources—including subsidies and tax incentives—toward domestic enterprises. The growing influence of such parties will impede the formulation and implementation of integrated industrial policies.

Opacity in decision-making and implementation exacerbates criticism. Core policy frameworks emerge from closed negotiations between the European Commission and member states, lacking public participation. Under IPCEI, for instance, definitions of “European interests and values” are internally determined by the Commission, with civil society and SMEs marginalized in subsidy standard-setting processes ^[7].

3.3. Constraints on policy efficacy

Current policies fail to establish a sustainable industrial competitiveness framework. The EU’s fragmented governance inhibits concentrated resource allocation for key industrial breakthroughs, while member state divergences complicate coordination. Intra-institutional frictions—such as tensions between the Directorate-General for Competition (emphasizing free markets and SMEs protection) and the Directorate-General for the Internal Market (advocating intervention)—challenge von der Leyen’s leadership and inter-departmental coherence ^[8].

The EU’s support for industrial policies is constrained by fiscal restraints and debt rules. From the perspective of fiscal capacity, although the EU economy managed to grow marginally amid multiple pressures in 2024 and showed a moderate recovery in the first quarter of 2025, the manufacturing PMI has not yet rebounded above the neutral threshold. Future economic growth will rely more heavily on member states’ investments in infrastructure and defense. This implies that the EU still faces challenges in reducing fiscal deficits while

maintaining the intensity of fiscal expenditures. In terms of debt rules, some heavily indebted Southern European countries currently remain under pressure for structural adjustments, making it difficult for them to promote industrial upgrading through large-scale investments.

The EU's stringent legal and regulatory framework exacerbates the innovation burden on enterprises, undermining innovation's role as a driver of industrial upgrading. The EU has long prioritized the protection of users' data privacy and emphasized the necessity of "trustworthy" AI. For instance, the *General Data Protection Regulation* (GDPR) imposes strict stipulations on enterprises' information processing methods, significantly increasing compliance costs for digital enterprises and creating substantial obstacles to financing for small, medium-sized, and start-up enterprises—ultimately impeding the enhancement of competitiveness among EU-based digital enterprises. The EU's *Artificial Intelligence Act* sets high standards for the transparency and interpretability of data and algorithms among large-model enterprises, which also adds to the compliance burden on corporate innovation.

4. Conclusion

Amid intensifying great-power rivalry, proliferating geopolitical conflicts, and accelerated technological revolution, the EU faces increasing strategic anxiety and eroding economic competitiveness. With its focus on forging a geopolitical identity and strategic autonomy surging, state intervention in industrial policy has grown apace. Under the new European Commission, industrial policy—rooted in technological and supply chain autonomy and leveraging rule-formulation—promotes green and digital sectors through EU coordination to enhance aggregate competitiveness.

This policy shift reflects both reactive adaptation to deteriorating geopolitical and geo-economic landscapes and proactive efforts to advance integration and strategic autonomy. Despite unlikely optimal outcomes, the EU's commitment to stronger intervention persists. It must overcome governance flaws, inadequate innovation, and funding constraints—formidable hurdles indeed.

Disclosure statement

The author declares no conflict of interest.

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Policy Space Conflict under GATS Art XIV: Limitation, Dilemma, and Challenge for Data Ethics in International Data Service Trade

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Abstract: This article interrogates the contested policy space under Article XIV of the General Agreement on Trade in Services (GATS) in the governance of cross-border data services. It demonstrates how the indeterminacy of the public morals and national security exceptions (Articles XIV and XIV bis) enables states to justify trade-restrictive measures that contravene the multilateral disciplines of Most-Favoured-Nation (MFN) treatment, National Treatment (NT), Domestic Regulation, and the participation rights of developing countries. Considering the RESTRICT Act and recent social media sanctions as focal examples, the article argues that ethical concerns—ranging from privacy protection to algorithmic bias and moral dilemmas in automated decision-making—are increasingly instrumentalized as neo-protectionist tools. This juridical ambiguity not only expands domestic regulatory discretion but also entrenches structural asymmetries in the digital economy, particularly between the Global North and South. Against the backdrop of a paralyzed WTO Appellate Body, the article calls for recalibrating exception clauses through clearer necessity and proportionality tests, embedding technology-neutral standards, and reinvigorating multilateral negotiations to mitigate regulatory fragmentation in the data services trade.

Keywords: GATS Article XIV; Data service trade; Policy space conflict; Neo-protectionism

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1. Introduction

This article explores the limitations and dilemmas of Article XIV of the General Agreement on Trade in Services (GATS), with which the issue of data ethics interacts ^[1]. Restrictive policies will undoubtedly violate MFN, NT, Domestic Regulation and Developing Countries' Participation obligations under WTO treaties, but governments can claim to rationalize their trade-restrictive behavior and legitimize their policy by claiming to have protected the public interest under the GATS exceptions ^[2]. However, the public morals and national security exceptions in GATS Article XIV and XIV bis are plagued with varying degrees of dilemmas. This, in turn, makes it difficult for

the WTO legal framework to function. It also does not allow for an effective response to the policy space challenge of the RESTRICT Act. This brings more neo-protectionism and global trade order challenges to the global trade of data services.

2. Data ethics with multiple social values and dilemmas under WTO rules

In the previous article, the author discussed the impact of ethical issues of data services on international trade and the complexity of such ethical issues mixed with politics in the case of social media sanctions. Trade-restrictive policies and laws may violate many obligations under WTO law ^[3]. Restrictions on the content of social media services lack “objective and transparent criteria” on “UNDUE or UNACCEPTABLE RISK” and violate domestic regulation in GATS Article VI (4). The provision in the RESTRICT Act that lists other countries and data service trade companies as foreign adversaries violates the trade principles of MFN in Article II, and NT in Article XVII. The sanctions that restrict other countries’ participation in the services industry chain as a developing country violate the GATS Article IV.

But governments can argue that these policies are in line with the general exceptions set out in GATS Article XIV (a) and the Security Exception in GATS Article XIV bis, further justifying the legitimacy of trade sanctions and restrictions as protecting public interests. Regarding the data protected by privacy laws, which are also provided for in Article XIV(c), there are still ethical issues arising from imported data in cross-border data flow services. There needs to be a border between legitimate public policy measures and illegitimate trade barriers. Trade law needs to be technology-neutral to avoid getting into a dilemma.

While there are positive proposals and solutions to privacy issues in national data laws and the WTO Joint Statement Initiative on Electronic Commerce (JSI) under negotiation, not much more attention has been paid to public morality and national security issues in the trade of data services ^[2]. Although there are general exception provisions in the GATS framework, it is clear that the agreements of the last century are lagging and insufficient in addressing the new issues that have arisen from the explosive growth of data technologies in recent years. Meanwhile, the standstill of the appellate body is magnifying this limitation ^[3].

3. Multiple value dilemma with GATS Article XIV(a): Is there a standard for people’s minds in the whole world?

When policies addressing data ethics involve impacts on human society, they may undermine the protected objects in GATS XIV(a). GATS Article XIV(a) divides such protected objects into two categories: public moral and public order. The two concepts do not, by definition, protect the same range of morals. Public order can be interpreted as a “fundamental interest of society.” Invoking the public order exception requires proof of a “real and sufficiently serious threat” to one of the fundamental interests of society ^[3]. Public moral, on the other hand, is an undefined term that is much broader in scope than public order. The WTO panel in US-Gambling held that “public moral and public order protect “similar values” and therefore overlap in scope ^[4]. The terminology used here reflects the fact that what is termed “public moral” protects a set of values, which mainly concern about consumer community ^[4]. In practice, the WTO has favored interpreting the meaning of public morals as a domestic value when a conflict between universal values and domestic values. In the US-Gambling tribunal decision, public morals in Article XIV(a) was “a standard judgment of what is right or wrong maintained by society or the State” ^[3]. In the trade of data services, the ethical issues raised by data services output by algorithms need to be considered as part of the

scope of “public morality”, as this falls under the protection of the values of consumers, the social order, the youth, and many other groups ^[4].

Public morality certainly needs to be protected, and the problem is that the scope of government policy space cannot be constrained. Governments have much autonomy in deciding how to define and interpret public morality and public policy. In EC-Seals, the panel identified a two-step process for assessing the public morals exception: first, whether the problem that the policy addresses actually exists in society; and second, whether it falls within the scope of “public morals” ^[5]. In many WTO tribunal cases, the resolution of the issue itself is in line with universal values, such as online gambling in the US, animal welfare in EC-Seals, and combating money laundering in Colombia-Textiles ^[5]. The problems with data ethics are even more ambiguous. In both steps themselves, it is subject to problems arising from differences in the values of its members. For example, in the case of the social media sanction, if the algorithms pushed certain content to teenagers based on user preferences, conservative parents would see this as a significant undermining of public morality. While pushing anti-abortion content to Catholic husbands would be seen by wives as oppressive to feminism ^[6]. Data ethics may also confront questions for which there are no optimal right answers to human values. In the trade market of data services, automated machines, and driverless car systems (ADS), which are already worth billions of dollars, the “collision and avoidance algorithms” of the ADS system have different conflicting values on the level of algorithmic ethics. This is because of the still-debated “Trolley Dilemma” ^[7]: should ADSs prioritize the protection of passengers in the car or innocent pedestrians on the road when faced with an emergency? Should the gender, age, status, and contribution to society influence this automatic decision? ^[8]. In a survey published in Nature, “The Moral Machine Experiment”, 40 million responses from 233 countries and territories revealed significant regional differences in moral judgments. In North America, young people are generally considered to have more survival value than old people, while the opposite is true in East Asia. Significant cross-cultural moral differences exist across the three country clusters ^[9].

Reflecting this in the output data, it is entirely possible that the algorithm’s decisions and influences could have resulted in the correct answers for the two opposite values. Such a judgment is highly subjective to values and too vague in scope. If all public moral dilemmas can be interpreted as “UNDUE RISK” in the RESTRICT Act, then the right to decision and ultimate interpretation will be completely reserved in the policy space of the U.S. government. Any protectionism and trade restrictions can be interpreted as countering “UNDUE RISK” in the processing of data services, thus becoming an exception to the WTO rules. Any protectionism and trade restrictions can be interpreted as “UNDUE RISK” in the processing of data services, thus becoming an exception to the WTO rules, as is often the case with modern digital trade barriers ^[10].

Returning to the discussion of the scope of public morality, previous panel rulings have favored domestic values, which are certainly conducive to the protection of domestic public morals. However, in this ambiguous issue of algorithmic ethics, state policies favoring conservatism and trade protection can also expand the scope of interpretation of public morality without limit and further expand its policy space ^[10]. In turn, this can create restrictions and sanctions on data service providers, shaping and exploiting structural pressures through expansive interpretations of policy space to create trade hegemony in data services. This is more strongly expressed in the political dimension of national security.

4. Severity dilemma with GATS XIV bis and national security: Is it essential enough for security interests or just an excuse?

In light of the cases and practice relating to Article XXI of the GATT, the application of the security exception

will not be limited to military activities, since other “periods of urgency in international relations” may also apply. The “essential security interests” in such cases are protected by Article XIV bis of GATS ^[11]. In its decision in *Russia-Traffic in Transit*, the Panel emphasized the limits of such a finding of international tension by excluding political or economic conflicts in normal circumstances unless they give rise to “Maintenance of law and public order interests” ^[12]. In practice, the terms “exigency”, “essential security interest”, and “necessary action” are the policy boundaries for the application of security exceptions. Restrictive policies for the protection of national security must satisfy a reasonable interpretation of these terms as well. These terms reflect the fact that “national security” in the context of data services can be interpreted as the protection of the national order, political situation, and policy. It is noteworthy that the panel refers to the principle of uniformity in treaty interpretation, so that “emergency in international relations” is placed under “essential security interests” along with “military service” and “war.” They are all regarded as having a significant impact on national order and policy ^[12]. In other words, the “emergency” should be of comparable gravity to the other two. In *US-Gambling*, the panel mentioned that the security exception could be interpreted by the balancing test established in the *Republic of Korea—Various Measures on Beef* and *EC-Asbestos*, whether the degree of protection and the trade effects of the policy outweigh the importance of the social interest to be protected ^[3, 13].

The problem, however, is that the seriousness of this type of “emergency” is the same as that of a state of war, but there is a lack of objective criteria for evaluating it, and the same problem applies to public order under Article XIV(a). While on the one hand, this does not present an obstacle to WTO members invoking the Article in their defense, on the other hand, countries subject to restrictive and sanctioning policies lack the means to confront them, and thus may lose further regulatory power in trade wars. This is particularly true in the case of trade in data services. It is entirely possible that national security exceptions can be turned into weapons of protectionism under a subjective test. The “which it considers” invocation requirement is too broad and vague and can be easily abused ^[13].

These situations are not enough to threaten US national security or public crisis, as the initiating organizers and influencers of these movements are American political forces, and no foreign powers have intervened through the social media algorithm, which is simply telling the people what is going on. This does not match the description of “serious harm” and “undue or unacceptable risk” in the *RESTRICT Act* ^[4]. However, the U.S. government can also directly restrict data service trade companies and other countries under the “FOREIGN ADVERSARY” and “HOLDING” (viii) catch-all clause provisions of the Act. Under the *RESTRICT ACT*, data service products from other countries can be placed under sanctions at any time, which is a serious violation of WTO trade rules (MFN&NT). However, the U.S. government can still rely on the Act to judge the degree of severity through a unilateral subjective test. Even the country’s name can be determined to be “an unacceptable and emergency risk to national security”, and argued that it was a security exception under WTO regulations to avoid free and fair trade obligations. This dissertation argues that this is a kind of new protectionism that uses the expansion of policy space as a means ^[14]. This subjective speculation and the subsequent attempt to force the sale of the social media business to Oracle are manifestations of protectionist behavior, but the broadness and vagueness of the WTO legal framework mask and justify the irrationality of such policies.

Although Article XIV of GATS has a premise that it must not constitute “arbitrary or unjustifiable discrimination or a disguised restriction on trade in services”, the vague boundaries of public morality and national security, and the subjective test can still enable the recipient of data services to form a policy space that is completely favorable to itself and protect its trade advantage and dominance ^[8]. This policy clash and expansion has been going on since 2018, with tariff wars on the pretext of intellectual property and corporate reforms ^[14]. And

now, when it comes to international trade in data services, this suppression continues, and resolving issues through the WTO platform is even more difficult. The suspension of the Appellate Body (AB) reduces the corresponding role of the dispute resolution mechanism for such issues.

5. WTO, policy space conflict, and North-South structures: Issues and challenges of neo-protectionism

Ambiguous boundaries of the rules can lead to an unfettered expansion of discretion in national policy. The WTO's multilateral trade agreements provide for the reduction of trade barriers by prescribing rules that member countries must follow to protect the principles of free trade and non-discrimination. The exceptions and flexibility are part of the principles, but would constitute the trade restriction and protection policies of member countries^[8]. There is an inherent contradiction between the WTO goal of promoting free trade and the member states' goal of obtaining more domestic benefits through policy space.

In view of the previous literature, WTO restrictions have always been seen as hindering a country's ability to implement policies tailored to its unique circumstances, particularly the expanded policy space for subsidies and tariff protection for firms by developing country governments^[13]. However, an interesting phenomenon in social media's trade restriction policy can be found. The developed country governments, such as the US and Australia, have hindered the development of other countries' trade in data services by enlarging the policy space for data ethics. But in this, national policy can always be used as a tool for profit-making and restricting free trade, especially in the parts where international rules are ambiguous. Policy space is determined by the institutionalization of the global economy and is influenced by political factors in trade relations. As a result, member states will tend to enable international rules by enabling policies that favor their interests and give them more advantages in trade. This is not a case of oppression from the global South or North to the other side of the world, but rather a structural policy space conflict between the two^[14]. The hazards of ethical issues cannot be left to the policies of one country to interpret its boundaries. It requires more objective and impartial testing, and meeting WTO non-discrimination obligations.

Looking back at the spatial conflict of policies that began in 2017 with the trade war between other countries and the United States, from the traditional forms of tariffs and subsidies on goods to the ethical constraints on data services of today, the spatial conflict of trade policies and forms of protectionism has taken on a new dimension. This category of protection policies, based on values or international issues other than trade itself, has become a form of neo-protectionism^[15]. The regulation of data (especially AI data) algorithms themselves is challenging. Transparency and accountability of algorithms that confront ethical issues lack standards. Additionally, in the abuse of domestic standards and the lack of international objective interpretations, the algorithms themselves cannot be properly addressed in the context of international data services, and protectionist policies in trade can be further exploited^[15]. The stability and prospects of trade in data services are greatly challenged by ethical issues under the influence of such trade. As trade discourse and geopolitics are contested, trade between advanced countries can further amplify irreconcilable regulatory conflicts and form preference-like conglomerates or reformist coalitions^[16].

The global trade order and the global governance of data services are also challenged by the combination of the two. If conflicting policy spaces contribute to a clear de-convergence of regional regulatory policies, the consensus on global trade governance will break down, and key players will be divided into opposing camps based on the standard of regulatory legitimacy^[17]. In this circumstance, the issue of global governance will be broken

up with the global fragmentation of the data service industry chain. Strategic interests and geopolitics will become the determining factors in the regulation of algorithms and further amplify the division between countries in the global North and South ^[18]. This will depart from the original intent of the WTO and move towards a reverse tide of globalization, and the normative foundations of the multilateral trading system will inevitably be undermined ^[13]. Indeed, the governance of ethical issues seems to have moved towards an era of separated and regional systems.

6. WTO and multilateral initiatives: A future that needs more consensus

The Joint Statement Initiative on Electronic Commerce (JSI) is seen as a positive attempt by the WTO system to address digital trade issues. While different participating countries have different preferences in terms of PTA choices and regional policies, a weak agreement is better than a deep disagreement. As the convener of the JSI has argued, leaving policy space that can accommodate the different circumstances of participating members is important to ensure the adoption of such a provision ^[19]. Such exceptions may lead to exemptions from unilateral self-judgment and trigger legal uncertainty. As in the previous critique of Article XIV of GATS, the elements of the legal test and the objective test cannot be clearly demonstrated in the WTO jurisprudence.

In the preamble of the Marrakesh Agreement, one of the objectives of the WTO is to ensure the development of the share of developing countries in international trade and to reduce various types of trade barriers ^[1]. As the era is coming, the WTO should still fulfil these roles in trade in services and better respond to the global governance and regulatory challenges. The WTO law should provide a platform that is more suitable for countries with different cultures and ideologies to communicate with each other, rather than making this governance issue more fragmented and regionalized ^[20]. If the WTO wants to play a sustained role as an international trade platform, it needs to reduce regulatory conflicts. Regulatory conflicts in policy space and neo-protectionist barriers to trade need to be countered through continuous consultation and negotiation. Ultimately, a consensus is reached in the new multilateral decision-making on data trade governance ^[19]. A new round of multilateral negotiations or ministerial meetings is needed to consider standards and space for exceptions on ethics in international trade. Reconciling this type of economic interests and values dilemma, which is deeply intertwined with politics, also requires consideration of the WTO's DSM role in conjunction with multilateral initiatives. There is a need for greater regulation and cooperation in efforts to improve trade law in data services, but there must also be sufficient safeguards to protect non-economic interests and ethical values issues ^[20].

7. Conclusion

Analysis indicates that the framework established under Articles XIV and XIV bis of the current GATS struggles to strike a balance between legitimate public interests and the necessity for non-discriminatory trade in data services. Whilst public morality, national security, and privacy protection remain core policy objectives, their ambiguous definitions and subjective review standards have created fertile ground for new protectionism and structural policy conflicts, particularly manifesting in the polarization between global North and South nations. The Restrictive Bill exemplifies how expansive interpretations of “undue risk” and “essential security interests” can serve as pretexts for trade restrictions that undermine core WTO values such as most-favored-nation treatment and non-discrimination. This not only erodes the global digital trade order but may also consolidate hegemonic influence over data flows, algorithms, and emerging technologies. A sustainable development pathway requires establishing clearer legal boundaries, enhancing transparency in national measures, and strengthening multilateral

cooperation. Though imperfect, the Joint Statement on E-commerce offers a platform for reconciling divergent values and establishing more predictable data services governance mechanisms. Failure to advance reforms balancing regulatory flexibility with accountability risks further eroding the WTO's normative authority. The ultimate challenge lies in reconciling ethics, security, and trade liberalization within a rules system compatible with diverse cultural and political contexts.

Disclosure statement

The author declares no conflict of interest.

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An Investigation and Analysis of Linguistic Landscape in Wufu Town, Wuyishan City

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Abstract: As a renowned historical and cultural town in Fujian Province, Wufu Town is experiencing vigorous development in its cultural tourism industry, thanks to the implementation of the rural revitalization strategy. Besides performing the basic function of information transmission, the linguistic landscape of Wufu Town carries rich historical and cultural connotations. It also reflects the construction progress and development trend of Wuyi Mountain's cultural tourism industry. Through field research, including photographing, recording, and interviewing the linguistic landscape of Wufu Town, combined with quantitative and qualitative analysis of the survey results, it can be found that there are issues such as irregular use of language and script, inaccurate translation codes, and untimely repairs of damaged or obscured linguistic landscapes in Wufu Town. By analyzing the causes of related problems, the author provides feasible suggestions from three perspectives: language and literacy accomplishment, linguistic landscape serviceability, and local cultural heritage protection. These aim to improve local linguistic landscape management, enabling the historical charm of Wufu Town to integrate more closely with modern development.

Keywords: Wufu Town; Linguistic landscape; Rural revitalization; Zhu Xi culture

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1. Analysis of the basic situation of the language landscape in Wufu Town

1.1. Survey object of the basic situation of the language landscape in Wufu Town

Wufu Town, located in the southeast of Wuyi Mountain City, was originally named Wufuli and dates back to the mid-Eastern Jin Dynasty, more than 1700 years ago. Known as the "Hometown of White Lotus" and the "Origin of Zou and Lu", it is the birthplace of Zhu Xi's Neo-Confucianism. With a rich historical atmosphere and cultural heritage, Wufu Town was named a "National Historical and Cultural Famous Town" in 2010. In recent years, with the in-depth development of the rural revitalization strategy, Wufu Town, as a township with strong local characteristics in northern Fujian, has continuously increased its tourism development efforts. Relying on the cultural relics of Zhu Xi, it has been exploring and practicing, actively developing cultural tourism and leisure projects such as Zhu Xi culture and agricultural tourism, improving the construction of eco-tourism infrastructure, and holding regional cultural activities such as the "Zhu Xi Memorial Ceremony" and the "Wufu

Lotus Flower Festival.” Wufu is being built into an “all-for-one eco-tourism town” integrating food, shelter, transportation, entertainment, and shopping. The language landscape of Wufu Town affects local tourism services and experiences ^[1]. They are not only the inheritance and display of Chinese excellent traditional culture, but also the shaping and promotion of the tourism image, playing an important role in the development of the cultural tourism industry.

In 2017, the Chinese government issued the “National Vision for Language Landscape Research”, emphasizing the importance of China’s cultural quintessence and establishing language landscape research as one of the key research areas for the future. In recent years, domestic language landscape research has achieved significant development, and some key academic research topics have been completed, with progress made in research results. Chinese scholars have conducted many investigations on street signs, window advertisements, commercial plaques, posters, and other aspects, but the research focus is mainly on the discussion of typical language landscapes in real space, and rarely mentions the identity and spatial relationships behind the language landscape, which is the core of international language landscape research. If researchers can draw on international research perspectives and focus on new dimensions, language landscape research is likely to achieve considerable development.

In this survey, based on factors such as street morphology, population density, and pedestrian traffic, the author comprehensively selected four streets in Wufu Town as samples for investigation and analysis. These are Xingxian Ancient Street, Yuhong Street, National Scenic Route 1, and the road along Zhu Xi Statue to Wuxian Bridge. Although all are located within Wufu Town, these four streets exhibit distinct linguistic landscapes due to their different morphologies and functions. A visual study of these four streets reveals the overall linguistic landscape of Wufu Town.

1.2. Methodology and process design of the survey

This article adopts a fieldwork approach to investigate the visible linguistic landscape of Wufu Town, combining quantitative and qualitative analyses for a comprehensive understanding and analysis of language use within the town.

Firstly, fieldwork was conducted. The author surveyed the linguistic landscape of four main streets in Wufu Town, collecting primary data through observation, photography, and recording, including various linguistic signs such as signs, indicators, and billboards, to obtain sample data information. Secondly, quantitative analysis was performed. The collected data were quantitatively processed and statistically analyzed to calculate the number, spatial distribution, and frequency of different linguistic signs. Subsequently, information such as the types of linguistic symbols, textual content, and carrier materials in the linguistic landscape was transcribed into a unified format for easy comparison and further research using descriptive statistical methods. Thirdly, qualitative analysis was carried out. Detailed descriptions and classifications of the collected linguistic signs were made, considering the specific environments and usage scenarios of the linguistic signs, exploring their functions and impacts in real life, summarizing the current status of the use of tourist linguistic landscapes in Wufu Town, pointing out existing problems, and making corresponding suggestions.

1.3. Basic information of the survey

In July 2024, the author conducted fieldwork in Wufu Town to collect visible linguistic data, using an exhaustive photographic method. A total of 548 photo samples and 624 linguistic signs were collected, which were divided into public signs, shop signs, and advertising signs. Among them, Xingxian Ancient Street had 281 signs, including 219 public signs, 40 shop signs, and 22 advertising signs. Yuhong Street had 148 signs, including 28 public signs,

113 shop signs, and 7 advertising signs. National Scenic Route 1 had 157 signs, including 146 public signs, 1 shop sign, and 10 advertising signs. The route from the Zhu Xi Statue to Wuxian Bridge had 38 signs, including 19 public signs, 3 shop signs, and 16 advertising signs (**Table 1**).

Table 1. Details of street linguistic landscapes

Road name	Sign type	Quantity	Total per road	Grand total			
Xingxian Ancient Street	Public Signs	219	281	624			
	Shop Signs	40					
	Advertising Signs	22					
Yuhong Street	Public Signs	28	148		624		
	Shop Signs	113					
	Advertising Signs	7					
National No. 1 Scenic Road	Public Signs	146	157			624	
	Shop Signs	1					
	Advertising Signs	10					
Zhuze Statue — Wuxian Bridge	Public Signs	19	38				624
	Shop Signs	3					
	Advertising Signs	16					

As can be seen from **Table 1**, there are certain differences in the number and distribution of various types of signs on the four streets. Among them, public signs along Xingxian Ancient Street and National Scenic Route 1 dominate, while the number of public signs, shop signs, and advertising signs along the Zhu Xi Statue — Wu Xian Bridge is relatively balanced. The majority of signs on Yuhong Street are shop signs.

Through statistics, comparison, and analysis, the collected corpus sign samples in this study are subdivided into 11 categories: directional road signs, warning signs, scenic spot introductions, historical inscriptions, government agency-related signs, public welfare promotions, notices and announcements, decorative calligraphy and paintings, and shop advertisements. The specific classification and percentage of slogans are as follows (**Table 2**).

Table 2. Specific classification of slogans

Specific category	Quantity	Percentage
Directional Signs	45	7%
Warning Signs	26	4%
Scenic Spot Introductions	137	22%
Historical Inscriptions	86	14%
Government Institutions	26	4%
Public Welfare Publicity	55	9%
Notices and Announcements	19	3%
Decorative Calligraphy and Paintings	18	3%
Commercial Advertisements	212	34%
Total	624	100%

Description of **Table 2**: Shop advertisements account for the largest proportion of the linguistic landscape in Wufu Town, accounting for 34%, indicating that the commerce in Wufu Town is relatively prosperous. This is followed by scenic spot introductions and historical inscriptions, accounting for 22% and 14% respectively. This type of linguistic landscape is beneficial for foreign tourists to understand the local historical context and cultural connotations, indicating the emphasis and promotion of history and culture in Wufu Town. Directional road signs provide clear directions for pedestrians, helping visitors identify routes to various locations. Warning signs provide safety instructions for tourists, reducing safety risks. Public welfare promotional signs are conducive to enhancing public social awareness and advocating good social practices. The richness of these types of linguistic signs reflects the standardized management of Wufu Town as a tourist attraction, which is conducive to shaping a good image of the scenic area.

2. Characteristics of the linguistic landscape in Wufu Town

Through statistical analysis of the linguistic landscape in Wufu Town, the author summarizes the following three characteristics from three dimensions: quantity, type, and content. Firstly, in terms of quantity, there is no significant difference between the number of official and non-official linguistic landscapes. Secondly, from the perspective of type, the linguistic landscape in Wufu Town is diversified and service-oriented. Thirdly, regarding content, the linguistic landscape in Wufu Town is rich in connotation, reflecting a profound Confucian cultural linguistic landscape and non-official linguistic landscapes.

2.1. There is no significant difference in quantity between official and non-official linguistic landscapes

As a tourist attraction strongly supported by the government, the difference in the number of official linguistic landscapes and non-official linguistic landscapes in Wufu Town is not significant (**Table 3**). On the one hand, it reflects that the scenic area management department attaches great importance to the setting of official linguistic landscapes, invests certain resources and energy, showcases the official image of the scenic area, and provides corresponding guidance, services, and promotion for the tourism area. On the other hand, the non-official linguistic landscape reflects the situation of the private economy in the region. The considerable number of non-official linguistic landscapes means that businesses and enterprises in Wufu Town actively respond to the call of management departments, focus on improving their service quality, and provide better tourism services for tourists.

Table 3. The quantity of official linguistic landscapes and non-official linguistic landscapes

Type	Quantity	Percentage
Official Linguistic Landscape	322	51.60%
Non-Official Linguistic Landscape	302	48.40%
Total	624	100.00%

During the field visits and investigations, the author found that the official and unofficial linguistic landscapes are configured differently based on the specific conditions of the scenic spots. The layout and font of the official linguistic landscapes adopt various forms according to the distinct features and service functions of different attractions. In ancient streets, calligraphy fonts and wooden plaques that match the atmosphere are often used, enhancing the overall integration of the scenic area, such as the “Civil Tea House” in Xingxian Ancient

Street (**Figure 1**). Signs for introducing scenic spots adopt a simple layout and standardized fonts, forming a recognizable identification system for the scenic area, ensuring that visitors can quickly and accurately obtain relevant information, such as the introduction to “Liu Family Ancestral Hall” (**Figure 2**) and “Zhu Zi Community Warehouse” (**Figure 3**).



Figure 1. Civil tea house ^[2]



Figure 2. Introduction to “Liu Family Ancestral Hall”

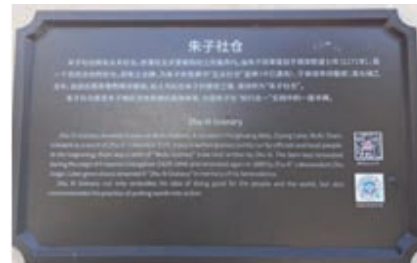


Figure 3. Introduction to “Zhu Zi Community Warehouse”

The unofficial linguistic landscapes reflect the diversification of linguistic landscapes driven by personal preferences and wishes of businesses. For example, “Apo Baozi Shop” (**Figure 4**) uses wooden plaques and calligraphy fonts, while “Caomuxin Tea Industry and Homestay” (**Figure 5**) adopts the form of stone inscription, combining calligraphy and black fonts. Both official and unofficial linguistic landscapes respect the local culture of Wufu Town and carry out appropriate language expression and design, presenting a harmonious and symbiotic state.



Figure 4. Apo Baozi shop

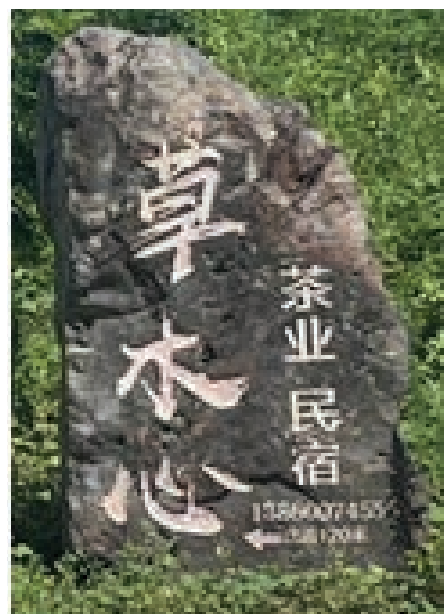


Figure 5. Caomuxin tea industry and homestay

2.2. Diverse types of linguistic landscapes with prominent service features

The linguistic landscape of Wufu Town can be classified into 11 categories based on its functions, including directional signs, warning signs, attraction introductions, historical inscriptions, government-related signs, public service announcements, notices, decorative calligraphy and paintings, and commercial advertisements. This comprehensive range of types effectively meets the diverse needs of tourists and enhances their overall travel experience.

The linguistic landscape of Wufu Town is not limited to text but also incorporates non-linguistic elements such as graphics and icons, shifting the focus from a monologue of words to a cross-symbolic dialogue. For example, the “Zhu Xi’s Former Residence Guide Map” (**Figure 6**) and the “Xingxian Ancient Street Guide Map” (**Figure 7**) are dominated by images with text as a supplement, effectively reducing the cognitive load on tourists’ spatial perception. This approach helps tourists better understand the scenic area, plan their itineraries, and improve their visiting experience. The “Zhu Xi Family Feast” (**Figure 8**) follows the principle of complementary text and graphics, with textual explanations corresponding to visual indices, achieving cognitive synergy and more vividly showcasing unique regional characteristics and culture.



Figure 6. Zhu Xi’s former residence guide map



Figure 7. Xingxian ancient street guide map



Figure 8. Zhu Xi family feast

In addition to static text and graphic symbols, there are also dynamic linguistic landscapes in Wufu Town, realizing the cognitive expansion of the linguistic landscape from a two-dimensional plane to a four-dimensional spacetime. For instance, the “Introduction to Zhu Xi’s Life” (**Figure 9**) utilizes multimedia videos and voiceovers, employing montage editing techniques to recreate Zhu Xi’s life experiences and enhance the immersion in historical scenes. The “Introduction to Zhu Wen Gong Temple” (**Figure 10**) achieves dynamic information delivery through a scrolling LED display, adding dimensionality and vividness to the linguistic landscape of the scenic area.



Figure 9. Introduction to Zhu Xi’s life



Figure 10. Introduction to Zhu Wengong Temple

2.3. The rich connotation of linguistic landscapes reflects profound Confucian culture

As vivid carriers of regional culture and historical inheritance, linguistic landscapes embody extremely rich cultural connotations. The ancient culture of Wufu Town can be traced back over a thousand years. The ancestors of the poet Liu Yong established a private school in Wufu during the Northern Song Dynasty to give lectures, and scholars such as Hu Anguo made academic trends flourish in Wufu. During the Southern Song Dynasty, the philosopher Zhu Xi spent more than 40 years in Wufu, teaching classes, discussing ethics, and founding Zhu Xi's Neo-Confucianism, leaving a precious Confucian culture for Wufu ^[3].

In the history of Chinese Confucianism, Zhu Xi's Neo-Confucianism is second only to Confucius in terms of its role and influence. Wufu Town is the core area of Zhu Xi culture in the world, the birthplace of Zhu Xi culture, and the cradle of Zhu Xi's Neo-Confucianism. Therefore, its linguistic landscapes not only carry the functions of daily communication and indication but are also deeply integrated with the essence of Zhu Xi culture, serving as a bridge connecting history and reality. These linguistic landscapes are widely distributed in the streets, alleys, historic sites, schools, and daily life of the town in various forms. In terms of content, the linguistic landscapes of Wufu Town heavily utilize terminology and allusions related to Zhu Xi's Neo-Confucianism. Road signs, inscriptions, and inscriptions on ancient buildings feature core vocabulary from Zhu Xi's Neo-Confucianism, such as "investigating things", "extending knowledge", "sincerity of intention", and "rectifying the mind." These words implicitly promote Zhu Xi's academic spirit and moral pursuit.

Besides Neo-Confucianism, Wufu Town is also deeply influenced by Confucian filial piety and integrity culture. The so-called filial piety and integrity ideology is a general term for the long-standing consciousness, philosophy, and values of officials based on filial piety towards parents and elders, forming and adhering to a clean government. The ideology of filial piety and integrity is a combination of filial piety and clean government, covering various ideological understandings, ethical concepts, and moral norms related to filial piety and integrity ^[4]. In Wufu Town, filial piety and integrity culture are not only traditional virtues but also shape the social atmosphere. Display boards and inscriptions promoting filial piety and integrity culture, such as "filial piety and integrity" and "clean government walking path", can be seen everywhere on the streets. These linguistic landscapes actively inherit and promote filial piety and integrity culture, facilitating moral education, shaping a positive social atmosphere, guiding people to regulate their behavior, and establishing correct values and moral views.

3. Analysis of main issues and their causes in the linguistic landscape of Wufu Town

3.1. Main issues in the linguistic landscape of Wufu Town

3.1.1. Irregular use of Chinese characters: Mixed use of simplified and traditional Chinese characters and the presence of typographical errors

In some linguistic landscapes pursuing unique aesthetic effects, traditional Chinese characters are often used to highlight their distinctive cultural charm. The standards for the use of traditional Chinese characters are relatively complex, and in recent years, their standardized use has become a significant social issue. Taking Wufu Town as an example, the use of traditional Chinese characters in establishing the linguistic landscape undoubtedly enhances its ancient town charm. However, in practice, there are irregularities such as the mixed use of simplified and traditional characters and typographical errors.

Among the 624 samples of linguistic landscape signs collected in Wufu Town, the author found 8 cases of mixed use of simplified and traditional characters, accounting for 1.28%. This mixed use violates Article 14 of the

“Law of the People’s Republic of China on the Standard Spoken and Written Chinese Language” (hereinafter referred to as the “National Standard Language Law”), which states that signboards and advertisements should use the national standard spoken and written language as the basic language^[5]. For instance, in the introduction of the scenic plaque “Zhu Zi She Cang Cang Gui” (**Figure 11**), the title uses simplified Chinese characters, while the following introduction of warehouse rules uses traditional Chinese characters. In “Longxing Bailian Pingfang” (**Figure 12**), the character “蓮” is written in traditional Chinese, while “興” is in simplified Chinese. Such mixed use not only disrupts the overall harmony of the linguistic landscape but may also cause confusion in meaning. Besides the mixed use, there are also typographical errors due to missing strokes in the linguistic landscape of Wufu Town. For example, in the shop sign “Dahongpao Tea Leaf Eggs” (**Figure 13**), the character “冷” after “Lotus Seed Soup” is missing a stroke, resulting in a typographical error. The presence of typographical errors can reduce the quality and standardization of the text, affecting not only the reading experience but also potentially damaging the image and credibility of the author or organization, which should be taken seriously.

3.1.2. Grammatical errors in language and text

During the investigation of the linguistic landscape in Wufu Town, the author found grammatical errors in some of the language and text used in scenic area introductions and public signage. The “Law on the Standard Spoken and Written Chinese Language” establishes the legal status of Mandarin and standardized Chinese characters as the national common language, emphasizing the importance of their normalization and standardization. In the establishment of the linguistic landscape, relevant scenic areas should strictly comply with this law, ensuring that the language and text used are accurate and avoiding issues such as grammatical errors. For example, in the introduction to Zhu Zi’s life experience (**Figure 14**), the sentence “The following year, to fulfill his father’s last wish, he moved his family from Wufu to Jianyang Kaoting” is missing a subject. The author found during the research that some scenic area introductions contain a large number of sentences with multiple modifiers to provide more detailed information about the area’s cultural and historical context. However, such sentences can easily lead to the omission or obscuring of the subject due to excessive modifiers. An example of this can be found in the introduction to Banmu Fangtang (**Figure 15**), which states, “During this period, Neo-Confucianism ideas sparked inspiration and led to the writing of this famous piece that has lasted through the ages.”



Figure 11. Rules of Zhu Zi’s community



Figure 12. Longxing Bailian bungalow

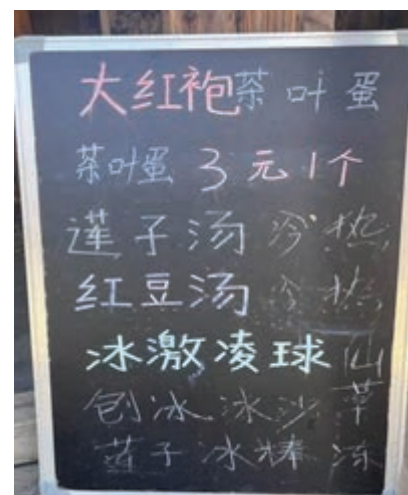


Figure 13. Signboard granary



Figure 14. Introduction to Zhu Zi's life experience

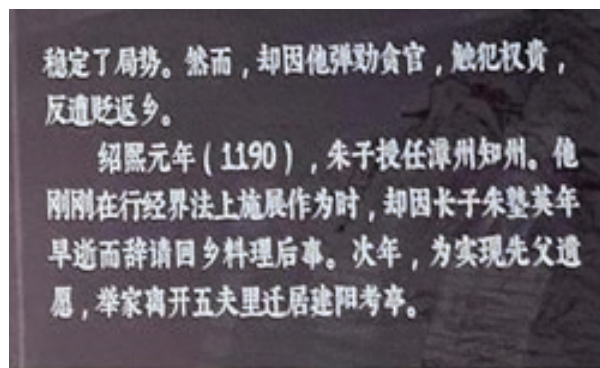


Figure 15. Introduction to Banmu Fangtang

3.1.3. Incorrect use of punctuation in language and text

In the investigation and study of the linguistic landscape in Wufu Town, the author found that errors in the use of language, characters, and punctuation can seriously affect the perfect performance of its original linguistic indicative function, and even cause grammatical errors. Such errors are common in various signs, advertisements, guides, etc. For example, in the preface introduction of the Wufu Intangible Cultural Heritage Memorial Hall on Xingxian Ancient Street, as shown in **Figure 16**, “The Zhu Xi family banquet, which integrates traditional culinary flavors with the innovative culture of Zhu Xi...” features a consecutive use of ellipsis and full stop. China released the “Punctuation Usage” on June 5, 2012, and implemented it on October 1, 2012. This standard stipulates the usage and principles of punctuation, aiming to standardize punctuation usage and enhance the expressive effect of language and characters. The regulation points out that generally, no punctuation should be used after an ellipsis because the ellipsis is already a type of punctuation, and adding a full stop would create redundancy. The incorrect use of punctuation reduces the indicative function of the linguistic landscape and may even create ambiguity, causing unnecessary misunderstandings and troubles.

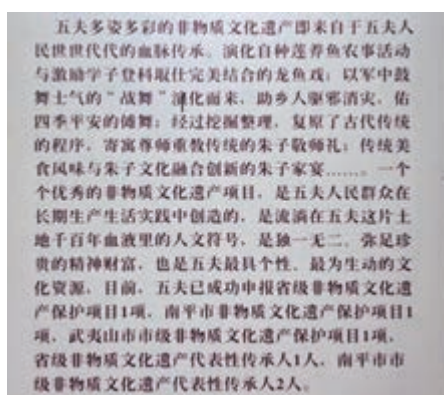


Figure 16. Preface

3.1.4. There are irregularities in the use of foreign languages

In today's era of globalization, the linguistic landscape, as an important manifestation of urban cultural diversity, has increasingly become a focus of attention from various sectors of society. With the increasing frequency of international exchanges, the use of foreign languages in various signs, advertisements, road signs, and other linguistic landscapes has become more common. For tourists seeking exotic atmospheres and culturally immersive

experiences, accurate and standardized translations are crucial factors that enhance tourism satisfaction. Incorrect translations not only mislead tourists, reducing their interest and understanding of attractions, but may also cause misunderstandings and dissatisfaction, thereby weakening the overall quality of the tourism experience.

During the investigation, it was found that the irregularities in the use of foreign languages in Wufu Town mainly manifest in the following ways: Firstly, spelling errors, such as the incorrect English translation of “禁止触摸” (Figure 17) as “NO YOUCHING” instead of “NO TOUCHING.” The second issue is the improper use of grammar, where deviations occur in the translation of some proprietary terms and formatting norms. For example, traditional Chinese units such as “chi” and “hu” should be retained as “chi” and “hu” with conversion annotations added, rather than being directly translated as “feet.” The third issue is the inconsistent quality of translations, where some direct translations are stiff and lack semantic coherence, while others deviate from the original context, leading to distorted information. For instance, in the introduction to Xingxian Academy (Figure 18), the term “letao”, which means exploring knowledge, is directly translated as “tell music stories”, which is not conducive to tourists’ understanding of local history, culture, and traditions.



Figure 17. No touching



Figure 18. Introduction to Xingxian Academy

3.1.5. Timely repair of damaged or obscured linguistic landscapes is not carried out

As an important component of the city’s cultural landscape, linguistic landscapes not only carry the function of information transmission but also deeply reflect the city’s maintenance and management level, as well as its attention to cultural details. However, in the investigation of Wufu Town’s linguistic landscapes, it was found that there is a phenomenon of untimely repair of damaged or obscured linguistic landscapes, including road signs, indication signs, advertising boards, etc. For example, most of the text on the wall introducing Bethune (Figure 19) has been worn away, making it difficult to see the original appearance; the functional annotations on the sign next to Wuxian Well (Figure 20) have also been worn away by weathering; and the poster for “Activities of Wufu Town Children’s Service Demonstration Site” (Figure 21) has been damaged and not timely repaired or replaced.

These damaged or obscured linguistic landscapes, like “scars” in the city, not only weaken the effective transmission of information, causing inconvenience to citizens and tourists, but also seriously affect the overall beauty and image of the city. Damaged road signs may make people lose their way, while obscured advertising boards may conceal important public service information. More importantly, this phenomenon reflects the lagging

issue of information content maintenance and updating in Wufu Town in terms of maintaining public facilities and protecting cultural heritage. Therefore, relevant departments in Wufu Town should attach great importance to damaged or obscured linguistic landscapes, establish a rapid response mechanism to ensure timely discovery and repair.



Figure 19. Introduction to Bethune



Figure 20. Wuxian Well



Figure 21. Activities of the children's service demonstration site in Wufu Town

3.2. Suggestions for optimizing the construction of the linguistic landscape in Wufu Town

3.2.1. Strengthening the construction of the local cultural linguistic landscape

The linguistic landscape exhibits its unique value in the process of transmitting knowledge. The signs and identifications in towns and public areas not only provide necessary information to the public but also carry the profound heritage of the region's culture and history^[6]. As a historic and cultural town, Wufu's linguistic landscape should rely on local culture, deeply explore the local cultural connotations, and fully utilize the function of the linguistic landscape in interpreting material culture and manifesting intangible culture. Firstly, cultural elements of the tourist village and local cultural policies should be carefully displayed in areas where tourists stop, forming a systematic cultural promotion that provides a positive cultural influence for tourists. For example, along Xingxian Ancient Street, there are banners with the phrase "Xingxian Ancient Street." Local historical celebrity quotes and cultural interpretations could be added to each banner, increasing the area of cultural promotion and allowing tourists to integrate into the regional civilization of Wufu Town through details, strengthening their sense of identity with Wufu's regional culture. Secondly, the regional characteristics of Wufu's linguistic landscape can be enriched by local production and lifestyle. For instance, the unique "top hat" on the top of local ancestral hall buildings vividly demonstrates the local admiration for achieving success in imperial examinations influenced by traditional culture; the natural resource of the "Ten Thousand Mu of Lotus Pond" can be used as a theme for linguistic landscape content; and intangible cultural heritages such as "Wufu Tan Dance" and "Dragon Fish Play" can serve as novel topics for tourism promotion. By deeply exploring the unique cultural resources of the local area and strengthening the construction of the local cultural linguistic landscape, the dissemination and influence of Wufu culture can be expanded through language, thereby promoting Wufu culture to the outside world.

3.2.2. Enhancing language and literary skills in the public domain

Everyone is a user, perceiver, and creator of the linguistic landscape^[7]. However, there are many issues with non-standard usage in the linguistic landscape of Wufu Town, primarily due to the generally low cultural literacy of the populace. Improving the cultural literacy of local residents and their understanding of standard language usage should be a top priority. In terms of education and publicity, it is important to advocate for the importance of standardized language usage. The government can regularly organize corresponding cultural leisure activities and

cultural skill training based on the cultural needs of different groups^[8]. Through mass media and daily language usage, people can develop the habit of using standardized language, effectively exerting their consciousness, autonomy, initiative, and creativity in cultural construction, and playing a supervisory role in regulating the linguistic landscape.

Chen Bo believes that the general weakening of rural public spaces is the biggest problem in cultural construction^[9]. As Wufu Town transitions from being a traditional township to being a tourist ancient town, apart from managing their private spaces, the public also needs to actively maintain public spaces. It is essential to raise public awareness and understanding of the linguistic landscape, making villagers aware of its important symbolic function, heritage value, and educational significance, thereby consciously maintaining the linguistic landscape ecology of Wufu Town. For damaged, blurry, outdated, or misplaced linguistic landscapes, government departments should strengthen supervision, regularly inspect the linguistic landscape, and promptly identify and correct issues.

3.2.3. Enhancing the serviceability of the linguistic landscape

The “Rural Revitalization Strategic Plan (2018–2022)” issued by the CPC Central Committee and the State Council states: “Combining the resource endowments of various regions, we will deeply explore the multiple functions and values of agriculture and rural areas, such as ecological conservation, leisure and tourism, cultural experience, and healthy aging”^[10]. As a historic and cultural town, Wufu Town has a high reputation, but due to its relatively remote geographical location away from the city, the traffic volume is not large, showing the characteristics of rural tourism. Therefore, the design of the tourism linguistic landscape should effectively serve rural production, life, and tourism development, providing precise services for local residents and tourists, and effectively promoting tourism activities.

Firstly, the town should focus on the content system to improve the quality of language landscape services. Considering the current situation and planning of Wufu Ancient Town, as well as industry development, location factors, and characteristics of the town, the targeted and practical aspects of the language landscape in Wufu still need improvement. The content distribution, carriers, and placement spaces of the language landscape also require optimization. For example, within Xingxian Ancient Street, there is a series of language landscapes called “Xingxian Ancient Street Check-in Route”, which can be extended to a “Wufu Town Check-in Route.” This targeted approach can help with the overall planning of tourist routes in Wufu Town, enhancing visitors’ travel experience. While the language landscape facilities in Wufu Town are relatively complete, covering national policies, advertisements, scenic area introductions, service and travel prompts, route signs, and landscape displays, the design can be diversified to stimulate “implicit interactions” between tourists and local residents, as well as between tourists and the countryside.

Secondly, officials should promote digital platforms to create efficient and convenient service methods. Digital platforms can provide tourists with convenient access to information about rural tourism projects, including attraction introductions, transportation guidance, accommodation information, and more. This enables tourists to have a more comprehensive understanding of relevant information when selecting rural tourism projects, allowing them to choose projects that better meet their needs and greatly enhancing tourist satisfaction. Additionally, digital platforms can offer more precise promotion and marketing channels for rural tourism projects, attracting more tourists to experience them and thereby increasing the popularity and influence of these projects. This injects new momentum into the rural revitalization industry^[11]. Most of the language landscapes in Wufu Town rely on

traditional physical media and have a low level of digitization. Building a digital platform can inject new vitality into the development of Wufu Town, expand the industry chain, and drive economic development in the region.

4. Conclusion

As rural revitalization continues to be vigorously promoted, the high-quality development of rural tourism in Wufu Town urgently needs to rely on core consumption scenarios such as food, accommodation, transportation, and entertainment to build a new ecosystem of cultural tourism services.

Through field investigations, this survey conducted quantitative and qualitative analyses of the linguistic landscape in Wufu Town. It identified issues such as the standardization of language use, the restoration of linguistic landscapes, and the insufficiency of language codes. Corresponding suggestions were provided for the construction of the linguistic landscape, aiming to promote the modernization of the local linguistic landscape and enable high-quality development of the cultural tourism industry.

This survey only covered the linguistic landscape of place symbols and did not delve into the oral communication of residents. Based on the development trends of sociolinguistics, future explorations can examine the connections and influences between oral language, dialects, and the linguistic landscape. By promoting the quality upgrade of the local linguistic landscape, people can foster the protection and inheritance of dialect culture, creating a multidimensional and comprehensive cultural tourism experience.

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The Role of Error Management in Improving Service Level and Blood Quality in Blood Collection and Supply at Blood Stations

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Abstract: *Objective:* To evaluate the effectiveness of error management in the management of blood collection and supply at blood stations. *Methods:* 35 blood donors and 18 staff members who participated in blood collection and supply at the blood station from January 2021 to January 2022 were selected as the control group and received routine management. 35 blood donors and the same staff members who participated in blood collection and supply from February 2022 to February 2023 were selected as the observation group and received error management. The management effects were compared between the two groups. *Results:* The service level scores of the staff in the observation group were higher than those in the control group ($P < 0.05$). The blood quality (unqualified rate of blood tests) of the blood donors in the observation group was lower than that in the control group, the blood scrap rate was lower than that in the control group, the incidence of error events was lower than that in the control group, and the management satisfaction was higher than that in the control group ($P < 0.05$). *Conclusion:* Error management can improve the service level of blood station staff, enhance blood quality, reduce blood scrap situations and error events, and achieve high management satisfaction.

Keywords: Error management; Blood collection and supply at blood stations; Service level; Blood quality

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1. Introduction

The work function of blood stations is blood collection and supply, which can meet the development needs of transfusion medicine. Blood is a special medical resource, mostly obtained through voluntary blood donation. However, at this stage, there is an imbalance between blood supply and demand in China, so the service pressure of blood stations is relatively high^[1]. In addition, the blood collection and supply process in blood stations is complex, and medical disputes may arise due to errors, which can even affect the health of blood donors. Error management is a newer management model that aims to reduce the probability of errors, optimize work processes, continuously monitor key points of management quality, and thereby improve blood quality^[2].

Under this premise, this study selected 70 blood donors and 18 staff members to evaluate the implementation effect of error management.

2. Materials and methods

2.1. General information

The study was conducted from January 2021 to February 2023, involving 70 blood donors and 18 blood station staff members. Among the 35 blood donors in the control group, there were 19 males and 16 females, aged from 21 to 47 years, with a mean age of 32.15 ± 2.41 years. Among the 35 blood donors in the observation group, there were 18 males and 17 females, aged from 22 to 48 years, with a mean age of 32.31 ± 2.48 years. Comparison of data between groups showed no significant difference ($P > 0.05$). Among the same batch of staff members, there were 3 males and 12 females, aged from 22 to 41 years, with a mean age of 30.26 ± 2.47 years, and a work experience ranging from 2 to 18 years, with a mean of 10.26 ± 1.34 years.

2.2. Methods

The control group implemented routine management, following standardized procedures for blood collection and supply, preparing corresponding equipment or instruments, providing targeted guidance to blood donors, screening for high-risk factors of blood donation, and conducting predictive management.

The observation group implemented error management: (1) Collecting error information: Organize the incidence of error events in the blood station over the years, summarize the error links, including verification and initial screening before blood collection, operational errors during blood collection, and other aspects. Summarize unqualified test results, such as inaccurate blood samples and inaccurate blood type screening, and analyze common reasons for disqualification. (2) Staff management: Clearly divide the responsibilities of the staff in the blood station, enumerate their responsibilities, authorities, and service scope, regularly assess the management quality of blood collection and supply links, and improve staff self-correction awareness through reward and punishment mechanisms, performance-related pay, and other ways. Organize a weekly employee meeting to explain blood collection and supply management knowledge, update staff knowledge reserves, and conduct skill training, such as blood collection operations, adverse reaction monitoring, and error event control, to gradually cultivate innovative thinking among staff and enhance their sense of responsibility. (3) Optimizing work processes: Standardize key operation points such as blood donor physical examinations, blood testing, and blood sample preservation, and propose quality standards. Standardize the writing content of infectious disease reports, disinfection operations, instrument quality control, and other aspects. Register errors in blood collection and supply, as well as work schedules, regularly organize registration forms, and dynamically draw control charts for error events. (4) Blood donation care: (1) Environmental management: Post promotional posters in the rest area, place water dispensers, and arrange potted plants or flowers to create a relaxing environment. Manage the blood collection room by zones, arrange corresponding materials in an orderly manner, clean indoor items regularly every day, and use UV disinfection lamps. Staff should have a kind attitude, dress appropriately, and actively communicate with blood donors to improve their sense of tension. (2) Knowledge education: Provide educational videos and brochures to blood donors, explaining the blood donation process, cooperation points, and precautions, so that blood donors can understand relevant knowledge. Guide blood donors to ask questions and answer them one-on-one to eliminate their cognitive blind spots. (3) Nursing during blood collection:

Check the blood donor's age, name, blood type, and other information, review the results of their initial screening and physical examination, and ensure that they meet the indications for blood donation. Before blood collection, open the disposable blood collection bag in front of the blood donor, check for any abnormalities such as omissions in the transfer bag, and adjust the relevant parameters of the blood collection equipment. Patiently explain the cooperation method during blood collection, improve the one-time puncture rate, and reduce the pain of blood collection for blood donors. Observe changes in the blood donor's complexion during the process, and provide symptomatic treatment if they experience palpitations or dizziness. (4) Post-donation care: Explain the precautions that need to be taken after blood donation, such as the pressing method and time for disposable band-aids, exercise precautions, diet and sleep precautions, etc. Give verbal affirmation to blood donors or distribute souvenirs.

2.3. Observation indicators

(1) Service level: Examination questions were issued to the staff, including theoretical knowledge, blood station quality management, and operational skills. Each item was scored out of 100 points, with positive scoring. (2) Blood quality: The failure rate of blood tests was recorded. Alanine aminotransferase (ALT) was determined by the Reitman-Frankel method. Syphilis, hepatitis C virus (HCV) antibodies, human immunodeficiency virus (HIV) antibodies, and hepatitis B surface antigen (HBsAg) were determined by enzyme-linked immunosorbent assay (ELISA). The evaluation of the failure rate was based on the "Quality Requirements for Whole Blood and Blood Components". (3) Blood scrap rate: Scrap due to blood clots, transportation scrap, and centrifugal bag breakage was recorded as physical scrap; scrap due to inspection factors was recorded as inspection scrap. (4) Error events: The incidence of events such as thawing and bag breakage, fatty blood, verification errors, blood leakage, sample retention errors, service complaints, labeling errors, accidental injuries, and initial blood type screening errors was recorded. (5) Management satisfaction: A self-made questionnaire was issued to blood donors, including workflow, blood donation care, service attitude, etc. The total score was 100 points. Very satisfied was defined as a score above 80, basically satisfied was between 45 and 80 points, and unsatisfied was below 45 points.

2.4. Statistical analysis

The data was processed using SPSS 28.0 software. Measurement values were compared/tested using t-values, and count values were compared/tested using chi-square values. Statistical significance was defined as a *P*-value less than 0.05.

3. Results

3.1. Comparison of service levels between the two groups of staff

The service level scores of the observation group staff were higher than those of the reference group ($P < 0.05$).

Table 1. Comparison of service levels between the two groups of staff [Mean \pm SD/points]

Group	n	Theoretical knowledge	Blood center quality management	Operational skills
Observation group	18	92.56 \pm 3.84	93.55 \pm 3.78	94.75 \pm 3.05
Reference group	18	87.18 \pm 3.75	89.14 \pm 3.70	90.17 \pm 3.02
<i>t</i> -value	-	4.253	3.537	4.527
<i>P</i> -value	-	0.000	0.001	0.000

3.2. Comparison of blood quality between the two groups of blood donors

The unqualified rate of blood tests in the observation group was lower than that in the reference group ($P < 0.05$).

Table 2. Comparison of blood quality between the two groups of blood donors [n/%]

Group	n	ALT Abnormal	Syphilis Abnormal	HCV Antibody Abnormal	HIV Antibody Abnormal	HBsAg Abnormal
Observation	35	1 (2.86)	0	0	0	1 (2.86)
Reference	35	6 (17.14)	4 (11.43)	4 (11.43)	4 (11.43)	6 (17.14)
χ^2 value	-	3.968	4.242	4.242	4.242	3.968
<i>P</i> -value	-	0.046	0.039	0.039	0.039	0.046

3.3. Comparison of blood discard rate between the two groups of blood donors

The blood discard rate in the observation group was lower than that in the reference group ($P < 0.05$).

Table 3. Comparison of blood discard rate between the two groups of blood donors [n/%]

Group	n	Physical discard			Testing discard	Total discard rate
		Clotted blood	Transport damage	Centrifugation damage		
Observation	35	1 (2.86)	0	0	1 (2.86)	5.71 (2/35)
Reference	35	2 (5.71)	1 (2.86)	2 (5.71)	3 (8.57)	22.86 (8/35)
χ^2 value						4.200
<i>P</i> -value						0.040

3.4. Comparison of the incidence of error events between the two groups of blood donors

The incidence of error events in the observation group was lower than that in the reference group ($P < 0.05$).

Table 4. Comparison of the incidence of error events between the two groups of blood donors [n/%]

Group	n	Thawing Bag Breakage	Lipemic Blood	Verification Error	Blood Leakage	Sampling Error	Service Complaint	Labeling Error	Accidental Injury	Blood Type Screening Error	Incidence Rate
Observation	35	1 (2.86)	1 (2.86)	0	1 (2.86)	0	0	0	0	0	8.57 (3/35)
Reference	35	2 (5.71)	2 (5.71)	1 (2.86)	0	1 (2.86)	1 (2.86)	1 (2.86)	1 (2.86)	1 (2.86)	28.57 (10/35)
χ^2 value											4.629
<i>P</i> -value											0.031

3.5. Comparison of management satisfaction between the two groups of blood donors

Management satisfaction in the observation group was higher than that in the reference group ($P < 0.05$).

Table 5. Comparison of management satisfaction between the two groups of blood donors [n/%]

Group	n	Very satisfied	Satisfied	Dissatisfied	Satisfaction rate
Observation	35	20 (57.14)	14 (40.00)	1 (2.86)	97.14 (34/35)
Reference	35	15 (42.86)	13 (37.14)	7 (20.00)	80.00 (28/35)
χ^2 value					5.081
P -value					0.024

4. Discussion

Blood collection and supply in blood stations are important channels for blood sources in major hospitals. Quality control of blood collection and supply can ensure blood quality and improve the efficiency of blood stations. However, during the collection, testing, and preservation of blood, errors can easily occur, which may even lead to medical disputes ^[3]. Therefore, it is necessary to implement nursing management during blood collection and supply in blood stations.

The service level of each link in blood collection and supply is a common indicator to evaluate the management quality of blood stations, while blood quality is one of the indicators to evaluate the work accuracy of blood stations. Previous studies have found that the low service level of blood station staff is a common cause of error events, which can significantly reduce blood quality ^[4]. Therefore, it is crucial to efficiently control the quality of each link in blood collection and supply at blood stations, which can improve the safety and effectiveness of blood collection and supply ^[5]. Error management is a relatively new management approach, and its management purpose is to reduce error events and eliminate the hidden dangers of errors, with strong scientificity, standardization, and rigor. In the error management measures for blood collection and supply at blood stations, screening and analyzing error information, sorting out the causes of errors, and drawing up rectification plans are the keys to successful management ^[6]. The essential reason for error events is that the current blood collection and supply quality management system has defects, which are prone to unplanned events due to factors such as human operation errors and improper equipment use. Therefore, the focus of error management is to optimize the blood collection and supply work process of staff, implement position management, strengthen skill training, ensure that staff clearly grasp the nursing management plan, skillfully carry out blood collection and supply operations, and fully stimulate their autonomy, so that they can efficiently complete blood collection and supply tasks ^[7].

The results showed that the service level scores of the observation group staff were higher than those of the reference group, the blood quality (blood test failure rate) of the blood donors in the observation group was lower than that of the reference group, the blood scrap rate was lower than that of the reference group, the incidence of error events was lower than that of the reference group, and the management satisfaction was higher than that of the reference group ($P < 0.05$). The reason is that the workflow of error management is more standardized and normalized, and the management procedures are more flexible. It can improve the management efficiency of each link in the blood station through various forms such as responsibility division, skill training, and blood collection and supply registration, dynamically analyze the management problems of

blood collection and supply in the blood station, and continuously improve management measures^[8]. Collecting error information can provide a comprehensive understanding of common types of error events and analyze their causes, ensuring the operability and timeliness of management plans. The collection of error information needs to be dynamic, regularly gathering common error events from blood stations, or organizing error event registration forms to record new types of error events, causes of errors, relevant responsible persons, and other information for staff to refer to at any time. This allows staff to grasp the occurrence trends and common causes of error events and to timely revise error management measures to ensure their effectiveness. Cultivating staff's self-correction awareness and implementing reward and punishment mechanisms can continuously screen staff with limited work capabilities and a weak sense of responsibility. Utilizing training and assessment formats can improve staff's professional level, stimulate their work enthusiasm, significantly enhance service levels, and maximize blood quality^[9]. In staff management, continuing education is highly valued, requiring a weekly employee meeting focused on knowledge dissemination and education. This enables staff to receive skills training, continuously optimizing their adverse reaction monitoring abilities and error event control capabilities. More importantly, continuing education can enhance staff's innovation abilities, making them dare to question current error management plans and propose effective corrective measures. Workflow optimization can refine quality standards, clarifying various aspects such as physical examination, blood testing, and quality control for staff, and recording work schedules in detail to visually reflect the effectiveness of current error management. Additionally, orderly nursing during blood donation can improve blood donors' cooperation during blood collection, flexibly carrying out nursing management according to the situation on site. This allows for controlled management quality in various aspects of blood collection and supply, reducing blood waste and actively preventing error events. Based on the above nursing management plan, the blood collection and supply process for blood donors becomes safer and more humane, alleviating their fear or anxiety and improving their satisfaction with error management. However, in practical operations, it is necessary to continuously identify potential risk factors for error events, maintain vigilance, and actively improve the error management system to continuously optimize management quality.

5. Conclusion

In summary, error management can reduce the incidence of errors in blood collection and supply at blood stations, improve the service level of staff, ensure blood quality, and achieve high management satisfaction.

Disclosure statement

The authors declare no conflict of interest.

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Analysis of Ice and Snow Tourism Activities in Jilin Province: Applying the Theory of Planned Behavior

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Abstract: Under the dual national strategies of “300 Million People Participating in Winter Sports” and Jilin Province’s development as a “Winter Sports Economy Powerhouse”, ice and snow tourism has become a core driver for regional economic transformation and winter consumption market activation. However, existing research inadequately explores the driving mechanisms of ice and snow tourism behaviors in small and medium-sized cities and specific regions, particularly lacking systematic empirical analysis based on the Theory of Planned Behavior (TPB). This study focuses on potential ice and snow tourists in Jilin Province, integrating TPB core dimensions with tourism scenario characteristics to construct a theoretical framework of “attitude-subjective norms-perceived behavioral control-tourism intention.” Through questionnaire surveys collecting 623 valid samples, the study conducted validity/consistency testing, correlation analysis, and structural equation modeling using SPSS 29.0 and AMOS 23.0. The findings reveal that attitude ($\beta=0.327$, $P < 0.001$), subjective norms ($\beta=0.285$, $P < 0.001$), and perceived behavioral control ($\beta=0.251$, $P < 0.001$) all significantly positively influence tourism intention, with attitude exerting the strongest effect. At the factor level, perceived tourism value ($\beta=0.612$, $P < 0.001$), influence of social reference groups ($\beta=0.587$, $P < 0.001$), and transportation/time convenience ($\beta=0.563$, $P < 0.001$) are key drivers across dimensions. These results provide theoretical foundations and practical references for optimizing ice and snow tourism product supply and developing targeted marketing strategies in Jilin Province.

Keywords: Theory of Planned Behavior; Jilin ice and snow tourism; Behavioral intention; Ice and snow economy

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1. Introduction

Under the backdrop of global climate warming, the scarcity and uniqueness of ice and snow resources have become increasingly prominent, making ice and snow tourism an important sub-sector of the low-carbon economy and ecotourism^[1]. The Chinese government has successively issued policies such as the “Opinions on Vigorously Developing Ice and Snow Sports in Conjunction with the 2022 Beijing Winter Olympics” and the “Ice and Snow

Tourism Development Action Plan (2021–2023)”, promoting the transformation of ice and snow tourism from “niche experiences” to “mass consumption.” As one of the provinces with the richest ice and snow resources in China, Jilin Province boasts world-class ice and snow IPs such as Changbai Mountain, Changchun Ice and Snow World, and Jilin Rime. During the 2023–2024 ice and snow season, it received over 120 million tourist visits and generated tourism revenue exceeding 80 billion yuan, making the ice and snow economy a strategic pillar industry for the province.

However, Jilin Province’s ice and snow tourism development continues to face a “supply-demand mismatch” issue: On one hand, some scenic areas suffer from severe product homogenization and insufficient exploration of cultural depth; on the other hand, potential tourists’ risk awareness and cost concerns about winter tourism hinder their travel decisions. Existing research predominantly focuses on large cities or popular tourist destinations (such as Harbin and Zhangjiakou), with limited studies examining ice and snow tourism behaviors in medium and small cities that serve as core radiation zones in Jilin Province. Moreover, there is a lack of systematic analysis of psychological factors such as “attitude-subjective norms-perceived behavioral control.”

2. Theoretical framework

2.1. Theoretical review

2.1.1. Review of the TPB literature

The Theory of Planned Behavior (TPB) proposed by Ajzen posits that individual behavioral intention is shaped by three interrelated factors: attitude, subjective norm, and perceived behavioral control. This theory has been extensively applied in tourism behavior research.

The Theory of Planned Behavior has been extensively applied and studied. In the tourism field, it proves effective in researching low-carbon tourism, rural tourism, winter sports tourism, and destination selection, significantly enhancing the explanatory and predictive power of tourist behavior. Lorenza López Moreno found through TPB research that tourists’ attitudes toward ecotourism, participation behaviors of surrounding groups, and transportation accessibility all positively influence travel intention ^[2]. Setiawan et al. investigated how tourism behavior affects willingness to consume low-carbon tourism services, arguing that yacht tourism consumption is typically a rational choice made after careful consideration and meticulous planning, thus validating the applicability of the Theory of Planned Behavior for predicting and testing yacht tourism consumption behavior ^[3]. Rujiu et al. analyzed factors influencing yacht tourism consumption intentions by introducing demographic characteristics and yacht culture as two new variables, conducting empirical analysis on the three foundational variables of TPB, and examining their mechanisms ^[4]. Hoeksma et al. utilized an extended TPB model, establishing structural equations through case studies and investigating tourists’ willingness to pay for ecological compensation based on theoretical frameworks ^[5]. Wismantoro et al. developed an expanded TPB model incorporating ethical norms and environmental concern variables to study ecotourism behavior intentions at Zhongshan Scenic Area (National Forest Park), Nanjing ^[6]. Xingjun et al. found in the study of green travel of urban residents that attitude affects travel intention through “environmental awareness”, the effect of “policy support” and “social group influence” in subjective norms is significant, and perceived behavioral control is restricted by “transportation facility convenience” ^[7].

2.1.2. Review of the ice and snow tourism behavior literature

Scholarly research on ice and snow tourism behavior primarily focuses on three dimensions: First, the resource

and product dimension, such as how the scarcity of ice resources and product innovation influence tourist choices; Second, the marketing and communication dimension, where Mahon found that the “video content credibility” and “brand credibility” on social media platforms can indirectly enhance purchase intention by influencing consumer attitudes—a conclusion applicable to ice and snow tourism marketing (e.g., Douyin’s “Jilin Ice and Snow” challenge) ^[8]; Third, the psychological and cognitive dimension, where Przymuszaa et al. proposed the “perceived behavioral control-device fit” mechanism explaining why tourists abandon ice tourism due to “insufficient skiing skills” or “incompatible scenic facilities” ^[9]. Research on Jilin Province predominantly focuses on resource development and industrial planning, such as analyzing brand building for Changbai Mountain ice tourism and developing models for Jilin’s rime ice tourism, but lacks empirical analysis of tourist psychological factors, particularly addressing the core question: “Which psychological factors drive tourists to choose Jilin over other ice and snow destinations?”

2.2. Theoretical framework

This study is grounded in the Theory of Planned Behavior, using attitudes, subjective norms, and perceived behavioral control as independent variables to examine ice-snow tourism intention.

Attitudes refer to tourists’ overall evaluation of participating in Jilin Province’s ice-snow tourism, comprising two sub-factors: Value Perception of Ice-Snow Tourism and Risk Awareness of Ice-Snow Tourism. Subjective Norms represent external group influences perceived by tourists, including Social Reference Group Influence and Policy Guidance. Perceived Behavioral Control assesses tourists’ confidence in completing ice-snow tourism activities, encompassing three sub-factors: Transportation and Time Convenience, Economic Cost Controllability, and Social Environment. Ice-snow Tourism Intention indicates tourists’ willingness to participate in future ice-snow tourism in Jilin Province.

Based on these definitions, the study constructed a theoretical model of factors influencing ice-snow tourism behavior in Jilin Province. In this model, attitudes (ATT), subjective norms (SN), and perceived behavioral control (PBC) are exogenous latent variables with their sub-factors as observed variables; ice-snow tourism intention (BI) is an endogenous latent variable with its items as observed variables. The model hypothesizes that attitudes, subjective norms, and PBC directly influence ice-snow tourism intention, while sub-factors indirectly affect intention through their effects on latent variables.

2.3. Research hypotheses

2.3.1. The influence of attitude on ice and snow tourism behavioral intention

Attitude constitutes an individual’s comprehensive evaluation of behavior, where positive attitudes enhance behavioral intention. In ice and snow tourism scenarios, “value perception” reflects tourists’ judgment that “benefits outweigh disadvantages” regarding Jilin Province’s ice and snow tourism — If tourists perceive unique entertainment and cultural value from ice and snow tourism, their travel intention will significantly increase ^[10], whereas “risk perception” indicates concerns about potential drawbacks — Cold health risks and skiing safety hazards may reduce travel intention ^[11]. Based on this, the hypotheses are proposed:

H1: Tourists’ positive attitude toward Jilin Province’s ice and snow tourism positively influences behavioral intention.

H1a: Value perception positively affects behavioral intention in ice and snow tourism.

H1b: Risk perception negatively impacts behavioral intention in ice and snow tourism.

2.3.2. The influence of subjective norms on ice and snow tourism behavioral intention

Subjective norms influence behavioral intention through “social pressure” and “information transmission.” Regarding “Social Reference Group Influence”, recommendations and positive experiences from family and friends can reduce tourists’ decision uncertainty and enhance their travel willingness. For “Policy and Public Opinion Guidance”, Jilin Province’s “Ice and Snow Tourism Season” policies (including scenic area subsidies and transportation discounts) combined with social media promotion (e.g., the “Jilin Ice and Snow” topic on Douyin) strengthen tourists’ trust in the destination, indirectly boosting behavioral intention ^[12]. Based on this, the authors propose:

H2: Tourists’ perceived subjective norms positively influence their ice and snow tourism behavioral intention.

H2a: Social reference group influence positively impacts ice and snow tourism behavioral intention.

H2b: Policy guidance positively influences ice and snow tourism behavioral intention.

2.3.3. Perceived behavioral control’s impact on ice and snow tourism behavioral intention

Perceived behavioral control reflects an individual’s judgment of behavioral difficulty; stronger control perception leads to stronger behavioral intention. Regarding “Transportation and Time Convenience”, most ice-snow destinations in Jilin Province are located in medium and small cities, where accessibility is a key factor influencing tourists’ decisions — Adequate high-speed rail services and convenient shuttle buses to scenic areas can significantly boost travel willingness ^[13]. For “Economic Affordability”, the high costs associated with ice-snow tourism — such as ski equipment rentals and luxury accommodations — constitute major barriers. When expenses align with tourists’ budgets, travel intentions increase substantially ^[11]. In terms of “Snow Skills and Facility Adaptability”, beginners often abandon trips due to insufficient skiing skills or a lack of suitable facilities at resorts. Providing instructor guidance and beginner slopes enhances tourists’ sense of control ^[14]. Based on these findings, the hypotheses are proposed:

H3: Perceived behavioral control positively influences ice-snow tourism intention.

H3a: Transportation and time convenience positively influence ice-snow tourism intention.

H3b: Economic affordability positively influences ice-snow tourism intention.

H3c: Social environment positively influences ice-snow tourism intention.

3. Research methodology

The study utilized a Likert 5-point scale to develop questionnaires distributed through the Questionnaire Star platform and physical tourist attractions to collect potential visitor data. SPSS 29.0 was employed for reliability/validity testing and correlation analysis, while AMOS 23.0 was used to construct structural equation models for hypothesis verification and model fit evaluation.

3.1. Questionnaire design

The questionnaire design takes the planned behavior theory (TPB) as the core framework, and adjusts the items according to the characteristics of ice and snow tourism scenarios in Jilin Province, and finally forms a structured questionnaire containing five parts:

All items used the Likert 5-point scale (1=strongly disagree, 5=strongly agree). After completing the initial draft, three tourism management scholars and two practitioners from Jilin’s ice-snow attractions participated in content validity evaluations. Issues such as “ambiguous phrasing” (e.g., clarifying “ice-snow activities” as “skiing,

ice fishing”) and “item redundancy” (removing one item highly overlapping with “transport convenience”) were addressed through revisions. Subsequently, 50 questionnaires were pre-distributed through the “Wenjuanxing” platform. Analysis using SPSS 29.0 revealed an overall Cronbach’s α coefficient of 0.918, with all dimensions exceeding 0.8. The KMO value reached 0.887, and the Bartlett’s test of sphericity showed $P < 0.001$, indicating good reliability and validity. This confirms the questionnaire’s suitability as a formal research tool.

3.2. Data collection

The data collection methodology combines online and offline approaches, balancing sample representativeness with seasonal characteristics of Jilin’s ice-snow tourism. The survey period spans from December 1, 2024, to February 28, 2025 (Jilin’s peak ice-snow tourism season), ensuring respondents are in their “decision-making active phase” for winter tourism, thereby enhancing data timeliness. Online surveys were distributed through the Wenjuanxing platform to potential tourists in neighboring provinces, including Jilin, Liaoning, Heilongjiang, and Inner Mongolia. Offline surveys were conducted at airports, high-speed rail stations, and ice-snow attractions in Changchun and Jilin cities, with on-site guidance provided to minimize inefficiency.

The sample was screened to exclude questionnaires with completion times under 3 minutes, items showing patterned responses (e.g., all selecting “3=Normal”), and those lacking exposure to ice-snow tourism information. A total of 623 valid questionnaires were collected, achieving an 87.5% response rate. This met the “sample size $\geq 5:1$ item count” criterion proposed by Jonckere and Rosseel for SEM analysis (the questionnaire contains 33 scale items, satisfying the requirement).

3.3. Data analysis methods

The reliability test adopts Cronbach’s α coefficient (the standard of “ $\alpha > 0.8$ is high reliability”); the validity test verifies the structural validity of the scale through the KMO test, Bartlett’s sphericity test (the standard of “KMO > 0.8 is suitable for factor analysis”), and confirmatory factor analysis (CFA).

Correlation analysis was used to analyze the correlation between variables with the Pearson correlation coefficient, and the logic that “significant correlation ($P < 0.05$) is the premise of model construction” laid a foundation for subsequent SEM analysis.

Structural equation model (SEM). The model was constructed with AMOS23.0, and the fitting criteria ($\chi^2/\text{df} < 3$, RMSEA < 0.08 , CFI > 0.9) were used to test the significance of path hypotheses and analyze the direct effects between variables.

4. Analysis and results

4.1. Credibility and validity testing

The overall reliability of the questionnaire was 0.937, indicating stable and reliable measurement results. The KMO (Kurtosis of Moments) reached 0.912, with Bartlett’s test of sphericity $\chi^2=4826.357$ ($P < 0.001$), confirming data suitability for factor analysis. Key metrics showed $\chi^2/\text{df}=2.137$ (< 3), RMSEA=0.062 (< 0.08), CFI=0.958 (> 0.9), and TLI=0.949 (> 0.9), demonstrating excellent structural validity as the scale structure closely aligns with the theoretical framework.

4.2. Correlation analysis

Attitude and Behavioral Intention ($r=0.624$, $P < 0.001$), Subjective Norms and Behavioral Intention ($r=0.587$,

$P < 0.001$), and Perceived Behavioral Control and Behavioral Intention ($r=0.546$, $P < 0.001$). This provides preliminary support for Hypotheses H1, H2, and H3.

Attitude and Subjective Norms ($r=0.485$, $P < 0.001$), Attitude and Perceived Behavioral Control ($r=0.452$, $P < 0.001$), and Subjective Norms and Perceived Behavioral Control ($r=0.417$, $P < 0.001$). These findings align with the “three-variable interconnection” hypothesis in TPB theory, with no multicollinearity issues ($VIF < 5$).

4.3. Structural equation modeling results

4.3.1. Model fit

The overall model fit results of this study are shown in **Table 1**, where all indicators meet the “good fit” standard. This indicates that the Jilin Province Ice and Snow Tourism Behavior Influencing Factors Model, constructed based on the Theory of Planned Behavior, closely aligns with actual data, enabling further path analysis.

Table 1. Structural equation modeling fit indicators

Type of fitting indicator	Specific indicators	Finding	Applicability judgement
Absolute fitting index	χ^2/df	2.089	Fine
	RMSEA	0.059	Fine
Value-added fit indicators	CFI	0.962	Excellent
	IFI	0.958	Excellent
Simplified fitting index	PNFI	0.683	Fine
	PGFI	0.657	Fine

4.3.2. Path coefficients and hypothesis testing

The path coefficient was calculated by the maximum likelihood estimation method through AMOS 23.0, and all the research hypotheses were supported.

Core Dimensions Direct Influence on Ice and Snow Tourism Behavioral Intention. Attitude ($\beta=0.327$, $P < 0.001$), subjective norm ($\beta=0.285$, $P < 0.001$), and perceived behavioral control ($\beta=0.251$, $P < 0.001$) all exerted significant positive effects on behavioral intention, with attitude having the strongest impact. This aligns with the conclusion from Vincent that “attitude is the core driver of green travel behavioral intention”, and also corroborates Vermeir et al.’s emphasis on “the dominant role of consumer attitudes in behavioral intention” — n ice and snow tourism scenarios, tourists’ overall evaluation (attitude) of destinations directly determines whether they include Jilin Province in their travel plans ^[15–16].

Attitude Sub-factors Influence Ice and Snow Tourism. Value Perception ($\beta=0.612$, $P < 0.001$) positively influenced attitude, while ice and snow tourism risk perception ($\beta=-0.356$, $P < 0.001$) negatively impacted it. This result echoes East et al.’s decomposition logic of “attitude = positive cognition + negative cognition” ^[10]. Tourists’ perception of unique values like rime landscapes and Manchu ethnic customs (positive cognition) strengthens positive attitudes, while concerns about low temperatures and skiing safety (negative cognition) weaken them, ultimately jointly influencing behavioral intention.

The impact of subjective norm sub-factors. Social reference groups ($\beta=0.587$, $P < 0.001$) and policy/opinion guidance ($\beta=0.413$, $P < 0.001$) both positively influence subjective norms, with social reference groups exerting stronger effects. This aligns closely with Djukic and Stankovic’s conclusion that “reference group evaluations

significantly outperform platform dissemination in shaping consumer attitudes”^[17]. Recommendations from family and friends, along with shared travel experiences, demonstrate greater effectiveness than government policy promotion in reducing tourists’ decision uncertainty and enhancing participation willingness.

The impact of behavioral control sub-factors. Transportation and time convenience ($\beta=0.563$, $P < 0.001$), cost controllability ($\beta=0.432$, $P < 0.001$), and snow sports skill-facility compatibility ($\beta=0.408$, $P < 0.001$) all positively influence behavioral control. Transportation convenience shows the strongest effect, consistent with Klinger and Lanzendorf’s finding that “commuter behavior in small and medium-sized cities is most significantly constrained by transportation accessibility”^[18]. As Jilin Province’s ice-snow destinations are predominantly located in medium-sized cities like Tonghua and Baishan, transportation infrastructure, such as high-speed rail services and scenic area shuttle buses, directly determines tourist accessibility.

5. Research conclusions

5.1. Conclusions

The Theory of Planned Behavior demonstrates strong applicability to ice-snow tourism behaviors in Jilin Province, with attitudes, subjective norms, and perceived behavioral control collectively explaining 68.3% of variations in travel intention ($R^2=0.683$). This validates TPB’s cross-scenario explanatory power in seasonal, experience-intensive ice-snow tourism contexts.

The core driver of attitude formation stems from the “value-risk” balance: perceived value of ice-snow tourism serves as the primary positive factor ($\beta=0.612$), while risk perception acts as the dominant negative factor ($\beta=-0.356$). This indicates that tourist attitudes toward Jilin’s ice-snow tourism fundamentally reflect a balance between “unique experiential value” and “potential risks.” Positive attitudes and travel intentions emerge only when perceived value outweighs perceived risk, aligning with Qing et al.’s conclusion that “attitudes are shaped by both positive and negative cognitive factors”^[14].

In subjective norms, the “social reference group” effect dominates. The influence of social reference groups ($\beta=0.587$) on subjective norms significantly surpasses that of policy guidance and public opinion ($\beta=0.413$), suggesting that recommendations from family and friends carry more weight in tourist decision-making than government policies like the “Ice-Snow Tourism Season” initiative or social media promotions. This finding aligns closely with Vincent et al.’s conclusion that “reference group evaluation is the core influencing factor of consumer attitudes”^[15]. In the information-overloaded winter tourism market, travelers place greater trust in “authentic experiences” from acquaintances rather than official or platform “one-way communication.”

Perceived behavioral control is most significantly influenced by “transport convenience”: transportation and time accessibility ($\beta=0.563$) are the strongest drivers, followed by cost controllability ($\beta=0.432$) and snow sports skill adaptability ($\beta=0.408$). This aligns with Dzicelski et al.’s finding that “commuter behavior in small and medium-sized cities is most affected by transportation accessibility”^[19]. Most winter destinations in Jilin Province are located in smaller cities, where issues like insufficient high-speed rail services and inadequate shuttle buses directly reduce tourists’ sense of control over “smooth participation”, thereby suppressing behavioral intentions.

5.2. Research limitations

5.2.1. Sample representativeness limitation

The sample primarily comes from neighboring provinces like Jilin, Liaoning, and Heilongjiang (78.3%), lacking nationwide representation, which may limit the conclusions’ generalizability to southern tourist groups.

5.2.2. Variable configuration limitation

The study did not account for moderating variables such as “winter tourism habits” and “destination loyalty.” If tourists have annual participation habits, risk perception’s negative impact might weaken. Future research should incorporate these moderating variables to refine the model.

5.2.3. The limitation of data timeliness

The survey time is the 2024–2025 ice and snow season, which does not cover the “off-season” data, so it is impossible to analyze the influence of seasonal changes on behavioral intention. However, ice and snow tourism has strong seasonality, so cross-seasonal tracking research should be carried out in the future.

5.3. Future prospects

5.3.1. Expand research samples and scenarios

Extend the study to southern provinces (e.g., Guangdong, Zhejiang) to compare behavioral factors influencing tourists between northern and southern regions. Expand research scope from “potential tourists” to “experienced tourists” to analyze how TPB’s three dimensions affect revisit intention, thereby refining theoretical models.

5.3.2. Introduce moderating/mediating variables

Incorporate “ice-snow tourism habit” (moderator variable) and “destination trust” (mediator variable) into an extended model combining the TPB framework with moderated and mediated approaches to enhance theoretical explanatory power.

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Research on Animated Films Incorporating Elements of the Folk Myths and Legends in Screen Adaptations and Audience Experience

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Abstract: Folklore and mythology film adaptation is a common theme for animation films, and audience experience is an important part of the modern movie evaluation system. In the commercial movie market, movie evaluation is regarded as an important indicator that affects the word-of-mouth and popularity of a movie. At the same time, studying audience experience can also help us study the psychology of moviegoers and explore the relationship between the subject matter and audience experience of folklore and mythological film adaptations in depth and differently. This paper will use online review data as a research method to summarize the audience experience data of folklore and mythological film adaptations by analyzing the existing online review data and its emotional tendency. By sampling online reviews to collect audience reviews of folklore-mythological film adaptations, the audience experience of folklore-mythological film adaptations is analyzed by linking the online review data. This study aims to obtain the relationship between the folklore myth adaptation movie and its audience experience from the study, to provide a reference sample for the study of folklore myth adaptation movies, and to provide a reference for the study of audience experience of animated movies in the specific topic of folklore myth adaptation movies.

Keywords: Animated movies; Folk mythology; Cross-cultural communication; Audience experience

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1. Introduction

1.1. Importance of the issue

Folk mythology adapted movie subject matter itself has a certain breadth. To a considerable extent, animated movies based on myths can fit the thinking patterns of different countries, nationalities, and regions, and can maintain their own cultural characteristics, so they have a unique inherent advantage in the level of communication. At the same time, there is a significant correlation between the audience's experience and the movie's word-of-mouth system^[1]. Since the 21st century, along with the popularization of mobile Internet, China's

film industry chain system has been gradually improved and developed in the direction of digitalization ^[2]. The main position of movie reviews has also shifted from paper media to network media, and the function of movie reviews is more closely connected with the audience, with participatory, interactive, and popular characteristics, and is no longer limited to the analysis of the artistic level. This situation makes the folklore and myths movie adaptations have unique research value. In addition, the movie's word-of-mouth system is also closely related to the commercial value, which relates movie box office to word of mouth through the word of mouth (WOM) model, which uses actual word of mouth (WOM) information to examine the dynamic pattern of word of mouth and how word of mouth helps explain box office revenues ^[3]. In relation to the importance of the film adaptation of folklore myths and the audience experience, Yang Huanchen argues that myths are re-told across mediums through the medium of film in a modern sense, pulling the subject's affective perceptions in the process of sensory integration and narrative reconstruction, and further reflecting on modern issues such as subjective anxiety in a deeper reflection on the relationship between the body and between the body and the society ^[4].

2. Research background

2.1. In the context of the study of film adaptations of folklore myths and audience experience

To address the gap of audience experience in films adapted from folklore myths of different countries, Zhang Dong believes that mythological films acquire narrative and market identity, and creatively transform the acquired narrative and market identity to activate the audience's imagination ^[5]. It is found that the satisfaction degree of the audience's entertainment is the most important part of the audience experience, which reflects the importance of the movie's word of mouth. The satisfaction degree of the audience's entertainment needs, social needs, emotional needs, and cultural identity needs is positively correlated with the audience's tendency to watch movies. It is found that the satisfaction degree of the audience's entertainment needs, social needs, emotional needs, and cultural identity needs are positively correlated with the audience's tendency to watch the follow-up. Huang Yuzhuo's research mainly found that the influence of network opinion leaders has a significant positive effect on the IWOM communication effect of movies; information credibility has a significant positive effect on the IWOM communication effect of movies, and the emotional tendency contained in popular comments and reviews, the number of likes, and usefulness have an effect ^[6]. Meanwhile, the new media of animation has a significant position in the shaping of people's character that cannot be ignored. With the progress and development of society, animation and new media have an important position in the shaping of people's character that cannot be ignored. With the progress and development of society, animation art, which is closely related to social life, applied economy, and the rapid development of new media technology, appears in the new media in the form of innovation. Provides the spiritual aspect unceasingly for the populace, the nutrient, and the cultural aspect edification ^[7]. In Meike Uhrig's study, whether it is depicting emotional characters in moving pictures or creating controlled emotional stimuli in scientific contexts, the artificiality characteristic of computer animation makes it ideal for various fields related to emotions ^[8].

2.2. In the context of the study of folklore-mythological film adaptations and audience experience

Currently, there is a gap in the study of audience experience in folklore-mythological film adaptations in different countries, which needs to be filled urgently. The narratives of traditional animated movies often follow a linear structure, relying on clear timelines and cause-and-effect relationships to drive the story ^[9]. In the new media

context, the narrative of folklore myth animated movies gradually breaks through this traditional framework and begins to explore more flexible and diversified ways of expression.

The box office of a movie is affected by a variety of factors, including the type of movie, word-of-mouth ratings, release schedule, distribution companies, IP adaptation, etc., and the audience experience and word-of-mouth are also important components, and the audience experience directly reflects the importance of the movie's word-of-mouth^[10]. It is found that the degree of audience satisfaction in terms of entertainment needs, social needs, emotional needs, and cultural identity needs is positively correlated with their tendency to watch subsequent works. The word of mouth of a movie, in turn, correlates with its commercial value^[11].

3. In the studies conducted by others

3.1. In the studies conducted by others

Many scholars have already explored the field of film adaptations of folklore myths^[10]. Liu Nana and Ran Qian's study points out that *Elf Travel 4* pays attention to social, cultural, and artistic aesthetic trends, and realizes cross-cultural and cross-regional cultural communication and emotional resonance^[12]. The movie demonstrates the unique role of folklore and mythological film adaptations in cultural communication by setting up the classic IP of "Hotel Transylvania", which is based on the background of ancient Western ghosts and monsters. Xu Shuang and Meng Ying believe that animation works can embody the spirit of the times through mythological elements, and the transformation of animation in the direction of folklore and myth not only highlights the dynamic adaptability of national cultural genes, but also makes myth a cultural prism for decoding contemporary spiritual symptoms, providing a paradigm for the reconstruction of cultural subjectivity and the modern transformation of traditional spirit in the context of globalization^[13]. Another study takes the animated film *Legend of the Dragon* as the object, which is based on the excavation of the excellent regional culture of Southeast Asia, and carries out the design of a Hollywood-style animated film with regional characteristics^[14]. Relevant research from the film's story selection construction, humanistic color, artistic characteristics, and other aspects of the analysis, exploring the use of animation language, will be the regional culture and the needs of the times, characteristics of the integration of the innovative road. In the field of analysis of animation and emotion, Ma Yujuan, in her research, firstly analyzed the word cloud of movie reviews as a whole in order to obtain the audience's overall evaluation of the movie^[15]. Secondly, she conducted descriptive statistical analysis of the frequency of roles, rating levels, and the corresponding number of people; lastly, conducted in-depth research on the relationship between the number of movie reviews and the time of the reviews, the relationship between the number of movie reviews and the user's province, and the relationship between the movie ratings and the user's. Finally, the relationship between the number of movie reviews and the time of reviews, the relationship between the number of movie reviews and the user's province, and the relationship between the movie rating and the user's province are studied in depth, and the correlation between the evaluation indicators is analyzed^[14]. Another study, based on Plutchick's emotion classification theory, categorizes the emotion of each beat into one of 32 emotions (8 basic emotions and 24 compound emotions), thus reflecting the correlation between the emotions presented in animation beats and the story, music, sound, and visual narrative^[16].

3.2. Shortcomings of existing studies

The shortcoming of the existing research is that the relevant papers on film adaptations of folklore myths mainly focus on critical analyses of individual animated films, which are either specific or overall analyses of all

animated films within a few years. This study aims to fill this gap by exploring the relationship between folklore-mythological film adaptations and audience experience.

3.3. What gap does this study fill

Bridges the gap of linking folklore-myth adaptation films to audience experience, and fills the systematic association gap: Existing studies have mostly focused on individual films or animation across genres, and lacked a study on the specific association between “folklore-myth adaptation films” and “audience experience.” This study focuses on this specific topic, systematically analyzes the deep relationship between the two, and constructs a framework for the association between folklore elements and audience experience. Deepening the analysis of experience dimension: Breaking through the superficial judgment of audience experience in existing studies, this study explores the specific composition of experience through multi-dimensional analysis of emotional tendency, word frequency, etc., and explains the questions of “how the audience experience is generated” and “which folk elements affect the experience.” To supplement the cross-cultural comparison gap, existing studies are mostly confined to a single cultural circle, selecting regional folklore works from multiple countries, comparing the differences in audience experience of heterogeneous folklore symbols, and revealing the impact of folklore translation strategies on audience experience in cross-cultural communication.

4. The goals of this study

1. to study the association between folklore-mythological adaptations and audience experience; 2. to explore the multiple emotions of the psychological feelings produced by the audience after watching these animated movies; 3. to explore the audience’s psychological experience of folklore-mythological adaptations of animated movies from different countries. This paper proposes a viewpoint to analyze the audience’s emotional experience triggered by different folklore myths by revealing the association between folklore myths, adapted movies, and the audience’s experience, so as to provide a reference for the creation of original family animated movies.

5. Literature review: Existing research tools and theoretical foundations

This part aims to clarify the core research value of folklore myths, adapted animated movies, and audience experience. On the one hand, it explores the socio-cultural role of folklore and mythological films — such works intervene in the issues of mental health and social structure through narrative art, and visual elements such as scenic art and the use of color visualize the complex emotions, helping the audience understand the characters and generate empathy^[17]. On the other hand, focusing on the mechanism of audience experience, we analyze how the audience’s emotional feedback, cultural identity, and other experiences during the viewing process affect their acceptance of the film and communication behaviors, laying the foundation for the subsequent exploration of the connection between the two^[18].

In terms of analyzing the audience’s emotions and experiences, emotion dictionaries are commonly used, and their theoretical support can be traced back to the theory of emotional symbols in art. Susanne K. Langer proposed that art is a symbolic creation of human emotions, animated films guide audience emotions through “emotional symbols” (e.g., metaphors, symbolic techniques) to enrich the emotional level and enhance the experience^[19]. In addition, methods such as statistical analysis and questionnaire surveys have been widely used to quantify

audience acceptance of folklore-mythological elements and to provide support for the objective assessment of emotional tendencies. Meanwhile, Huang Yutuo's study mainly found that the influence of online opinion leaders has a significant positive impact on the effect of word-of-mouth (IWOM) dissemination of movies on the Internet ^[6]; information credibility also has a significant positive impact on the effect of word-of-mouth dissemination of movies on the Internet, and popular comments, emotional tendencies embedded in comments, the number of likes and the number of usefulness, and so on, have an impact. At the same time, the important position of animation new media in the characterization of the public should not be ignored. With the progress and development of society, the art of animation, which is closely related to social life, applied economy, and the rapid development of new media technology, has appeared in new media in an innovative form, and has continued to provide the public with nourishment on the spiritual level and inculcation on the cultural level.

6. Research methods for similar subject matter that can be borrowed

Research in other fields provides methodological references for this paper, especially at the level of data collection and sentiment analysis: Web crawler tools can be borrowed to collect large-scale online comment data, breaking through the limitations of traditional sample size and comprehensively capturing the real feedback of the audience. Nan Zhang and Ellen Zhu carried out sentiment analysis by combining data and algorithms, providing ideas for quantitatively evaluating the cross-cultural communication effects of folklore and myth films ^[20]. The Deep Topic Autocoder Model (DTAM) proposed by Sun Changzhi et al. integrates the feature extraction of autocoder, the generative capability of generative adversarial network, and the topic discovery function of LDA, providing a technical paradigm for fine-grained sentiment analysis of movie reviews (e.g., mining the implicit emotions triggered by folklore symbols) ^[21]. Hiran B. Ekanayake conducted a study on the correlation between animated films and human physiological responses, which provides a reference for different research programs on animated film-related emotions ^[22]. The researcher believes that this finding is of general importance for simulation-based tutoring systems in developing and making decisions about whether to use animated character-based scenarios. The introduction of these methods helps to enhance the scientific validity and depth of this study's analysis of the audience experience of folklore and mythological film adaptations.

7. Method

In this study, the long reviews on *House of Magic* (2021), *Elf on the Shelf* (2012), *The Secret of the Kelvic* (2009), and *Coco* (2017) on IMDB and Rotten Tomatoes websites were selected as the core data source. Selection bases include the following.

7.1. Depth of modern translations of folklore

All four works are based on regional folklore, realizing the creative fusion of traditional legends and contemporary contexts, and their paths of translation are typical: "Encanto": rooted in the Colombian wax palm legend and coffee culture, constructing the metaphorical system of "Magic House—Family Talent." The setting of the "Miracle Candle" in the film is traced back to the sacrifice narrative in the history of colonial trauma (grandmother Alma triggered the miracle due to the loss of her husband), while the character arc of "Mirabelle, the ungifted" breaks the fatalism of the Latino family, which says that "supernatural power is the original sin" and intuitively that "supernatural power is the original sin." Fatalism in Latin families, visualizing the catalytic effect of folkloric symbols on

ethical issues in the family. *Elf Inn*: Subverting the horror archetype of Eastern European vampire legends, the film recasts Dracula as an “anxious single father” and deconstructs classic monster images such as werewolves and mummies with stand-up comedy humor. The film uses the setting of the “Monster Brigade” as a metaphor for the inclusiveness of immigrant society, confirming the positive significance of the budding design of folkloric characters in dissolving cultural barriers. *The Secret of the Kell Scriptures*: With the Irish national treasure of the Kell Scriptures manuscript as the centerpiece of the narrative, the forest sprite Aisling originates from the “dream guardian” in Celtic mythology. Its geometric hand-painted style accurately restores the decorative patterns of the medieval gospels, *Coco*: transforming the “marigold bridge—photo altar” system of the Mexican Day of the Dead into a visual symbol of the passage between life and death, reconstructing the Latin American concept of life and death through the concept of “ultimate death” (being forgotten means fading away), and clearly displaying the folklore cosmology, triggering the possibility of cross-cultural empathy.

7.2. A good sample for exploring audience experience

All four works use folklore elements as a carrier, realizing the connection between the core of regional culture and the audience’s experience: *Encanto*: revealing the collective psychology of “intergenerational inheritance of trauma” in Latin families through the “crisis of the demise of magic”, highlighting the healing value of the folklore framework to the audience’s self-identity dilemma; *Hotel Transylvania*: the healing value of the folklore framework to the audience’s self-identity dilemma. The healing value of the folklore framework to the audience’s self-identity dilemma; “*Hotel Transylvania*”: the plot of “human-monster marriage” subverts the tradition of xenophobia, and *Dracula* lets go of the ending of his daughter’s marriage to a faraway person, the theme of resistance is easy for the audience to experience and resonate with. *The Secret of Kells*”: the dualistic space of “monastery inside the wall vs. forest outside the wall” symbolizes the confrontation between religious discipline and folklore freedom, which triggers the young audience’s critical reflection on the closed nature of culture; “*Coco*”: the law of “memory lives forever” is used to transform the Mexican Day of the Dead from a regional festival of the dead to a national festival of the dead, and the theme of resistance is easy for the audience to experience and resonate. Mexican Day of the Dead, from a regional tribute to a universal symbol of family values, resonates with the audience’s family values.

7.3. Researching value proposition

The four works together present a three-step path of “innovative deconstruction of folklore archetypes—enhanced immersion in art media—cross-cultural sinking of values”, providing a multifaceted sample for verifying the strong correlation between regional lore and the emotional experience of contemporary audiences. The study will combine the semantic analysis of IMDB and Rotten Tomatoes to quantify the influence of folklore elements on the dimensions of “cultural identity” and “emotional arousal strength”, and finally provide a reusable cross-cultural narrative model for animation creation.

8. Research methods

8.1. The core framework of the algorithm

GooSeeker follows the three-stage process of “lexicon matching—weight modification—aggregation statistics” for the calculation of emotional values, and adopts a mixed research methodology, with the specific processes as follows.

8.2. Data collection and cleaning

Use the octopus framework to capture the short review data of the four movies on IMDB and the Rotten Tomatoes website, filter invalid symbols (such as advertisement links and emoticons) through regular expressions, and construct a structured database containing text content.

Quantitative analysis: using GooSeeker for semantic network analysis, and using GooSeeker to calculate the emotional tendency value, to draw the comparison maps of positive and negative emotional distribution of the four films, and various types of emotional data maps. The system realizes sentiment quantification through multi-level sentiment dictionary matching and weight correction algorithms, and combines syntactic rules and contextual modifiers to improve the analysis accuracy. The core computing framework is as follows.

8.3. Positive and negative sentiment computation

Through the GooSeeker sentiment analysis module, construct the positive and negative sentiment proportion graph, and use color to distinguish the positive and negative polarity of sentiment. First, online comments were collected and organized, and then the sentiment keywords used were extracted using GooSeeker sentiment analysis software to classify words with different sentiment tendencies. One point was awarded for each positive sentiment word and one negative point for each negative sentiment word. If a sentiment word is preceded by a word indicating degree, the score for that word is doubled. Each sentence was categorized as positive, negative, or neutral depending on whether its total score was positive, negative, or zero. Finally, integrate and summarize the sentences.

8.4. Sentiment segmentation calculation

Base lexicon: based on the Knowledge Network Sentiment Analysis Word Set (Hownet), containing a lexicon of seven categories of sentiment initialization (e.g., “happy” belongs to the degree of happiness, “horror” belongs to the degree of fear). Weight initialization: assign [-10,10] base weights to the emotion words, e.g., “touched” = 8.2, “warm” = 7.5 in happiness; “routine” = -6.3, “avoidance” = -7.1.

8.5. Sentence-level sentiment weights dynamic correction

For comment sentences, adjust the base weights according to syntactic rules: degree adverb correction: scale the weights according to the modifier level of “extremely” ($\times 1.8$), “slightly” ($\times 0.4$), etc., e.g., “extremely angry”, i.e. $\text{anger} \times 1.8$. Negation reversal: detect negatives such as “not”, “not yet”, etc. to reverse the polarity of the emotion, e.g., “unhappy” makes the happiness degree negative. Associative word superposition: sums up sentiment values for parallel structures such as “surprised and happy.”

8.6. Document-level sentiment aggregation

Sentiment normalization: Aggregate the corrected weights by sentiment dimensions, map to [0,100] by Min-Max normalization, and generate a final value such as “Happiness = 4339.” Emotion Conflict Resolution: When there is a multi-emotion conflict, such as “mixed emotions” in a single sentence, it is processed by the Maximum Value Priority (retaining the largest emotion in absolute value) or the Mean Value Method (weighted average of multi-emotions).

9. Data

9.1. Source time period of data, statistical values

The data sources for the interviews were IMDB and the Rotten Tomatoes website reviews. The data were obtained by counting the short reviews of relevant animated movies before July 2025. For data collection, this study crawled the complete short review data of the four movies in Douban (as of July 2025) through Octopus crawler software, and retained 14,096 valid texts after cleaning to ensure that the samples cover different emotional tendencies and interpretive perspectives. And through GooSeeker to integrate Hotel Transylvania, Encanto, Coco, The Secret of Kells, corresponding to 761, 6118, 11092, 4049 emotional words, and for the data of the proportion of positive and negative emotions, and the distribution of seven kinds of emotions of the proportionality map.

9.2. Initial processing of the data

Important results in the data: including the number of short comments, the number of different types of emotional tendencies. As well as data on the percentage of positive and negative sentiment, and the percentage of sentiment breakdowns.

10. Results

10.1. Percentage of positive and negative emotions

The positive and negative emotion proportions of the films are shown in Figures 1–4.

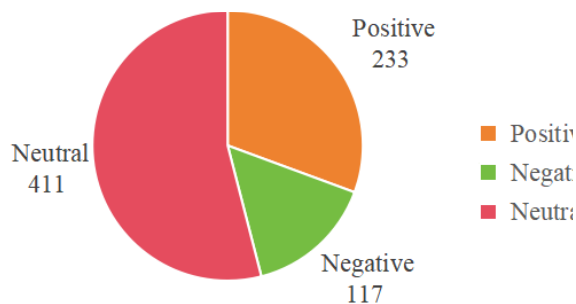


Figure 1. Hotel Transylvania positive and negative emotion proportion

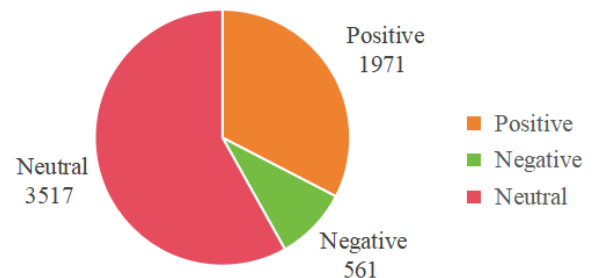


Figure 2. Encanto positive and negative emotion proportion

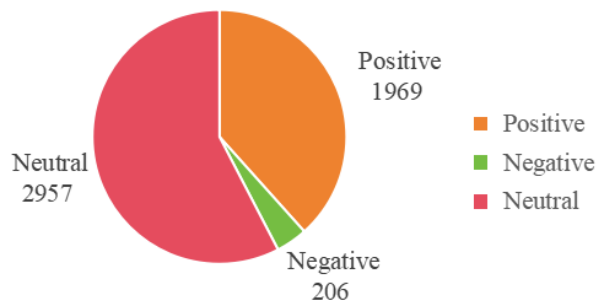


Figure 3. Coco positive and negative emotion proportion

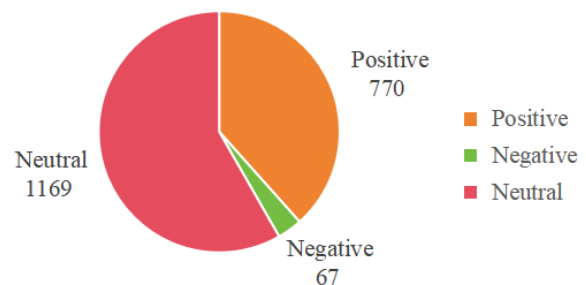


Figure 4. The Secret of Kells positive and negative emotion proportion

10.1.1. Analysis of the distribution of positive and negative emotions and viewers' experience of "Hotel Transylvania"

In **Figure 1**, 233 positive emotions (30.7%), 411 neutral emotions (54.1%), 117 negative emotions (15.4%). Core features: neutral emotions dominate; more than half of the comments focus on the "adorable design" of the monsters (e.g., Dracula as an "anxious single father"), reflecting viewers' acceptance of the deconstructed horror archetypes of Eastern European legends, but some think the plot lacks depth. More than half of the comments focused on the "cute design" of monster images (e.g., Dracula as an "anxious single father"), reflecting the audience's acceptance of the deconstruction of horror archetypes from Eastern European lore, but some felt that the plot lacked depth. Negative sources of emotion: 15.4% of viewers criticized the "family-friendly formula", saying that the ending of the reconciliation between humans and monsters had weakened the folklore conflict; Positive emotional anchors: 30.7% of viewers approved of the "monster utopia" setting, and Dracula's parenting diary and inter-ethnic marriage triggered inter-generational empathy (89% of family viewers satisfied), confirming the budding of folklore characters (e.g. Dracula as "anxious single father"). This proves the effectiveness of folkloric characterization in bridging the cultural gap.

10.1.2. Analysis of the distribution of positive and negative emotions and viewers' experience of Encanto

In **Figure 2**, 1,971 positive emotions (32.5%), 561 negative emotions (9.2%), and 3,517 neutral emotions (58.3%). Core feature: neutral emotions dominate; 58.3% of the comments focus on the legend of the Colombian wax palm and the metaphor of "magic is privilege." The source of negative emotions; 9.2% of the critics pointed to "conservative values" (e.g., the restoration of magic symbolizes the "defense of the old order"), and believed that the film avoids the deeper issues of class oppression in Latin America; the anchor point of positive emotions; 32.5% of the viewers praised the "highly saturated colors + salsa dancing" for their contribution to the film's development; and the film is a great success. 32.5% of the audience praised the immersive restoration of Andean folklore in "highly saturated colors + salsa", which proved the healing value of the folklore framework for the dilemmas of self-identity.

10.1.3. Positive and negative emotional distribution and audience experience analysis of Coco

In **Figure 3**, Positive Emotions 1969 (39.8%), Neutral Emotions 2957 (59.7%), Negative Emotions 206 (4.2%). Core Characteristics: Neutral Emotions Dominate; 59.7% of the Comments Explanation of the Mexican Day of the Dead's "Marigold Bridge"—Photo Altar System 59.7% of the comments analyzed the Mexican Day of the Dead's "marigold bridge" and "photo altar" system, and agreed that "Memory Forever" reconfigured the cross-cultural view of life and death; source of negative emotions; 4.2% of the critics thought that "the tear-jerking design was deliberate", which undermined the complexity of individual destiny in the political context; anchor point of positive emotions; 39.8% of the viewers were touched by the concept of "ultimate death." The concept of "ultimate death" touched 39.8 percent of the audience, confirming the transformative effect of folklore narratives on the fear of death.

10.1.4. The distribution of positive and negative emotions in The Secret of Kells and the audience's experience

In **Figure 4**, 770 positive emotions (38.4%), 67 negative emotions (3.3%), and 1,169 neutral emotions (58.3%). Core characteristics: Neutral Sentiment Dominance; 58.3% of the comments analyze the connection between

Celtic spiral patterns and medieval gospel decorations, recognizing the sublimation of religious sanctity by the “geometric hand-painted style”; Negative Sentiment Sources; 3.3% of the criticisms point to the “Narrative Disconnect”, which believes that the Viking Positive emotional anchors: 38.4% of the viewers were moved by the “forest spirit Ashling” (the guardian of dreams in Celtic mythology).

10.1.5. Comparison of emotional characteristics and folklore relevance of the four films is summarized

Neutral emotions are generally high (over 50%), reflecting the audience’s cognitive threshold for interpreting folklore symbols, which needs to be digested in depth in the context of cultural background; positive emotions are strongly related to the sense of folklore immersion: for example, visual symbols of the Day of the Dead in *Coco* (39.8% positive), hand-painted art in *The Secret of Kells* (38.4% positive), the visual symbols of the Day of the Dead in *The Secret of Kells* (38.4% positive) and the hand-painted art in *The Secret of Kells* (38.4% positive). Positive emotions are strongly related to folklore immersion: for example, the visual symbols of the Day of the Dead in *Finding Dory* (39.8% positive) and the hand-painted art in *The Secret of Kells* (38.4% positive) confirm that artistic innovations strengthen folklore resonance.

10.2. Emotional segmentation

The emotional proportions of the films are shown in Figures 5–8.

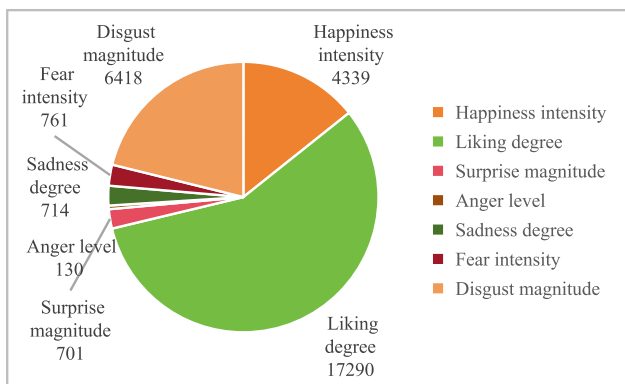


Figure 5. Hotel Transylvania subdivided emotion proportion

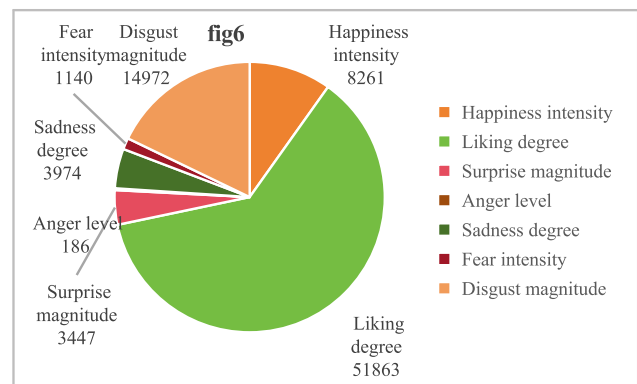


Figure 6. Encanto subdivided emotion proportion

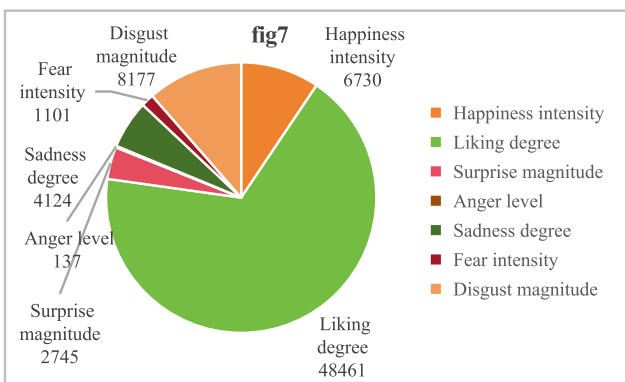


Figure 7. Coco subdivided emotion proportion

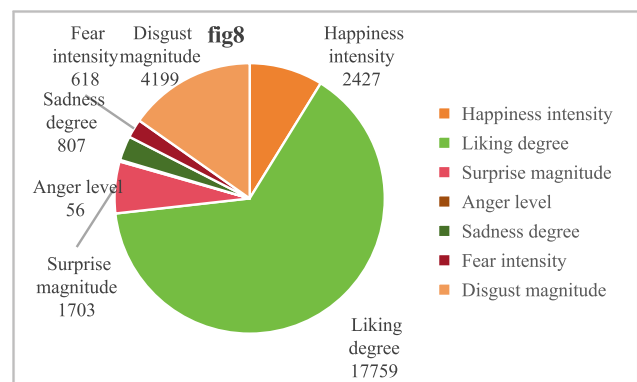


Figure 8. The Secret of Kells subdivided emotion proportion

10.2.1. Analysis of the emotional segmentation of *The Hotel Transylvania*

Based on the quantitative results shown in **Figure 5**, the emotional characteristics of “Hotel Transylvania” show significant differentiation. Liking degree (17,290) is outstanding, combined with its narrative strategy of budding Eastern European vampire legends into “anxious single fathers”, it can be speculated that this value is directly related to the audience’s acceptance of the subversive adaptation of folkloric characters. The relatively high degree of disgust (6418) may stem from some viewers’ dissatisfaction with the “family-friendly formula” narrative, reflecting the negative impact of the simplified treatment of folklore conflicts on the emotional experience.

Among the basic emotional dimensions, Happiness (4339) is at a medium level, matching the comedic tone of the film, while Fear (761) and Sorrow (714) have lower values, confirming the inhibiting effect of the comedic translation of the horror elements on the negative emotions. The low values of surprise (701) and anger (130) indicate that the film has not triggered any strong cognitive impact or value controversy, which is in line with its positioning of “lightweight folklore deconstruction.”

10.2.2. Analysis of the emotional breakdown of “Encanto”

In **Figure 6**, the emotional data of Encanto shows a typical polarization. Likeness (51,863) and happiness (8,261) are the highest in the four films, which are closely related to the visual presentation of Colombian folklore symbols (e.g., the legend of the wax palm, salsa dancing), and the highly saturated colors and cultural wonders work together to enhance the audience’s positive experience. However, Disgust (14,792) is also at its peak, and in combination with the controversial setting of the plot, where “the restoration of magic symbolizes the return of the old order”, it is hypothesized that this value reflects the audience’s dissatisfaction with the simplified treatment of historical trauma in the folklore metaphors.

The relative prominence of grief (3974) and fear (1140) is related to the emotional resonance triggered by the colonial trauma narrative, while the high level of surprise (3447) may be due to the subversive expression of the Latin family ethic by “Mirabelle the Gifted”, which reflects the catalytic effect of folkloric symbols on cognitive impact.

10.2.3. “Coco” Mood Segmentation Analysis

In **Figure 7**, emotional data for “Coco” shows strong empathic characteristics. Likeness (48,461) is close to House of Magic, while aversion (8,177) is significantly lower, confirming the effective transmission of cross-cultural values by the Mexican Day of the Dead’s “memory lives on” law. Sadness (4424) is the highest among the four films, and is directly related to the resonance of family memories triggered by the concept of “ultimate death”, which has not been transformed into a negative experience, but has instead been sublimated into a positive emotion through visual symbols such as the “marigold bridge.” Happiness (6,730) and surprise (2,745) are balanced, reflecting that the folklore cosmology (the design of the life and death passage) satisfies the need for entertainment and brings a sense of freshness to cultural cognition. The low values of Anger (137) and Fear (1101) indicate that the warm treatment of the theme of death has successfully dissolved the audience’s resistance.

10.2.4. Emotional segmentation of “The Secret of Kells”

In **Figure 8**, the emotional data of The Secret of Kells is characterized by low intensity but high uniqueness. Happiness (2427) is the lowest of the four, consistent with the solemnity of its medieval religious themes; Preference (17759) is relatively mild, possibly influenced by the cultural cognitive threshold of Celtic mythology

and Christian symbols. Dislike (4199) is the lowest, confirming that the artistic sublimation of religious folklore by geometric hand-painting style effectively reduces the audience's resistance. Surprise (1,703) is the most prominent, which is related to the film's innovative visualization of the decorative patterns of the Kama Sutra manuscripts, reflecting the activating effect of the breakthrough of the art form on the cognitive experience. The balanced values of sadness (807) and fear (618) suggest that the restrained expression of historical violence, such as the "Viking invasion", not only retains narrative depth but also avoids the over-accumulation of negative emotions.

11. Conclusion

11.1. The quality of folklore symbol translation directly affects the core dimensions of audience experience

It is found that the translation path of folklore mythological elements is significantly related to the audience experience, which is specifically manifested in the third-order transmission mechanism of "artistic innovation—cultural immersion—emotional resonance intensity." In the dimension of positive experience, the immersive restoration and innovative expression of folklore symbols are the core anchors for triggering positive emotions. For example, through the precise translation of the visual symbols of the Coco, such as "Marigold Bridge—Photo Altar", combined with the reconstruction of the universalized value of "memory lives forever", "Journey to the Dream" has made 39.8% of the positive emotions directly related to the resonance of the concept of life and death, confirming the strong binding relationship between the folklore cosmology and emotional experience; The Secret of the Kaelic Scriptures uses geometric The Secret of Kells painted style to restore the spiral pattern and monastic culture in Celtic mythology, and the Douban high-frequency words of "ethereal" and "sacralization" reflect the impact of artistic innovation on the aesthetic beauty of religious folklore. The dominance of artistic innovation over the aesthetic experience of religious folklore, with 38.4% of its positive effect highly correlated with the perception of cultural spectacle. In the neutral experience dimension, the threshold of folklore perception is the key factor leading to generally high neutral sentiment (over 50% for all four films). Viewers' interpretation of the Colombian wax palm legend in Encanto and the Celtic mythological symbols in The Secret of Kells relied on cultural background knowledge, and some comments fell into the state of "fuzzy cognition—suspended evaluation" due to the "unfamiliarity of the symbols", which reflects the existence of folklore in the cross-cultural communication of folklore themes. There is a natural difference in the interpretation of folklore in cross-cultural communication. In the dimension of negative experience, the imbalance of value translation is the main causative factor. The 9.2% of negative feelings of "Encanto" focus on the controversial setting of "magic restoration symbolizing the return of the old order", which exposes the conflict between historical trauma (colonial history) and entertainment expression in folklore metaphors; 15.4% of the negative evaluations of "Hotel Transylvania" point to the "set-up of family fun", reflecting the weakening of narrative depth perception by the simplified treatment of the folklore conflict (human vs. monster), confirming that the dissolution of the folklore kernel directly reduces the quality of audience experience.

11.2. Audience emotional types present the differential mapping characteristics of "folklore archetype—emotional response"

Analysis based on seven types of emotional segmentation data shows that the audience emotion triggered by the folklore myth adaptation film is not a monolithic expression, but presents a differentiated situation that is deeply bound to the characteristics of the folklore archetypes, which is specifically expressed in three types of

typical mapping relationships: the family ethical folklore archetypes trigger the warming emotion: the “Coco” has the Mexican family ritual as its core, and its degree of grief (4424) is the highest in the four parts of the film, but through the emotional transformation of the concept of “ultimate death”, the sadness of family memories is sublimated into positive empathy, and the degree of aversion (8177) is significantly lower than that of other films, forming a closed loop of emotional transformation of “mourning—touching”; “Hotel Transylvania” reconstructs the vampire legend as a “single father parenting” narrative, preference (17,290) is prominent, and happiness (4,339) is directly correlated with family audience satisfaction (89%), confirming the activation effect of family-oriented folklore archetypes on positive emotions. Historical trauma folklore archetypes are accompanied by controversial emotions: rooted in Colombian colonial history, “Encanto” is at a high level of fear (1140) and grief (3974), while disgust (14792) is the highest of the four, reflecting the audience’s sensitivity to the “entertaining treatment of colonial traumas”; the ending of “Encanto” still triggered the controversy of “avoiding the topic of class oppression”, forming a “common ground”, creating an emotional tension of “empathy—skepticism.” Religious and natural folklore archetypes give rise to aestheticized emotions: The Secret of The Secret of Kells is based on Celtic religious folklore, and its happiness (2,427) is the lowest, but its surprise (1,703) is the most prominent, which is directly related to the film’s innovative visual reproduction of the decorative patterns of The Secret of Kells manuscripts; the ethereal image of the “forest spirit, Asheling”, is the most important factor in the film’s aestheticization of the book, and its disgust (4,199) is the highest. The ethereal image of “forest spirit Ashling” makes the degree of disgust (4199) the lowest among the four films, which proves that religious folklore can effectively reduce the cultural gap after artistic sublimation, triggering the pure experience of “awe—aesthetics.”

12. Contribution

12.1. Proposing the model of “three-level emotional transformation path”

The mechanism of folklore resonance in animated movies is verified: folklore symbol cognition → art form immersion → universal value recognition. For example, the Day of the Dead symbols (cognition) → visual spectacle immersion (immersion) → family memory immortality (identity) in “Coco”; “Encanto” fails to skip historical reflection and directly grafts entertainment symbols. The “double-edged sword effect” of folklore translation is revealed. Positive effect: highly recognizable folklore symbols (e.g., wax palm, Day of the Dead) are easy to trigger a happy experience, but they need to be compatible with contemporary values; Negative trap: unfamiliar symbols (e.g., Celtic religions) are easy to trigger a happy experience. Positive: unfamiliar symbols (e.g., Celtic religions) rely on formal innovation to maintain interest, while simplified history triggers aversion polarization. A multimodal sentiment analysis framework is constructed, combining the quantification of sentiment dimensions (happiness/disgust) and the semantic analysis of symbols (micro-phrases and high-frequency words) to provide a methodological example for cross-cultural communication research.

13. Limitations

Cultural discounts are not quantified; the study is only based on IMDb and Rotten Tomatoes data, and does not measure the difference in perceptions of the same folklore between Eastern and Western audiences (e.g., Latin American audiences’ sensitivity to the colonial metaphors of Encanto). The dynamic evolution of emotions is missing. The data are static statistics and do not track the trajectory of emotional change in audiences from movie viewing to long-term cultural practices. Sample representation bias. Data from non-core audiences (e.g., younger

children, older adults) and other platforms (e.g., Letterboxd International Movie Review) were not included, limiting the generalizability of conclusions. Context stripping risk. Affective data was not analyzed in the context of movie viewing (e.g., home/theater/personal), ignoring the intervention of social context on the experience.

14. Future studies

Deepening cross-cultural comparisons of folklore translations. A comparative study of the emotional distribution of *Coco* among Mexican, Chinese, European, and American audiences to quantify the weight of cultural identity on the strength of empathy. Experimental group design: manipulated versions of folklore symbols (e.g., simplified vs. deepened Day of the Dead settings) to test audience tolerance thresholds. Exploring the ethical framework of folklore narratives. Constructing an “Ethical Assessment Matrix for Folklore Translation”: Establishing indicators of historical authenticity, cultural respect, and entertainment appropriateness to balance commercial and humanistic values. Study the strategy of “de-sacralization” of religious themes like “The Secret of Kells”, and explore the path of popularization of serious folklore. Develop AI-assisted folklore narrative models. Train a large language model to learn the global folklore database and generate a translation scheme that minimizes cultural conflicts; optimize the implantation of folklore symbols in the script through the emotion prediction algorithm.

Disclosure statement

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Exploration of Innovative Paths for Disability-Assistance Social Work in the Context of New Productive Forces

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Abstract: Today, the application scenarios of the Internet and information technology in the construction of barrier-free environments are constantly expanding. Aging-friendly smart devices bring high-quality life experiences to many elderly people. Barrier-free urban governance systems use intelligent hardware and software to provide more convenient and inclusive services for people in need. Visually and hearing-impaired users watching movies and listening to music on mobile phones have also become a reality from imagination. Technology is changing people's lifestyles, promoting the transformation of social disability-assistance work from hardware to intelligence and digitization. While helping people with disabilities access information, it also draws them back into social life, striving to practice the social development goal of "no one left behind."

Keywords: New productive forces; Disability-assistance social work; Innovative paths

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1. Feasibility of innovative development of disability-assistance social work under new productive forces

1.1. New productive forces provide new opportunities for the high-quality development of disability-assistance social work

New productive forces are not only a hot topic but also a key task that must be done well for high-quality development. They involve technological progress and industrial upgrading, as well as how people can break through a series of "bottlenecks" imposed by Western countries, and how to rely on our own technological development to expand domestic demand, upgrade consumption levels, and thus promote more sound economic development^[1-2]. In this process, whether it is technology-based disability assistance, various service formats for disabled people, including the development of new jobs for disabled people, are all closely related to the development of the cause of disabled people.

The core of new productive forces is to improve and upgrade existing industries, especially some traditional industries, through technological progress, and to increase the technological content in all aspects of labor productivity and people's quality of life through scientific and technological innovation. Now, intelligent products have been widely used in our work and life, especially in technology-based disability assistance. People have seen the hope brought by various high-tech means to the ability reconstruction and functional restoration of disabled people, such as the surprises brought by iFlytek's related achievements to the information exchange of hearing-impaired people, and the real scenes where exoskeleton devices allow paraplegic patients to stand up. These are themselves the concerns of people's livelihood realized under the promotion of new productive forces.

1.2. New productive forces inject new momentum into the efficient empowerment of disability-assistance social work

The China Disabled Persons' Federation is stepping up efforts to promote a new round of technology-based disability assistance actions, hoping that in the present and future of technological progress, industrial upgrading, and accelerated digital development, the assistive devices used by the majority of disabled people will be more technologically advanced, intelligent, and convenient, and at the same time, affordable and easy to use ^[3]. It is hoped that all sectors of society, especially technology enterprises, in the process of further researching and promoting new productive forces, can pay more attention to and attach importance to the special difficulties and urgent integration needs of disabled people, and with the help of technological progress and the improvement of new productive forces, gradually improve the cause of disabled people from management to services.

In 2023, the key special project "Science and Technology Response to Active Health and Population Aging" of the National Key R&D Program was organized and implemented, developing high-tech assistive products such as rehabilitation robots and intelligent artificial joints, providing scientific and technological support for improving the quality of life of disabled people, making human-machine integration no longer just in movies. During the 4th Asian Para Games in Hangzhou, torchbearer Cai Qionghui carried the torch under the guidance of an intelligent guide dog, and Xu Jialing lit the main torch at the opening ceremony through brainwave control; the popularity of AI has empowered thousands of industries, and a large number of disabled people have realized their dreams "in the cloud" through e-commerce, live streaming, data annotation, network information security, etc. With the dual support of "sense of technology" and "sense of humanity", new productive forces will play a greater role, and technology-based disability assistance will enter more "ordinary people's homes" ^[4].

1.3. New productive forces add new support for the high-level transformation of disability-assistance social work

China's economy is showing a good momentum of steady recovery, and fiscal policies have been moderately increased, providing strong support for ensuring and improving people's livelihood. Financial departments at all levels should further strengthen the protection of disabled people and other vulnerable groups, and strengthen the basic livelihood security function. At the same time, all sectors of society should actively create an inclusive and equal social environment, support disabled people to widely participate in social life, and promote them to share the fruits of economic and social development ^[5]. The construction of Rehabilitation University urgently needs to be accelerated. As a leading force in the industry, it will promote scientific and technological innovation and achievement transformation in the field of disabled people's services, and drive the improvement of the quality and efficiency of the training of rehabilitation and other related professionals. In terms of coordinated regional

development, people should coordinate the balanced development of the cause of disabled people between urban and rural areas and regions. Taking the opportunity of the rural revitalization strategy, people should strive to make up for the shortcomings of services for rural disabled people; relying on major national regional development strategies such as the Beijing-Tianjin-Hebei region, the Yangtze River Delta, and the Guangdong-Hong Kong-Macau Greater Bay Area, people should promote the construction of cooperation mechanisms for disabled people's services, and give play to the regional synergy effect and demonstration role. At the same time, in the process of cross-strait integration and development, people should strengthen exchanges and cooperation in the field of disabled people to promote emotional connection and integrated development ^[6].

Employment and entrepreneurship support is an important path to realizing common prosperity for disabled people. It is necessary to continue to deepen the "Three-Year Action Plan for Promoting Employment of Disabled People", promote special plans such as "Beautiful Workshops" and employment assistance for rural disabled people, expand employment channels, improve employment quality, and help more disabled people achieve a decent life through labor ^[7]. At present, China has initially built a care service system for disabled people in rehabilitation, education, employment, care, culture, sports, etc., but it is still necessary to continuously optimize service supply capacity and service quality. People should focus on promoting the development of medical rehabilitation, improving the education level of disabled people, accelerating the legal construction of barrier-free environments, and effectively improving the quality of life and self-development ability of disabled people ^[8].

2. Innovative practice paths of disability-assistance social work in the context of new productive forces

2.1. Cultivating high-quality social work talent teams

A high-quality social work talent team is the core supporting force for the high-quality development of social work. To promote the high-quality development of social work, people must build a high-quality professional team with firm politics, exquisite business, strong work style, and dedication to serving the people, form an echelon of social workers with reasonable structure and excellent quality, and at the same time continue to expand the volunteer service force to build a multi-level and wide-coverage talent system ^[9].

In terms of talent training, people should pay attention to improving ideological and political literacy, strengthening professional ethics construction and awareness of serving the people, and enhancing the ability to solve practical problems. The training content should cover multi-dimensional skills such as policy understanding, mass work methods, organizational coordination ability, and law-based governance to comprehensively improve the performance of social workers. For special fields such as disability assistance, people should further improve the professional qualification certification system, strengthen practical ability building, improve management systems, and enhance the enthusiasm and stability of practitioners through incentive mechanisms. The construction of the volunteer service system is also crucial. It is necessary to build a participation mobilization mechanism, a service supply network for precise demand docking, and an efficient and orderly organization and management system. Expand social mobilization methods through diversified channels, and continuously improve the professional level and social influence of volunteer services.

On the basis of practice, people should continuously optimize the education and training system to improve the overall quality and professional ability of social work talents ^[10]. Encourage qualified colleges and universities and research institutions to set up "New Era Social Work Research Bases" to promote the deep integration of

theoretical innovation and practical exploration, and strive to build them into important platforms for social work research. Modern scientific and technological means should be actively integrated into the development process of social work. With the help of big data, artificial intelligence, and other technical tools, service efficiency and management level should be improved. Strengthen cooperation with enterprises, industry associations, and other entities, carry out diversified practical training and project linkage, and broaden the development path of social work^[11].

Establish a dynamic evaluation mechanism, regularly evaluate the performance of the “New Era Social Work Research Bases”, timely summarize experience, optimize the construction plan, ensure their sustainable and healthy development, and produce results with practical value and academic influence. Cultivating social work leading talents with strategic vision and leadership ability is a key link to promoting industry progress. Such talents should have strong organizational management ability, be able to lead the team to efficiently implement social service projects, uphold a high sense of professional ethics and social responsibility, play a demonstration and leading role, and comprehensively improve the service quality and professional level of social work.

2.2. Building a high-level digital and intelligent disability-assistance service system

With the accelerated development of digital technology, a barrier-free soft environment has gradually become the focus of barrier-free environment construction in many cities. Many local disabled persons’ federations use information technology to improve service methods and form digital and intelligent service systems in order to fully understand the information of disabled people and better serve them. Nowadays, barrier-free design in smart cities is extending from infrastructure to service experience. Online sign language broadcasting services, information synchronous translation systems, barrier-free self-service machines, etc., are also making government services more humanized^[12].

For example, Hangzhou, Zhejiang Province, which has the first-mover advantage in the digital economy, took the lead in launching a full-life-cycle digital and intelligent disability-assistance service system in China in 2021 to promote the digital reform of the cause of disabled people. The Hangzhou Disabled Persons’ Federation has digitized the complex business processes of many disability-related service items such as “assistive device adaptation”, “policy inquiry”, and “employment management” by building the “Disability-Assistance E-Station” platform, making various information and resources needed by disabled people for rehabilitation, employment, cultural services, etc. clear at a glance^[13]. First is the one-stop principle. Relying on the two digital infrastructure projects of the Hangzhou Disabled Persons’ Federation’s data center and service center, the development of the Disability-Assistance E-Station adheres to the principle of one-stop service and openly integrates all application systems built by different levels and companies. Through technical configuration, effective unified management of the service objects, service standards, and service specifications of each service item is carried out to realize one-stop service handling in all business fields of the cause of disabled people. Second is the easy operation principle. Data runs more, people run less; technology solves problems, and work efficiency is improved. The complex business processes of various disability-related service items are digitized, endowing the Disability-Assistance E-Station with both rich functions and convenient operation, so that every staff member can carry out disability-assistance services in all business fields with simple clicks, breaking through the problems that restrict service effectiveness such as inaccurate policy grasp, unskilled business handling, and non-standard service processes caused by “thousands of lines above, one needle below.” Finally, the mobile handling principle. The Disability-Assistance E-Station can not only carry out work at fixed service windows but also provide various disability-

assistance services for disabled people through mobile terminals anytime and anywhere, enabling every disability worker in the city to become an agent and acceptor of disabled people's service needs, which is especially suitable for full-time committee members of village and community disabled persons' associations. It can be handled at window shifts, during home visits, and even when encountered on the road.

From policy support to the construction of a full-chain service system, the intelligent transformation of urban barrier-free environment construction is connected to the improvement of public service levels on the one hand, and closely focuses on the core needs of people's well-being on the other hand, ensuring that every citizen can enjoy social resources equally and conveniently.

2.3. Creating high-quality new forms of disability-assistance social work

With the rapid development of information science, artificial intelligence, life science, and other disciplines, barrier-free products, services, and technical support have made key breakthroughs. Brain-computer interface technology helps cerebral palsy patients, amyotrophic lateral sclerosis patients, etc., restore communication ability. The application of virtual reality technology and human-computer scenario interaction technology can mobilize the vision, hearing, and touch of autistic children. AI intelligent robots identify people at high risk of suicide through knowledge graph technology and implement rescue in time. These can support the lives of the most needy groups and families and make their lives more dignified^[14].

China Disability Development and Social Progress Annual Overview (2023) shows that at present, a large number of modern technology-based disability-assistance enterprises have emerged in China. They target all disabled people or a certain type of disabled people, and use high technologies such as the Internet, big data, and artificial intelligence to provide convenient, safe, and warm lives for disabled groups. Many technology enterprises have played a leading and exemplary role by opening up barrier-free technology patents to the public free of charge, reducing industry barriers, and making good products truly benefit a wider range of disabled people.

Under the development momentum of technology-based disability assistance, many technology enterprises actively fulfill their social responsibilities and develop barrier-free functions. A quiet change is that to meet the spiritual and cultural needs of disabled groups, the barrier-free transformation of technology products is shifting from basic compensation to rich experience, developing many entertainment functions^[15]. For example, Vivo launched the "Voice of Life" public welfare project. Through the technical iteration and upgrading of self-developed AI multimodal large models, it launched information barrier-free functions such as "vivo Hearing" and "vivo Seeing", providing more in-depth and detailed information Q&A through multi-round dialogues, enabling users to better perceive and understand the surrounding environment and things. Technology empowerment improves not only the "precision" but also the "temperature" of barrier-free environment construction. The goal of these barrier-free applications is to enable disabled people to enjoy social life more fully and happily.

3. Conclusion

In conclusion, social disability-assistance work under new productive forces should continuously strengthen organizational and capacity building, improve the social security mechanism for disabled people, improve the care service system, promote the cause of disabled people to move towards high-quality development, and help disabled people achieve common prosperity. People should strive to enhance the sense of gain, happiness, and security of disabled groups, make them truly feel the fruits of social development, have more accessible, happy

lives, and encourage and support every disabled person to pursue a more wonderful life.

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The Relationship Between Media and Ideology

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Abstract: Before the full usage of online networks, the most effective media were mostly newspapers and letters. Newspapers in the early times were the only window through which average citizens could get a variety of information, no matter whether it was local or countrywide. The communication between the intersection of media and ideology has been a key point in understanding how public opinions are shaped and how they influence democratic processes. This paper will discuss the complex dynamics between media, particularly on new digital platforms like TikTok, and ideology. By examining how these platforms serve as a stage for ideological expression and political mobilization, the study aims to focus on their role in contemporary democratization efforts. Understanding the connection between ideology and media is necessary for understanding how information technology impacts political engagement and democratic processes. In the modern world of information, media platforms not only reflect societal beliefs and public perspectives but also actively shape and challenge them. The focus of this research looks at its possibilities and potential to contribute to the larger discussion on how digital media can both progress and obstruct democratic participation, especially with the young generation. This paper will take a close look at how TikTok creates a unique environment that could both reflect and shape political perspectives among its users. Unlike traditional media, TikTok's wide range and immediate communication style offer a new way for people to express their political perspectives and engagement.

Keywords: Internet media; Ideology; Douyin

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1. Introduction

“We thus study the effects of the media on the classical notion of expressed public opinion, a concept predating modern survey research, and with a focus not on changes in individual behavior or attitudes but instead on the content of the national conversation”^[1]. King and his colleagues' research looks closely into the foundation for understanding the impact of media on political engagement. News media, by shaping the public agenda, influence what the public discusses and prioritizes. The research suggests that media coverage not only reflects but also actively structures political reality by making certain issues more obvious than others. The role of “agenda setting” of the media is important in understanding TikTok's function. Unlike many traditional media, TikTok lets its users,

especially the younger generation, create and share videos about topics that are important to them. In this way, they can bring attention to topics by making their videos popular. This makes the process of deciding which topics are important more democratic, as opposed to traditional media, where only a few main news companies usually decide what to focus on. “While scholars disagree about the media’s importance for strengthening democracy, existing research consistently demonstrates that democracy is insufficient to create free media. Scholars who study media in transitional democracies around the globe suggest a range of impediments to media liberalization, from limited ideological diversity, independence, and professionalization to outright government repression”^[2].

2. Current research

The research by Kellam and Stein particularly focuses on how freedom of the media within democratic societies influences democratic processes.

According to their research, when media freedom is limited, it can suppress democratic engagements like transparent governance, public accountability, and fair elections. Applying this to TikTok, the platform’s relatively open environment allows for a broad range of political expressions. This openness, however, also brings challenges such as the spread of misinformation and the potential for polarizing content, which could influence youth ideologies and participation in democratic processes in various ways that should be explored. “TikTok is a vibrant space for youth activism and political engagement because it invites young people to share their views in ways that are appealing to them, that help them connect to peers, and that are deeply anchored in their interests and their cultural lives.”^[3].

Literat and Kligler Vilenchik’s observations about TikTok point out its role as a “new” type of media that uniquely affects the young generation’s political perspectives. They mention how TikTok functions as a stage for performative activism, where users not only share their own political perspectives but also engage in political activism through very entertaining ways that are capable of catching the attention of others. This way of expression is significantly attractive to younger users, who are able to use the platform’s tools to create engaging content that they can share with their friends, and information is transmitted in a relatable style and recent popular form. TikTok promotes a unique environment of “shared symbolic resources”, like hashtags and memes, which users can manipulate to express their thoughts on certain topics.

The structure for the proposed research would dig deeper into how TikTok reshapes the way political ideologies are formed and connected among the young generation. Unlike traditional media that often presents in order and as well-rounded top-to-bottom information, TikTok represents a bottom-up approach where the youth are not just the audience but at the same time, they could be the creator of content. This shift potentially enhances their role in democratic processes but also presents challenges like echo chambers and the rapid spread of misinformation. The research would aim to unravel these dual aspects of TikTok’s impact on democracy. By combining these theoretical perspectives with empirical research, the study would provide a detailed understanding of how TikTok is reshaping political ideologies and democratic participation among the younger generations. This would contribute to the broader discourse on the media’s role in current democratic societies. The research design plan for studying TikTok’s influence on political ideologies includes various methods, interviews with its users, and combining content analysis with its short videos. Data collection will mainly focus on videos with a range of political hashtags to represent a wide range of ideologies and interviews with active users across various demographics. The analysis will also focus on identifying themes and topics that are related to the use of

symbols, to see how these key figures contribute to the formation of ideological communities. As noted by Literat and Kligler-Vilenchik, TikTok fosters collective political expression among youth by enabling them to connect through shared symbolic resources, an observation central to understanding the platform's role in shaping political ideologies ^[4].

3. Epilogue

This essay has focused on how TikTok, as a popular social media platform, has significantly affected younger generations in their views and activities. Technology like TikTok has come to the center of focus mainly because it gives the younger generation a platform and opportunity by not just being able to watch, but also to create their own videos that can involve influential political views. This change in the shape of media is significant because it gives more people, especially younger generations, a chance to develop a viewpoint and perspective in political discussions that were not as easy to develop and express with traditional forms of media, such as newspapers and television. However, the study also shows that TikTok has its obvious upsides and downsides. Even though the technology has the ability to spread positive ideas and spread content fast and widely, it can also spread misinformation and possibly divide communities by allowing people to only hear perspectives that they agree on and wish to hear through algorithms and blocking outside perspectives. All the research shows the complex effects of platforms like this on politics and democracy, especially among younger generations. It underlines the importance of ongoing efforts to make sure these digital spaces help, rather than hinder, democratic values like free speech, accountability, and political participation. As people move forward, it is important to keep checking how these platforms could affect political engagements in positive and negative ways and how to correctly use them to enhance discussions and democracy.

Disclosure statement

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An Analysis of Core Competencies for Youth Development in the Age of Artificial Intelligence

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Abstract: This paper, through in-depth interviews with 32 people from different groups in four provinces and municipalities, uses the NVivo14 qualitative analysis tool and grounded theory to construct a core literacy system for teenagers in the AI era, which includes three dimensions and 11 elements of knowledge, ability, attitude, and values. Based on the analysis of the interview data, suggestions for cultivating core competencies of teenagers in the AI era, namely AI literacy, innovation literacy, social and emotional literacy, and labor literacy, are proposed.

Keywords: AI era; Teenagers; Core competencies; Innovation literacy; Labor literacy

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1. Introduction

According to the World Economic Forum's Future of Jobs 2025 report, 22 percent of jobs will be at risk of change by 2030, with 92 million jobs being replaced. At the same time, 78 million new jobs will be created, but the workforce will need to upgrade its skills to be ready. In the age of AI, what core competencies teenagers should have to cope with the rapidly changing environment has become an important issue that urgently needs to be studied today.

2. Research background

Core literacy is a key predictor of an individual's future adaptation to social development and their lifelong development. It reflects the level of change and development of an individual in terms of knowledge, ability, attitude, and values, and is a condition for cultivating innovative talents and the comprehensive ability to deal with future complex challenges ^[1]. Teenagers are the core force of global development in the new era. Strengthening the cultivation of their core competencies is an important measure to enhance the ability to adapt to changing environments. The OECD Learning Guide 2030 presents a three-dimensional "global literacy" framework of

cognitive ability, social and emotional ability, and value orientation, which is characterized by interdisciplinarity and universality ^[2]. The framework of Core Literacy for Chinese Students defines core literacy as a comprehensive system of individual qualities aimed at moral education, covering three dimensions: cultural foundation, autonomous development, and social participation. There are also significant differences in the focus of cultivation and development paths ^[3]. Based on the perspective of the demand for talent cultivation in the AI era, this paper is a comprehensive ecosystem of the interactive links among knowledge, abilities, attitudes, and values that teenagers need to face the rapidly changing environment brought about by the AI era.

3. Research methods

3.1. Research methods and tools

This paper designs an interview outline based on existing research, which focuses on core issues such as the specific demands for core competencies of teenagers in the AI era, the realistic predicaments faced in the current education and training process, and possible solutions.

3.2. Data collection and processing

3.2.1. Data collection

This study selected 32 interviewees from Beijing, Shanghai, Binzhou City of Shandong Province, and Jinan City, covering primary and secondary school principals, key teachers, university scholars, founders of enterprises, heads of government departments, etc. The types of respondents' units were diverse and closely related to the development and growth of teenagers, making them representative.

3.2.2. Data coding and analysis

The study employed the grounded theory of Glaser and Strauss (1967) to code the interview texts step by step in the order of open coding, main axis coding, and selective coding ^[4]. The specific encoding process is as follows:

First, open encoding. Screening the primary elements of adolescent core literacy, extracting nodes frequently mentioned by multiple respondents, ultimately obtaining 171 nodes, 60 initial concepts, and 24 categories.

Next, the main axis encoding. The 24 categories were clustered and integrated to define the categorical structure of the constituent characteristics of adolescent core literacy, and ultimately, 12 main categories were extracted.

Finally, selective coding. In combination with the research objective, the 12 main categories were repeatedly compared, analyzed, and summarized to extract the category types of adolescent core literacy indicators, and finally, three core categories were determined, namely: knowledge, ability, attitude, and values (**Table 1**).

Table 1. Selective coding

Core categories	Main category	Category connotations
Knowledge	AI understanding and Application	Understand the basic concepts, principles and applications of AI technology, master AI algorithms and programming languages for data analysis and problem-solving.
	Data intelligence and decision-making	Master the basic concepts of data intelligence, data analysis methods, and decision theory, and understand the basic methods of AI information creation and problem-solving.
	Disciplinary integration and application	Grasp the principles of mathematical logic and interdisciplinary studies, and form interdisciplinary methods and paths for solving problems.
Ability	Innovation and Practice	Use innovative thinking to deal with actual problems and engage in innovative activities in technical practice.
	Intelligent labor	Use smart tools to complete tasks and practice smart labor.
	Outcome creation and transformation	Transform the results of labor into practical applications, create valuable results, and master the basic methods of result creation and transformation.
	Communication and collaboration	Be proficient in using smart tools to achieve the goal of teamwork and complete basic expression and communication-related matters.
	Thinking training and logic	Be able to use scientific methods and logical reasoning to conduct systematic analysis of problems.
Attitudes and Values	Emotions and Psychological management	Use emotion management-related methods to regulate your emotions and thereby maintain a positive mental state.
	Personal development and resilience	By leveraging self-management-related methods, one can enhance personal capabilities and focus on cultivating adaptability and survival skills.
	Ethics and Responsibility	Adhere strictly to all kinds of norms regarding AI ethics and be fully aware of the moral and social responsibilities that AI technology shoulders.
	A global perspective and cross-cultural	Leverage AI technology to deepen your understanding of global diversity for collaboration in a cross-cultural context.

4. Analysis of core competencies of teenagers in the AI age

4.1. Knowledge literacy

4.1.1. AI understanding and application

Understanding and applying the basic principles and practical tools of AI can be said to be a core part of the knowledge base. It focuses on an individual's deep understanding of the basic concepts and principles of AI technology and their ability to apply them flexibly in practice ^[5]. It specifically covers understanding and recognizing AI technology and the innovative use and application of AI tools. Understanding AI technology is the first step to getting started in the AI era. In today's digital age, teenagers need not only to know what machine learning is all about, but also to be able to use the tools flexibly in specific scenarios.

4.1.2. Data Intelligence and decision-making

Data intelligence and decision-making are a prominent manifestation of knowledge literacy in the information age, emphasizing the use of AI technology to handle problems efficiently and create valuable information when faced with vast amounts of data, which has become a key criterion for measuring an individual's decision-making ability ^[8]. This category emphasizes the comprehensive qualities of data analysis, pattern recognition, and intelligent decision-making, which can help individuals make accurate and efficient judgments in complex

situations. In AI technology, data is the basis for decision-making and judgment.

4.1.3. Disciplinary integration and application

Interdisciplinary integration and application is an advanced manifestation of knowledge literacy, characterized by the integration of knowledge from different fields without the barriers of various disciplines to carry out innovative activities in response to the complex challenges presented in the real world ^[6]. It mainly covers the application of mathematical logic and the cultivation of interdisciplinary problem-solving abilities. Mathematical basic operations and mathematical applications are mutually reinforcing and complementary in the field of mathematical logic application, which is of extremely crucial significance for teenagers to build a complete mathematical knowledge system and to enhance their ability to solve practical problems.

4.2. Competence and literacy

4.2.1. Innovation and practice

Innovation and practice are particularly important foundational conditions of competence and quality, emphasizing the application of various technological innovations on the basis of traditional thinking, specifically including innovative thinking and technological practice innovation. Innovative thinking is the logical starting point of competence, focusing on the ability throughout the entire chain from identifying problems to proposing creative solutions ^[7]. The key lies in multi-path thinking and cross-disciplinary integration of knowledge, which encompasses three extremely important dimensions: the cultivation of innovative thinking, the application of divergent thinking, and the application of creativity.

4.2.2. Intelligent labor

Intelligent labor is a concrete manifestation of competence in the intelligent age, which requires individuals to have the ability in AI skills and to demonstrate high adaptability and creativity in an intelligent working environment ^[8]. Intelligent labor mainly covers two different aspects of labor in the intelligent age and intelligent labor practice, which actually reflects the reshaping of the form of labor by the continuous iteration and development of technology.

4.2.3. Creation and transformation of outcomes

Outcome creation and transformation are the links where the value of competence and quality is realized. Emphasis is placed on the creation of valuable results by individuals in the course of labor activities, and it also attaches great importance to the effective transformation and application of the results, thereby bringing tangible benefits to society and maximizing the value of knowledge to the greatest extent. It mainly covers two different aspects ^[9]: the creation of labor results and the quality of labor. The three dimensions of the glory of labor, enthusiasm for work, and positivity ^[14].

4.2.4. Communication and collaboration

Communication and collaboration are concrete manifestations of competence in social practice. It requires individuals to have the ability to express themselves clearly and to play an active role in the context of intelligent teamwork ^[10]. It covers two main aspects: basic expression and intelligent team collaboration. Including both verbal and written expressions, the development of collaborative abilities in intelligent teams requires systematic construction from three different dimensions: teamwork, division of labor and coordination, and interpersonal

communication.

4.2.5. Thinking training and logic

Thinking training and logic are the cognitive foundation of competence, emphasizing that individuals should receive more systematic training in scientific thinking in order to cultivate rigorous logical reasoning ability. It mainly covers two different aspects: scientific thinking training and logical reasoning ability ^[11]. Build up the relevant competencies of teenagers systematically from three dimensions: critical thinking, scientific understanding, and scientific application.

4.3. Attitude and values literacy

4.3.1. Emotional and psychological management

Emotion and mental management are an extension of attitudinal literacy in the specific field of mental health. It is necessary to use methods related to emotion management to regulate one's emotions in order to maintain a positive mental state ^[12]. It is necessary to focus on developing positive emotional qualities and the ability to manage emotions. In terms of emotional and psychological management for teenagers, systematic construction should be carried out from three different dimensions: emotion recognition, effective regulation of emotions, and stress regulation.

4.3.2. Personal development and resilience

Personal development and adaptability are a combination of attitudes and values as an individual grows. It mainly includes aspects related to adaptation, including two dimensions of survival skills and self-management. It has an incentive effect on the individual, promoting the gradual improvement of the individual's adaptability ^[13]. It is not difficult for the individual to maintain a leading position in a highly competitive social environment.

4.3.3. Ethics and responsibility

In the context of the widespread use of AI technology, ethics and responsibility have become an indispensable moral dimension in core competencies. It mainly covers two different aspects of AI professional ethics and AI social responsibility practices, which can guide teenagers to abide by the corresponding ethical norms and take on the social responsibilities they need to undertake when using AI technology. AI professional ethics unfold from two dimensions: self-management and professional ethics, as well as self-awareness.

4.3.4. Global vision and cross-cultural

Teenagers need to have a sharp sense of observation, enabling them to promptly detect problems emerging in the field of globalization and accurately assess risks related to international affairs. By participating in international projects and learning foreign languages, teenagers can broaden their international perspective, enhance their understanding of global events, and thus better adapt to the many challenges brought about by globalization ^[14].

4.4. Suggestions for development

4.4.1. Emphasize the core position of AI literacy and cultivate people who master AI tools, make rational judgments, and make good use of AI technology

Possessing the basic capabilities of a future digital citizen, not only mastering core algorithms and proficiently applying AI systems, but also having critical thinking, information integration ability and ethical judgment ability,

and being good at using AI for interdisciplinary integration, improving learning efficiency and serving social needs, to become an intelligent age teenager who can master technology, lead change and promote development.

4.4.2. Encourage technological innovation and cross-border integration, and cultivate people who can identify problems, practice technology, and adapt to complex and changing environments

Teenagers should have the sensitivity to practical problems and the ability to design solutions, the practical ability to quickly transform new knowledge into innovative achievements, the comprehensive ability of continuous optimization, cross-border connection, lifelong learning and rapid iteration, and become people who are diligent in experimentation, good at creation, proactive in updating, constantly improving, and capable of efficient collaboration and transformative innovation in the AI society ^[15].

4.4.3. Advocate empathy and collaboration, and cultivate people who are emotionally stable, understanding, cooperative, and socially responsible

Teenagers should be able to recognize and regulate their own emotions, understand and respect others' viewpoints, maintain a positive mental state, have cross-cultural communication skills, be able to build trust relationships among diverse groups, construct good communication mechanisms, and become empathetic teenagers with team spirit, cultural understanding, and social responsibility.

4.4.4. Attach importance to labor awareness and practical ability, and cultivate people who love labor, have solid skills, are diligent in practice, and courageous in taking on responsibilities

Young people in the new era should be able to carry out tasks and create results in real situations, possess certain professional skills and the ability to operate intelligent tools, be able to plan their career directions and practical paths, establish labor values close to the development needs of the country, and become compound practical talents with a clear professional awareness, the courage to do hands-on work, the ability to innovate, and the courage to undertake social responsibilities.

5. Conclusion

Based on grounded theory, this study constructed a three-dimensional core literacy system of "Knowledge-Ability-Attitude and Values" for adolescents in the AI era through in-depth interviews with multiple groups in four provinces and municipalities, and clarified the specific connotations of 11 key elements. The study found that AI literacy, innovative literacy, social and emotional literacy, and labor literacy are the core priorities for responding to changes in the AI era. Future education should be guided by this system: by strengthening the ability to apply AI technology, fostering innovative and interdisciplinary thinking, consolidating the foundation of social emotions, and improving the level of intelligent labor practice, it will help adolescents build comprehensive literacy that adapts to future employment changes and lifelong development, and provide theoretical support and practical paths for cultivating new-era talents who can master technology and take responsibility.

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Create a Local Food Card and Tell a “Tasteful” China Story: Take Hainan Qing Bu Liang as an Example

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Abstract: This paper focuses on Hainan Qing Bu Liang, delving into how to create a distinctive local culinary brand and tell the “flavorful” China story. Through research on the historical origins, ingredient characteristics, production techniques, cultural connotations, and market promotion of Hainan Qing Bu Liang, this study reveals its unique charm and value. The findings indicate that Hainan Qing Bu Liang, with its abundant ingredients, distinctive production methods, and profound cultural heritage, possesses the potential to become a highly influential regional culinary brand. By innovating marketing strategies, strengthening brand building, and promoting cultural dissemination, Hainan Qing Bu Liang can better reach the national market and even the global stage, effectively telling China’s culinary stories and spreading its excellent food culture.

Keywords: Hainan Qing Bu Liang; Local specialty cuisine; Culinary landmark; China story

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1. Introduction

1.1. Research background and significance

In today’s globalized and culturally diverse world, regional specialty cuisines serve as vital carriers of local culture. More than just satisfying our taste buds, they act as dynamic windows showcasing regional heritage and preserving historical memory. Each dish embodies the unique customs, traditions, and cultural essence of its origin, serving as a vivid manifestation of local culture and emotional bonds that connect communities^[1]. Creating a distinctive local culinary identity not only helps boost regional economic development and promote tourism prosperity but also promotes local culture, strengthens national cultural confidence, and allows the world to better understand China’s rich and diverse culinary culture^[2].

Hainan Qing Bu Liang, a quintessential local delicacy in Hainan, has become a beloved choice for both locals and travelers alike with its unique flavors, diverse ingredients, and rich cultural heritage. More than just a

traditional thirst-quenching snack, it stands as a shining symbol of Hainan's culinary culture. However, the dish still faces challenges in brand development, market expansion, and cultural promotion, leaving its full potential as a regional culinary icon unrealized ^[3]. Therefore, in-depth research on Hainan's Qing Bu Liang cuisine and exploring effective approaches to establish its culinary identity hold significant practical importance for inheriting and promoting Hainan's food culture, advancing the development of Hainan's tourism industry, and telling the "flavorful" China story well.

1.2. Domestic and international research status

International research on regional specialty cuisines primarily focuses on three key areas: culinary culture, the integration of tourism with food culture, and food brand development. Scholars widely recognize the vital role of culinary traditions in fostering cultural identity and enhancing tourist appeal. Through studying distinctive dishes across different countries and regions, researchers analyze the cultural significance and social value embedded in these culinary practices. Regarding brand-building strategies, foreign studies emphasize brand positioning, communication approaches, and marketing tactics, offering valuable insights for the branding development of local specialty foods ^[4-5].

In recent years, domestic research on regional specialty cuisines has been increasing significantly, covering multiple fields such as culinary culture, culinary geography, culinary tourism, and the development of the culinary industry. Some studies delve into the origins, evolution, and development of regional specialty cuisines from a historical and cultural perspective, revealing their cultural heritage and historical value. Other research focuses on the integration of cuisine and tourism, exploring how culinary tourism can promote local economic development and cultural dissemination. In terms of culinary industry development, studies mainly concentrate on the current status, issues, and countermeasures of the culinary industry, as well as brand building and market promotion. However, research specifically targeting Hainan Qing Bu Liang (a traditional herbal cold dish) remains relatively limited, with most studies focusing on its preparation techniques and flavor characteristics. There is insufficient in-depth and systematic research on how to establish Hainan Qing Bu Liang as a culinary brand and effectively communicate the stories behind it.

1.3. Research methods and innovations

This study employs a literature review methodology, compiling extensive research on Hainan Qing Bu Liang (a traditional herbal tonic soup), regional culinary traditions, and food culture to establish theoretical foundations. Through fieldwork at local Qing Bu Liang shops, markets, and production facilities, researchers documented the preparation process, tracked ingredient sourcing and market distribution patterns, while conducting in-depth interviews with local residents and vendors to gather firsthand data. By applying case analysis techniques and referencing successful models of regional culinary branding from both domestic and international contexts, the study identifies replicable strategies for enhancing the brand recognition and market promotion of Hainan's distinctive Qing Bu Liang cuisine.

The innovation of this paper lies in placing Hainan Qing Bu Liang within the broader context of telling a "flavorful" China story, exploring how to build its culinary brand from the perspective of cultural dissemination. It not only focuses on the culinary attributes of Qing Bu Liang but also emphasizes uncovering its cultural connotations and values. Through innovative marketing strategies and cultural communication methods, Hainan Qing Bu Liang becomes an important vehicle for spreading China's culinary culture. Additionally, this paper

proposes targeted and actionable development strategies aligned with modern market demands and consumption trends, providing new approaches and methodologies for the industrialization of Hainan Qing Bu Liang.

2. Overview of Hainan Qing Bu Liang

2.1. Historical origin of Hainan Qing Bu Liang

The history of Hainan Qing Bu Liang (a traditional herbal remedy) dates back over two millennia. Legend has it that after Emperor Qin Shi Huang unified China, he dispatched generals Tu Sui and Zhao Tuo with 500,000 troops to pacify the Baiyue Kingdom in Lingnan. However, the humid climate of Lingnan caused soldiers to suffer from severe water-related illnesses and frequent outbreaks of disease, which significantly weakened their combat effectiveness^[7-9]. After research with military physicians, Zhao Tuo developed a medicinal congee using traditional ingredients like lotus seeds, lilies, radix scrophulariae, water chestnuts, Solomon's seal, Chinese yam, and coix seeds. The soldiers who consumed it saw rapid reductions in illness rates and regained combat effectiveness. Recognizing its "heat-clearing and energy-replenishing" properties, Zhao Tuo named the congee "Qing Bu Liang" (Cooling and Replenishing), ordering each soldier to consume a bowl daily. This became the precursor to Qing Bu Liang, initially serving as military provisions that played a crucial role in soldiers' health and battlefield victories.

Over time, Qing Bu Liang (a traditional Hainanese cold-nourishing dessert) gradually spread from military provisions to civilian households. Local residents continuously refined their ingredients and preparation methods based on regional climate conditions and local produce. Initially featuring a sweetened broth, the dessert evolved into a coconut milk-based version. The menu now incorporates distinctive Hainan specialties like fresh coconut flesh, coconut water, mangoes, and pineapples, creating a richer flavor profile and balanced nutrition. This culinary tradition has become a beloved snack cherished by Hainanese people^[10].

2.2. Ingredients and production process of Hainan Qing Bu Liang

Hainan Qing Bu Liang (cooling herbal soup) boasts a diverse array of ingredients, typically containing over 10 varieties and sometimes more than 20. Key components include: mung beans and red beans—rich in protein and vitamins that clear heat, detoxify, and strengthen the spleen and stomach, resulting in a tender, sweet texture when cooked; coix seeds, which help eliminate dampness and support digestion in Hainan's hot and humid climate, offering plump grains with refreshing flavors; dried sago, which becomes translucent and chewy when boiled, absorbing other ingredients aromas to enhance complexity; taro, steamed into small pieces that deliver velvety sweetness with distinctive local fragrance; glutinous rice, pre-soaked and steamed for its soft yet chewy texture that provides filling comfort; seasonal fruits like mangoes, pineapples, watermelons, and dragon fruit infused with vibrant vitality and vitamin-rich juices; along with ingredients such as pasta, jelly blocks, red dates, raisins, quail eggs, corn kernels, peanuts, lily bulbs, tremella fungus, longan pulp, and lotus seeds. Each element uniquely contributes to the soup's rich flavor profile and nutritional balance through its harmonious combination^[11].

The preparation of Hainan Qing Bu Liang appears simple but is actually quite sophisticated. Taking the traditional coconut milk version as an example, the process goes like this: First, prepare all ingredients. Soak mung beans, red beans, coix seeds, glutinous rice, and other grains for several hours before cooking them in a pot. Once cooked, drain and set aside. Clean yams and sweet potatoes, peel them, cut into small pieces, and steam until cooled. Blanch dried fish in boiling water until translucent, stirring constantly to prevent sticking. After cooling,

rinse with cold water to achieve a chewy texture. Wash fruits and cut into small chunks. Boil quail eggs until cooked, then shell them. Next, make the coconut milk. Select plump, ripe coconuts, open the shells, pour out the coconut water (some shops add coconut water to enhance the refreshing taste), remove the coconut meat, cut into small pieces, and blend with an appropriate amount of water (or coconut water). After blending, strain through a gauze cloth to remove the residue, yielding smooth and creamy fresh coconut milk. Some shops may add a small amount of sugar or condensed milk for flavoring. Finally, assemble the Qing Bu Liang. Place it in a clean bowl, add all ingredients according to preference, then pour in fresh coconut milk until fully covered. For a richer texture, you can also mix in some ice cream or shaved ice ^[12].

2.3. Taste classification and characteristics of Hainan Qing Bu Liang

There are many common flavors of Hainan Qing Bu Liang, such as coconut milk Qing Bu Liang, coconut water Qing Bu Liang, sugar water Qing Bu Liang, fried ice Qing Bu Liang, and ice cream Qing Bu Liang. Each flavor has its own unique characteristics.

Coconut milk's refreshing and cooling flavor stands as one of the most popular and beloved tastes. Built on a rich, velvety coconut milk base, it harmoniously blends the sweet essence with diverse ingredients, creating a fragrant, silky-smooth experience. The fresh coconut milk infuses this drink with a distinctive island-inspired flavor, transporting drinkers to tropical paradises where coconut groves and sandy beaches come alive, immersing them in the vibrant rhythm of tropical vibes.

Coconut water serves as the refreshing base, offering a sweet and tangy taste that highlights the coconut's natural essence. Packed with minerals and vitamins, it effectively cools the body and quenches thirst during hot summer days. A bowl of this refreshing drink instantly brings relief from heat and thirst, leaving one feeling both cool and rejuvenated.

Sweet and Refreshing Cold Nourishment is a traditional flavor of Qing Bu Liang (Cold Nourishing Soup), featuring a broth made from brown sugar water or white sugar water. This version delivers a richly sweet taste where the sweetness of the syrup harmonizes with the flavors of its ingredients, allowing diners to savor the timeless essence of traditional Chinese cuisine.

Hot Ice Qing Bu Liang (a traditional cooling tonic drink) has been innovatively upgraded. Blending coconut milk or other juices with various ingredients in a blender creates a smooth, velvety ice cream-like texture that delivers refreshing coolness. Combining the rich flavor of traditional cooling tonics with the unique mouthfeel of smoothies, this creation has become a crowd favorite among young consumers.

Ice Cream Qing Bu Liang (a traditional Chinese herbal tonic) combines ice cream with herbal cooling properties. The preparation involves placing various ingredients in a bowl, then topping it with scoops of chilled ice cream. The sweet essence of ice cream interacts with the refreshing properties of Qing Bu Liang, creating a unique sensory experience that delivers a dual delight of sweetness and herbal refreshment.

3. The cultural connotation of Hainan Qing Bu Liang

3.1. Integration of Hainan Qing Bu Liang with Hainan regional culture

Hainan Qing Bu Liang, deeply rooted in the region's cultural heritage, embodies the wisdom of the Hainanese people. Located in a tropical zone with a hot and humid climate, this traditional cooling food effectively addresses heatstroke prevention and summer relief needs. More than just a culinary delight, Qing Bu Liang represents a

distinctive lifestyle that helps locals cope with the intense heat ^[13].

Along the streets of Hainan, Qing Bu Liang stalls dotting every corner can be found. These humble setups typically feature just a few tables, an ice cabinet stocked with ingredients, and a busy vendor — creating a unique urban landscape. On summer evenings, locals flock to these stalls, ordering their favorite Qing Bu Liang bowls. They sit amidst the cool breeze, savoring the refreshing drink while beaming with contentment. Here, Qing Bu Liang transcends being a mere snack; it is a social hotspot where people gather to share meals and chat about life, radiating authentic island vibes. As a cultural symbol of Hainan, Qing Bu Liang embodies the locals' laid-back lifestyle and warm hospitality, showcasing their optimistic spirit and hospitality that defines their island heritage.

3.2. Folk customs and traditions behind Hainan Qing Bu Liang

Throughout its long evolution, Hainan Qing Bu Liang has become deeply intertwined with the region's folk traditions. This traditional drink plays a vital role in major festivals and celebrations. During the Spring Festival, families gather for reunion dinners where they enjoy not only sumptuous New Year's Eve feasts but also a bowl of Qing Bu Liang, symbolizing the cleansing of internal heat and vitality for the new year. Similarly, during the Dragon Boat Festival, while enjoying zongzi (sticky rice dumplings) and dragon boat races, people consume this refreshing drink to dispel summer's sweltering heat.

Furthermore, Qing Bu Liang (a traditional Hainanese dish) holds deep cultural significance tied to the island's wedding customs. In Hainan, when a groom visits his prospective bride's family to propose, the bride's household prepares this dish as a welcoming gesture. If the groom finds her attractive, he will finish the dish in one sitting; if not, he might just take a symbolic bite. This unique tradition has given Qing Bu Liang a special cultural meaning, making it a heartfelt way to convey affection and express intentions.

3.3. Health preservation concept embodied in Hainan Qing Bu Liang

The ingredients selected by Hainan Qing Bu Liang mostly possess certain medicinal value and health-preserving effects, reflecting the traditional Chinese health preservation philosophy. Ingredients such as mung beans and coix seeds have the functions of clearing heat, detoxifying, removing dampness, and promoting diuresis, effectively alleviating summer heat and dampness; ingredients like lily bulbs and tremella fungus have the benefits of moistening the lungs, relieving coughs, and enhancing skin beauty; while ingredients including red dates and longan meat can nourish qi and blood, strengthen the spleen, and benefit the stomach. When combined, these ingredients not only offer a rich flavor profile but also provide balanced nutrition, supplying the body with essential nutrients to achieve health-preserving effects such as clearing heat, relieving summer heat, strengthening the spleen, and boosting energy, nourishing yin, and replenishing kidney essence ^[14].

In today's health-conscious society, people increasingly prioritize balanced diets. Hainan Qing Bu Liang (a traditional herbal tonic) has gained popularity for its natural ingredients and unique health benefits, perfectly aligning with modern consumers' pursuit of wholesome indulgence. More than just a tasty snack, this wellness-focused delicacy offers a perfect balance between culinary enjoyment and holistic nourishment — allowing people to enjoy delicious meals while achieving their health goals.

4. Strategies for building the food name card of Hainan Qing Bu Liang

4.1. Brand building and positioning

To establish Hainan Qing Bu Liang as a culinary icon, the priority lies in strengthening brand development and

strategic positioning. This requires clearly defining the brand's core values while highlighting its distinctive regional cultural identity, diverse ingredients, and holistic wellness philosophy ^[15]. People can create distinctive brand identities showcasing Hainan's unique elements like coconut trees, ocean waves, and sandy beaches, embodying the tropical charm of Hainan's refreshing "Qing Bu Liang" (cooling tradition). Simultaneously, people should focus on building a cohesive brand image through standardized store decor, packaging designs, and service protocols to enhance brand recognition and reputation ^[16].

In brand positioning, it is crucial to segment and target different consumer groups. For instance, for local residents, people can emphasize the emotional value and nostalgic memories of Qing Bu Liang as a traditional delicacy, building an approachable and affordable brand image. For tourists, highlight its regional characteristics and commemorative significance, positioning it as a representative culinary experience in Hainan tourism. For health-conscious consumers, emphasize its healthy ingredients and wellness benefits, positioning it as a premium health-focused gourmet. Through precise brand positioning that caters to diverse consumer needs, brands can enhance their market competitiveness ^[17].

4.2. Product innovation and quality improvement

While preserving Hainan's traditional Qing Bu Liang flavor, continuous product innovation should be pursued to meet modern consumers' taste preferences and consumption trends. By integrating contemporary culinary concepts and technologies, new flavors and varieties can be developed. For instance, introducing low-sugar and low-fat versions of Qing Bu Liang catfish soup to cater to health-conscious consumers, or creating creative combo flavors like chocolate Qing Bu Liang and matcha Qing Bu Liang to attract younger demographics. Additionally, blending Qing Bu Liang with other Hainan specialties could create innovative experiences such as Qing Bu Liang cakes and Qing Bu Liang ice cream.

Quality is the lifeblood of a brand, and enhancing the quality of Hainan Qing Bu Liang is crucial. People must strictly control ingredient procurement channels to ensure freshness and safety. Establish standardized production processes and quality control systems to regulate Qing Bu Liang's preparation techniques, guaranteeing every bowl meets uniform standards in taste and quality. Strengthen staff training to improve production skills and service standards, delivering premium products and services to consumers ^[18].

4.3. Marketing and promotion strategy

Using social media platforms for online promotion is one of the key marketing strategies today. Platforms such as TikTok, Xiaohongshu, and Weibo can be utilized to publish the production process, food images, and videos of Hainan Qing Bu Liang, share its cultural stories and culinary experiences, attracting user attention and sharing. Inviting food bloggers and influencers to explore and check in at stores can leverage their influence and fan base to enhance the visibility and reputation of Qing Bu Liang. Conducting online interactive activities like food contests and lotteries can increase user engagement and retention ^[19].

Hosting food festivals and cultural events can effectively showcase the unique charm of Hainan's Qing Bu Liang cuisine, attracting more consumers. Local Hainan could host a Qing Bu Liang Food Festival, inviting vendors from across the region to display diverse flavors and specialties. The event would include culinary competitions and cultural exhibitions to create a vibrant food culture atmosphere. Furthermore, integrating Qing Bu Liang promotion with Hainan's tourism festivals, folk celebrations, and other popular events would leverage these platforms' visibility to boost the popularity of Hainan's traditional delicacy.

Enhance collaboration with the tourism industry by integrating Hainan Qing Bu Liang (traditional herbal tonic) into travel itineraries and culinary recommendations. Establish dedicated stores or kiosks for Qing Bu Liang at tourist attractions, hotels, airports, and other locations to facilitate purchases and tastings. Offer hands-on workshops where visitors can experience the preparation process and cultural significance of Qing Bu Liang firsthand, adding fun and interactivity to their travels. By blending tourism with culinary culture, people aim to boost Qing Bu Liang's visibility and influence, making it a shining hallmark of Hainan's tourism offerings^[20].

5. The practice and prospect of Hainan Qing Bu Liang to tell China's story well

5.1. The dissemination status of Hainan Qing Bu Liang at home and abroad

With the development of Hainan's tourism and increasingly frequent international exchanges, Hainan Qing Bu Liang has gradually expanded beyond Hainan to reach the whole country and even the world. In Hainan-themed restaurants and dessert shops across major Chinese cities, Qing Bu Liang can often be seen, as more and more people begin to learn about and savor this distinctive culinary delicacy from Hainan. Abroad, in Chinese communities and international food festivals, Hainan Qing Bu Liang has also garnered attention and affection. Many foreign friends, after tasting Qing Bu Liang, have praised its unique flavor and rich cultural connotations, making Hainan Qing Bu Liang a messenger spreading China's culinary culture.

However, Hainan Qing Bu Liang currently faces limitations in its global reach. Its popularity remains concentrated in tourist cities and Chinese communities, with room for greater recognition and cultural impact. The cultural significance behind Qing Bu Liang has not been sufficiently explored or promoted, leading many consumers to view it merely as a dessert without fully appreciating its profound cultural heritage.

5.2. How to tell a “flavorful” China story in Hainan Qing Bu Liang

To tell the “flavorful” stories of China through Hainan Qing Bu Liang, people must start by exploring and disseminating its cultural connotations. By promoting the historical origins of Qing Bu Liang, its integration with Hainan's regional culture, and the folk traditions behind it, consumers can understand that Qing Bu Liang is not merely a delicacy but also a carrier of traditional Chinese culture. People can produce promotional documentaries and cultural books to detail the cultural narratives of Qing Bu Liang, spreading them through various channels.

In international communication, it is crucial to consider cultural differences and audience needs while adopting globalized expressions and communication methods. By blending Qing Bu Liang's cultural elements with international pop culture, people can create visually appealing promotional posters and videos to promote through global social media platforms and tourism marketing channels.

6. Conclusion

As a representative delicacy of the free trade port, Hainan Qing Bu Liang is not only a microcosm of regional culinary culture but also a vibrant medium for telling China's story. With coconut milk as its base and complemented by over ten ingredients, including red beans, taro balls, and jelly, it preserves the traditional health wisdom of “clearing heat and relieving summer heat” while integrating the distinctive local products of tropical islands, becoming a taste symbol of Hainan's “slow life” culture. In recent years, Hainan has upgraded Qing Bu Liang from street snacks to a cultural icon through standardized production, youthful innovation, and scenario-based communication: establishing ingredient ratios and production standards to ensure quality stability;

introducing new flavors such as coconut-flavored Qing Bu Liang and ice cream Qing Bu Liang to meet the needs of young consumers; integrating tourism scenarios by setting up specialty stores in duty-free shops and scenic areas, and showcasing the “freshly made and sold” process through short video platforms, allowing tourists to experience Hainan’s charm through tasting.

In the future, it is possible to further explore the “coconut culture” and “health preservation culture” behind Qing Bu Liang, develop souvenirs and cultural products, promote its nationwide and overseas expansion, and use “small delicacies” to carry “great culture”, enabling the world to understand China’s regional characteristics and life wisdom through culinary experiences.

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Exploring the Music Psychology in the Aria “A Peach Blossom” from the Opera “Farewell to Cambridge”

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Abstract: This paper explores the music psychology behind the vocal performance of Lin Huiyin, the core character in China’s first Chamber opera “Farewell to Cambridge”, with a focus on analyzing Lin Huiyin’s aria “A Peach Blossom.” Lin Huiyin, portrayed by the renowned Chinese singer Lei Jia, serves as an entry point for an in-depth exploration of the psychological dimensions of opera music. Utilizing music psychology as the theoretical framework, this study interprets the emotional expression and psychological connotations behind the performance from the perspectives of musical characteristics such as melodic progression, rhythmic variation, and musical expression. The research reveals that musical features are closely related to character psychology and audience aesthetic experience. Music can accurately convey the inner world of characters and evoke emotional resonance in the audience. This study not only enriches the theoretical content of opera music psychology but also provides psychological references for opera performance practice, thereby enhancing the expressiveness and appeal of opera art.

Keywords: Music psychology; Vocal performance; Emotional expression; Musical expression

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1. Introduction

Music psychology is a science that applies psychological methods and theories to study the interrelationships between music and various psychological phenomena in humans, while also exploring their underlying principles^[1]. Its scope is wide-ranging, encompassing music perception, cognition, emotional response, creative psychology, performance psychology, and the psychology of musical appreciation^[1]. The music psychology emphasizes the interaction between music and human psychology. Music can evoke emotions and influence psychological states, which in turn shape perception and understanding of music^[2]. In 1883, the British music psychologist Percival Buckley published *The Psychology of Musicians*, a seminal work that drew upon psychology, physiology, physics, genetics, anthropology, and aesthetics. Employing experimental psychological methods, Buckley explored

auditory perception, memory, musical imagination, skill development, and the psychological states associated with performance. His research suggested that mental states directly influence the effectiveness of musical performance^[3].

This article takes the musical expression of Lin Huiyin, a character in the Chinese chamber music “Farewell to Cambridge”, as the research object, with Lin Huiyin’s aria “A Peach Blossom” as the case study. The author analyzes the musical expression characteristics of the aria “A Peach Blossom” from the perspective of music psychology. Using music psychology as the theoretical framework, the author interprets the emotional expression and psychological connotation behind the performance from the perspectives of melodic progression, rhythmic variation, and emotional expression, providing psychological references for opera performance practice, thereby enhancing the expressiveness and appeal of opera art.

2. Statement of problem

Applying the principles of music psychology to enhance artistic expression in opera singing presents a valuable research opportunity. This study takes the aria of Lin Huiyin from the Chinese chamber opera Farewell to Cambridge as a case study to explore the application and significance of music psychology in vocal performance.

The research is guided by the following questions:

- 1) In what specific ways are the principles of music psychology reflected in the singing techniques and performance outcomes of A Peach Blossom of Lin Huiyin in Farewell to Cambridge?
- 2) How can psychological knowledge be applied to enhance artistic expression and overall effectiveness in vocal performance, with particular reference to Lin Huiyin’s interpretation of Farewell to Cambridge?

3. Synopsis of the opera “Farewell to Cambridge”

The chamber opera “Farewell to Cambridge” is widely recognized as China’s first chamber opera, written by Chen Wei and composed by Zhou Xueshi. The title of the opera, “Farewell to Cambridge”, is derived from a poem of the same name by the renowned Chinese poet Xu Zhimo. The opera primarily tells the love story of Lin Huiyin, a famous Chinese female architect, depicting the emotional bonds and friendship among a group of patriotic youths during China’s turbulent period. The opera premiered at the Beijing People’s Art Theatre on December 1, 2001, with Lei Jia, a renowned Chinese singer, portraying Lin Huiyin. In his music review article “Let Poetic Sentiment and Love Fluctuate in Polyphony: Zhou Xueshi and His Little Theater Opera ‘Farewell to Cambridge’”, Qian Renping mentioned: “On December 5, 2001, the first report about the opera published in the 44th issue of Music Weekly pointed out that ‘Farewell to Cambridge’ was indeed the first chamber opera performed on the domestic stage”^[4]. Since its premiere, the opera has been deeply loved by Chinese audiences, with the character of Lin Huiyin particularly gaining popularity. Lin Huiyin’s aria “A Peach Blossom” has been used as a teaching piece by vocal teachers in many colleges and universities. Reflecting on the music composition process, Qian Renping noted, “On December 5, 2001, the first report about the play published in the 44th issue of Music Weekly stated that Farewell to Cambridge was indeed the first chamber opera performed on the domestic stage”^[4].

Professor Peng Zhimin from Wuhan Conservatory of Music commented on the opera in his paper Exploring, Choosing, and Thinking: A Brief Discussion on the Music Creation of the Chamber Opera Farewell to Cambridge^[5]. The intellectuals of the 1920s and 1930s in China seemed to possess broad and profound inner sentiment and a transcendent personality charm. They possess knowledge and artistic talent from both Chinese and Western cultures, setting a high-quality example for modern people. They are romantic and elegant, cherish

friendship, and advocate love. These examples and aspirations are real, and their pursuit of them has gained widespread recognition and high universality.”

The opera “Farewell to Cambridge” is a chamber music. Compared to grand opera, chamber opera features fewer actors, a smaller stage, simpler stage design, and no distance between the audience and the actors. Regarding chamber opera, Professor Peng Zhimin from Wuhan Conservatory of Music stated in his paper Exploring, Choosing, and Thinking: A Brief Discussion on the Music Creation of the Chamber Opera Farewell to Cambridge that chamber opera is an opera style that emerged in the first half of the 20th century^[5]. Compared with traditional grand opera, chamber opera is relatively small and flexible in scale and performance style^[5].

4. The application of music psychology in the musical expression of the aria “A Peach Blossom”

The lyrics of A Peach Blossom are taken from Lin Huiyin’s poem of the same name and set to music by composer Zhou Xueshi. The aria appears in the fifth act of the opera. In this scene, Lin Huiyin, having contracted pneumonia from overwork, is recuperating in Xiangshan, Beijing, when Xu Zhimo comes to visit. Reflecting on her time at Cambridge, Lin Huiyin channels her emotions into the poem, which is expressed on stage through her passionate singing, conveying both her personal sentiment and artistic elegance.

The first half of the poem emphasizes the static beauty of peach blossoms, while the second half highlights their dynamic beauty, metaphorically portraying the shy posture of a young girl. The lyrics capture her inner emotions through expressions such as “the crimson of a tree”, “the delicate beauty of dew”, and “the longing of life.”

The song A Peach Blossom follows a two-part structure, divided into sections A and B. Section A is recitative, and section B is an aria.

From the perspective of music psychology, the musical expression of the character Lin Huiyin in the opera Farewell to Cambridge can be analyzed along four dimensions: Timbre and Personality Attribution, Melodic Emotional Induction, Text Setting and Schemata Activation, and Performance and Empathy Pathways. The following is a detailed analysis of the first dimension:

4.1. Text setting and schemata activation

In Lin Huiyin’s singing, the repetitive structure of the lyrics strengthens the audience’s memory. For example, the song A Peach Blossom is based on Lin Huiyin’s own poem of the same name, which many viewers are familiar with before watching the opera Farewell to Cambridge. When performed, the song evokes the audience’s prior memories of the poem, enhancing emotional engagement. Employ the psychological principle of auditory memory rehearsal to reinforce understanding of the character. American psychologist Ulric Neisser explains: “Echoic memory rehearsal refers to the process of maintaining or transferring auditory information in echoic memory to higher-level memory systems (such as working memory or long-term memory) through active repetition. Its core function is to maintain auditory information, support working memory, promote understanding and learning, and enhance long-term memory”^[6].

4.2. Melodic emotional induction

Linear melody and reduced cognitive load: The first line of the song goes, “桃花 (Tao Hua), 桃花 (Tao Hua), 那一树的嫣红, 像是春说的一句话 (Na Yi Shu De Yan Hong, Xiang Shi Chun Shuo De Yi Ju Hua)” (**Figure 1**). When Le Jia sings it, her voice is loud and steady, carrying a narrative quality of sharing beautiful scenery with friends,

without excessive emotional embellishment. In this section, the melody and pitch gradually progress upwards.



Figure 1. The A section of “A Peach Blossom” (13th bar–16th bar)

Note: The meaning of the lyrics: Peach blossoms, ah peach blossoms, that tree of rosy red is like a sentence spoken by spring

In the 18th measure, “朵朵露凝的娇艳，是一些玲珑的字眼 (Duo Duo Lu Ning De JjiaoYan, Shi Yi Xie Lling Long De Zi Yan)” (**Figure 2**), the accompaniment music begins to fluctuate, enriching Lin Huiyin’s musical portrayal. Le Jia adopts an open yet controllable tone, vividly expressing the emotional fluctuations of the character through octave jumps, elevating the atmosphere to a new climax. There is a brief pause in this phrase, but the continuity and smoothness of her breathing are carefully maintained. The melody line in this section is simple, and the emotional expression is direct. David Huron, a musicologist and psychologist at Ohio State University, notes in his 2006 book *Sweet Anticipation: Music and the Psychology of Expectation* that “listeners predict stepwise melodies more accurately, resulting in a pleasurable ‘prediction effect’ and reduced cognitive stress”^[7]. This progressive melodic direction makes the musical expression of Lin Huiyin’s character more easily accepted by the audience.



Figure 2. The A section of “A Peach Blossom” (17th bar–20th bar)

Note: The meaning of the lyrics: Each petal of dew-kissed beauty is a delicate word

Creating “Expectation—Solution” through rubato: Music’s emotional power often arises not merely from sounds themselves but from the interplay between expectation and reality. David Huron emphasizes: “It is in the violation, fulfillment, or deferral of expectations that music gains its affective potency”^[7]. In the song *A Peach Blossom*, in the singing of the B section, Lei Jia employed fast inhalation and slow, restrained exhalation to achieve precise breath control. For instance, the opening word “看 (Kan)” required a stronger breath to support the changes in intensity, ensuring clarity and projection. In contrast, the final line, “一瞥、一瞥、一瞥多情的痕迹 (Yi Pie Yi Pie Yi Pie Duo Qing De Hen Ji)” (**Figure 3**), demanded a much softer vocal delivery, which is technically more challenging to master. Lei Jia handled this transition with remarkable finesse, maintaining both stability and expressiveness. Her nuanced control not only conveyed the delicate emotions of Lin Huiyin but also elevated the overall dramatic impact of the aria, allowing the character’s inner world to resonate profoundly with the audience.



Figure 3. The B section of “A Peach Blossom” (27th bar–33rd bar)

Note: The meaning of the lyrics: Look, that quiver in the breeze, she left a faint trace on the thin lips of March, a glimpse of love. Look, that quiver in the wind, she left a faint trace on the thin lips of March, a glimpse, a glimpse, a glimpse of love

4.3. Timbre and personality attribution

Advantages of high-frequency overtones: In the opera “Farewell to Cambridge”, Lin Huiyin is portrayed by Lei Jia, a renowned Chinese soprano. According to a Baidu search, Lei Jia is hailed as a leading figure in Chinese national vocal music, with a bright and clear tone. In a 2007 paper Research on the Characteristics of Singer Resonance Peaks in Bel Canto and Ethnic Singing Techniques, Chinese vocal educator Yu Shanying noted that “singer resonance peaks” are commonly present in the voices of excellent ethnic singing technique performers^[8]. For sopranos, the resonance peak occurs around 2,900 Hz, while the bass intensity is approximately 500 Hz. The overall sound intensity reaches about 78 dB, producing a tone that is clear, round, pure, and beautiful. This bright timbre naturally triggers pleasurable associations in the audience. As Patrik N. Juslin and John A. Sloboda point out in Handbook of Music and Emotion, “bright, resonant tones are more likely to trigger feelings of happiness or excitement”^[9].

4.4. Performance and empathy pathways

The opera Farewell to Cambridge is a chamber opera, performed in a small venue with closely connected viewing areas. In an intimate setting, spectators can clearly perceive the subtle facial expressions and body language of the singers during performance. Yang Chennan of the Yunnan Academy of Arts notes in his paper A Brief Analysis of the Relationship between Watching and Performing in Chamber Operas that the “homogenization” of the viewing area in small theaters brings the audience closer to the performers, enhancing direct communication, increasing intimacy, and facilitating mutual influence between actors and audience^[10]. This proximity makes it easier for viewers to develop emotional empathy for the characters in the drama.

5. Conclusion

Opera is a comprehensive art form that demands not only excellent vocal skills from performers but also a

profound understanding of the inner world of characters to convey rich emotions. The research reveals that musical features are closely related to character psychology and audience aesthetic experience. Music psychology is a relatively new yet highly valuable discipline. Active study of this field helps address many challenges encountered in learning vocal techniques and in musical performance, thereby making both learning and practice more efficient while fostering healthy habits of vocal study and musical thinking. Music psychology provides scientific theoretical guidance for opera interpretation. By applying the principles and methods of music psychology, singers can better understand the psychological state of characters, grasp the correspondence between music and emotion, and thus express the emotions of characters more accurately during performance. Furthermore, music psychology also aids singers in analyzing the aesthetic psychology of the audience, adjusting their performance style according to the audience's needs and expectations, and enhancing the relevance and appeal of their performance.

Disclosure statement

The author declares no conflict of interest.

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Research on the Influence of Tourists' Perceived Restorativeness of the Western Sichuan Music Linpan on Post-Visit Behavioral Intentions: The Mediating Effect of Place Attachment

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Abstract: Grounded in the “Cognitive-Affect-Behavior” (CAB) theoretical framework, this study constructs a multiple mediation model to systematically investigate the impact mechanism of tourists' restorative environment perception on post-visit behavioral intentions within rural tourism contexts. The empirical findings reveal: (1) The ecological and cultural attributes of the Linpan landscape demonstrate notable psychological resource restoration efficacy; (2) Place identity functions as the “emotional nexus” shaping tourists' behavioral intentions; (3) Mediation effect analysis identifies a “functional-affective transformation threshold” in the transmission of restorative effects.

Keywords: Perceived restorativeness; Place attachment; Post-visit behavioral intentions

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1. Introduction

1.1. Research background

Currently, rural tourism has not only become a crucial engine for implementing the rural revitalization strategy but, leveraging its natural ecological foundation, local cultural heritage, and slow-living characteristics, has increasingly evolved into a vital space for urban residents to alleviate stress and restore physical and mental balance. Notably, against the backdrop of deepening cultural and tourism integration, how to stimulate tourists' revisit intention and recommendation behavior by optimizing environmental perception quality has become a core issue for enhancing the quality and efficiency of rural tourism.

With the acceleration of urbanization and the ubiquity of digital technology in modern society, urban populations commonly face the dual predicaments of “attention overload” and “psychological resource depletion.” In this context, restorative environment theory has gradually emerged as a frontier area in environmental

psychology and tourism research. However, existing studies are largely confined to settings such as urban parks and natural landscapes, with a systematic understanding of the transmission mechanisms within the specific context of rural tourism yet to be formed ^[1].

This paper aims to reveal the functional relationships of different dimensions of place attachment in the transmission of restorative effects by constructing a multiple mediation model, thereby providing feasible solutions for product design and tourist behavior management in rural tourism destinations.

1.2. Research significance

First, by introducing the PRS-11 scale into Chinese rural tourism research, the study expands the explanatory boundaries of restorative environment theory within rural spatial contexts.

Second, by validating the chain mediation effect of place dependence and place identity, the research reveals the distinct roles of different dimensions of place attachment in the transmission process.

Third, based on the “cognitive-affective-behavioral” theoretical framework, it elucidates the formation mechanism of rural tourists’ behavioral intentions, providing theoretical support for rural tourism destination management and sustainable development.

2. Literature review and theoretical foundation

2.1. Perceived restorativeness of environments

In the mid-19th century, Frederick Law Olmsted, an expert in the American landscape design field, observed that residents experienced emotional regulation and stress buffering effects after prolonged exposure to natural environments, thus pioneering the concept of “restoration” ^[2]. Kaplan et al. (1989) further developed the Attention Restoration Theory (ART) based on this, positing that prolonged use of directed attention leads to fatigue, and natural environments possessing “restorative” qualities can facilitate the recovery of such attention ^[3].

In tourism research, Pasini et al. (2014) developed a simplified version of the perceived restorativeness scale, the RPS-11, comprising four dimensions: Fascination, Being-Away, Coherence, and Scope ^[4]. Therefore, this study adopts Pasini’s scale to measure tourists’ perceived restorativeness of environments.

2.2. Post-visit behavioral intentions

The concept of behavioral intention originated in behavioral science and social psychology and has gradually been applied in tourism research. Chew et al. (2014) defined tourists’ post-visit behavioral intentions as their inclination towards future actions at the conclusion of a trip, encompassing three dimensions: revisit intention, recommendation intention, and preference intention ^[5].

Scholars domestically and internationally have explored the influence of various factors on post-visit behavioral intentions across different tourism contexts. For instance, Pedro et al. (2019) found that tourism services exerted the strongest influence on tourists’ behavioral intentions ^[6]. Liu Li et al. (2011) found that Korean tourists’ satisfaction with Jiuhua Mountain positively influenced their revisit intention ^[7].

2.3. Theoretical foundation

The Cognitive-Affect-Behavior (CAB) model, initially proposed by Holbrook, is widely applied in environmental psychology and behavioral science to describe the process from consumer cognition to behavior ^[8]. The generation mechanism of post-visit behavioral intentions follows the progressive logic of cognitive development, exhibiting

characteristics of “person-place” emotional evolution in the vertical dimension ^[9]. Within this study’s framework, perceived restorativeness constitutes the cognitive dimension, representing the individual’s assessment system of the environment’s restorative efficacy; place attachment represents the affective dimension, characterizing the emotional bond formed between tourists and the setting; and post-visit behavioral intentions constitute the behavioral dimension, reflecting the individual’s behavioral tendencies in a specific context.

3. Research design

3.1. Research hypotheses

3.1.1. Perceived restorativeness and post-visit behavioral intentions

Current research directly linking perceived restorativeness and post-visit behavioral intentions is limited. However, recent studies suggest a significant relationship. For example, Pasanen et al. (2018) empirically demonstrated that tourists in restorative environments showed enhanced cognitive functions, with creativity and altruistic behavior exhibiting significant improvement ^[9]. Consequently, the following hypothesis is proposed:

H1: Perceived restorativeness has a significant positive impact on post-visit behavioral intentions.

3.1.2. Perceived restorativeness and place attachment

Accelerated urbanization has led to a diminishing sense of place, bringing the conflict in human-place relationships into sharper focus. Place attachment, describing the emotional bond between people and specific environments, was first proposed by Shumaker in 1983 ^[10]. This concept is often divided into two core dimensions: place dependence and place identity.

Post-2010, Chinese scholars began integrating place attachment into the research framework of perceived restorativeness ^[11]. Furthermore, as related research deepened, the relationship between the two has been partially confirmed by scholars ^[12]. Therefore, the following hypotheses are proposed:

H2: Perceived restorativeness has a significant positive impact on place dependence.

H3: Perceived restorativeness has a significant positive impact on place identity.

3.1.3. Place attachment and post-visit behavioral intentions

When a tourism setting forms deep functional and spiritual dependence with tourists, this emotional interaction constructs a mechanism of place identity, subsequently influencing the occurrence of behavioral intentions ^[13]. Previous research indicates that place attachment not only influences tourist loyalty and satisfaction, but findings from multiple scholars also show that place attachment stimulates individuals’ behavioral intentions to visit ^[9, 14–15]. Therefore, the following hypotheses are proposed:

H4: Place dependence has a significant positive impact on post-visit behavioral intentions.

H5: Place identity has a significant positive impact on post-visit behavioral intentions.

Place dependence reflects the rural tourists’ level of reliance on the material and non-material aspects of the destination. When rural tourists exhibit a high degree of dependence on a rural tourism destination, they tend to gain a deeper understanding and integration into the local social environment. This deeper connection influences their sense of identity with the place. Hence, this study also proposes:

H6: Place dependence has a significant positive impact on place identity.

3.1.4. Mediating effect of place attachment

The mediating effect of place attachment is a crucial topic in place theory research ^[16]. Current research has focused on the relationship between place attachment and perceived restorativeness, as well as post-visit behavioral intentions. Furthermore, research by multiple scholars has found that place attachment can directly, as an internal factor, positively influence tourists' behavioral intentions ^[9, 17]. Therefore, the following hypotheses are proposed:

H7: Place dependence plays a mediating role in the model.

H8: Place identity plays a mediating role in the model.

H9: Place dependence and place identity play a chain mediating role in the model.

3.2. Questionnaire design and data collection

Data was primarily collected through questionnaires comprising two parts. Part one measured core variables: Perceived restorativeness included 11 measurement items, mainly adapted from Pasini's (2014) Perceived Restorativeness Scale (RPS-11) ^[4]; Measurement of place attachment primarily drew on Zhang Hui's (2022) scale, comprising 8 items ^[18]; Measurement of post-visit behavioral intentions mainly utilized Huang Jie's (2022) scale, comprising 4 items ^[19]. Part two measured demographic information to examine individual characteristics across different populations, comprising 5 items.

4. Data analysis

4.1. Descriptive statistical analysis

Analysis showed that female respondents predominated (59.5%). In terms of age composition, young tourists aged 25–44 accounted for 60.10%. Regarding education, bachelor's and associate degrees constituted 63.0%. Occupations were mainly freelancers and enterprise employees (63.3%). Monthly income mostly ranged from 3001 to 9000 RMB (67.6%).

4.2. Reliability and validity analysis

Reliability was assessed using Cronbach's alpha coefficient. A coefficient greater than 0.7 indicates good questionnaire quality ^[19]. The coefficients for the latent variables in this study ranged from 0.73 to 0.93, indicating good reliability.

Following Wu Minglong's (2017) recommendations, the standardized factor loadings of the latent variable items were all above the reference standard, ranging from 0.73 to 0.95 ^[20]; Composite Reliability (CR) values ranged from 0.88 to 0.95, and Average Variance Extracted (AVE) ranged from 0.75 to 0.86, meeting reference standards and indicating good convergent validity. The square roots of the AVE values ranged from 0.86 to 0.93, all greater than the corresponding cross-variable correlation coefficients, indicating good discriminant validity.

4.3. Hypothesis testing

The model fit indices (CMIN/DF=2.99, RMSEA=0.08, IFI=0.92, TLI=0.91, CFI=0.92) all met the standards, indicating good model fit, allowing for hypothesis testing.

Hypotheses H1–H6 were tested first. Except for H4 ($P > 0.05$, not significant), all other hypotheses were significant.

To examine the mediating effects of place attachment (H7–H9), AMOS software was used for validation.

The results showed that the confidence intervals for H8 and H9 did not include the critical value 0, confirming the existence of indirect effects and supporting these hypotheses.

5. Conclusion and suggestions

5.1. Conclusions

This study primarily yields the following conclusions:

First, the Western Sichuan Music Linpan, characterized by its ecological and cultural attributes, demonstrates significant psychological resource restoration efficacy. It creates a favorable restorative environment for rural tourists, thereby fostering high levels of place attachment.

Second, place identity constitutes the “emotional nexus” shaping tourists’ behavioral intentions and decisions. This finding reveals that the behavioral intentions of rural tourists are essentially driven by symbolic value identification rather than simply fulfilling functional utility.

Third, a “functional-affective transformation threshold” exists in the transmission of restorative effects. The results indicate that the restorative effects can only be effectively translated into tourists’ behavioral intentions when the functional support provided by the Western Sichuan Music Linpan rural tourism environment reaches this critical point for emotional transformation.

5.2. Research limitations and future directions

Limited by the author’s capabilities, this study has the following shortcomings: First, the sample coverage is limited, unable to fully reflect perception differences among tourists of different age groups, income levels, or cultural backgrounds. Second, the depth of model testing is insufficient. Although this study examined the impact mechanism of perceived restorativeness on place attachment and post-visit behavioral intentions, it did not delve into specific sub-dimensions.

Disclosure statement

The authors declare no conflict of interest.

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Three Logical Implications of the Spirit of the Educator

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Abstract: The educator ethos of the new era has emerged through three key processes: being rooted in China's rich cultural heritage, drawing from Marxist theoretical essence, and serving the national goal of building an "educational powerhouse." Teachers are both the driving force and the key to realizing this vision. Their teaching attitudes, methodologies, and professional responsibilities directly determine whether this educational ambition can be achieved. Ultimately, educators' competencies and qualities stem from proper ideological guidance. Therefore, studying the emergence logic of educator ethos in contemporary China, exploring its profound connotations, and extracting its modern relevance to cultivate today's educators constitute essential research topics for advancing the "educational powerhouse" strategic goal during China's modernization process.

Keywords: Educator spirit; Exit logic; Rich connotation; Contemporary value

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1. Introduction

In September 2023, President of the CPC first proposed the "educator's spirit" in his letter to outstanding teachers nationwide, outlining it as embodying "the ideal of serving the nation with a broad-minded vision and sincere dedication, the moral integrity of setting examples through words and actions, the pedagogical wisdom of enlightening minds and teaching according to individual aptitude, the scholarly attitude of diligent learning and innovative practice, the compassionate heart of loving students and dedicating oneself, and the grand pursuit of cultural edification through global vision" ^[1]. He provided profound and scientific explanations regarding the rich connotations, contemporary value, practical demands, and implementation requirements of this educator's spirit. The educator's spirit is not spontaneously formed. Instead, it has gradually developed by being rooted in the fertile soil of China's excellent traditional culture, drawing essence from Marxist theory, and serving the goal of high-quality educational development. In 2025, the Central Committee of the Communist Party of China and the State Council issued the "Outline for Building a Strong Education Nation (2024–2025)" (hereinafter referred to as the

Outline), which clearly outlined nine major tasks targeting the grand goal of “building a strong education nation.” The implementation subject and key factor of this “education power” initiative lies with teachers. Teachers’ teaching attitudes, methods, and responsibilities directly determine whether this goal can be achieved. Whether teachers possess the required skills and qualities depends on proper ideological guidance. Therefore, studying the emergence logic of the educator’s spirit in the new era context, exploring its rich connotations, and extracting contemporary value to cultivate modern educators has become an essential task for realizing the “education power” strategic goal during China’s modernization process.

2. The logic of the emergence of the spirit of the educator

The emergence of the educator’s spirit manifests in the public eye as a “spiritual” state. However, studying this phenomenon cannot be confined to merely examining its spiritual dimension. Instead, it requires a comprehensive analysis that integrates the formation process, historical context, and theoretical foundations of the educator’s spirit to demonstrate how this spiritual essence emerges.

2.1. The formation process of the educator’s spirit

“Motion, in the broadest sense—when understood as a mode of existence and an inherent attribute of matter—it encompasses all transformations and processes occurring in the universe, ranging from simple positional shifts to mental activities” ^[2]. In his work *Dialectics of Nature*, Engels provided a detailed analysis of motion progressing from physical objects to mental processes. He demonstrated that motion extends beyond physical phenomena to include the formation of consciousness. Therefore, the development of educators’ consciousness serves as a vivid manifestation of materialist dialectical motion. This cognitive evolution arises through interactions between individual elements and collective systems, ultimately shaped by both internal and external influences on the educational subject.

The educator’s spirit is gradually cultivated through the dynamic interplay between individual practitioners and collective educational systems. Rooted in educators themselves, this ethos manifests differently across various roles—whether as full-time ideological and political education instructors, secondary school teachers, or extracurricular practice instructors. While each educator’s approach varies according to their discipline, professional identity, and career stage, the core spirit of education maintains unified principles and objectives when guiding broader teaching communities. Within individual contexts, educators share common traits: Secondary school teachers cultivate foundational scientific thinking through knowledge instruction; ideological and political educators guide students in understanding the Party’s latest theories and policies; while practical instructors engage learners through hands-on activities to achieve educational goals. The shared mission of enhancing students’ foundational competencies and developing future-ready talents for national development drives educators to collaborate. Ultimately, the formation of this educator’s spirit emerges through both the evolving practices of individual educators and the systematic cultivation of students’ skills, collectively advancing the grand vision of building a “strong educational nation.”

The educator’s spirit emerges through the combined influence of internal and external factors. The primary internal drivers include continuous self-transcendence and a pioneering, innovative spirit. Throughout history, renowned educators have consistently pursued lifelong challenges of self-improvement. As Tao Xingzhi, a celebrated educator, famously stated: “Spirit resides within us — how much we open up determines how

much we possess. It is not about wealth, but about willingness to unleash our potential”^[3]. This reveals that the educator’s spirit is forged through persistent self-transcendence and higher aspirations. The innovative drive of educators serves as a crucial internal catalyst for this spiritual development. Progress in education requires pivotal innovations, with educational innovation being particularly vital among these. Historically, educators have consistently pushed boundaries while adhering to core principles, persistently innovating teaching methodologies to realize educational philosophies and explore their true essence.

The external factors shaping educators’ professional ethos primarily consist of historical context and family environment. The evolving social landscape provides educators with essential objective foundations, while their teaching practices align closely with contemporary developmental needs. Each historical phase presents distinct primary social contradictions, prompting educators to design curricula that address these societal challenges. Moreover, family upbringing profoundly influences the formation of educators’ character traits and subtly shapes their professional spirit. As renowned educator Chen Heqin recalled: “I never had a single meal with him since age six — we dared not get close to our father”^[4]. This early experience with his father’s strict discipline ultimately led Chen to advocate for gentle approaches in childhood education during his later years.

2.2. The historical background of the spirit of the educator

“Every era has its own spirit, and every era has its own values”^[5]. The emergence, development, and perfection of the spirit of education are gradually completed by educators in teaching practice.

Firstly, the spirit of education carries a profound cultural heritage, representing both the inheritance and development of China’s outstanding traditional culture. “Chinese traditional culture forms the foundation of our nation’s values, continuing to powerfully shape cultural identity”^[6]. As early as the Hundred Schools of Thought during the Pre-Qin period, educators from various schools like Confucianism, Taoism, Mohism, Legalism, and Yin-Yang School engaged in intellectual exchanges, each developing unique educational philosophies. These provided fertile ground for the formation of China’s later educational ideologies and the spirit of education. Over time, aligned with the centralized governance needs of feudal dynasties, Confucian educational thought gradually became dominant. “What religion must possess, Confucius lacked; what Confucius possessed—a spiritual essence religion could not attain. This is his belief that all humans possess rationality and can be fully trusted”^[7]. Thus, Confucian education emphasized moral cultivation as its core. For Confucius, the founder of this philosophy, “grounding oneself in virtue” enabled one to “master skills”, “achieve more through practice”, and ultimately “pursue scholarly refinement.” Moral education also stressed “inner cultivation”, advocating that individuals should focus on self-improvement. “Exerting oneself within one’s capacity is effortless and achievable. Relying on others proves strenuous and uncertain”^[8]. The Confucian ideal of “teachers transmitting wisdom, imparting knowledge, and resolving doubts” is reflected in maxims like “establishing the mind for heaven and earth, securing destiny for the people, continuing lost learning for past sages, and ushering in peace for future generations” and “cultivating oneself, harmonizing families, governing states, and bringing peace to the world.” This has become a vital source of educational ethos, embodying the ideals of selfless dedication and sincere patriotism; the moral integrity of setting examples through words and actions; the pedagogical wisdom of enlightening minds and tailoring instruction to individual needs; the diligent attitude of scholarly inquiry and innovative practice; the compassionate heart of teaching with joy and selfless devotion; and the grand pursuit of cultural edification through global vision. These elements collectively form the essential spiritual foundation of educators.

Secondly, the spirit of education is a genetic inheritance from the Party’s century-long educational practices.

As early as the New Democratic Revolution period, the Party emphasized the crucial role of education and launched the ideological movement of “education for national salvation.” During the May Fourth Movement period, the Party prioritized integrating Marxist theory with the actual conditions of the workers’ movement to develop education and dissemination that aligned with China’s realities. Simultaneously, the Party gradually established red education, cultivated revolutionary talents, and improved the red education system as key projects to save the nation from peril. During the Anti-Japanese War and Liberation War periods, the Party founded multiple red schools covering basic education, Marxist theoretical education, cultural arts education, and soldier training, laying the foundation for the post-establishment educational system of New China. In the Socialist Revolution and Construction period, Mao Zedong personally formulated the “Hundred Flowers and Hundred Schools” policy in cultural education, providing fundamental guidance for the New China’s educational development. The most significant feature of educational reform was its emphasis on popularizing education among workers and peasants while safeguarding the basic right to education. Regarding educational entities, the Party and state prioritized ideological transformation of intellectuals, asserting that intellectuals were also crucial to the proletariat. With the deepening development of socialist education, the teaching profession flourished as generations of educators selflessly contributed, providing diverse talents for New China’s construction. During the Reform and Opening-up and Socialist Construction periods, the Party and state formally established the “Education Revitalizes the Nation” strategy, legally safeguarding the basic rights of teachers and learners. The promulgation of regulations and policies such as the “Law of the People’s Republic of China on Teachers” has stimulated the enthusiasm of teachers to actively implement the strategy of “Education Revitalizing the Nation”, making significant contributions to China’s efforts in building a modern education system. As socialism with Chinese characteristics enters a new era, the CPC Central Committee, with the President of the CPC at its core, has demonstrated visionary leadership by accurately grasping the critical requirements for education in this new era, proposing the strategy of “Building a Strong Education Nation.” It is imperative to prioritize the strengthening of teacher workforce development as the most crucial foundational task in building a strong education nation ^[9]. Particularly, the introduction of the “Outline of the Plan for Building a Strong Education Nation (2024–2025)” further highlights the Party and the state’s heightened emphasis on education since the dawn of the new era.

2.3. Theoretical support of the educator spirit

The formation of the educator’s spirit cannot be separated from the guidance of scientific theory. When studying the educator’s spirit as a spiritual process, it is necessary to consider the scope of spiritual research. The Marxist theory of spiritual production is the theoretical support of the educator’s spirit.

The scope of spirit studies: Spirit studies emerged as a product of philosophical speculation within the theoretical framework of Western philosophy, with its conceptual boundaries primarily established through philosophical inquiry. As early as the ancient Greek era, Plato attributed the essence of the world to the “Forms” and “Spirit”, thereby formulating the theory of idealism (Theory of Ideas). The study of spirit reached its zenith during the German classical philosophy period. Following Kant’s Copernican revolution that shifted ontological research to epistemology and delineated the boundaries of rationality, Western philosophy regained emphasis on logical reasoning. Hegel, the synthesizer of classical philosophy, elevated spirit studies to unprecedented heights by integrating spirit with logic. In his *Phenomenology of Spirit*, Hegel asserted: “Spirit is the unshakable foundation and starting point for all human action; it is humanity’s ultimate purpose and goal; it is the self-consciousness of all beings existing in thought as an independent entity” ^[10]. However, while pushing spirit studies

to their peak, classical philosophy overlooked fundamental laws governing the world. By incorporating ontology into the spirit system, it produced a series of “world-reversing” conclusions. Therefore, when conducting spirit studies in educational contexts, we must explore both the process of spirit’s transition from mystified religious theology to secular realms within specific theoretical frameworks and pay attention to the material production theories underlying spirit.

Marx’s theory of spiritual production serves as the theoretical foundation for educators’ spirit. Marx conducted a comprehensive analysis and critique of classical philosophy’s theories on spiritual inquiry. First, he challenged Hegel’s concepts of absolute spirit and absolute idea, restoring order to the inverted world and infusing dialectics with materialist attributes, thereby exposing Hegel’s logical fallacy. Second, he launched a comprehensive critique of Feuerbach’s incomplete materialism, asserting that “social life is essentially practical. All mystical elements that entice theory into mysticism can be rationally resolved through human practice and its understanding”^[11]. This “Theses on Feuerbach” also became the embryonic form of his genius conception. Finally, in *The German Ideology*, Marx elaborated on the materialist conception of history. In summary, he viewed spirit as the content of productive activities, meaning its emergence depends on material production. Therefore, Marx considered the material aspect as the primary essence of spirit, possessing material attributes. In other words, he believed that spiritual production constitutes one of the fundamental forms of human social production, serving as a crucial foundation for fulfilling people’s spiritual needs and achieving the leap from the realm of necessity to the realm of freedom. According to Marx’s historical materialism, educators’ spirit belongs to the category of social ideology, not merely a product of abstract speculation, but rather formed through the long-term teaching practices of numerous educators. Constrained by societal material conditions, it manifests different forms across historical periods, varying under different historical circumstances and principal social contradictions. Therefore, the spiritual research under the perspective of Marxist theory is the combination of materiality, scientificity, and practicability, which has become the theoretical support for the study of educators’ spirit.

3. The rich connotation of the spirit of an educator

Through generations of educators’ practice, the essence of the educator’s spirit has gradually enriched while its framework has become fundamentally complete. President of the CPC elaborated on six dimensions of this ethos: the ideal of serving the nation with selfless dedication; the moral integrity of leading by example and setting societal standards; the pedagogical wisdom of enlightening minds and tailoring education to individual needs; the scholarly commitment to diligent study and innovative exploration; the compassionate heart of teaching with joy and selfless devotion; and the grand vision of cultural edification through global engagement. These comprehensive discussions fully address the contemporary demands of the era—meeting the needs of the times, the people, and development—to redefine the educator’s spirit in the new era.

3.1. The ideal and belief of having a great self and serving the country with utmost sincerity

“Be a great mentor for students in their studies, careers, and character development” embodies the highest ideals of educators^[12]. This principle not only sets exemplary standards for teachers’ conduct from the perspective of grand ideals and beliefs, but also requires discussion through two key aspects: embracing selfless dedication and serving the nation with utmost sincerity.

From the perspective of embracing a “greater self”, this concept stands in contrast to the “small self.”

Fundamentally, it requires educators to adopt a macro vision encompassing students, schools, society, and education. At its core, this “greater self” embodies collectivism transcending individualism, where teachers align student development with the fundamental interests of the people and national collective welfare. Only by adhering to this principle can educators cultivate the era’s talents capable of “reassuring the Party and contributing to the nation’s prosperity” through their teaching practices.

From the perspective of serving the nation with utmost sincerity, if embracing a grand vision constitutes the guiding principle for educators’ ideals and beliefs in teaching, then serving the nation with utmost sincerity serves as the benchmark for testing these ideals within the realm of convictions. Different professions have varying requirements for this commitment. For educators, the best way to fulfill this duty is by keeping pace with the times, improving teaching methods, prioritizing student needs, and focusing on the goal of building a “strong educational nation”, cultivating talents that meet contemporary development goals. This has become one of the key criteria for evaluating successful teaching practices.

To sum up, the ideal and belief of having a great self and serving the country with utmost sincerity requires teachers to “keep the country and the nation in their hearts, pay attention to the times and society in the great practice of the Party and the people, draw nourishment and enrich their thoughts” and cultivate a new generation of people who are willing to work hard and dare to take responsibility ^[13].

3.2. The moral sentiment of speaking as a model for scholars and acting as a model for the world

Teachers should consciously set examples through their words and actions, continuously improving their moral cultivation. By demonstrating exemplary conduct, they influence and inspire students, becoming mentors who guide learners in academic pursuits, professional endeavors, and personal growth. They should become respected role models in society and exemplars worthy of emulation” ^[14]. This ethical requirement for teachers to align words with deeds not only inherits the Confucian tradition of moral education but also highlights how leading by example has become a vital approach in nurturing young minds and shaping character in the modern era.

The principle of “words as moral exemplars” requires educators to prioritize sincerity and emphasize the importance of verbal instruction. Educational approaches vary widely, including utilizing modern technology, conducting social practice research, and implementing group-based learning. Among these methods, verbal instruction proves most effective. This approach not only encompasses teachers’ linguistic techniques when imparting knowledge but also involves maintaining integrity throughout the teaching process. It serves as a crucial pathway for educators to guide students in self-reflection and cultivate personal character.

The Code of Conduct for Educators requires teachers to exemplify ethical behavior and cultivate students’ proper values through personal example. While verbal guidance is important, educators must primarily shape students through their actions. As the saying goes, “It takes a hundred years to grow a tree, but ten years to educate a person.” To nurture socialist successors who meet the demands of our era, educators must adhere to the principle that “moral integrity precedes teaching, and self-discipline precedes nurturing.” By refining their own moral character, resisting the temptations of fame and profit, and becoming exemplary mentors, teachers can effectively guide students in establishing correct values.

“A teacher’s influence on students stems not only from their knowledge and abilities, but more importantly from the values they uphold in personal conduct, national responsibilities, public service, and private ethics” ^[15]. Therefore, educators must adhere to the moral principle of “leading by example through words and actions”, while

strengthening self-reflection alongside teaching. Only through this dual approach can teachers genuinely cultivate and instill proper values in students.

3.3. The wisdom of educating the mind and teaching according to individual aptitude

Enlightening the mind and teaching according to the aptitude of students are the requirements for teachers in the new era in terms of teaching methods. It requires every educator to learn to carry out active and effective teaching activities according to the different aspects of different students.

Intellectual Enlightenment and Emotional Nurturing constitute the dual dimensions of holistic development. Intellectual Enlightenment requires educators to master students' psychological growth patterns, cognitive development stages, and subject-specific knowledge. Teachers should implement age-appropriate instruction at each developmental phase. Emotional Nurturing involves actively listening to students' academic challenges and life dilemmas, providing timely emotional support, fostering meaningful spiritual connections, and serving as dedicated mentors for emotional well-being.

Teaching according to individual aptitude is the essence of the unique wisdom in China's traditional education, embodying the great wisdom of nurturing talents. Teachers should learn to recognize and acknowledge differences among students in their teaching practices, thereby embracing variations and shortcomings. During instruction, educators should focus on each student's strengths and weaknesses, align with their interests, and guide them to leverage their advantages while addressing their limitations. By adopting diversified and targeted teaching methods, we can maximize the exploration and cultivation of each student's unique interests and specialties, guiding them to thrive in fields that align with their personal passions.

From this perspective, the educational wisdom of enlightening minds and nurturing hearts through tailored teaching methods not only carries forward China's millennia-old educational heritage but also embodies the distinctive requirements of building a "strong education nation" in the new era. Educators should focus on students' holistic development while respecting individual differences, fully leveraging their crucial role as guides in shaping young minds.

3.4. Diligent study, earnest practice, truth-seeking, and innovative attitude

Diligence, learning, and practice, seeking truth and innovation, are a vivid interpretation of teachers' dedication to education and practical teaching in the new era. They contain the relevant requirements for the improvement of teachers' quality in the new era, as well as the requirements for the innovation of teaching methods and means.

Diligent Learning and Devoted Practice emphasize that teachers must continuously learn to enhance their professional competence and teaching capabilities. Diligent learning requires both the accumulation of knowledge and a dedicated teaching attitude. To motivate educators in the new era, they must constantly update their knowledge and maintain a scholarly mindset to keep pace with the times, thereby imparting the latest theories and knowledge to students. Devoted practice demands that teachers transform theoretical knowledge into dynamic teaching practices, achieving the integration of knowledge and action. This commitment to deepening pedagogical expertise is also an essential path for professional growth.

Seeking truth and innovation are the requirements for teachers' development in the new era. Seeking truth requires teachers to pursue truth and continuously explore the essence and laws of education. In educational practice, teachers should uphold a pragmatic attitude, dare to face real-world challenges, question existing teaching concepts, and summarize patterns by integrating students' cognitive needs. Innovation is one of the core principles

of Marxist theory. The President of the CPC emphasized: “Over the past century, our Party has adhered to the unity of emancipating the mind and seeking truth, as well as the unity of consolidating fundamentals and pursuing innovation. This has continuously opened up new horizons for Marxism, giving rise to Mao Zedong Thought, Deng Xiaoping Theory, the important thought of ‘Three Represents’, the Scientific Outlook on Development, and the Thought on Socialism with Chinese Characteristics for a New Era, providing scientific theoretical guidance for the cause of the Party and the people”^[16]. Innovation requires teachers to inherit traditions while courageously experimenting with new teaching philosophies and methods, driving profound innovations that meet objective demands. Seeking truth and innovation serve as crucial drivers for teachers’ progress.

In conclusion, the dedicated attitude of diligent study, steadfast practice, truth-seeking, and innovation serves as a crucial foundation for teachers’ professional growth and educational innovation. Educators should uphold this commitment to continuous learning, courageous exploration, and bold innovation, thereby contributing to the thriving development of education in the new era.

3.5. The benevolent heart of loving teaching, loving students, and being willing to contribute

The benevolent heart of loving teaching and students, and being willing to contribute, as an important part of the spiritual connotation of educators, is not to be underestimated. It profoundly reflects teachers’ deep feelings for the cause of education and their meticulous care for students.

Joyful teaching means educators should transform educational practice into an intrinsic joy rather than merely a professional obligation. When teachers embrace joyful teaching, they not only achieve personal fulfillment but also ignite students’ thirst for knowledge. Caring for students reflects a teacher’s profound and genuine affection, directly demonstrating the noble ethos of the teaching profession. Educators should focus not only on academic progress but also on holistic development, balancing academic guidance with psychological support to foster well-rounded growth.

The willingness to dedicate oneself embodies the highest form of compassion in educators. The teaching profession confronts numerous challenges that demand significant time and effort from teachers. Yet many educators remain selfless, choosing to serve remote areas and rural regions where education is most urgently needed. It is precisely this unconditional dedication—loving their students, nurturing talents, and giving selflessly—that ensures a continuous supply of skilled professionals for societal progress.

“Education is a noble pursuit of ‘compassion and love for humanity’. Love forms the soul of education – without it, there can be no true education”^[17]. The benevolent dedication to teaching with passion and selfless devotion constitutes not only a fundamental professional ethic in education, but also reflects, and more importantly, the great love of the teaching profession.

3.6. The pursuit of cultural and moral development with a global vision

In the new era, educators should not only cultivate their own students, but also have a big vision of education and pursue the pursuit of cultural education with a global vision.

To embrace the world means educators should cultivate a global vision, stay attuned to worldwide educational trends, uphold the vision of building a community with a shared future for mankind, and actively engage in international exchanges and cooperation. This mindset encourages educators to adopt a broader perspective when addressing educational issues, embracing openness and inclusiveness to learn from the strengths of diverse

countries' education systems. By adopting this approach, they can refine their own teaching methods through mutual learning and improvement.

Cultivating cultural awareness through education is the fundamental mission of educators, who strive to preserve China's outstanding traditional culture. By implementing educational strategies, teachers can foster students' cultural identity and confidence, nurturing them into modern individuals with cross-cultural communication skills. Moreover, educators should lead by example, demonstrating cultural values through their daily conduct, thereby becoming role models and guides for their students.

Therefore, as educators pursue the path of promoting culture in the new era, they should embrace the world and cultivate people with culture. Teachers are required to adopt a more open and inclusive attitude, absorb the advantages of education from other countries, inherit the excellent traditional Chinese culture, and contribute to cultivating a new generation of people with a global vision and cultural confidence.

4. The contemporary value of the spirit of educators

4.1. Inject new content into the spiritual spectrum of Chinese Communists

“For a century, the Communist Party of China has upheld the great founding spirit of the Party, building a spiritual lineage of Chinese Communists through prolonged struggle and forging a distinct political character”^[18]. In its century-long journey of struggle, the Communist Party of China has established a spiritual lineage with distinctive contemporary characteristics. The spiritual lineage of Chinese Communists is not only a product of the integration of Marxist cultural theory with the Party's century-long practical endeavors, but also a spiritual force driving the great rejuvenation of the Chinese nation. The educator spirit, as profoundly articulated by the CPC Central Committee with the President of the CPC at its core in response to the strategic needs of “strengthening education” and the requirements for educational entities, represents both an innovative inheritance of the red gene and an inevitable choice for realizing the “education power” strategy in the new era. The integration of the educator spirit into the spiritual lineage of Chinese Communists embodies the combination of Marxist educational philosophy with Chinese educational practices, revealing the underlying principles of spiritual civilization construction.

The spiritual essence of educators has historically been deeply rooted in the ideological lineage of Chinese Communists. From its founding, the Communist Party of China (CPC) has regarded education as a vital instrument for social transformation. In its early days, the Party mobilized revolutionaries to sow revolutionary seeds through workers' night schools and peasant literacy programs. During the Yan'an period, it established the Anti-Japanese Military and Political University to train revolutionary cadres, demonstrating how educational practices seamlessly aligned with revolutionary objectives. Pioneering educators like Xu Teli and Cheng Fangwu embodied their belief in “educating for national liberation”, with their selfless dedication—coming “with a heart full of devotion” yet leaving “without taking a single blade of grass”—mirroring the Party's original aspirations. This shared heritage not only laid the historical foundation for the systematic inheritance of the educator spirit but also provided inherent conditions for integrating it into the CPC's ideological framework.

Secondly, the spirit of educators demonstrates profound value alignment and methodological coherence with other spiritual elements in the Chinese Communist Party's ideological lineage. Most notably, it shares a people-centered value framework with other spirits within this spectrum. The grassroots education philosophy of renowned educator Tao Xingzhi—“life is education”—resonates with the Party's mass line. Zhang Guimei, a modern-day educator, exemplifies selfless dedication through her pioneering efforts to establish a girls'

high school in remote border regions. This value convergence manifests in three key aspects of the new era: defining educational objectives, shaping pedagogical approaches, and clarifying beneficiary demographics. Methodologically, the spirit of educators aligns with the Party's principle of "case-specific analysis" in governance. Its emphasis on "tailored teaching" and "nurturing both intellect and character" mirrors the Party's approach to addressing specific challenges. Similarly, the reform movement to eliminate the "five rigid criteria" in education shares the same vision as China's comprehensive institutional reforms that advocate "self-reform."

Ultimately, integrating the spirit of educators into the spiritual lineage of Chinese Communists stems from practical strategic needs. "Building a modern socialist powerhouse imposes new and higher demands on teacher development, as well as on the entire Party and society's respect for teachers and education" ^[19]. Against the backdrop of unprecedented global changes in a century and the grand strategy of national rejuvenation, education has become even more crucial as a cornerstone of national development. Incorporating the educator spirit into the Communist Party's ideological framework provides stronger spiritual support for high-quality educational advancement. The emergence of Huang Danyan-style teaching teams demonstrates the enduring vitality of revolutionary heritage in education, while the implementation of the "double reduction" policy highlights the organic integration of the Party's educational policies with educational wisdom. When the educator spirit merges deeply with the vanguard consciousness of Communists, it will foster a high-quality talent cultivation ecosystem, creating an optimal environment for advancing Chinese-style modernization.

4.2. Stimulate the main motivation of teachers

"We must prioritize the strengthening of teacher team building as the most crucial foundational task in building a strong education nation, improve China's distinctive teacher education system, and vigorously cultivate a high-quality professional teaching force characterized by noble ethics, excellent expertise, rational structure, and vitality" ^[20]. The goal of "building a strong education nation" in the new era and the demand for high-quality educational development have raised higher requirements for teacher team building. The value pursuit and practical character embodied in the spirit of educators serve as the spiritual source that inspires the primary motivation of teachers. This motivation not only manifests as individual professional awareness among educators but also highlights the collective intention of teachers to serve national strategies. Under the goal of achieving a "strong education nation", guiding teacher development with the spirit of educators is both an important path to resolve practical challenges in education and a strategic support for building a high-quality education system.

The educator's spirit establishes a shared value framework for teachers through exemplary conduct and comprehensive guidance. Yu Yi's motto, "Devoting my life to teaching while continuously learning to teach", elevates professional refinement into a means of realizing life's purpose. In the face of educational utilitarianism, this ethos guides educators to uphold their fundamental commitment to nurturing minds. Through integrated ideological-political education across primary, secondary, and higher education, teachers combine disciplinary characteristics with humanistic values aligned with students' developmental needs, deeply integrating subject instruction with patriotic education. This spiritual leadership enables teachers to awaken collective value consciousness under its guidance. Such guidance restores education to its essential mission of "cultivating well-rounded individuals", while empowering educators to internalize pedagogical practices as pathways to self-actualization, thereby igniting intrinsic motivation.

The reform and innovation demands inherent in the educator's spirit inject sustained momentum into teachers' professional development. At the individual level, educators' practice philosophy of "unity of knowledge

and action” throughout their teaching careers facilitates the transformation of cutting-edge pedagogical theories into student-centered educational practices. From a collective perspective, the exploratory spirit inherited through the educator’s ethos within educational communities helps foster an innovative ecosystem for education. Educator Gu Mingyuan’s pioneering work on “subject-oriented education” has inspired countless teachers to establish new teacher-student relationships, while Li Jilin’s creation of situational education systems demonstrates educators’ courage to break conventions. Guided by this educator’s spirit in the new era, such group innovation manifests as transformative wisdom for contemporary teachers to leverage intelligent technologies in classroom instruction, thereby cultivating next-generation talents.

The educator’s spirit guides modern teachers to inherit past teaching experiences while fostering their proactive development. Through cultural immersion, educators transcend passive roles in completing teaching tasks, evolving into dynamic agents of educational reform. This self-awareness catalyzes the optimization of educational ecosystems. When teachers transition from “task-executing instructors” to “educational researchers”, differentiated instruction can truly take root. Similarly, when educators shift from “knowledge transmitters” to “lifelong learners”, classroom transformation can sustain its momentum.

4.3. Leading the realization of the value reconstruction of the education system in the new era

Since the new era, there have been structural contradictions in the spiritual values of China’s education system, which are mainly reflected in the insufficient integration between teachers’ professional teaching standards and mainstream spiritual values. Therefore, it is urgently necessary for the value guidance of educators’ spirit to achieve a value reconstruction of the education system in the new era.

First, educators should harness the spiritual attributes of the educator’s ethos. Firstly, it fulfills the function of preserving educational culture. The modern adaptation of Tao Xingzhi’s “life is education” philosophy demonstrates how the educator’s spirit anchors the essence of education. Teachers in the new era should strive to transform traditional educational wisdom into innovative models that cultivate vitality, character, learning capacity, and creativity. Secondly, it advances the ethical construction of teachers’ moral values. With the deepening development of modern education, particularly the significant increase in teacher ethics evaluation authority under the “Guidelines for Building High-Quality Teacher Teams in the New Era”, the educator’s spirit becomes crucial in guiding teachers’ ethical conduct. Finally, it promotes institutional innovation. Establishing an integrated system encompassing talent selection mechanisms, resource allocation frameworks, and evaluation reform paradigms provides educators with standardized systems to practice the educator’s ethos.

Second, advancing the construction of China’s educational discourse system under a global perspective. With the deepening of globalization, building an educational discourse system with Chinese characteristics has been placed on the agenda. Since the new era, through initiatives such as establishing Confucius Institutes, systematic interpretations have been made of the educational thought lineage from Confucius to Tao Xingzhi, constructing an Eastern educational philosophy system that “takes benevolence as its foundation and integrates knowledge with action.” This has contributed Chinese wisdom to enriching the international repository of educational ideas and addressing challenges in global education. In terms of educational systems, institutional innovations with Chinese characteristics, such as the “Special Post Program” and “Silver Age Teacher Action”, have also been included by UNESCO in the “Best Practices in Global Teacher Development.” The institutional export of China’s teacher training model exemplifies how the spirit of educators provides spiritual impetus for building China’s educational

discourse system under an international perspective.

In summary, the process of educators' spirit evolving from cultural awareness to institutional awareness is essentially a reconstruction of the education system in the new era. When the pursuit of becoming "great educators" becomes the common aspiration of millions of teachers; when Tao Xingzhi's educational philosophy is deeply integrated into smart classrooms; and when teachers gradually develop behavioral consciousness, evolving into new-era educators who love and excel in teaching—this represents the driving force for reconstructing the education system in the new era through the spirit of educators, providing China solutions to global educational challenges, and serving as an indispensable impetus for high-quality educational development.

Disclosure statement

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Challenging and Remediating: The Impact of Online Cultural Consumerism on Aesthetic Education in Vocational Colleges

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Abstract: Online cultural consumerism is a social trend shaped by the interplay of capitalist logic and aesthetic consumption logic, profoundly influencing the aesthetic concepts and spiritual world-building of vocational college students. Theoretical analysis reveals that Online cultural consumerism impacts vocational college students' aesthetic education in multiple ways. On one hand, it develops students' aesthetic sensory abilities in a one-sided manner while diminishing their aesthetic cognitive abilities; on the other hand, it weakens their aesthetic judgment and undermines their aesthetic creativity. Therefore, grounded in the critical perspectives of capital critique and aesthetic consumption critique, the research analyzes that these negative impacts primarily stem from the following points: First, consumerism simplifies aesthetics into mere consumption choices and pursues profit through traffic metrics. Second, online dissemination creates information silos. Third, herd mentality leads students to be drawn to lowbrow culture. This must be addressed from multiple angles—including value-based guidance, social oversight and governance, and educational direction—to enhance students' aesthetic judgment and creativity, thereby supporting their comprehensive and free development.

Keywords: Online cultural consumerism; Vocational college students; Aesthetic education; Cultural consumption; Impact; Governance strategies

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1. Introduction

The report to the 20th National Congress of the Communist Party of China states, “Chinese modernization is a modernization that harmonizes material and spiritual civilization. Material abundance and spiritual richness are fundamental requirements of socialist modernization”^[1]. Aesthetics, as a fundamental aspect of human spiritual and cultural life, is a crucial element in constructing and enriching the human spirit. In higher vocational institutions, aesthetic education constitutes an important component of higher vocational education. However, with the rapid advancement of the internet and artificial intelligence technologies, online cultural consumerism

has gradually emerged. As a social trend characterized by widespread diffusion and potent pervasiveness, online cultural consumerism—fueled by capitalist and consumerist logics—exhibits traits of utilitarianism, pervasive entertainment, and superficial sensory gratification. This phenomenon profoundly influences the aesthetic perceptions and spiritual world-building of vocational college students, even exerting negative impacts on the formation of their outlook on life, worldview, and values.

Currently, on the one hand, domestic research on “cultural consumerism” has yielded substantial findings. In recent years, scholars have increasingly focused on “online cultural consumerism”, with existing studies primarily concentrated in the following areas: First, regarding the connotation, characteristics, and generative mechanisms of online cultural consumerism, such as Su Feng et al. (2024), Gu Guihua (2023), Zheng Zhikang (2023), Lu Shujian et al. (2022), and Yang Zhangwen (2022) ^[2-6]. Zhao Hui and Yang Chaoran (2017) point out that cultural consumerism leads to the loss of spiritual beliefs and pursuits among youth, moral decline, widespread skepticism, a lack of responsibility, and refusal to confront reality, as well as crises in self-identity and self-construction ^[7]. Second, its impact on the spiritual lives of youth. For example, Cao Zhilei et al. (2022) note the erosion of ideals and convictions, distorted value pursuits, vulgar aesthetic lifestyles, and empty entertainment lives among young people ^[8]. Third, its impact on mainstream ideology. Some scholars analyze how cultural consumerism erodes college students’ political identity and socialist ideology by examining aspects like the inheritance of youth’s revolutionary heritage. Fourth, remedial strategies: Zuo Luping and Zhu Yuli (2021) propose countering cultural consumerism through government regulation, media-driven value guidance, capital-led initiatives, and individual cultivation of aspirations for a better life ^[9]. Peng Jiyu and Guo Fengrong (2022) emphasize countering its negative effects by providing high-quality cultural offerings ^[10].

On the other hand, within Western academic circles, critical researches of consumer culture emerged, represented by works such as Fredric Jameson’s *Postmodernism and Cultural Theory*, Daniel Bell’s *The Contradictions of Capitalist Culture*, Jean Baudrillard’s *The Consumer Society*, and Guy Debord’s *The Society of the Spectacle* ^[11-14]. In their analysis of postmodern society, these scholars offered profound critiques of cultural consumption within the context of the consumer society, providing valuable theoretical insights for this research.

Although existing research has explored the connotations, impacts, and countermeasures of online cultural consumerism, most researches have not specifically focused on the group of vocational college students, nor have they provided systematic analyses of the effects on their aesthetic education. Furthermore, existing research predominantly examines ideological or spiritual life issues from a macro perspective, with few researches proposing targeted countermeasures at the practical level of aesthetic education. Therefore, this research adopts a perspective of online cultural consumerism, taking vocational college students’ aesthetic education as its research subject. It focuses on analyzing the impact mechanisms of online cultural consumerism on their aesthetic abilities, spiritual world, and value systems. Based on this analysis, it proposes practical educational countermeasures to help cultivate high-quality craftsmen and skilled artisans who meet the requirements of Chinese modernization.

2. The essence, evolution, and characteristics of online culture consumerism

What is online cultural consumerism? It refers to a social trend where, with the proliferation of the internet, people consume cultural products under the manipulation of capitalist logic, pursuing material gratification and sensory stimulation in a one-sided manner, and becoming obsessed with lowbrow or even distorted cultural consumption. This social trend continues to spread rampantly through the medium of the internet, infiltrating people’s daily lives

and influencing their values, ways of thinking, and behaviors. This phenomenon particularly impacts Generation Z vocational college students. As digital natives, they possess ingrained habits of online cultural consumption and are thus most vulnerable to the impact and influence of this social trend.

The historical evolution of online cultural consumerism has broadly followed three progressive stages: First: Consumer culture alongside the development of the entertainment industry, “idol chasers” evolved into consumer-oriented fans. Second: Cultural consumerism through the collusion of social media and unscrupulous capital. This evolved into the current form of cultural consumerism that runs counter to mainstream culture. Third: Digital media propels the evolution into online cultural consumerism. Driven by capitalist logic and market principles, this phenomenon exhibits spiritually and culturally consumptive traits characterized by utilitarianism, pervasive entertainment, and superficial sensory gratification.

How did online cultural consumerism come into being? Its emergence is inseparable from the operational logic of capital and the internet as an information-based medium. On one hand, online cultural consumerism shares a kinship with the logic of capital. As a social trend that runs counter to the content and values of mainstream culture, its operation, rise, and ability to generate traffic are all driven by the logic of capital. In the pursuit of profit and traffic, capital collaborates with certain non-mainstream cultures to promote alternative values, capturing public attention. Alternatively, it satirizes, distorts, or vulgarizes mainstream culture as a gimmick to attract netizens. As a social trend, online cultural consumerism emerges from the convergence of capital logic and aesthetic consumption logic. On the other hand, online cultural consumerism is inextricably linked to the logic of aesthetic consumption. The coupling of aesthetics and consumption constitutes this logic. Within cultural consumption, aesthetic elements are employed as factors stimulating consumption, capturing the spending preferences of college students to facilitate expanded reproduction. To dismantle online cultural consumerism, one must adopt a critical perspective grounded in both capital critique and aesthetic consumption critique.

3. The impact of online culture consumerism on aesthetic education for vocational college students

The impact of online cultural consumerism on aesthetic education for vocational college students manifests in the following four aspects:

First, it developed unilaterally aesthetic sensory perception. Day after day, immersion in shallow sensory cultural consumption relentlessly erodes the aesthetic sensibility of vocational college students. Lacking rational judgment, they fail to elevate their aesthetic cognition while simultaneously turning to algorithmic dependence. As Plato observed, “Intuition is the highest level of human wisdom.” Aesthetic sensibility, as an expression of intuition, perceives the world through sensory means. Aesthetic perception is a fundamental form of creative thinking, pervasive in human spiritual activities and playing a vital role in the objectification of human essence. Influenced by online cultural consumerism, vocational college students’ aesthetic discernment is declining. Prolonged daily usage of short-video platforms has led over half of these students to judge a work’s value by its number of likes, fostering a data-driven evaluation system.

Second, it diminished aesthetic discernment. The herd mentality in cultural consumption has eroded vocational college students’ aesthetic judgment, leading to a symbolic reconstruction of their aesthetic perceptions. The vast majority develop a brand logo worship mentality, blindly following trends by equating the purchase of trendy brands and internationally renowned labels with aesthetic expression, reducing design value to mere

trademark premiums. Additionally, a segment of vocational college students is deeply immersed in gaming culture, consuming virtual avatars with rapidly increasing trends. Another group idolizes celebrity culture, with their spending on anime-inspired virtual idol merchandise showing a year-on-year growth rate.

Third, it weakened aesthetic judgment. The lack of subjectivity in cultural consumption concepts diminishes vocational college students' aesthetic discernment, leading their aesthetic practices toward consumerist transformation. Easily influenced by livestreaming trends in influencer culture, these students fantasize about becoming streamers or internet celebrities themselves in the near future. Consequently, their interests and focus shift from campus mainstream culture—such as red culture, traditional heritage, classical music, and Hanfu—toward campus influencer incubation clubs. For instance, in intangible cultural heritage craft courses, the vast majority of vocational college students prioritize “whether it is suitable for vlogging” over skill inheritance. Under the negative influence of online cultural consumerism, they distort artistic creation into a means of monetizing traffic.

Fourth, it diminished aesthetic creativity. Byung—Chul Han observes: “Beauty establishes a free relationship with the world and with the self” ^[15]. In aesthetic activities, as the connection between the aesthetic subject and the external world evolves, it creates space for the subject's creative endeavors. The non-utilitarian nature of aesthetic activities provides individuals with an irrational environment less disturbed by rationalism. When individuals reduce the constraints of needs and utilitarian pursuits, they enhance psychological experiences of direct intuition and insight into the essence of things. Within this experience, individuals more readily develop a sense of immediacy and presence. Psychological processes become more integrated, facilitating interaction between conscious and unconscious minds. Various psychological elements become more active, sparking unexpected yet intuitively logical creative inspiration. Homogeneous cultural consumption content weakens the aesthetic creativity of vocational college students. This, in turn, impedes the construction of their spiritual world and the formation of their worldview, values, and outlook on life, transforming them into one-dimensional, unidirectional individuals.

Through the preceding analysis, it is evident that the impact of network culture consumerism on the aesthetic education of vocational college students is multidimensional. Moreover, it extends to areas such as the shaping of values, the distortion of aesthetic standards, and the diminishing effectiveness of education. This also encompasses the utilitarianization, homogenization, and superficiality of aesthetics, as well as the alienation of values.

4. An in-depth analysis of how online cultural consumerism weakened the aesthetic appreciation of vocational college students

Online cultural consumerism, in layman's terms, refers to how consumption behaviors are driven by cultural factors within the online environment, or how consumerism manifests through internet culture. The educational background of vocational college students differs from that of regular undergraduates, as they lean more toward vocational skills training. Consequently, their aesthetic education may prioritize practicality and applicability. To deeply analyze the underlying reasons behind the impact of online cultural consumerism on the aesthetic education of vocational college students, the following dimensions need to be considered.

First, aesthetic enticement. Under the manipulation of capitalist logic, online cultural consumerism cloaks itself in the guise of aesthetics and art to lure vocational college students into participation. Consumerism typically emphasizes material possession, brand symbols, and instant gratification, which may distort students' aesthetic

judgments. For instance, they might focus more on appearances and trends rather than on deeper aesthetic values. Vocational college students may be more susceptible to the influence of social media and influencer culture, as these platforms are saturated with consumption-oriented content. The purpose of aesthetic education is typically to cultivate the ability to perceive, appreciate, and create beauty, involving the comprehensive development of emotional, moral, and cultural aspects. However, consumerism may reduce aesthetics to mere consumption choices—for instance, suggesting that purchasing certain goods equates to demonstrating aesthetic taste. This leads students to equate aesthetics with material consumption, neglecting the cultivation of intrinsic aesthetic literacy.

Second, profit-driven expansion. In pursuit of greater profits, capital expands chaotically, continuously churning out unscrupulous, nutritionally devoid cultural products—the ugly, the vulgar, the tasteless, the grotesque—stimulating vocational college students to perpetually engage in the production, consumption, and reproduction of such content. Leveraging the predatory effects of the attention economy, platforms employ neuropsychological designs—such as variable reward mechanisms—to increase daily screen interactions, diminishing the sustained focus required for deep aesthetic engagement. Overloaded with fragmented information, cognitive bandwidth becomes congested, reducing prefrontal cortex activity and hindering the critical thinking essential for traditional aesthetic education.

Third, media amplification. Capital manipulates social media platforms to promote content online and expand influence. Consumerism spreads rapidly through the internet, exposing students to fragmented information that fosters superficial aesthetic values. Algorithmic recommendations in online culture readily create information silos, where students only encounter content aligned with their preferences and consumerist values, further reinforcing superficial aesthetic standards. This undermines diversity in aesthetic education, potentially leaving vocational college students lacking understanding and appreciation for diverse cultures and art forms. The value deconstruction of subculture circles. Twelve subcultural spheres—including esports and domestic fashion trends—form information silos, diminishing cross-cultural aesthetic comprehension.

Fourth, the herd mentality in cultural consumption. Regarding psychological factors among vocational college students, consumerism often exploits people's vanity and social needs. Students may pursue specific aesthetic standards under peer pressure, leading to homogenized tastes and stifling creativity. Aesthetic chaos frequently occurs, and the herd mentality in cultural consumption makes successive cohorts of vocational college students susceptible to vulgar, mediocre, and kitsch cultural products, fostering distorted aesthetic views. For instance, popular elements on short-video platforms may lead them to believe beauty lies in following trends rather than expressing individuality. Aesthetic education should instead encourage personalized expression and cultivate independent thinking skills.

Additionally, vocational college students engage more with practical courses and receive relatively less theoretical education, potentially resulting in less systematic aesthetic education. The gap between virtual personas in online culture and reality may also influence vocational students' self-perception. An excessive pursuit of "perfect" online images can lead to real-world aesthetic anxiety, impacting mental health—a factor that indirectly relates to the effectiveness of aesthetic education.

5. Aesthetic education strategies for vocational college students under the critique of online culture consumerism

How can aesthetic education be strengthened in vocational colleges amidst the critique and resistance against online cultural consumerism? This requires a multi-pronged approach encompassing value-based guidance, social

oversight and governance, and institutional educational direction to help students maintain healthy aesthetic perspectives within a consumerist-dominated digital environment. By leveraging online platforms themselves to promote high-quality artistic resources, vocational college students can develop more comprehensive aesthetic sensibilities.

Firstly, value-driven leadership: Securing the ideological leadership of Marxism. Guided fundamentally by the President of the CPC Thought on Culture, people must strengthen value-driven leadership to help college students deeply understand the essence of socialist core values. This enables them to consciously resist erroneous notions promoted by consumerism—such as materialism and entertainment supremacy—and cultivate healthy, rational cultural consumption perspectives. Whether as cultural producers, market regulators, or individuals, the guidance of Marxist ideology must be consistently adhered to. Guided by the President of the CPC Thought on Culture, actively advance embodied teaching reforms—such as the VR Dunhuang Mural Reproduction Lab. Utilize haptic feedback devices to restore traditional aesthetic perception dimensions. Align with vocational students’ specializations by implementing “blind touch assessment” in industrial design workshops, stripping visual symbols to evaluate material aesthetics. Establish an evaluation system overhaul: Introduce an “aesthetic resilience index” to comprehensively assess cross-cultural comprehension, original expression, and critical reflection; develop a “time value assessment model” for works to track their cultural vitality three years post-graduation.

Secondly, social oversight: Controlling at the source to regulate the cultural and entertainment market order. Strengthen oversight and regulation of the cultural market to purify the online cultural environment. By improving laws and regulations and enhancing industry self-discipline, combat vulgarity, false advertising, and excessive commercialization. Foster a positive and wholesome ecosystem for cultural product supply, offering college students high-quality cultural consumption options. Clarify capital sources and boundaries, guiding orderly entry into the cultural industry market for sound operations. Regulate cultural producers through both “law and ethics”, reinforcing social responsibility and highlighting the social benefits of culture. Strengthen governance of the cultural industry to prevent capital’s predatory appropriation of cultural resources. Enhance social responsibility among cultural and entertainment enterprises, uphold the principle of prioritizing social benefits, and achieve positive interaction between capital and the cultural-entertainment sector to deliver more and better spiritual products. Resolutely resist cultural consumption values such as traffic-driven content and materialism, guide digital media like the internet to integrate into mainstream culture, and prevent capital from manipulating or skewing the cultural industry.

Thirdly, School guidance: Fostering proper cultural consumption values through education. School education plays a pivotal role. Vocational colleges should prioritize integrating and expanding aesthetic education by offering courses in aesthetic theory and organizing cultural activities to systematically enhance students’ aesthetic literacy and appreciation skills. On the one hand, aesthetic education should be integrated into ideological and political theory courses to cultivate students through beauty and culture. On the other hand, it should be combined with professional practice, guiding students to embody aesthetic pursuits in skill training and creative work, achieving unity of knowledge and action. Ultimately, students will develop strong aesthetic perception and judgment, enabling them to discern and resist negative cultural influences. This fosters autonomous and critical cultural consumption behaviors, leading to well-rounded growth.

There is an urgent need to establish an educational system for “resistance-oriented aesthetic literacy”, transforming the characteristics of consumer society into teaching resources to rebuild aesthetic subjectivity through decoding the logic of capital. This demands that vocational educators possess aesthetic insight in

the digital age, seeking breakthroughs for educational innovation through the dialectic of deconstruction and reconstruction. For instance, implementing metacognitive development programs: launching “Media Critique Workshops” to enhance symbolic decoding skills through advertising deconstruction exercises; implementing aesthetic journaling initiatives requiring weekly documentation and analysis of the psychological mechanisms behind three instances of consumer impulses. Integrating more critical thinking content into specialized curricula guides students in discerning the influence of consumerism.

6. Conclusion

In summary, this research focuses on the impact of online cultural consumerism—driven by capital and consumption logic—on the aesthetic education of vocational college students, based on theoretical and literature analysis. The research finds that this trend excessively emphasizes sensory aesthetics, weakens deeper aesthetic cognition and judgment, and suppresses aesthetic creativity. Its primary causes include the simplification of aesthetics into a tool for chasing traffic and profits, the intensification of the online information echo chamber effect, and the spread of vulgar culture fueled by herd mentality. This research proposes targeted, multi-faceted, and collaborative solutions to address these issues. By guiding values, implementing social oversight and governance, and strengthening aesthetic education in schools, educators can comprehensively enhance students’ aesthetic literacy. This research not only provides insights for ideological and aesthetic education in vocational colleges but also offers a foundation for theoretical expansion. However, it lacks empirical data support. Future researches could further explore quantitative and qualitative research through questionnaires and interviews.

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Analysis of the Impact of Leadership on Teachers' Internal Motivation in Minority Areas in the Background of Digitalization

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Abstract: Against the backdrop of the deep interweaving of educational digital transformation and ethnic cultural diversity, stimulating the internal motivation of university teachers in minority areas has become a key factor in promoting teachers' professional development and high-quality educational development. Focusing on universities in Guizhou's minority areas, this paper constructs a multi-level analytical framework of "macro-medium-micro" to deeply explore the impact path of educational leadership on teachers' internal motivation in the digital context. The study points out that context-sensitive leadership can activate teachers' intrinsic motivation in digital reform through practices at different levels, prompting teachers to transform from passive recipients to active agents. This provides ideas for understanding and promoting the internal driving force of teachers' professional development under the role of educational leadership.

Keywords: Minority areas; Digital background; Educational leadership; University teachers; Internal motivation

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1. Introduction

With the rapid advancement of the digital age, promoting educational modernization through educational informatization and leading the high-quality development of education and teaching is a strategic development path for educational modernization^[1]. As a cradle of talent cultivation and an inheritor of culture, universities' quality and level of digital educational development are determined by teachers' internal motivation—that is, teachers' willingness and ability to actively participate in professional development and engage in educational reform based on intrinsic motivation. However, universities in Guizhou's minority areas face difficulties in tapping and developing teachers' internal motivation due to inadequate digital infrastructure, obvious gaps in university teachers' digital literacy, and challenges in integrating excellent ethnic traditional culture with digital education. In view of this, the author explores the influence channels of teachers' internal motivation in the digital context from the perspective of leadership, aiming to provide references for addressing issues such as the lack of internal

motivation for the professional development of university teachers in minority areas and realizing the coordinated development of digitalization and ethnic culture ^[2].

2. Interpretation of the connotation of leadership on teachers' internal motivation in minority areas in the background of digitalization

2.1. Educational implications of digitalization in minority areas

The informatization in ethnic minority areas within university campuses is a concept that does not rely on technology alone, but requires the synchronous development of digital thinking, university education and teaching, and ethnic minority cultures ^[3]. From an educational perspective, it includes, on the one hand, the development of digital classroom environments in university campuses in ethnic minority areas—namely, online teaching platforms and information-based learning classrooms tailored to the teaching characteristics of universities in these areas. On the other hand, it encompasses the development of digital educational materials incorporating ethnic minority cultural elements, such as the construction of digital resources for subject content with ethnic characteristics based on teachers and students in universities of ethnic minority areas, so as to form curriculum resource packages that embody both the educational content of universities in ethnic minority areas and contemporary educational connotations. Additionally, it involves the development of digital educational thinking in ethnic minority areas, which refers to the development of information-based teaching methods and new educational concepts by teachers in university campuses of these areas, aiming to organically integrate the teaching of ethnic minority cultures with the digitalization of university education in ethnic minority areas ^[4].

2.2. Core orientation of teachers' internal motivation

Intrinsic motivation refers to an active subjective behavior of teachers who, driven by internal interests, consciously explore and possess a high level of growth motivation and ability to achieve their independent professional development. In the digital environment, university teachers are no longer passively implementing reform plans; instead, they combine their own teaching practices with the realities of ethnic cultural teaching to strive for exploring new forms of digital teaching—for example, integrating their own ethnic cultural stories into classroom teaching through digital means. University teachers maintain the persistence and determination to continuously promote their personal professional development, take digital teaching reform as an opportunity to reflect on their practices, and optimize their teaching methods. While constantly strengthening their own digital teaching capabilities, they also comprehensively improve their professional competence, thereby playing their positive role and initiative in educational reform as well as in the cause of inheritance and development of ethnic cultures ^[5].

3. The influence path of educational leadership on teachers' intrinsic motivation under a multi-level framework

3.1. Macro level: Motivation foundation under policy guidance and resource coordination

Educational leadership at the macro level, such as that of university leaders and education authorities, is primarily administered from the perspective of educational administrative departments, and its main role is to provide a premise for the exertion of university teachers' intrinsic motivation. Firstly, regarding the digital education policies formulated by the state, on the basis of respecting the particularities of universities in ethnic minority areas, further

concretization should be carried out to fully elaborate on the intentions of national and local policies, rather than mechanically adhering to the textual requirements. By considering the characteristics of universities and clarifying the positioning of reform, teachers can clearly understand the relationship between the current digital reform of universities and individuals, schools, and ethnic cultures, thereby alleviating teachers' confusion about digital reform and forming an internal driving force for teachers' reform. Secondly, educational leadership at the macro level is also reflected in the coordination of digital resources. Due to the impact of the geographical environment, digital educational resources vary greatly among different regions and universities in ethnic minority areas. Educational leadership at the macro level is mainly manifested in coordinating resources. On the basis of unified standards, it can more effectively promote the construction of digital resource libraries covering teaching, scientific research, cultural inheritance, and other aspects in universities in ethnic minority areas. For example, establishing digital resource libraries of ethnic cultural resources to provide a foundation for teachers in universities in ethnic minority areas to develop digital curriculum resources; introducing technical resources and building stable and easy-to-use digital teaching platforms to reduce the technical threshold for teachers to use digital tools ^[6].

3.2. Meso level: Motivation activation under organizational support and cultural cultivation

Educational leadership at the meso level, with department heads as the core, further activates teachers' intrinsic motivation through organizational promotion and cultural construction ^[7]. Firstly, organizational guarantee. Departments are the direct responsible units for teachers' teaching and scientific research. In terms of organizational guarantee, it is necessary to provide all-around support for teachers in accordance with the requirements of digital reform. From the perspective of working hours, optimize teaching plans and work task distribution, and provide teachers with sufficient time for digital teaching training, curriculum research and development plans, and spare time, so that teachers can complete digital teaching training within the allowable scope of work progress and pressure, and reduce teachers' psychological resistance to digital transformation. From the perspective of teacher development, build digital teaching exchange platforms, organize teachers to carry out digital teaching seminars and experience reports, and provide opportunities for teachers to learn and make progress through cooperation. From the perspective of incentive mechanisms, incorporate teachers' digital teaching reform practices into teacher performance evaluations, and provide corresponding rewards and feedback, so that teachers can recognize that their reform efforts are good and valuable, and enhance their sense of happiness and enthusiasm for digital teaching. Secondly, in terms of cultural construction, meso-level leadership fosters a departmental culture that is inclusive, innovative, and integrated with ethnic cultural characteristics. On the one hand, it supports teachers' attempts in digital teaching, tolerates reform failures, allows teachers to break free from the constraints of traditional teaching models, and explores new attempts and methods of integrating digital technology with ethnic cultural teaching. On the other hand, it organizes ethnic culture-themed activities, such as exhibitions of digital teaching cases of ethnic culture and seminars on the integration of ethnic culture and digital technology, to enhance teachers' awareness of ethnic culture and make them understand their responsibilities in ethnic cultural inheritance. Only then will teachers consciously or unconsciously integrate ethnic culture into the development and application of digital teaching resources, enabling them to have initiative derived from the responsibility of cultural inheritance, thus transforming teachers' passive "being asked to reform" into active "wanting to reform" ^[8].

3.3. Micro level: Deepening momentum through individual empowerment and motivation stimulation

Educational leadership at the micro level mainly refers to teaching and research section directors, discipline leaders, and core teachers, focusing on in-depth efforts to specifically empower individual teachers and stimulate their intrinsic motivation. In terms of individual empowerment, educational leaders should pay attention to the differences among teachers and provide targeted guidance. For teachers with relatively weak digital literacy, one-on-one training should be conducted on the popularization of digital technologies and the use of digital platforms for teaching resources, enabling them to become familiar with digital teaching tools through gradual practice and eliminate their fear of using digital technologies. For teachers with a certain foundation in digital literacy, they should be guided to explore more in-depth digital teaching models, such as blended learning and project-based learning in ethnic traditional culture courses, and encouraged to participate in the in-depth development of digital teaching resources to improve their innovative capabilities in digital teaching. In terms of motivation stimulation, micro-level leadership focuses on exploring teachers' intrinsic needs and satisfying their needs for self-actualization and social recognition. On the one hand, platforms should be built for teachers to showcase their digital teaching achievements—for example, organizing teachers to conduct open digital teaching classes and recommending them to participate in various levels of digital teaching competitions, so that their teaching innovation achievements can be displayed and recognized, helping them gain professional fulfillment. On the other hand, attention should be paid to teachers' emotional needs: maintaining regular communication with them, understanding the difficulties and confusions they encounter in participating in digital reform, and providing timely emotional support and encouragement to make them feel understood and cared for. When teachers' intrinsic needs are met, their motivation to participate in digital reform and promote their own professional growth will continue to strengthen, and their intrinsic motivation will be further deepened through continuous positive feedback, prompting them to invest in digital teaching reform and professional development for a long time and proactively.

4. Practical key points for educational leadership to stimulate teachers' internal momentum

4.1. Adhere to a teacher-centered value orientation

Against the backdrop of digitalization in colleges and universities in ethnic minority areas, educational leadership needs to translate the teacher-centered value orientation into concrete actions and stimulate intrinsic motivation from three aspects: demand response, rights protection, and value recognition.

In terms of demand response, it is necessary to establish a regular research mechanism to accurately address the differentiated needs of different teachers through interviews, questionnaires, and other forms. For young teachers' needs to learn cutting-edge technologies, customized training should be offered in collaboration with technical departments; for senior teachers' fear of technology, "one-on-one" assistance and experience sharing should be arranged to alleviate their anxiety, make them feel cared for, and stimulate their willingness to participate.

In terms of rights protection, the "management mindset" should be abandoned, and a system of teachers' professional autonomy should be implemented. Teachers have autonomy in curriculum: they can select applicable educational technology tools and strategies on their own; autonomy in resources: they can create micro-courses, instructional videos, etc., based on the traditional cultures of ethnic minorities in their regions, and receive corresponding financial and resource support; autonomy in assessment: diversified assessment criteria

should be adopted, incorporating tentative innovations and student evaluations, adhering to the principle of non-quantification, thus transforming the situation from “teachers having no choice but to comply” to “teachers taking the initiative.”

In terms of value recognition, a comprehensive system should be built. Spiritually, titles such as “Star of Digital Teaching Innovation” should be established, and achievement shows should be held; materially, digital achievements should be linked to assessments and professional titles, with performance bonus points and funding inclinations provided, and typical teacher cases should be publicized to enhance their sense of professional honor and sustained motivation.

4.2. Emphasizing the synergistic integration of ethnic culture and digitalization

Relying on the heritage of ethnic minority cultures, educational leadership needs to transform cultural identity into teachers’ intrinsic motivation through cultural guidance, carrier innovation, and achievement transformation.

In terms of cultural guidance, exchange platforms should be built to carry out activities such as ethnic culture studies, expert lectures, and intangible cultural heritage exhibitions. A “Teaching and Research Section for the Digital Inheritance of Ethnic Cultures” should be established to help teachers recognize their dual roles as both knowledge imparters and cultural inheritors, and proactively integrate ethnic culture into digital teaching.

In terms of carrier innovation, resources should be integrated to build practice bases, guiding the exploration of “culture + technology” paths. Funding should be provided to establish virtual resource libraries of ethnic cultures, transforming items such as Miao silver ornaments and Dong Grand Choirs into 3D models and VR courses. The use of information technology to implement immersive teaching—such as virtual village experiences and online ethnic culture projects—should be advocated to provide teachers with more creative ideas and enhance their sense of gain.

In terms of achievement transformation, a “teaching-research-social service” mechanism should be established. Excellent digital resources should be promoted in teaching; in research, teachers should be supported to summarize their achievements for project applications and paper publications; at the social service level, resources should be promoted to local communities or teachers should be encouraged to participate in digital cultural and tourism projects, enabling them to feel the social value of their work and strengthen their intrinsic motivation.

4.3. Constructing a dynamically adjustable leadership practice mechanism

In response to the iteration of digital technologies and changes in teachers’ motivation, it is necessary to build a dynamically adjustable mechanism through monitoring and evaluation, feedback and optimization, and collaborative linkage.

For process evaluation, hierarchical evaluation criteria should be established, with the leadership level (system implementation, support intensity), teacher level (recognition, enthusiasm), and functional performance (level, effectiveness) as the evaluation subjects. A combination of qualitative and quantitative analysis methods should be adopted for hierarchical and process-based evaluation to identify problems in a timely manner.

Feedback and optimization require a rapid response. For common problems (such as complex platform operations), technical departments should be collaborated with to upgrade systems or increase training; for individual problems (such as low enthusiasm for resource development in departments), targeted assistance should be provided. At the same time, teachers should be invited to participate in strategy adjustments to enhance their

recognition.

In terms of collaboration, an internal coordination mechanism should be established among the university, schools (colleges), teaching and research sections, and technical/academic affairs departments with clear responsibilities. Externally, collaboration should also be carried out with peer universities, research institutes, enterprises, and public institutions to learn advanced practices and invite experts to participate in diagnosis. Such coordinated efforts ensure that leadership practices are suitable for the university's actual situation and development needs, and continuously release momentum.

5. Conclusion

In the development of digital education in colleges and universities in ethnic minority areas, it is necessary to tap teachers' internal motivation through educational leadership. Through the "top-middle-bottom" three-level leadership operation, from cultivating the foundation and stimulating motivation to nurturing internal motivation, teachers can be gradually developed into active agents of digital transformation reform. This is not only a context-sensitive leadership model based on ethnic minority areas, but also a leadership model that conforms to the development of digital education. It provides a feasible practice for improving the internal motivation of teachers' professional development in the digital transformation of colleges and universities in ethnic minority areas.

Disclosure statement

The author declares no conflict of interest.

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The Study of Strategic Planning, Market Research, the Allocation of Resources, and Promotion Practice in Business Operations

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Abstract: The success of business operations relies on various dimensions of scientific decision-making, including clear goal programming, accurate market awareness, efficient resource utilization, and effective promotion strategy. This essay integrates two business practice research, making an analysis of core elements in business plan, methods and application in market research, different resource allocation logic in different economic systems, and strategies of promoting products. The aim of this essay is to provide a systematic reference from making a plan to carrying out the plan for enterprises, showing internal relationships and the law of practice of the business operating environment.

Keywords: Business operations; Market research; Resource allocation

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1. Business plan and strategy

The definition of a business plan is a project that includes the goals and strategies of a business in detail ^[1]. A properly used business plan is a valuable tool to develop abilities of competence ^[2]. There are several different features of a business plan. In order to successfully achieve the goal of making a mobile kitchen on the truck. It is necessary for Jack to use a well-established business plan to start his future business.

Firstly, the description of the business opportunity is an essential factor in a business plan for a new business. If Jack wants to successfully make a mobile kitchen on the track, Jack needs to analyze the market background and find out customers' potential needs. Traditional restaurants cannot move from one place to another. As a result of that, they lose the flexibility of trading and can only wait for customers to go to them to consume. One of the advantages of a mobile kitchen is its convenience. It is easier for Jack to seize the selling opportunities because whenever there are some events in different places in the UK. The truck can move rapidly to sell street food to people who anticipate events on time, which just caters to people's needs because they may feel tired and hungry

at that moment.

Secondly, the marketing and sales strategy in the business plan is also very important. It helps Jack to take action quickly in his future business and save time for consideration. Moreover, Jack can also avoid some unnecessary mistakes in action in the future because he can find out some of the obstacles of the business early and think of the solutions. Jack should make sure the location of his business and make suitable for his targeted customers, young people who enjoy taking part in different events, and also like eating street food, and people who want to save the cost of time and money. The social class of the targeted people may be around the middle class. Jack can decide on proper strategies according to his analysis.

What is more, the executive summary is of equal importance. This part explains the core ideas of Jack's business. As a result of that, Jack should illustrate his idea of creating his own unique selling point—specializing in street food from just one country or region of the world. For example, Jack can sell Chinese food to customers in the UK because Chinese food is full of color, aroma, and taste. It is beneficial for Jack's mobile kitchen to become famous.

In conclusion, there are more advantages of writing the description of the business opportunity and marketing and sales strategy than those of writing the executive summary. Therefore, Jack needs to ensure the completion of the first two features of a business plan.

2. Market research and application

The definition of market research is the process that people collect, present, and analyze the information that is used to learn about customers, competitors, and the whole market ^[3]. There are two types of market research: primary research and secondary research. The definition of primary research is the collection of first-hand information about the needs of a company. And there are two kinds of primary research: qualitative research and quantitative research.

Above all, if Jack wants to successfully make a mobile kitchen on the truck, Jack can carry on qualitative research through interviews and focus groups. Diversity is an important feature of qualitative research nowadays ^[4]. He can invite several customers in different classes and of different ages to attend a discussion about which country's street food they are interested in most and the reasons why they are interested in it. In this way, he can also learn about people's opinions and collect people's suggestions about the mobile kitchen.

What is more, it is useful for Jack to carry on quantitative research through test marketing. Jack can conduct a soft opening of the mobile kitchen in a small region of the UK before a full-scale launch, which can test customers' reactions to this service. The two kinds of methods can not only help Jack obtain up-to-date information, but also improve the efficiency of solving the questions that confuse Jack. Moreover, the information that Jack acquires is relevant, such as which street food people prefer to have and how he can decorate the truck to attract customers.

However, there are also some disadvantages to the two methods of primary research. It may cost Jack a lot of money and time to conduct customer surveys. Furthermore, there may be doubts over accuracy and validity because the customers that Jack invites to discuss cannot represent everyone. As a result of that, the information he obtains may be limited.

The definition of secondary research is the collection of secondhand information. There are several sources of secondary data, such as government publications, local libraries, local government offices, and the internet. Jack can search the internet to find out different features of different countries' street food and determine which flavor

may be the most popular one to become his unique selling point.

There are some advantages of this approach. Firstly, it is very easy for Jack to obtain the information, which costs less money and time. What's more, Jack is able to acquire information about different characteristics of different countries from both the internet and local libraries and make comparisons with them to obtain a more comprehensive understanding.

Nevertheless, the information that Jack may not be updated and may therefore be out-of-date. For example, the flavor of one dish in China may be changed after the improvement of the cooking method.

In conclusion, there are more advantages of primary research than those of secondary research. Jack can prefer to use primary research to prepare for his mobile kitchen.

Moreover, there is another research that can be used to discuss the approaches of market research. There are two approaches to research: primary research and secondary research. "Primary research: the collection of first-hand data that is directly related to a firm's needs." "Secondary research: the collection of data from secondhand sources." The two approaches can be divided into two types: qualitative research and quantitative research. Qualitative research is the research to find out the consumers' in-depth motivations when they buy products. Quantitative research is the research that contributes to results of numbers, which can be statistically analyzed. Additionally, there are several specific methods of them. Although it has internal technical debates, the quantitative research seems relatively methodologically unidimensional, while diversity is an important feature of qualitative research nowadays. Because of the diversity of qualitative research, there are different kinds of ways to conduct qualitative research. For instance, to research the market for the new flavored potato chips, firstly, the owners of Tudor can interview others by asking a series of questions about their thoughts on potato chips. They can also focus group to invite people from different classes to discuss their thoughts. In this way, the owners may receive some interesting ideas about the potato chips. Secondly, it is important for the owners of Tudor to do some test marketing, which is a way of quantitative research. They can sell the potato chips of the four flavors in some typical areas in advance in order to test the consumers' reactions. It should be noted that the amount of potato chips needed to be limited in order not to lose consumers' passion for the products. Through this method, the owners can decide to use the flavor that sells best to celebrate Tudor's 50th year.

The methods above are primary research. The owners of Tudor can also do some secondary research. In the past, print media was the main stream for people to obtain information. Most people go to the libraries or read the newspapers to get what they want to know. Nowadays, the internet has become one of the most convenient tools for producers to collect information. The producers can search for information about people's taste preferences that are posted on the Internet to predict which flavor may be more popular. However, primary research and secondary research have different characteristics. Primary research can collect new data, while secondary research can only collect existing data. As a result of that, the former may be more useful than the latter. The owners can mainly focus on the former.

John Gill and Phil Johnson pointed out that the major concerns of survey researchers are sample size, data collection procedures, analysis, and measurement ^[5]. According to these requirements, here are the results of the primary market research that identify which flavor of the potato chips may be most popular. With the aim of finding out which flavor of potato chips could be chosen to celebrate the Tutor's 50th year, this primary market research conducted a questionnaire survey among the university students and their parents. The research chose two target groups and adopted the random sampling method. The questionnaire survey was posted on WeChat so that students and their parents could easily answer the questions online. As the strategy is able to drive the design,

it is very important. The strategy is the logical rationale behind the design for answering the research questions. According to the importance of the strategy, the questions of the survey include: What is your age range? How often do you eat potato chips? Would you like to try new flavors? Which flavor would you like to choose among the four flavors below? These questions are listed step by step so that it is more effective for the owners to know the respondents' information. Moreover, Clare Morris pointed out that the keynote should be simplicity ^[6]. According to this point of view, questions like "What is your gender?" are not included in the survey. Because this may not be of help to the research. From the overall situation of the investigation, there are a total of 50 people who participated in the research. Among them, university students occupied 80 percent, and the students' parents accounted for 20 percent. The frequency of eating potato chips among students is higher than that of parents. Additionally, 70 per cent of the university students prefer to try to taste new flavors, while 50 per cent of the students' parents are more willing to eat the original flavor. Among the university students who have an interest in trying the new flavors, the most popular flavor is India Tandoori. However, among the parents who are willing to try new flavors, the most famous flavors are Bolognese and Parmesan. These phenomena have reflected that young people are more willing to try new and unconventional things, while middle-aged and elderly people are more likely to maintain the routine. And there is no doubt that young people are the main force of potato chip consumers. As a result of that, which flavor to choose can be easily decided, though there are two different popular choices. The owners of Tudor can choose Indian Tandoori as the new flavor to celebrate the 50th year.

3. Economic systems and resource allocation

There are numerous differences among the three economic systems. The definition of a free market economy is that the market guides the distribution of limited resources. Distinctly, a planned economy is defined as the construction that government guides resource allocation. And mixed economy, just as its name implies, is an integration of market forces and government intervention to manage resource distribution. Moreover, the three economic systems have distinct characteristics. One of the differences is the origin of motivation ^[7]. It illustrates that the free market economy is a structure where consumers and employees can spare no effort to enhance their efficiency, and the producers are also able to make an attempt to maximize their interests. In this situation, those who own land and capital are private individuals. Furthermore, social welfare reaches its maximization. For example, America and Canada adopted this mode and developed their economy rapidly. However, in a planned economy system, the public always shares the factors of production. The distribution of resources needs to be put into consumption, investment, inputs, and outputs. The mixed economy is still the combination of the former two, whose motivation is original from the self-interest of consumers, producers, and employees, and consideration of the good of the community. Another difference among the three economic systems is the level of the influence of government. In a free market economy system, the government often sets few limits, which support private individuals and organizations to pursue their maximized profit. In a planned economy system, the government guides the allocation of resources, which plays a crucial role in society. And in a mixed economy system, the responsibilities of the government are more complex: to regulate the activities of the economy and provide both public goods and merit goods.

Having explored the definition and characteristics of the three economic systems, additionally, there are, respectively, advantages and disadvantages of the free market economy, planned economy, and mixed economy. As for a free market economy, when social marginal benefit (SMB) equals social marginal cost (SMC), the

welfare of society reaches its maximum point. Additionally, the free market can also contribute to community surplus. However, it is possible for market failure to occur when resources are not allocated efficiently by the free market equilibrium, as evidenced by the 2008 economic crisis. Grigor'ev and Salikhov describe that the inefficient allocation of resources by local government in the USA made a horrible difference to the economic market at that moment ^[8]. What is more, market failure happens when prices do not reflect social costs, which leads to negative externalities. **Figure 1** shows the change and the area of social welfare loss it contributes to. Actually, there are many other types of market failure. For instance, merit goods will be underprovided and demerit goods will be overprovided. Gillespie also emphasizes monopoly power, which is a situation where some companies begin to dominate and utilize monopoly power in some markets. Nevertheless, these companies will not receive more profit because they have to reduce their prices to improve their ability to compete.

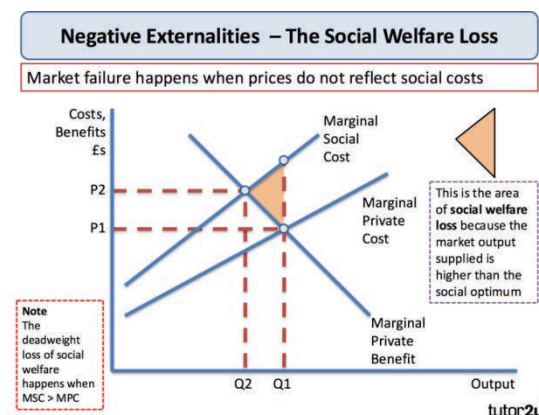


Figure 1. Social welfare loss during market failure

As for the planned market, there are some obvious strengths, such as high investment, high and stable growth, and low unemployment. It attributes the success to the government intervention, and it still has some drawbacks. In this economic system, it is possible for the government to ignore consumers' demand. As a result of that, it may lead to inefficient allocation of resources. Because of the combination of the characteristics of the free market and the planned market in a mixed market, the function of a mixed market is more complete and comprehensive. For instance, China utilized this market system to achieve targeted poverty alleviation rapidly, which shows the huge power of a mixed market.

Having analyzed the advantages and disadvantages of free market, planned market, and mixed market, the evaluation of whether resource allocation can only be maximized when an economy moves from a planned economic system to a free market economic system is followed. Firstly, the atmosphere of the free market is more motivational than that of the planned market. The government will not place many limits so that private individuals and organizations have more choices and opportunities to achieve their goals. While in a planned market, people's choices are fewer because resource allocation is guided by the government. In this situation, innovations are more likely to be stimulated in a free market. Partiti and Radick analyzed that small firms cooperate with other agencies and leading to creativity and innovation ^[9]. Small firms in a planned market may not maximize their potential. Secondly, the free market has more adaptability and flexibility than the planned market. Because of the various factors that the government in a planned market needs to consider when making policies, such as society, culture, and country relationships, it is more difficult for the government to respond to the changes in the market. In contrast to it, the free market has more strengths. Private individuals and organizations can adapt to market

changes more easily and compete with each other freely. Thirdly, the efficiency of information transmission of the free market is higher than that of the planned market. In a planned market, the responsibility of information transmission is put merely on the government, so that the speed of transmission cannot satisfy the needs of market changes. Nevertheless, in a free market, information has various channels to spread, which encourages competition and the development of the economy. Finally, the risks of a planned market are fewer than those of a free market. It has stronger stability. The government can allocate the resources to put into investment so that society can develop rapidly in a short period. Conversely, sometimes market failures may occur in a free market, such as some firms owning monopoly power, which does harm to market competition. Due to the analysis above, whether resource allocation can only be maximized when an economy moves from a planned economic system to a free market economic system depends on the period of development. If countries have low production levels, they can utilize a planned market to pool resources in investment and construction to develop rapidly. In this situation, they can maximize their resource allocation. If countries have a high level of production, they can use the free market to improve their innovation and efficiency.

4. Promotion strategies and practice

The definition of promotion is attracting and persuading potential customers to buy products through advertising, sales promotion, and other methods. There are two types of promotion: above-the-line promotion and below-the-line promotion. The definition of above-the-line promotion is the form of promotion that businesses use to communicate with customers to inform and encourage them to purchase goods. For example, advertising is one of the typical above-the-line promotion methods. In the business market, advertising is thought to be beneficial to accomplish performance objectives^[10]. If Jack wants to successfully make a mobile kitchen on the track, Jack can put advertisements about the mobile kitchen through television, newspapers, and magazines.

There are several advantages of this approach. Firstly, a large number of people will receive the information about the mobile kitchen, including the potential organizers of events and potential customers. Secondly, the use of the mobile kitchen can be demonstrated: preparing street food and selling it to people who take part in different events around the UK, which lets people understand it more clearly. What is more, in the advertisements, sound and movement can be used. Jack can show the behaviors of driving the truck and sending street food to customers to attract people's interest in his service.

However, there may also be some disadvantages to advertising. Firstly, the cost of making an advertisement is very high. Therefore, it is necessary for Jack to make sure that the inheritance that he received can afford it. Furthermore, some viewers may choose to avoid TV advertisements, so that some targeted customers probably cannot know about this service. Jack should also evaluate the efficiency of advertising.

The definition of below-the-line promotion is the form of promotion that is based on short-term encouragement to purchase the products. Sales promotion is one of the most essential methods of below-the-line promotion, which includes price promotion and BOGOF. Jack can temporarily reduce the price of the street food that he provides to the customers. Hence, this method can encourage people to purchase more and attract more new customers. Nevertheless, it is also important for Jack to pay attention to the gross profit he obtains because the increased sales are gained from the reduction in price.

BOGOF means "buy one, get one free", which is suitable for Jack's service because people prefer to take part in events with their friends or family members. This approach is beneficial to them, so they may be attracted.

In conclusion, there are more advantages than disadvantages of advertisements, and the range that advertisements cover is wider than that of sales promotion. Advertisements can not only attract customers, but also inform potential organizers of events. So, if Jack wants to expand his influence, advertising is a better choice. However, sales promotion is more effective in attracting customers to purchase. If Jack wants to improve his profit in the short term, he can choose this method. It depends on Jack's core purposes.

In addition, there are several methods of promoting the new flavor of potato chips. Firstly, the owners of Tudor must adopt above-the-line promotion methods. One specific approach is advertising for potato chips. They can invite some representatives to shoot advertisements. It is an effective approach that can utilize the representatives' influence to expand the influence of potato chips. Furthermore, the most suitable place for owners to place advertisements is the Internet. On the Internet, the information about the new flavor can be updated regularly, such as when it will be sold and how many and how much of this kind of potato chips will be sold. Nowadays, young people rely on the Internet very much, and mobile phones have become their necessity of life. If the advertisements are placed on some websites that they frequently click on, the hits and responses will increase quickly, which will enhance the possibility of selling more potato chips. It is worth mentioning that middle-aged and elderly people are gradually joining in using the Internet. However, the applications that middle-aged and elderly people use are different from those of young people. As a result of that, it is necessary for owners of Tudor to place the advertisements in different applications specifically.

Secondly, some below-the-line promotion methods are of equal importance. People often prefer to choose products that are cost-effective, and potato chips are no exception. Therefore, sales promotion is vital for the owners to sell more products. For example, the potato chips can be combined with some free gifts such as toys and flowers, which is able to attract people's interest. Distributing coupons is an easy and effective way to stimulate consumption. Letting the consumers own loyalty cards can discourage the consumers from buying products in other shops. Nevertheless, the loyalty cards are too common, so that the effects of this method may be worse than the former one.

In conclusion, this essay has described two examples of practice, analyzing key contents of business plan, approaches in market research, and how to apply it, how resources are allocated in distinct economic systems, and methods of how to promote. Through this way, this essay aims to give a clear understanding to enterprises on how to make an accurate plan and how to turn it into reality, which also shows deep thoughts on the business operating environment.

Disclosure statement

The author declares no conflict of interest.

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Optimization of Production Line Balance Based on IE Methods

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Abstract: China's clothing industry occupies an important position in the manufacturing sector, with most enterprises being heavily reliant on the market, making both clothing styles and output subject to market demand. With the continuous economic development, consumers' requirements for clothing styles, functionality, and quality are increasing, prompting companies to urgently seek transformation and upgrades. This article focuses on the production process of the Type A shirt sewing workshop at Company ZY. Through research, it was found that this production line has issues such as low productivity, imbalanced production lines, and noticeable bottleneck processes. The study improved the balance of the production line based on the IE (Industrial Engineering) method, ultimately helping Company ZY enhance production efficiency and product quality, achieving a good level of balance for the clothing sewing production line. This also provides a practical case for production line optimization for the entire manufacturing industry. This article has significant practical implications for optimizing production processes in clothing enterprises and serves as a guiding reference for the study of optimization issues.

Keywords: Production line balance; IE methods; Production process optimization

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1. Introduction

As a traditional labor-intensive manufacturing industry, the clothing sector has historically focused on reducing production and labor costs, with little consideration given to upgrading production workshops and enterprise production management systems. With the widespread adoption of the internet and the rise of online sales channels, the clothing industry inevitably intersects with the internet, posing significant challenges to the production efficiency of traditional companies. At the same time, consumers' demands for personalized purchases are pushing the industry's production model toward small batches and customization, while most clothing companies in the country remain in traditional production models, struggling to meet the production scale required for modern manufacturing and the diverse individual needs of consumers. The COVID-19 pandemic in 2020

further delivered a tremendous blow to the physical industry, causing many small and medium-sized clothing enterprises to shut down or go out of business due to a slump in market demand triggered by the pandemic. Therefore, it is urgent to propose optimization plans for the production processes of clothing companies to cope with internal and external environmental pressures ^[1-4]. The core of the Industrial Engineering (IE) method lies in conducting a comprehensive evaluation of enterprises from the four dimensions of people, machines, processes, and environment, thus achieving optimal resource allocation and process optimization. Based on this logic, this paper takes the sewing production line of Company ZY as the research object, employing relevant IE methods to solve existing problems in the production line. The research goal is to enhance the balance rate of this production line, to help the business reduce costs and improve production efficiency ^[5-6]. This move can both strengthen Company ZY's competitiveness in an increasingly changing market environment and enhance its economic benefits while also providing a reference for other related manufacturing enterprises.

2. Analysis of the current situation and problems of the garment sewing production line of ZY Company

2.1. Current status of the production line

ZY Co., Ltd. was established in 1980 and is the first large modern joint-stock enterprise in China to have a complete production process of “spinning, weaving, printing, dyeing, cutting, sewing, and packaging”, as well as an integrated model of “trade, industry, and agriculture.” It has been ranked among the top 100 knitting enterprises in China for many years, and its products are exported to 24 countries and regions, including Japan, the United States, and the European Union, mainly providing processing services for domestic and foreign clothing companies, without involving its self-owned brand processing. As the market environment changes and consumer demands diversify, ZY Company faces multiple operational challenges: there are efficiency bottlenecks in the production process, the process design is unscientific and overly lengthy, leading to extended production cycles and increased operating costs; product quality fluctuates significantly, with a relatively high rate of defective products, negatively impacting brand image and customer satisfaction; production site management lacks systematic standards, and management systems are not well executed, further constraining the enhancement of production efficiency. Therefore, there is an urgent need to conduct a comprehensive optimization study of the company's production processes by diagnosing key issues in the existing process and formulating feasible optimization strategies in conjunction with market trends and changes in customer demands, in order to enhance the overall operational efficiency and market competitiveness of the enterprise.

This article selects the production process of the A-type shirt sewing workshop as the research object, which can be subdivided into 12 procedures, with a U-shaped layout for the production line.

Use the stopwatch method to measure the working times of each process on the production line.

- (1) Conduct a continuous measurement of the work content for each process three times, and calculate the average to obtain the average observation time for each process.
- (2) The workers selected for this observation are skilled employees, but due to a relatively chaotic working environment and long working hours each day, the selected average level assessment coefficient is set to 1. Considering factors such as employee concentration and fatigue, a comprehensive value of 10% is chosen as the allowance rate.

$$\text{Normal time} = \text{Average observation time} \times \text{Assessment coefficient} \quad (2-1)$$