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Ungul Laptaned
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Welcome Address from President, Sripatum University

Welcome to the thirteenth volume of International Journal of Management, Business, and Economics (IJMBE). IJMBE is dedicated to increasing the depth of the subject across business disciplines with the ultimate aim of expanding knowledge of the subject. The IJMBE is a thrice peer-reviewed journal published by Graduate College of Management, Sripatum University; University of Greenwich; and Lincoln University.

In retrospect, Sripatum University, one of the oldest and most prestigious private universities in Thailand, was established in 1970 by Dr. Sook Pookayaporn by the name "Sripatum College." The name "Sripatum" meaning "Source of Knowledge Blooming like a Lotus" was conferred on the college by Her Royal Highness the Princess Mother. In 1987, the college was promoted to university status by the Ministry of University Affairs, and has since been known as Sripatum University. The university's main goal is to create well-rounded students who can develop themselves to their chosen fields of study and to instill the students with correct attitudes towards education so that they are enthusiastic in their pursuit of knowledge and self-development.

To strive to be among the best, this second issue of the IJMBE is therefore instrumental for the most important academic growths to extend a high quality tradition in the education field to the world. The journal welcomes the submission of manuscripts that meet the general criteria of significance and scientific excellence, and will publish original articles in basic and applied research, case studies, critical reviews, surveys, opinions, commentaries and essays. It is hoped that this second issue will set a new benchmark in terms of academic publications. Through the support of our Editorial and Advisory Boards, I hope this journal could provide academic articles of the highest quality to all readers.



Dr. Rutchaneeporn Pookayaporn Phukkamarn
President, Sripatum University

Welcome Address from Dean, Sripatum University

It is appropriate to celebrate the continuity of an exciting and esteemed journal. The IJMBE will serve and provide a forum for exchange of ideas among business executives and academicians concerned with Management, Business, and Economics issues. With the rapid evolution of corporate business from international to global in recent years, general business has been one of the areas of greatest added complexity and concern for corporate managers. The IJMBE will be an academic journal combining academic inquiry and informed business practices. It will publish empirical, analytical, review, and survey articles, as well as case studies related to all areas of Management, Business, and Economics. A sentiment often expressed by practitioners is that academic research in general may not be addressing the most relevant questions in the real world.

It is fair to say that the IJMBE will publish high-quality applied-research papers. Nevertheless, studies that test important theoretical works and shed additional light on the issue with some business implications will also be solicited. Each submitted paper has been reviewed by several members of the IJMBE international editorial board and external referees. On the basis, we would like to thank all of them for their support with review process of submitted papers.

I cordially invite papers with theoretical research/conceptual work or applied research/applications on topics related to research, practice, and teaching in all subject areas of Management, Business, and Economics, or related subjects. I welcome paper submissions on the basis that the material has not been published elsewhere. The ultimate goal is to develop a journal that will appeal to both management and business practitioners. I expect the IJMBE to be an outstanding international forum for the exchange of ideas and results, and provide a baseline of further progress in the aforementioned areas.



Assoc. Prof. Dr. Vichit U-on
Dean, Graduate College of Management
Sripatum University

The Editors

Editor-In-Chief



Dr. Ungul Laptaned is an Assistant Professor in the Graduate College of Management, Sripatum University. He graduated with a Ph.D. in 2003 from the University of Nottingham, United Kingdom in the field of Manufacturing Engineering and Operations Management. Ungul has published over 60 proceedings and journal papers; for instances, Industrial Engineering Network, Asia Pacific Industrial Engineering and Management, International Association of Science and Technology for Development, Operations and Supply Chain Management, Intelligent Manufacturing System, Business and Information, etc. He served as a program chair and a steering committee for several domestic and international conferences. He was a journal editor of International Journal of Logistics and Transport, and Thai Researchers' Consortium of Value Chain Management and Logistics Journal, and has consulted for several public organizations and industrial firms on logistics and supply chain management such as Thailand Research Fund, Phitsanulok Province, Public Warehouse Organization, Amatanakorn Industrial Estate, Wyncoast Industrial Park, Iron and Steel Institute of Thailand, Chacheongsao Province, JWD Infologistics Co., Ltd., Kerry Distribution (Thailand) Co., Ltd., TKL Logistics and Supply Chain Co., Ltd., and Ministry of Transport (Thailand).

Associate Editor



Dr Ioannis Manikas holds a Bachelor in Agriculture and a Master of Science in the field of logistics from Cranfield University. He holds a PhD from the Department of Agricultural Economics in AUTH and his primary interest includes supply chain management, logistics and agribusiness management. Dr Manikas has conducted research for projects regarding supply chain modelling, development of IT solutions for agrifood supply chain management and traceability both in Greece and the UK. He has a wide experience in the elaboration of research proposals under FP6, FP7, and Eurostars-Eureka funding mechanisms; lifelong learning oriented programmes such as Leonardo; and Interregional development programmes such as Interreg III and Interreg IV. His work as a self employed project manager and consultant in the agrifood sector includes the design and development of regional operational programmes; analysis of regional needs and respective development policies focused on rural and food production; definition of funding areas and financing resources; definition of strategic goals for regional development and formulation of respective performance monitoring systems; and assessment (ex-ante, on-going, ex-post) of the implementation of EC and national funding mechanisms in national and regional levels.

Guest Editor



Dr. Gilbert Nartea is an Associate Professor in the Waikato Management School, University of Waikato, New Zealand. Dr. Nartea graduated a Master's Degree from New England and a Ph.D. from Illinois, USA. He is a senior lecturer in Finance. His teaching interests are in the area of investments, futures and options, and finance, futures and options. The area of research interests area asset pricing, investment management, decision-analysis and risk management, and microfinance and poverty alleviation. He has published several papers in such journals as of Property Investment and Finance, International Journal of Managerial Finance, Asian Journal of Business and Accounting, Australian Journal of Agricultural and Resource Economics, Pacific Rim Property Research Journal, Review of Applied Economics, Review of Development Cooperation, American Journal of Agricultural Economics, and Journal of the American Society of Farm Managers and Rural Appraisers.

Foreword

Welcome to the 2nd issue of the 13th volume of International Journal of Management, Business, and Economics (IJMBE), the Editors received a number of papers from different countries such as China and Thailand. The received papers encompassed many areas of marketing, banking, economics, insurance and risk management, industrial and operation management, strategic management, and international and global business management. After the review process, a total of ten manuscripts were selected for publication.

The first article is conducted by *Huizi Zhao*, and is entitled “*Research on the Art Management Strategies of Adult Ballet Training Institutions*”. This research aims to analyze the management strategies that can enhance both educational quality and institutional competitiveness while supporting the development of aesthetic education.

The second article is authored by *Jie He and Liming Zhang*, and named as “*Dual-Channel Mechanisms of Competitive Culture on Firm Performance: Parallel Mediation of Team Attitude-Capability and Lifecycle Moderation*”. This study examines the mechanism through which competitive culture affects corporate performance by focusing on the mediating role of team characteristics and the moderating role of the enterprise life cycle.

Article number third is written by *Li Wang and Shaowen Wang*, and is entitled “*Research on the Planning and Implementation of Art Public Welfare Activities under the Linkage of Universities and Communities*”. This study examines the collaborative mechanism and implementation pathways of art-based public welfare activities through partnerships between universities and local communities.

The fourth paper is examined by *Shi Li and Shaowen Wang*. Their paper is entitled “*Research on the Application of AI Empowering Aesthetic Teaching of Chinese Language in Vocational Schools*”. This study examines the collaborative mechanism and implementation pathways of art-based public welfare activities through partnerships between universities and local communities.

In the fifth article, entitled “*A Case Comprehensive Review of Performance Budget Evaluation Research in China Education Institutions*” is conducted by *Shiming Xie*. This study aims to examine the theoretical foundations, development trends, and practical implications of budget performance evaluation in public colleges and universities.

The sixth article is conducted by *Shuofei Wang*, and is entitled “*A Study on the Double-Edged Effects of Electronic Performance Monitoring on Employees’ Organizational Citizenship Behavior*”. This study investigates the mechanism through which electronic performance monitoring affects employees’ organizational citizenship behavior (OCB) by examining the mediating roles of challenge stressors and hindrance stressors.

The seventh article is authored by *Xiaobo Zheng*, and is entitled “*A Study on the Impact of Digital Marketing on Enhancing Brand Value*”. This study takes COCO Milk Tea as a case to investigate the relationship between digital marketing, brand trust, and brand value from the perspective of the 4I theory.

Article number eight is entitled “*Cultivating Confucian Heritage and Exploring the Construction of a High-Quality Special Education System*”, and is examined by *Xinyu Cao*. This study is to explore how Confucian educational philosophy can provide theoretical guidance for the construction of a high-quality special education system.

In the ninth article, entitled “*A Study on the Influence Mechanism of Film and Television Scenes on Game Scene Design in Contemporary Film Narratives*” conducted by *Yi Guangyu and Zhu Xuhui*. This study aims to explore the influence mechanism of film scene design principles on game scene design within the context of cross-media integration.

Last but not the least, the article entitled “*Based on Startup AI Enterprises: The Impact of Transformational Leadership on Employee Innovative Behavior*”, is conducted by *Zhihan Ni and Zhaoqi Peng*. This study examines the relationships among transformational leadership, innovative self-efficacy, perceived organizational support, and employee innovative behavior.

It is hoped that you will enjoy reading these articles and that they will generate responses and discussions that will help advance our knowledge of the field of Management, Business, and Economics. The Editors and the Editorial Board of the IJMBE would like to welcome your future submissions to make this journal your forum for sharing ideas and research work with all interested parties.

Ungul Laptaned
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Research on the Art Management Strategies of Adult Ballet Training Institutions

by

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Abstract

This study examines the art management strategies of adult ballet training institutions from the perspective of aesthetic education. With the growing emphasis on aesthetic education and cultural development, adult ballet training institutions have become important platforms for promoting artistic appreciation, cultural understanding, and personal development among adult learners. However, these institutions face increasing challenges in balancing artistic education with market-oriented management. Therefore, this research aims to analyze the management strategies that can enhance both educational quality and institutional competitiveness while supporting the development of aesthetic education. The study adopts a mixed-method research design that integrates qualitative and quantitative approaches. Qualitative data were collected through semi-structured interviews with administrators, teachers, and students from two representative adult ballet training institutions in Beijing. These interviews explored institutional practices related to curriculum design, pricing strategies, teaching channels, and marketing activities. Grounded theory was applied to analyze the qualitative data and identify key themes influencing art management practices. Based on these findings, a structured questionnaire was developed and distributed to learners and teachers, resulting in 245 valid responses. Statistical analysis, including reliability and validity testing and regression analysis, was conducted to examine the relationships between management strategies and learner behavior. The results indicate that the four dimensions of the 4P marketing framework—product, price, place (channel), and promotion—play important roles in the sustainable development of adult ballet training institutions. Among these factors, course design and teaching quality significantly influence learners' willingness to continue studying ballet, while teacher–student interaction and the integration of aesthetic education concepts strongly affect learning satisfaction and loyalty. Promotional activities and positive word-of-mouth also contribute to institutional reputation and market expansion. Although pricing strategies influence enrollment decisions, their direct impact is relatively weaker compared with educational quality and learning experience. Overall, the study highlights the importance of integrating aesthetic education principles with effective art management strategies. The findings provide both theoretical insights for arts management research and practical recommendations for improving the management efficiency and educational value of adult ballet training institutions.

Keywords: Aesthetic Education, Arts Management, Adult Ballet Training Institution, Marketing Strategy, Dance Education

1. Introduction

1.1 Background and Importance of the Problem

Since the advent of the new era, China has increasingly emphasized the development of aesthetic education and arts education as an important component of national educational reform and cultural development. Aesthetic education is widely regarded as a fundamental approach to cultivating individuals' artistic perception, creativity, and cultural appreciation through artistic experiences within the educational system (Dewey, 1934; Eisner, 2002). In the Chinese educational context, aesthetic education not only focuses on artistic skill acquisition but also aims to foster moral character, emotional development, and cultural identity, thereby contributing to the holistic development of individuals and the enrichment of social culture (Ministry of Education of the People's Republic of China, 2020). Adult ballet training institutions, as important carriers for the transmission and development of dance art, play a distinctive role in promoting aesthetic education within society. Ballet, as a classical art form that integrates music, movement, and visual aesthetics, provides learners with opportunities to experience artistic beauty while cultivating discipline, physical coordination, and artistic sensitivity (Adshead-Lansdale & Layson, 1994). With the increasing popularity of lifelong learning and cultural consumption, adult participation in dance education has gradually increased, leading to the emergence and expansion of adult ballet training institutions in many urban areas. These institutions not only contribute to the preservation and dissemination of ballet culture but also serve as platforms for adults to pursue artistic interests, improve physical health, and develop aesthetic awareness (Risner, 2007).

However, in the context of globalization and increasing market competition, adult ballet training institutions are facing new challenges in their development. On the one hand, they are expected to maintain the artistic authenticity and educational value of ballet education; on the other hand, they must respond to market dynamics, including diverse learner needs, competitive educational markets, and financial sustainability. Balancing the artistic essence of dance education with market-oriented operational strategies has therefore become a central issue for the sustainable development of these institutions (Kolb, 2013). Effective management strategies are required to ensure not only educational quality but also institutional viability and competitiveness in the broader art education market. At present, adult ballet training institutions are not only responsible for teaching dance techniques but also for cultivating learners' aesthetic appreciation, creativity, and cultural understanding. According to Eisner (2002), arts education plays a crucial role in shaping individuals' capacity to perceive, interpret, and create meaning through artistic forms. Similarly, Greene (2001) emphasizes that engagement with the arts enables individuals to develop imagination and emotional awareness, which are essential components of aesthetic literacy. Therefore, adult ballet education should extend beyond technical instruction and incorporate broader aesthetic education principles that encourage creativity, expression, and reflective learning.

To achieve these goals, effective management strategies are essential. Institutional management influences various aspects of educational quality, including curriculum planning, faculty development, resource allocation, and student assessment systems. In particular, strategic management practices can enhance teaching effectiveness and create a supportive learning environment that promotes both artistic development and learner satisfaction (Byrnes, 2015). Furthermore, integrating aesthetic education concepts into management practices can strengthen the alignment between institutional goals and educational outcomes, ultimately improving students' overall learning experiences. From a practical perspective, several management factors play a critical role in the development of adult ballet training institutions. Scientific curriculum design ensures that training programs meet learners' skill levels and artistic development needs. Faculty development programs are necessary to maintain high teaching standards and encourage innovative teaching approaches. Additionally, the optimization of teaching

facilities and learning environments contributes to effective training and student engagement. Beyond educational factors, marketing and strategic positioning are also essential for institutional sustainability. Understanding student needs, establishing strong institutional branding, and developing clear market positioning strategies enable institutions to remain competitive in the growing art education market (Kotler & Keller, 2016).

From a theoretical perspective, although the field of arts management has developed significantly in recent decades, research focusing specifically on dance education management remains relatively limited. Arts management studies typically examine topics such as cultural policy, marketing strategies, audience development, and organizational management in cultural institutions (Chong, 2010). However, the management practices of dance training institutions, particularly those focused on adult education, have received comparatively less scholarly attention. As a result, there is a need to explore management models and strategies that are specifically suited to the characteristics of dance education and aesthetic learning environments. In addition, interdisciplinary analytical approaches can provide valuable insights into the management of art education institutions. The application of concepts and methods from economics, marketing, and statistics can help institutions analyze operational efficiency, pricing strategies, and resource utilization. For example, the marketing mix framework, commonly known as the 4P model, Product, Price, Place, and Promotion, has been widely applied in service management and educational marketing to evaluate institutional strategies and improve market competitiveness (Kotler & Armstrong, 2018). By applying such analytical frameworks, researchers can better understand how management strategies influence institutional performance and student satisfaction in adult ballet training institutions.

Therefore, this study aims to analyze the management strategies of adult ballet training institutions within the framework of aesthetic education. By examining operational practices, curriculum design, and marketing strategies, the study seeks to provide practical recommendations for improving management efficiency and educational quality. At the same time, the research contributes to the theoretical development of arts management by expanding scholarly understanding of management practices in the field of dance education.

1.2 Research Question

Based on the background and significance of the study, the following research questions are proposed:

- 1) How are art management strategies applied in adult ballet training institutions under the framework of aesthetic education?
- 2) How can curriculum design, resource allocation, and student evaluation systems be optimized to improve teaching quality and student experience in adult ballet training institutions?
- 3) How can aesthetic education concepts be integrated into curriculum design, teaching methods, and evaluation systems to enhance students' aesthetic ability, creativity, and overall development?
- 4) How can the application of the marketing mix (4P: Product, Price, Place, Promotion) support the sustainable development and competitiveness of adult ballet training institutions?

1.3 Research Objective

The objectives of this study are as follows:

- 1) To analyze the application of art management strategies in adult ballet training institutions within the framework of aesthetic education.
- 2) To examine how teaching plans, resource allocation, and student evaluation systems can be optimized to improve teaching efficiency and student learning experience.
- 3) To explore the integration of aesthetic education concepts into curriculum design, teaching methods, and evaluation systems in order to enhance students' aesthetic literacy, creativity, and overall quality.
- 4) To investigate the role of the marketing mix (4P: Product, Price, Place, Promotion) in supporting the management and operational development of adult ballet training institutions.
- 5) To provide practical recommendations and theoretical insights for improving management practices and promoting the sustainable development of adult ballet training institutions.

2. Literature Review

2.1 Related Concepts and Theories

2.1.1 Aesthetic Education

Aesthetic education refers to the cultivation of individuals' ability to perceive, appreciate, and create beauty through engagement with artistic activities and cultural experiences. It plays a crucial role in fostering creativity, emotional development, and cultural awareness. According to Dewey (1934), aesthetic experience is an essential component of human development, as it allows individuals to interact with art and transform everyday experiences into meaningful expressions. Similarly, Eisner (2002) emphasized that arts education contributes significantly to cognitive development, imagination, and critical thinking skills. In recent years, aesthetic education has gained increasing attention in educational policy and cultural development strategies. Governments and educational institutions have recognized its importance in promoting holistic education and improving the cultural literacy of citizens. In the context of China, aesthetic education has been integrated into national education reform policies to strengthen students' artistic abilities, aesthetic appreciation, and cultural identity (Ministry of Education of the People's Republic of China, 2020).

2.1.2 Dance Education

Dance education is an important component of aesthetic education, integrating artistic expression, physical movement, and cultural learning. Dance training enhances students' physical coordination, aesthetic perception, emotional expression, and creativity. According to Adshead-Lansdale and Layson (1994), dance education not only teaches movement techniques but also develops students' understanding of artistic expression and cultural context. In particular, ballet education has been widely recognized as a structured and

systematic form of dance training. Ballet requires discipline, physical strength, coordination, and artistic interpretation, making it a comprehensive educational activity that promotes both physical and psychological development. Through structured training systems and standardized teaching materials such as ballet technique manuals, students gradually develop technical proficiency and artistic sensitivity (Kassing & Jay, 2003). Adult ballet education has emerged as an important field within dance education due to the growing interest in lifelong learning and personal artistic development. Adult learners participate in ballet training not only for skill development but also for health improvement, stress relief, and aesthetic enjoyment. However, compared with children's dance education, research on adult ballet training remains relatively limited, with most studies focusing on teaching methods and curriculum design rather than management strategies and operational models.

2.1.3 Arts Management and Dance Management

Arts management refers to the application of management principles and practices to cultural and artistic organizations. It involves planning, organizing, marketing, and evaluating artistic activities and institutions to ensure both artistic value and organizational sustainability (Chong, 2010). The field of arts management integrates knowledge from multiple disciplines, including management, economics, cultural studies, and marketing. Dance management is a specialized branch of arts management that focuses on the operation and development of dance organizations, training institutions, and performance groups. It involves the coordination of artistic production, educational programs, resource management, and audience or student development. According to Byrnes (2015), effective arts management requires balancing artistic objectives with economic realities, ensuring that cultural institutions can maintain both creative integrity and financial sustainability. With the rapid growth of the cultural industry and increasing demand for arts education, competition among arts training institutions has intensified. As a result, professional management strategies have become increasingly important for ensuring institutional success. Dance management emphasizes the understanding of student needs, the optimization of curriculum design, the development of qualified faculty members, and the effective use of marketing strategies to attract and retain students.

2.1.4 Marketing Theories in Arts Education

Marketing theories provide important analytical tools for understanding the management and promotion strategies of educational institutions. Among these theories, the marketing mix framework, particularly the 4P model, has been widely applied in service and educational marketing. The 4P theory, introduced by McCarthy (1964), includes Product, Price, Place, and Promotion. This model helps organizations develop comprehensive marketing strategies by focusing on product design, pricing strategies, distribution channels, and promotional activities. In the context of adult ballet training institutions, the "product" refers to dance courses and educational services, "price" refers to tuition fees and payment structures, "place" refers to teaching locations and accessibility, and "promotion" refers to marketing communication and branding strategies. The 7P model, proposed by Booms and Bitner (1981), extends the traditional 4P framework by adding People, Process, and Physical Evidence, which are particularly relevant in service industries such as education. These additional elements highlight the importance of teachers, service processes, and the learning environment in shaping customer experience.

Another important marketing theory is the 4C model, introduced by Lauterborn (1990), which emphasizes the consumer perspective. The 4C model consists of Customer Solution, Customer Cost, Convenience, and Communication. This approach encourages organizations to focus on customer needs, value creation, and effective communication rather than solely on product-oriented strategies. In addition, the STP marketing strategy, developed by Kotler and Keller (2016), focuses on Segmentation, Targeting, and Positioning. This strategy enables organizations to identify specific market segments, select target customers, and develop differentiated positioning strategies. For adult ballet training institutions, STP analysis can help identify specific learner groups, such as beginners, hobbyists, or professional learners, and design targeted programs accordingly.

2.2 Literature Surveys

Scholars both domestically and internationally have conducted extensive research on aesthetic education, dance education, and arts management. In the field of aesthetic education, many studies emphasize the role of artistic experience in personal development and cultural participation. Greene (2001) argued that aesthetic education enhances imagination and emotional awareness, enabling individuals to engage more deeply with cultural and artistic experiences. In dance education research, scholars have explored various aspects, including teaching methods, curriculum design, and learning outcomes. Kassing and Jay (2003) examined the pedagogical approaches used in dance training and emphasized the importance of structured teaching systems in developing students' technical and artistic abilities. Similarly, Risner (2007) highlighted the social and educational value of dance education in promoting creativity, collaboration, and personal expression.

However, most existing studies on dance education focus primarily on school-based programs or professional dance training. Research specifically addressing adult dance education, particularly adult ballet training institutions, remains relatively limited. Existing literature often concentrates on teaching methods, curriculum development, and performance training, while discussions on management strategies and operational models are relatively scarce. In the field of arts management, numerous studies have explored the management and marketing of cultural institutions. Chong (2010) provided a comprehensive overview of arts management theories and practices, emphasizing the importance of strategic planning, audience development, and financial management in cultural organizations. Byrnes (2015) further discussed the application of management principles in arts organizations, highlighting the need for professional management approaches in cultural industries.

In addition, marketing strategies in arts organizations have received increasing scholarly attention. Colbert (2003) introduced the concept of the "Arts Innovation Spectrum," which emphasizes innovation in cultural product development and marketing strategies. His work highlights the importance of adapting marketing practices to the unique characteristics of artistic products and cultural audiences. Despite these contributions, there remains a research gap in understanding how marketing theories and arts management strategies can be applied specifically to adult ballet training institutions. Most existing studies focus on large cultural organizations such as museums, theaters, and performing arts companies, while smaller educational institutions in the arts training sector receive less attention.

2.3 Conceptual Framework

Based on the literature review and theoretical foundations discussed above, this study develops a conceptual framework that integrates marketing theory with arts management practices in adult ballet training institutions.

The framework adopts the 4P marketing mix model as the primary analytical structure. The four elements of the model are used to examine key management strategies in adult ballet training institutions:

Product - the design and structure of ballet courses, curriculum content, and educational services.

Price - tuition fees, pricing strategies, and perceived value of educational services.

Place - the accessibility of training locations, facilities, and distribution channels for educational services.

Promotion - marketing communication, branding, and promotional strategies used to attract students.

These factors influence the overall performance and sustainability of adult ballet training institutions, including student satisfaction, enrollment growth, and institutional competitiveness. The conceptual framework also considers the role of aesthetic education in shaping the design and delivery of ballet courses, ensuring that management strategies align with educational objectives and artistic values.

2.4 Research Hypothesis

Based on the conceptual framework and the theoretical foundations of marketing and arts management, the following research hypotheses are proposed:

H1: Product strategy (course design and educational services) has a positive effect on the performance of adult ballet training institutions.

H2: Price strategy (tuition fees and pricing policies) has a positive effect on the performance of adult ballet training institutions.

H3: Place strategy (location accessibility and facilities) has a positive effect on the performance of adult ballet training institutions.

H4: Promotion strategy (marketing communication and branding activities) has a positive effect on the performance of adult ballet training institutions.

H5: The integrated implementation of the 4P marketing strategies positively influences student satisfaction and the sustainable development of adult ballet training institutions.

3. Research Methodology

3.1 Research Design

This study adopts a mixed-method research design combining qualitative and quantitative approaches to analyze the current situation of artistic management in adult ballet training institutions from the perspective of aesthetic education. The qualitative component focuses on in-depth interviews with key stakeholders, including institution managers, teachers, and students, in order to obtain first-hand insights into institutional management practices and the application of aesthetic education concepts. Interviews allow the researcher to explore participants' experiences, perceptions, and opinions regarding curriculum design, pricing strategies, teaching channels, and marketing activities within adult ballet institutions. In addition, grounded theory is employed as the main analytical approach to interpret the interview data. Through open coding, axial coding, and selective coding, the study identifies key themes and relationships among different aspects of institutional management practices. The 4P marketing framework, Product, Price, Place, and Promotion, is used as the theoretical lens to analyze the operational strategies of adult ballet training institutions. Furthermore, based on the coding results and theoretical framework, the study constructs an explanatory framework to examine how different management factors influence institutional competitiveness and sustainability. The quantitative component of the research is implemented through a questionnaire survey designed to verify the hypotheses derived from the qualitative analysis and to provide empirical support for the proposed management framework.

3.2 Population and Sample

The population of this study consists of adult ballet training institutions located in Beijing, China. According to available industry statistics, as of March 2025 there were approximately 214 ballet training institutions operating in Beijing. After removing duplicate records and inactive institutions, the actual number of operational institutions is slightly lower. Due to limitations in time and research resources, purposive sampling was adopted to select representative institutions that could provide rich and reliable data for the study. Two adult ballet training institutions were selected as the primary research samples: Shengwu Yueya Ballet Training Institution located in Haidian District and Yixin Ballet Training Institution located in Chaoyang District. These two institutions represent different operational models and serve diverse student groups across the eastern and western regions of Beijing, reflecting regional market characteristics. Shengwu Yueya operates within an arts complex and has developed a comprehensive service chain integrating dance education, artistic activities, and community engagement. The institution employs 24 teachers and has more than 600 students, offering courses ranging from beginner to professional levels. Yixin Ballet was founded by retired professional ballet troupe dancers and focuses on specialized and refined instruction. Both institutions have won awards in international dance competitions and offer systematic training programs covering various skill levels. The participants involved in this study include institution managers, ballet teachers, and adult ballet students. These groups represent the main stakeholders in adult ballet training institutions and provide diverse perspectives on institutional management practices and educational experiences.

3.3 Research Instruments

The research instruments used in this study include semi-structured interview guides and structured questionnaires. The interview guide was designed to collect qualitative information from institution managers, teachers, and students, providing multidimensional insights into the management of adult ballet training institutions. Managers were interviewed regarding strategic planning, market positioning, institutional operations, pricing strategies, and marketing activities. They explained how differentiated courses, small-class teaching, and personalized guidance are used to enhance students' overall development, as well as how pricing strategies are determined based on cost structures and market conditions. Managers also discussed promotional strategies such as social media communication, brand building through teaching environments, and collaborative activities. Teachers were interviewed as frontline educators responsible for implementing aesthetic education concepts in dance training. They discussed how aesthetic education principles are integrated into movement training and choreography, how teaching materials, videos, and music resources are utilized in instruction, and how communication with students contributes to learning effectiveness. Students, as the direct participants in ballet training programs, provided feedback regarding course content, teacher competence, classroom atmosphere, pricing fairness, and the accessibility of learning resources. Their responses also reflected their willingness to continue learning and their likelihood of recommending the courses to others. In addition to interviews, a questionnaire was developed based on the coding results and hypothesis framework derived from the qualitative analysis. The questionnaire includes questions corresponding to each research dimension, product, price, channel, and marketing, allowing the researcher to measure how these factors influence art management strategies in adult ballet institutions.

3.4 Data Collection

Data for this study were collected through two main methods: interviews and questionnaire surveys. In the qualitative phase, in-depth interviews were conducted with managers, teachers, and students from the selected institutions. Participants were informed about the research objectives and provided consent before participating in the interviews. The interviews were conducted either face-to-face or online and lasted approximately 30 to 60 minutes each. The conversations were recorded with participants' permission and later transcribed for further analysis. These interviews provided detailed information on institutional management practices and the integration of aesthetic education concepts in adult ballet training institutions. In the quantitative phase, a questionnaire survey was distributed to teachers and students to verify the hypotheses developed from the interview analysis. The questionnaire was designed to directly relate to the research topic and to collect feedback from participants regarding institutional management strategies and learning experiences. The survey targeted Shengwu Yueya and Yixin Ballet as the main research institutions, as they are well-known and influential in the field of adult ballet education in Beijing. Teacher questionnaires were selectively distributed to experienced frontline instructors to obtain professional insights, while student questionnaires were distributed more broadly through both online and offline methods to cover participants from the selected institutions as well as other adult ballet learners. In total, 245 valid questionnaires were collected. The high response rate indicates strong interest and participation among respondents and confirms the clarity and relevance of the questionnaire design. The collected data provide a reliable empirical foundation for further analysis of artistic management strategies and aesthetic education practices in adult ballet training institutions.

3.5 Statistics Used for Data Analysis

The collected data were analyzed using both qualitative and quantitative analytical methods. For the qualitative data obtained from interviews, grounded theory was applied as the main analytical method. The analysis began with open coding, during which interview transcripts were examined line by line to identify key concepts related to curriculum design, teaching quality, pricing strategies, channel development, and marketing activities. In the axial coding stage, these concepts were organized into broader categories corresponding to the four dimensions of the 4P marketing framework: product, price, place, and promotion. Finally, selective coding was conducted to integrate these categories into a coherent explanatory framework illustrating how aesthetic education principles are reflected in institutional management practices. The coding results also helped to construct the explanatory framework and provided the basis for the development of research hypotheses. In the quantitative phase, statistical analysis was used to examine questionnaire responses and verify the proposed hypotheses. Descriptive statistics were used to summarize respondents' demographic characteristics and general perceptions of course quality, pricing fairness, teaching channels, and marketing activities. The questionnaire items were designed to measure both independent variables, such as curriculum design, teaching quality, pricing strategies, and promotional activities, and dependent variables related to institutional competitiveness and student satisfaction.

4. Data Analysis and Findings

4.1 Introduction

This chapter presents the data analysis and findings of the study on the artistic management strategies of adult ballet training institutions from the perspective of aesthetic education. The analysis integrates both qualitative and quantitative research methods in order to provide a comprehensive understanding of the management practices and operational mechanisms of adult ballet training institutions. The qualitative analysis is based on interview data collected from managers, teachers, and students of the selected institutions, which were analyzed using grounded theory coding techniques. The quantitative analysis is based on questionnaire data collected from teachers and students, and statistical methods were used to examine reliability, validity, descriptive statistics, and regression relationships among variables. Through the integration of these analytical approaches, the study explores how the four dimensions of the marketing mix, product, price, channel, and marketing, affect the management strategies and sustainable development of adult ballet training institutions. The findings also examine how the integration of aesthetic education concepts influences student satisfaction, institutional competitiveness, and long-term development. The results presented in this chapter provide empirical evidence for verifying the hypotheses proposed in the previous chapter and contribute to a deeper understanding of art management practices in adult ballet education.

4.2 Data Analysis of the Qualitative Data

The qualitative analysis in this study is based on in-depth interviews conducted with managers, teachers, and students of adult ballet training institutions. Grounded theory was used as the analytical framework, and the interview data were coded through open coding, axial coding, and selective coding to identify key concepts and relationships related to institutional management strategies. The analysis was conducted based on the 4P theoretical framework, which includes

product, price, channel, and marketing factors. The coding results show that curriculum design and teaching quality are key elements in the product dimension. Adult ballet training institutions place great emphasis on balancing technical skill training with aesthetic experience. By incorporating elements of Chinese aesthetic education, institutions aim to provide systematic and personalized learning experiences for adult students. Teaching outcomes largely depend on the professional competence of teachers and the level of interaction between teachers and students. Establishing effective assessment and feedback mechanisms is therefore considered important for maintaining teaching quality.

In the price dimension, institutions typically determine tuition fees by considering factors such as operational costs, market competition, and the financial capacity of adult learners. Many institutions adopt differentiated pricing strategies and offer value-added services such as personalized guidance, flexible course packages, and promotional discounts to increase the perceived value of their courses. In the channel dimension, the integration of online and offline teaching platforms has become an important strategy for improving accessibility and enhancing communication between teachers and students. Institutions use social media platforms, online learning systems, and offline classes to create a blended learning environment that improves information dissemination and learning interaction. In the marketing dimension, institutions focus on enrollment promotion, event planning, and brand reputation building to enhance their visibility and competitiveness in the market. Word-of-mouth marketing, cultural events, and collaborations with other art organizations are frequently used strategies to strengthen institutional influence and attract new students. Overall, the qualitative analysis shows that the coordinated implementation of the 4P management strategies plays a crucial role in improving the artistic management efficiency of adult ballet training institutions and supporting their sustainable development.

4.3 Data Analysis of the Quantitative Data

4.3.1 Reliability and Validity Analysis

Reliability analysis was conducted to measure the internal consistency and dependability of the questionnaire results. This study used the Cronbach's alpha coefficient as the primary indicator of reliability. The alpha coefficient ranges from 0 to 1, and a value greater than 0.7 generally indicates good internal consistency. The results show that the overall Cronbach's alpha coefficient of the questionnaire is 0.892, which is significantly higher than the commonly accepted threshold of 0.8, indicating a high level of reliability and data quality. In addition, the "alpha coefficient after item deletion" for each question did not change significantly, and all corrected item-total correlation (CITC) values were above 0.4. These results indicate that the questionnaire items have strong correlations with the overall scale and that no items needed to be removed.

Table 1 Reliability Analysis

Cronbach's Reliability Analysis			
Question	Corrected Item-Total Correlation (CITC)	Deleted α Coefficient	Cronbach's Alpha Coefficient
During the learning process, did you feel the integration of aesthetic education concepts?	0.662	0.879	0.892
Do you think the pricing of this institution's courses is reasonable? Does this price match your expectations for the quality of the courses?	0.645	0.881	
Besides direct dance skill training, do you think the course also provides other benefits (such as aesthetic education, social opportunities, etc.)?	0.65	0.881	
How satisfied are you with the ballet class you are currently attending?	0.723	0.875	
How satisfied are you with the teaching staff of this institution?	0.646	0.882	
How is your interaction with the teacher during the learning process?	0.605	0.884	
How satisfied are you with the agency's feedback mechanism?	0.704	0.876	
Has your aesthetic taste improved through learning ballet?	0.602	0.884	
How willing are you to continue studying ballet at this institution?	0.685	0.878	

Note: Standardized Cronbach's α coefficient = 0.897

Validity analysis was conducted to evaluate the structural validity of the questionnaire through factor analysis. Factor loadings were used to measure the relationship between individual items and the underlying constructs. The results show that all factor loadings are greater than 0.4, indicating significant associations between the items and their corresponding factors. The communalities of the items also exceed 0.4, demonstrating that the items contribute substantially to the extracted factors. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy is 0.918, which is higher than the recommended threshold of 0.6, indicating that the data are suitable for factor analysis. Furthermore, the cumulative variance explained after rotation is 77.571%, showing that the extracted factors effectively represent the information contained in the dataset. These results confirm that the questionnaire has strong structural validity and is appropriate for subsequent statistical analysis.

Table 2 Validity Analysis

Validity Analysis Results					
Question	Factor Loading Coefficient				Communalities (Common Factor Variance)
	Factor 1	Factor 2	Factor 3	Factor 4	
During the learning process, did you feel the integration of aesthetic education concepts?	0.279	0.402	0.764	0.029	0.823
Do you think the pricing of this institution's courses is reasonable? Does this price match your expectations for the quality of the courses?	0.659	0.53	0.199	-0.057	0.757
Besides direct dance skill training, do you think the course also provides other benefits (such as aesthetic education, social opportunities, etc.)?	0.236	0.745	0.319	0.174	0.742
How satisfied are you with the ballet class you are currently attending?	0.737	0.168	0.388	0.21	0.766
How satisfied are you with the teaching staff of this institution?	0.797	0.198	0.089	0.267	0.754
How is your interaction with the teacher during the learning process?	0.276	0.245	0.148	0.83	0.846
How satisfied are you with the agency's feedback mechanism?	0.3	0.207	0.644	0.462	0.761
Has your aesthetic taste improved through studying ballet?	0.114	0.715	0.147	0.483	0.779
How willing are you to continue studying ballet at this institution?	0.668	0.039	0.457	0.309	0.752
KMO value	0.918				-
Bart spherical value	1018.397				
<i>df</i>	36				
<i>p</i> value	0				

4.3.2 Descriptive Statistical Analysis

The descriptive statistical analysis was conducted based on 245 valid questionnaire responses. The values for all questionnaire items ranged from 1 to 5, representing the full range of response options from the lowest to the highest scores. The average values of most items were above 1.3, while key factors such as teacher–student interaction, aesthetic literacy, and course value were all significantly higher than 1.4. These results indicate that respondents generally hold positive attitudes toward the educational services provided by adult ballet training institutions. The standard deviation values are approximately 0.6, suggesting that the responses are relatively concentrated and that there is limited variation in participants' opinions. In addition, the median values are consistent with the average values, further confirming the consistency and stability of the responses. Overall,

the descriptive statistical results provide a reliable foundation for further analysis of the relationships among the research variables.

4.3.3 Regression Analysis

Regression Analysis 1

Regression analysis was conducted to examine the relationship between learners' willingness to continue studying ballet courses and the market competitiveness of adult ballet training institutions. The results show that the independent variable "willingness to continue studying ballet courses at this institution" has a coefficient $B = 0.669$ and a standardized coefficient $Beta = 0.656$, indicating a strong positive relationship with the dependent variable. This result suggests that students' willingness to continue learning reflects a high level of social recognition of ballet education and contributes positively to institutional development. The model shows good fit, with $R^2 = 0.43$, adjusted $R^2 = 0.428$, $F = 183.354$, and $p = 0.000$. These results support Hypothesis 1A, indicating that satisfaction with course products and services significantly enhances the market competitiveness of adult ballet training institutions.

Regression Analysis 2

A second regression analysis further examined the relationship between learners' willingness to continue ballet training and institutional competitiveness. The results again show that the independent variable "willingness to continue learning ballet courses" has a coefficient $B = 0.669$ and a standardized coefficient $Beta = 0.656$. The model fit indicators remain strong, with $R^2 = 0.43$, adjusted $R^2 = 0.428$, $F = 183.354$, and $p = 0.000$. These findings further confirm that satisfaction with educational products plays an important role in strengthening institutional competitiveness and supports Hypothesis 1A.

Regression Analysis 3

This regression analysis examines the impact of course cost-effectiveness on students' choice of ballet training institutions. The results show that the independent variable has a coefficient $B = 0.016$ and a standardized coefficient $Beta = 0.047$, indicating a positive but relatively weak relationship with enrollment decisions. The model fit is relatively low, with $R^2 = 0.002$ and adjusted $R^2 = 0.001$, and the overall statistical significance is limited ($F = 1.3803$, $p = 0.241$). Although the explanatory power of the model is limited, the results still provide partial support for Hypothesis 2A, suggesting that cost-effectiveness may contribute to student satisfaction and confidence in course selection.

Regression Analysis 4

This analysis examines the relationship between teacher satisfaction and students' decision to enroll in ballet courses. The results show that the independent variable "factors that prompted students to choose the institution" has a coefficient $B = 0.026$ and a standardized coefficient $Beta = 0.11$, indicating that teacher satisfaction positively influences enrollment decisions. The model shows acceptable fit with $R^2 = 0.012$, adjusted $R^2 = 0.011$, $F = 7.776$, and $p = 0.005$. These findings support Hypothesis 2B and highlight the important role of teachers in influencing students' course selection behavior.

Regression Analysis 5

The fifth regression analysis examines the influence of institutional factors such as location, cooperation models, and promotional channels on students' selection behavior. The results show that the independent variable "factors that prompted students to choose the institution" has a coefficient $B = 0.061$ and a standardized coefficient $Beta = 0.069$, indicating a positive influence on student choices. However, the model fit is relatively low ($R^2 = 0.005$, adjusted $R^2 = 0.003$), with an F value of 3.013 and $p = 0.083$. Although the statistical significance is limited, the results provide preliminary evidence supporting Hypothesis 3A.

Regression Analysis 6

This regression analysis examines the relationship between teacher–student relationships and students' learning performance and satisfaction. The independent variable "learners' willingness to continue ballet courses" has a coefficient $B = 0.061$ and a standardized coefficient $Beta = 0.459$, indicating a significant positive effect. The model fit is relatively high, with $R^2 = 0.211$, adjusted $R^2 = 0.207$, $F = 64.845$, and $p = 0.000$. These results support Hypothesis 3B and confirm that strong teacher–student relationships are an important factor in maintaining stable learning outcomes and student success.

Regression Analysis 7

The seventh regression analysis examines the influence of learner recommendations on institutional market expansion. The results show that the independent variable "whether learners would recommend the institution to others" has a coefficient $B = 1.015$ and a standardized coefficient $Beta = 0.189$, indicating a significant positive impact on institutional growth. The model results ($R^2 = 0.036$, adjusted $R^2 = 0.032$, $F = 9.012$, $p = 0.003$) support Hypothesis 4A and highlight the importance of educational quality and positive word-of-mouth in expanding institutional markets.

Regression Analysis 8

The final regression analysis examines the influence of integrating aesthetic education concepts into the learning process. The results show that the independent variable "integration of aesthetic education concepts" has a coefficient $B = 0.49$ and a standardized coefficient $Beta = 0.458$, indicating a strong positive effect on long-term institutional development indicators such as student satisfaction and loyalty. The model fit is strong with $R^2 = 0.21$, adjusted $R^2 = 0.206$, $F = 64.493$, and $p = 0.000$. These findings support Hypothesis 4B and confirm that aesthetic education concepts play a crucial role in the sustainable development of adult ballet training institutions.

4.4 Summary of the Results

The results of this chapter provide important insights into the artistic management strategies of adult ballet training institutions. The qualitative analysis highlights the importance of integrating aesthetic education concepts into curriculum design, teaching practices, and institutional management strategies. The coordinated implementation of the 4P marketing framework, product, price, channel, and marketing, was found to significantly influence institutional competitiveness and operational effectiveness. The quantitative analysis further verifies the relationships between these factors and institutional outcomes. The reliability and validity tests confirm that the questionnaire data are highly reliable and suitable for statistical analysis. Descriptive statistics show that respondents generally hold positive attitudes toward ballet education institutions. The regression

analysis results demonstrate that factors such as course quality, teacher–student relationships, marketing reputation, and the integration of aesthetic education concepts play significant roles in influencing student satisfaction, enrollment decisions, and institutional development. Overall, the findings indicate that effective management strategies, combined with the integration of aesthetic education principles, can significantly enhance the quality and sustainability of adult ballet training institutions. These results provide both theoretical insights and practical guidance for improving art management strategies and promoting the development of aesthetic education in adult ballet training programs. The results of the statistical analysis were used to test the hypotheses summarized in Table 3, which examine the influence of product, price, channel, and marketing factors on the success of art management strategies in adult ballet training institutions. Through the integration of qualitative insights and quantitative evidence, the study provides a comprehensive understanding of how aesthetic education principles and marketing strategies contribute to the sustainable development of adult ballet training institutions.

Table 3 Summary of Hypothesis

Factor	Hypothesis
Product factors	Hypothesis 1A: The satisfaction and recognition of students in adult ballet training institutions (that is, ballet art education services incorporating aesthetic education concepts) positively impact their market competitiveness.
	Hypothesis 1B: Adult ballet training institutions continuously adjust their offerings based on the concept of aesthetic education, including course content, teaching methods, and performance formats, which will better help them adapt to and lead changes in market demand.
Price factor	Hypothesis 2A: Emphasizing the cost-effectiveness of the course, such as high-quality teaching resources, personalized learning experiences, and significant learning outcomes, can enhance adult learners' confidence in and satisfaction with ballet courses.
	Hypothesis 2B: A learner-centered art education approach can enhance students' motivation and satisfaction in learning, and also increase their long-term engagement and loyalty to ballet education.
Channel factors	Hypothesis 3A: The location, cooperation model, and promotional channels of educational and training institutions are important factors driving the success of art management strategies in adult ballet training institutions.
	Hypothesis 3B: A good teacher-student relationship is a decisive factor in helping adult ballet students maintains stability and success in their learning.
Marketing factors	Hypothesis 4A: The educational quality of adult ballet training institutions and the reputation among their students are important factors for these institutions to expand their market.
	Hypothesis 4B: Adult ballet training institutions maintain the core value of aesthetic education in their commercial operations, which helps achieve long-term and stable development.

5. Conclusion, Discussion, and Recommendation

5.1 Conclusion

This study examined the art management strategies of adult ballet training institutions from the perspective of aesthetic education, with the objective of identifying key management mechanisms that support the promotion of ballet aesthetics and the cultivation of artistic talent. The research adopted a mixed-method approach combining qualitative and quantitative analyses, and focused on two representative adult ballet training institutions in Beijing. The qualitative component involved interviews with administrators, teachers, and students to explore practical experiences related to curriculum design, pricing strategies, channel development, and marketing activities. The quantitative component used questionnaire data to analyze the relationships among various management factors and learners' behavioral responses. The findings indicate that the integration of aesthetic education concepts into institutional management contributes significantly to improving teaching quality, learner satisfaction, and institutional competitiveness. The results show that the four dimensions of the 4P marketing framework, product, price, place (channel), and promotion, play critical roles in shaping the management effectiveness of adult ballet training institutions. In terms of product strategy, curriculum design that integrates aesthetic education principles, technical training, and artistic appreciation helps improve learners' engagement and satisfaction, thereby increasing their willingness to continue learning. Regarding price strategy, although cost-effectiveness has a positive influence on students' enrollment decisions, the statistical results suggest that its direct impact is relatively limited compared with other factors such as teaching quality and institutional reputation. For channel strategy, the accessibility of learning opportunities, cooperation with community organizations, and the integration of online and offline teaching platforms contribute to expanding institutional influence and attracting diverse learners. With respect to promotion strategy, word-of-mouth communication, brand reputation, and marketing activities such as performances and cultural events significantly enhance institutional visibility and market competitiveness. Overall, the study confirms that the effective integration of aesthetic education concepts with systematic management strategies can promote both the educational mission and the sustainable development of adult ballet training institutions.

5.2 Discussion

The findings of this study highlight the importance of integrating aesthetic education with modern art management practices in adult ballet training institutions. Aesthetic education emphasizes the cultivation of artistic perception, emotional expression, and cultural understanding, which aligns closely with the educational objectives of ballet training. By incorporating aesthetic education principles into curriculum design and teaching methods, institutions can provide learners with more meaningful and comprehensive artistic experiences. The results of the regression analyses further demonstrate that learners' willingness to continue studying ballet is strongly associated with their satisfaction with course content, teacher-student interaction, and the overall learning experience. These findings suggest that educational quality and artistic value are key drivers of learner engagement and institutional sustainability. In addition, the study reveals that teachers play a crucial role in shaping students' learning experiences and influencing their enrollment decisions. Teacher expertise, communication skills, and the ability to integrate aesthetic concepts into dance instruction significantly affect students' perceptions of course value. This finding emphasizes the importance of investing in teacher development and maintaining high teaching standards in adult ballet training institutions. Furthermore, the analysis of promotional strategies indicates that word-of-mouth recommendations and positive learner experiences are important factors in expanding institutional influence. Compared with traditional marketing approaches, authentic learner feedback and community engagement appear to be more effective in building trust and strengthening institutional reputation. These insights contribute to a deeper

understanding of how aesthetic education principles and art management strategies interact to shape the development of adult ballet training institutions.

5.3 Recommendation

Based on the research findings, several practical recommendations can be proposed for improving the management and operation of adult ballet training institutions. First, institutions should further integrate aesthetic education concepts into their curriculum systems. Course design should not only emphasize technical skill development but also incorporate elements of artistic appreciation, choreography, music interpretation, and cultural understanding. Providing diversified courses, such as beginner training, advanced ballet techniques, choreography workshops, and ballet appreciation classes, can help meet the diverse needs of adult learners while enhancing their aesthetic literacy. In addition, personalized teaching approaches such as small-class instruction and one-on-one tutoring can improve learning outcomes and increase student satisfaction. Second, institutions should develop flexible and reasonable pricing strategies that reflect both educational value and market competitiveness. While maintaining fair and transparent tuition structures, institutions may offer course packages, membership programs, and promotional discounts to encourage long-term participation. Such pricing strategies can improve students' perceived value and strengthen their commitment to continuous learning. Third, in terms of channel development, institutions should expand their recruitment and teaching networks by integrating online and offline resources. Collaborations with communities, schools, cultural centers, and art organizations can help broaden the institution's influence and provide additional performance and learning opportunities for students. Finally, institutions should strengthen their marketing and branding strategies to enhance visibility and reputation in the art education market. Organizing ballet performances, workshops, exhibitions, and cultural lectures can showcase the institution's artistic achievements and attract potential learners. At the same time, effective use of social media platforms and digital communication channels can help institutions reach wider audiences and build interactive relationships with learners. By combining high-quality education with strategic management and effective communication, adult ballet training institutions can enhance their competitiveness, promote aesthetic education, and achieve sustainable development in the evolving cultural and educational landscape.

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Dual-Channel Mechanisms of Competitive Culture on Firm Performance: Parallel Mediation of Team Attitude-Capability and Lifecycle Moderation

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Abstract

In the context of increasing global competition and economic transformation, corporate culture has become a critical factor influencing organizational performance and sustainable development. Among various cultural types, competitive culture plays an important role in shaping employees' attitudes, capabilities, and organizational outcomes. This study examines the mechanism through which competitive culture affects corporate performance by focusing on the mediating role of team characteristics and the moderating role of the enterprise life cycle. Drawing on resource dependence theory, social identity theory, and regulatory focus theory, this research constructs a theoretical framework linking competitive culture, team attitudes, Team Capability, and corporate performance. Empirical data were collected through questionnaire surveys from employees of retail enterprises located in the coastal provinces and cities of eastern China. A total of 527 questionnaires were distributed, and 428 valid responses were obtained for analysis. The study employs statistical techniques including Pearson correlation analysis, hierarchical regression analysis, mediation analysis using the PROCESS macro with bootstrap methods, and moderation analysis to test the proposed hypotheses. The results indicate that competitive culture has a significant positive impact on both team attitude and team capability. In addition, team attitude and team capability are found to significantly enhance corporate performance. Competitive culture also directly contributes to corporate performance through mechanisms such as market orientation, performance incentives, and operational efficiency. Furthermore, the findings reveal that team attitude and team capability serve as parallel mediating variables in the relationship between competitive culture and corporate performance. The mediating effect of team capability is slightly stronger than that of team attitude, indicating that professional skills and collaboration play a crucial role in transforming cultural values into performance outcomes. The enterprise life cycle significantly moderates the relationship between competitive culture and team characteristics, but it does not significantly moderate the relationship between team characteristics and corporate performance. Overall, this study enriches the theoretical understanding of how competitive culture translates into organizational performance and provides practical implications for managers seeking to optimize cultural strategies and team management practices across different stages of enterprise development.

Keywords: Competitive Culture, Team Attitude, Team Capability, Corporate Performance, Enterprise Life Cycle

1. Introduction

1.1 Background and Importance of the Problem

In the context of global competition and the rapid transformation of the digital economy, the construction of a strong and competitive corporate culture has become a critical factor in enhancing organizational performance and promoting sustainable development. Corporate culture plays a fundamental role in shaping employees' behaviors, strengthening organizational identity, and guiding strategic decision-making within enterprises. Previous studies have shown that corporate culture significantly influences business performance by aligning employee values with organizational goals and improving internal coordination and resource allocation (Denison and Mishra, 1995). Among various cultural types, competitive culture has gained increasing attention in both academic research and business practice. Competitive culture emphasizes goal orientation, achievement motivation, and performance results, encouraging organizations to pursue excellence and maintain continuous improvement (Cameron and Quinn, 1999). This cultural orientation helps organizations strengthen market competitiveness, improve operational efficiency, and stimulate employees' intrinsic motivation to achieve higher levels of productivity (De, 2009; Dequan, 2023). In addition, competitive culture contributes to organizational innovation and teamwork. By encouraging healthy competition, collaboration, and performance accountability, organizations can create an environment that fosters creativity and problem-solving capabilities among employees (Cherian et al., 2021). Empirical research also indicates that competitive culture is positively associated with financial performance, market share, and long-term strategic success (Korschun and Welker, 2015). As a result, the cultivation of competitive culture has become an essential strategy for organizations seeking to strengthen their adaptability and resilience in dynamic market environments.

From a policy perspective, the importance of cultural development and competitive capability has also been emphasized at the national level in China. The report of the 20th National Congress of the Communist Party of China in October 2022 proposed the strategic goal of building a "socialist cultural power," highlighting culture as a fundamental driving force for high-quality economic and social development. The report also emphasized the cultivation of talents for the new era as a key pathway to achieving this objective. This policy direction underscores the importance of cultural confidence and talent-driven innovation in promoting the transition from quantitative growth to qualitative development. Furthermore, the Central Economic Work Conference in 2024 emphasized the need for a "comprehensive rectification of involution-style competition," encouraging enterprises to shift away from inefficient homogeneous competition toward differentiated and value-driven development models. In this context, enterprises must transform their traditional competitive models and focus more on creating sustainable value through innovation, efficiency, and organizational capability. Teams, as the fundamental units within organizations, play a crucial role in translating macro-level policies into practical actions at the micro level. Through effective collaboration and shared values, teams connect organizational culture with individual performance outcomes. Therefore, understanding how competitive culture influences employee attitudes, capabilities, and organizational performance is essential for both theoretical research and managerial practice.

Focusing on the retail industry, which is undergoing rapid transformation due to digitalization, consumer behavior changes, and increasing market competition, this study investigates the mechanisms through which competitive culture influences corporate performance. Using China's top 100 retail chain enterprises as the research context, the study examines how competitive culture affects organizational performance through two key channels: psychological empowerment and skills enhancement. By exploring these mechanisms, the research aims to provide insights into how corporate culture can be translated into measurable performance outcomes, thereby supporting the

sustainable development of enterprises in highly competitive markets.

1.2 Research Question

Based on the background and significance of the problem, this study seeks to address the following research questions:

- 1) How does competitive culture influence corporate performance in retail chain enterprises?
- 2) Does psychological empowerment mediate the relationship between competitive culture and corporate performance?
- 3) Does skills enhancement mediate the relationship between competitive culture and corporate performance?
- 4) How do the effects of competitive culture on corporate performance differ across different stages of the corporate lifecycle (growth, maturity, and decline)?

1.3 Research Objective

The main objective of this study is to examine the relationship between competitive culture and corporate performance in retail chain enterprises and to explore the mechanisms through which competitive culture influences organizational outcomes. Specifically, the study aims to:

- 1) Analyze the impact of competitive culture on corporate performance in retail chain enterprises.
- 2) Investigate the mediating role of psychological empowerment in the relationship between competitive culture and corporate performance.
- 3) Examine the mediating role of skills enhancement in the relationship between competitive culture and corporate performance.
- 4) Explore how the influence of competitive culture varies across different stages of the corporate lifecycle.

Through these objectives, the study aims to contribute to the theoretical development of competitive culture research and provide practical guidance for enterprises seeking to improve organizational performance through cultural transformation and strategic management.

2. Literature Review

2.1 Related Concepts and Theories

Competitive culture, as a strategic subsystem of corporate culture, has gradually developed through both Western theoretical exploration and localized research in the Chinese context. Early studies on competitive culture can be traced to the comparative management research conducted by Pascale and Athos (1982), who examined the differences between American and Japanese corporate management models. Their work introduced competition mechanisms into cultural analysis and

proposed that the “collective competition” model adopted by Japanese companies allows for an effective transformation of individual competitiveness into team competitiveness. Later, Schein (1985) further developed the concept by emphasizing the role of organizational culture in improving adaptability to external environments. According to Schein, competitive culture reflects the inevitability of market competition, the close relationship between performance and rewards, and the survival logic of continuously surpassing competitors in dynamic markets.

Cameron and Quinn (1999) further conceptualized competitive culture within the Competitive Values Framework (CVF), defining it as a market-oriented culture characterized by goal-driven management, results-oriented performance evaluation, and a strong focus on external competition. In such cultures, organizations emphasize efficiency, productivity, and the achievement of measurable outcomes. In the Chinese research context, scholars have further expanded the theoretical implications of competitive culture by emphasizing its strategic management function. De (2009) proposed that competitive culture shapes employee behavior through a transmission mechanism involving goal setting, performance evaluation, and incentive systems. Dequan (2023) further highlighted the role of competitive culture in transforming external market pressure into internal motivation for organizational development. Based on these perspectives, competitive culture can be defined as a cultural subsystem that is built upon external adaptability, supported by internal incentive mechanisms, and reinforced through shared organizational values. Its core dimensions include market sensitivity, differentiated performance evaluation, and a consistent orientation toward competition and achievement.

Team characteristics represent another important concept in organizational behavior and management studies. Team characteristics usually encompass both attitudinal and capability-related dimensions, which together influence team performance and organizational outcomes. The attitudinal dimension mainly includes employee satisfaction, participation, and organizational commitment, reflecting employees’ psychological attachment and behavioral tendencies toward the organization. Empirical research by Denison and Mishra (1995) confirmed a positive relationship between employee participation, satisfaction, and corporate development. In addition, Jie et al. (2008) emphasized the dynamic nature of organizational commitment across different stages of the corporate lifecycle. Their research indicates that employee commitment tends to increase during the growth stage of enterprises, reaches its peak during the maturity stage, and gradually declines during the decline stage due to environmental uncertainty and organizational changes.

The capability dimension of team characteristics includes both explicit professional competencies and implicit collaborative abilities. Spencer and Spencer (2008) developed a competency framework that classifies capabilities into five categories: motivation, attitude, values, knowledge, and skills. In the retail industry, empirical evidence suggests that employees’ professional skills and collaborative abilities significantly improve operational efficiency and productivity. For example, professional competence can increase per capita output, while team collaboration can enhance cross-channel sales and overall organizational performance (Chawla and Jain, 2021). These findings indicate that both attitudinal and capability-related team characteristics play critical roles in shaping corporate performance outcomes.

Corporate performance is generally defined as the measurable outcomes reflecting the extent to which an organization achieves its strategic objectives. Corporate performance typically includes both financial indicators, such as profitability and revenue growth, and non-financial indicators, such as customer satisfaction, innovation capability, and employee engagement. The influence of competitive culture on corporate performance presents a dual effect. On the one hand, moderate competition can enhance performance by strengthening market orientation, improving performance

incentives, and optimizing cost management (Schein, 1985; Kotter and Heskett, 1992). On the other hand, excessive competition may create negative consequences, including reduced collaboration, talent loss, and innovation suppression (Christensen, 1994; Sull et al., 2022). Therefore, the effectiveness of competitive culture largely depends on the balance between competitive pressure and organizational support mechanisms.

2.2 Literature Surveys

Existing studies suggest that team characteristics influence corporate performance through multiple mechanisms, including psychological empowerment, behavioral transmission, and resource integration. These mechanisms collectively form a causal chain of “attitude–capability–performance.” Competitive culture can enhance employee satisfaction and participation through fair resource allocation and equitable reward systems, which subsequently improve task performance and innovation outcomes (Xu et al., 2021). In addition, clear career development paths and empowerment mechanisms can significantly increase employee engagement, particularly among younger generations entering the workforce (Kim et al., 2009; Dhakal, 2016). Other studies emphasize the importance of interpersonal relationships and development opportunities in strengthening organizational commitment. Zain et al. (2009) and Chang et al. (2010) found that positive workplace relationships and career growth opportunities can significantly enhance employee commitment and loyalty. Moreover, shared performance indicators, such as collective KPIs, can strengthen cross-departmental collaboration and improve organizational efficiency (Dai and Bao, 2011). Differentiated skill management and talent development strategies can further improve innovation output and operational effectiveness (Cherian et al., 2021). However, excessive competition within organizations may produce negative consequences. For example, bottom-ranking elimination systems may reduce employee satisfaction and increase workplace stress (Chen, 2008). Similarly, an excessive overtime culture may lead to employee burnout and decreased productivity (Sull et al., 2022). Individual ranking mechanisms may encourage knowledge hiding behaviors among employees, which can hinder collaboration and organizational learning (Xie et al., 2014). In addition, rigid organizational processes may suppress exploratory learning and reduce innovation capability (Zhang and Liu, 2010). These findings indicate that the relationship between competitive culture and corporate performance is complex and requires careful management to achieve positive outcomes.

Another important factor influencing the relationship between culture, team characteristics, and performance is the enterprise lifecycle. Lifecycle theory suggests that enterprises evolve through several stages, including start-up, growth, maturity, and decline. Each stage presents different resource conditions, strategic priorities, and organizational structures, which influence the effectiveness of competitive culture. During the growth stage, enterprises experience rapid market expansion and resource dynamism. At this stage, competitive culture can significantly enhance Team Capability through skill training and collaborative mechanisms. Cai (2014) emphasized that enterprises in the growth stage should focus on strengthening production management and marketing capabilities while encouraging collaboration and learning among employees. During the maturity stage, organizations often face structural inertia and reduced flexibility. Therefore, enterprises must balance capability development with attitude management in order to sustain performance. Research by Chen et al. (2009) indicates that mature enterprises rely heavily on the synergy between strategic management and corporate culture. Similarly, Gu and Peng (2022) found that corporate social responsibility activities in mature enterprises significantly improve organizational performance and reputation. In contrast, declining enterprises often face resource shortages, low morale, and reduced market competitiveness. Under such circumstances, the positive effects of competitive culture may weaken. Xie et al. (2008) emphasized the importance of strengthening emotional communication to

maintain employee commitment in declining organizations, while Du et al. (2022) suggested that strategic transformation and mergers and acquisitions may help declining enterprises restore performance. Despite these contributions, existing studies still present several limitations. First, many studies focus on a single dimension of analysis and fail to integrate cultural factors with multidimensional team characteristics. Second, research often lacks industry-specific perspectives and does not fully incorporate Chinese policy contexts or generational workforce differences. Third, few studies provide quantitative analysis of the dynamic matching relationship between competitive culture, team characteristics, and corporate performance.

2.3 Conceptual Framework

To address the limitations identified in previous studies, this research proposes a conceptual framework that integrates competitive culture, team characteristics, and corporate performance. The framework follows the structure of “competitive culture – team characteristics (attitudes and abilities) – enterprise performance.” In this model, competitive culture serves as the independent variable that influences organizational outcomes. Team characteristics, including employee attitudes and capabilities, function as mediating variables that transmit the effects of competitive culture to enterprise performance. Enterprise performance is considered the dependent variable representing organizational outcomes. In addition, the enterprise lifecycle is introduced as a moderating variable that influences the strength of the relationships among these variables.

This framework is grounded in several theoretical perspectives. Resource dependence theory explains how organizations rely on external and internal resources to achieve performance outcomes. Competitive culture helps organizations acquire and utilize resources more effectively by aligning employee goals with market demands. Regulatory focus theory suggests that competition can stimulate employees’ motivation and learning behaviors by encouraging a promotion-focused mindset oriented toward growth and achievement. Social identity theory further explains how group comparison and collective identity can strengthen collaboration and organizational commitment. Together, these theoretical perspectives provide a comprehensive explanation of how competitive culture influences team characteristics and ultimately affects corporate performance.

2.4 Research Hypothesis

Based on the conceptual framework and theoretical foundations, several research hypotheses are proposed. From the perspective of resource dependence theory, competitive culture encourages organizations to clarify competitive goals and strengthen performance management systems. Under conditions of moderate competition, fair reward mechanisms and clear career development paths can improve employee satisfaction and participation (Kim et al., 2009). Regulatory focus theory further suggests that moderate competition promotes proactive learning and skill development by encouraging a growth-oriented mindset (Hongming et al., 2006). In addition, social identity theory indicates that team comparison mechanisms strengthen collective identity and cooperation (Ezirim et al., 2012). Therefore, the following hypotheses are proposed:

H1: Competitive culture positively affects team attitudes.

H2: Competitive culture positively affects Team Capability.

Previous studies also indicate that employee attitudes significantly influence corporate performance. Job satisfaction and organizational commitment contribute to higher task performance and innovation outcomes (Liu Jing and Lin Shu, 2020). Participation can enhance employee morale and reduce turnover rates, thereby improving financial performance (Xie Yuhua, Liu Xiaodong, and

Pan Xiaoli, 2010). Meanwhile, Team Capability such as professional skills and collaboration can improve service quality, operational efficiency, and organizational profitability (Spencer et al., 2008; Chawla et al., 2021). Based on these findings, the following hypotheses are proposed:

- H3: Team attitudes positively affect corporate performance.
- H4: Team Capability positively affect corporate performance.

From the perspective of resource dependence theory, competitive culture may also directly influence corporate performance by strengthening market orientation, improving performance incentives, and reducing operational costs through standardized processes (Jia Jianfeng, Yan Jiaqi, and Wang Nan, 2016). Although excessive competition may produce negative effects (Sull et al., 2022), these effects are less prominent in the context of economic pressure and intense competition within China's retail industry. Therefore, the following hypothesis is proposed:

- H5: Competitive culture positively affects corporate performance.

In addition to direct effects, competitive culture may influence corporate performance indirectly through mediating variables. Competitive culture can enhance employee satisfaction and participation through fair resource allocation and equitable compensation systems, which subsequently improve task performance and innovation outcomes (Xu Hongmei et al., 2021). Furthermore, competitive culture can strengthen team cooperation through shared performance indicators and encourage skill upgrading among employees (Dai Huayong et al., 2011). Accordingly, the following hypotheses are proposed:

- H6: Team attitudes mediate the relationship between competitive culture and corporate performance.
- H7: Team Capability mediate the relationship between competitive culture and corporate performance.

Finally, the enterprise lifecycle is expected to moderate the relationships among competitive culture, team characteristics, and corporate performance. In growth-stage enterprises, moderate competition and fair incentives can significantly enhance employee attitudes and capabilities, leading to strong performance outcomes. In mature enterprises, excessive competition may weaken employee commitment and suppress exploratory learning due to organizational inertia. In declining enterprises, resource shortages and low morale may weaken the positive effects of competitive culture on both attitudes and capabilities. Therefore, the following moderating hypotheses are proposed:

- H8a: The enterprise lifecycle moderates the relationship between competitive culture and team attitudes.
- H8b: The enterprise lifecycle moderates the relationship between competitive culture and Team Capability.
- H8c: The enterprise lifecycle moderates the relationship between team attitudes and corporate performance.
- H8d: The enterprise lifecycle moderates the relationship between Team Capability and corporate performance.

Through these hypotheses, the study aims to empirically examine the transmission mechanism through which competitive culture influences corporate performance and to explore the dynamic role of enterprise lifecycle in shaping this relationship.

3. Research Methodology

3.1 Research Design

This study adopts a quantitative research design supported by literature analysis and questionnaire surveys. The research aims to examine the mechanism through which competitive culture influences corporate performance through team characteristics, including team attitudes and Team Capability, while considering the moderating role of the enterprise life cycle. The research framework integrates theories such as resource dependence theory, regulatory focus theory, and social identity theory to construct a structural model of “competitive culture – team characteristics (attitudes and abilities) – enterprise performance.” Data were collected from employees working in retail enterprises, and statistical analysis was applied to test the proposed hypotheses. This design enables the study to empirically examine the relationships among organizational culture, employee team characteristics, and enterprise performance within the context of China’s retail industry.

3.2 Population and Sample

The population of this study consists of employees working in retail enterprises located in the coastal provinces and cities of eastern China. A questionnaire survey method was used to collect data from respondents across different retail organizations. A total of 527 questionnaires were distributed, and after excluding incomplete or invalid responses, 428 valid questionnaires were retained for analysis, resulting in a valid response rate of 81.21 percent. Among the respondents, 36.6 percent were male and 63.4 percent were female. In terms of age distribution, 15.8 percent were under 25 years old, 35.6 percent were between 25 and 35 years old, 44 percent were between 35 and 50 years old, and 4.6 percent were over 50 years old. The participating enterprises covered a wide range of sales scales, with annual sales ranging from 5 billion RMB to more than 100 billion RMB, ensuring that the sample represents different sizes of retail enterprises.

3.3 Research Instruments

The research instruments consist of structured questionnaire scales adapted from established studies to ensure reliability and validity. Competitive culture was measured using the Organizational Culture Assessment Instrument (OCAI) developed by Cameron and Quinn, consisting of 6 items with a reliability coefficient of $\alpha = 0.946$. Team attitude was measured based on three dimensions, employee satisfaction, participation, and organizational commitment, using items adapted from Schreisheim and Tsui as well as Wang Na and other scholars, totaling 9 items with a reliability coefficient of $\alpha = 0.892$. Team capability was measured through two dimensions, teamwork capability and professional capability, using items adapted from Liu Mingming and Kim, resulting in 12 items with a reliability coefficient of $\alpha = 0.901$. Corporate performance was measured using a scale developed by Zhang Renjiang and colleagues, with an additional indicator of per capita contribution level, comprising 5 items with a reliability coefficient of $\alpha = 0.825$. All measurement instruments were tested and confirmed to have satisfactory reliability and validity.

3.4 Data Collection

Data collection was conducted through questionnaire surveys distributed to employees working in retail enterprises across eastern China. The survey was administered during the research period, and respondents were asked to complete the questionnaire based on their perceptions of organizational culture, team dynamics, and enterprise performance. To ensure data quality, the collected questionnaires were screened to remove incomplete responses or those with inconsistent

answers. After the screening process, 428 valid questionnaires were retained for statistical analysis. In addition, the enterprise life cycle variable was determined by comparing the growth rates of enterprises and their respective industries across two consecutive periods, namely 2016–2019 and 2020–2023. Based on this comparison, the enterprise life cycle was categorized into three stages: growth, maturity, and decline.

3.5 Statistics Used for Data Analysis

This study employs several statistical techniques to analyze the collected data and test the proposed hypotheses. Reliability and validity tests were first conducted to evaluate the measurement scales. Descriptive statistical analysis was used to summarize the demographic characteristics of the respondents. Correlation analysis was performed to examine the relationships among the main variables. Regression analysis and mediation analysis were applied to test the direct and indirect effects of competitive culture on enterprise performance through team attitudes and Team Capability. In addition, moderation analysis was conducted to examine the moderating role of the enterprise life cycle in the relationships between competitive culture, team characteristics, and enterprise performance. Control variables, including sales scale, age, and gender, were also incorporated into the analysis to ensure the robustness of the empirical results.

4. Data Analysis and Findings

4.1 Introduction

This section presents the empirical analysis of the relationships among competitive culture, team attitude, team capability, and corporate performance, as well as the moderating role of the enterprise life cycle. The analysis aims to test the research hypotheses proposed in the conceptual framework and to verify the mechanisms through which competitive culture influences enterprise performance in the retail industry. Using statistical methods such as Pearson correlation analysis, hierarchical regression analysis, mediation analysis, and moderation analysis, the study examines both the direct and indirect relationships among the variables. First, Pearson correlation analysis is conducted to explore the initial relationships among the key variables and control variables. This analysis provides a preliminary understanding of the associations between competitive culture, team characteristics, corporate performance, and demographic factors. Second, hierarchical regression analysis is employed to test the direct effects of competitive culture on team attitudes, Team Capability, and corporate performance, as well as the effects of team characteristics on corporate performance. This step allows the study to examine whether the proposed relationships in the theoretical model are statistically significant. In addition, the mediating roles of team attitude and team capability are examined using the PROCESS macro in SPSS with a bootstrap method. This approach helps identify whether competitive culture influences corporate performance indirectly through psychological empowerment and skill enhancement pathways. Finally, moderation analysis is conducted to investigate the moderating effect of the enterprise life cycle on the relationships between competitive culture and team characteristics, as well as between team characteristics and corporate performance. Through these analyses, the study provides empirical evidence for the proposed theoretical model and offers a deeper understanding of how competitive culture contributes to enterprise performance through team-based mechanisms within different organizational life cycle stages.

4.2 Data Analysis of the Quantitative Data

4.2.1 Correlation Analysis

According to the Pearson correlation analysis shown in Table 1, stronger competitive culture correlates with stronger team attitude, team capability, and corporate performance. Team attitude and team capability are significantly positively correlated with corporate performance. The life cycle shows a significant negative correlation with team attitude, team capability, and corporate performance.

Table 1 Pearson Correlation Analysis

	1	2	3	4	5	6	7	8	9
1. Competitive Culture	1								
2. Team Attitude	0.36***	1							
3. Team Capability	0.11*	0.48***	1						
4. Corporate Performance	0.32***	0.49***	0.53***	1					
5. Lifecycle	-0.04	-0.44***	-0.27***	-0.18***	1				
6. Sales Revenue	0.03	0.40***	0.11*	-0.12*	-0.63***	1			
7. Gender	0.13*	-0.11*	-0.24***	-0.02	0.05	-0.08	1		
8. Age	0.16**	-0.06	-0.14**	-0.12*	0.13*	0.02	0.05	1	
9. Education Background	0.09	0.16**	0.21***	0.09	-0.39***	0.39***	-0.23***	-0.14***	1

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4.2.2 Main Effects

The results of the regression analysis shown in Table 2 indicate that competitive culture has a significant positive effect on team attitude ($B=0.23$, $p < 0.001$), supporting hypothesis H1. Competitive culture also has a significant positive effect on team capability ($B=0.07$, $p < 0.05$), supporting hypothesis H2. Team attitude has a significant positive effect on business performance ($B=0.12$, $p < 0.001$), supporting hypothesis H3. Team capability has a significant positive effect on business performance ($B=0.53$, $p < 0.001$), supporting hypothesis H4. Competitive culture has a significant positive impact on business performance ($B=0.11$, $p < 0.001$), supporting hypothesis H5.

Table 2 Direct Effects

	Team Attitude	Team Capability	Corporate Performance		
Control Variable					
	0.25***	-0.19	-0.39***	-0.54***	-0.33***
Sales Revenue	-0.15**	-0.23***	-0.06	0.04	0.13**
Age	-0.10*	-0.11*	-0.10*	-0.03	0.01
Educational Background	-0.13**	0.06	0.03	0.12**	0.03
Lifecycle	-0.30***	-0.29***	-0.39***	-0.21***	-0.2***
Independent Variable Competitive Culture					
Team Attitude	0.23***	0.07*	0.11***	-	-
	-	-	-	0.12***	-
Team Capability	-	-	-	-	0.53***
R ²	0.37	0.16	0.24	0.41	0.51
Δ R ²	0.14	0.02	0.11	0.27	0.38

Note: *p<0.05, **p<0.01, ***p<0.001

4.2.3 Mediating Effects of Team Attitude and Team Capability

To explore the mechanism of how competitive culture affects corporate performance, the study employed SPSS 20.0 Process Model 4 and the Bootstrap method to verify the mediating effects of team attitude and ability.

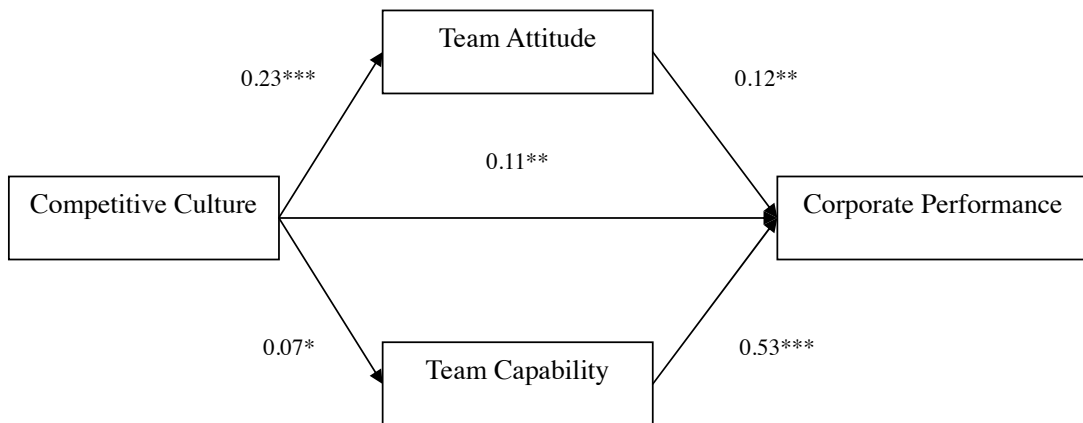


Figure 2 Path Coefficients diagram

As shown in Figure 2, the correlation coefficients between each pair of variables are displayed, while Table 3 presents the effect values of the mediating effect tests. The results indicate that competitive culture not only has a direct effect on corporate performance (direct effect 0.11, accounting for 64.20%), but also produces mediating effects through team attitude (indirect effect 0.03, accounting for 15.91%) and Team Capability (indirect effect 0.03, accounting for 19.23%). The

Bootstrap 95% confidence intervals do not include 0, indicating that both direct and indirect effects are significant; however, when comparing the mediating effects, the confidence intervals include 0, demonstrating that there is no significant difference in the mediating effects of the two, thus supporting hypotheses H6 and H7.

Table 3 Parallel Mediating Effects

	Effect Size	Se	LLCI	ULCI	Effect Size
Total Effect	0.18	0.03	0.12	0.23	-
Direct Effect	0.11	0.02	0.07	0.16	64.20%
Total Indirect Effect	0.06	0.02	0.03	0.10	35.23%
Indirect Effect (Team Attitude)	0.03	0.01	0.01	0.05	15.91%
Indirect Effect (Team Capability)	0.03	0.02	0.01	0.07	19.32%
Comparison of Indirect Effects (Team Attitude - Team Capability)	0.01	0.02	-0.05	0.03	

4.2.4 Moderating Effect of Corporate Life Cycle

The study uses SPSS 20.0 Process Model 58 and Bootstrap methods to validate the moderating effect of corporate life cycle. The results are shown in Table 4: In the path where competitive culture affects team attitudes and abilities ($X \rightarrow M$), the interaction terms $X*W$ values are -0.10 ($p=0.04$) and -0.12 ($p=0.02$), indicating that the moderating effect of life cycle is significant and negative, supporting hypotheses H8a and H8b; however, in the path where team attitudes/abilities affect corporate performance ($M \rightarrow Y$), the interaction terms $M*W$ values are not significant ($p>0.05$), indicating that hypotheses H8c and H8d do not hold. Further analysis shows that when the moderating variable is at a low score (growth stage), the mediating effect of team attitudes is not significant (confidence interval includes 0), while it is significant in the mature and decline stages; the mediating effect of team abilities decreases with the life cycle (growth stage 0.15 > mature stage 0.09 > decline stage 0.05), indicating that its effect strength gradually weakens as the stage progresses.

Table 4 Analysis of the Moderating Effect of Corporate Life Cycle on the Impact of Competitive Culture on Team Characteristics (Attitude + Ability)

Dependent Variable		X→M				Inspection Conclusion
		Coefficient	se	t	p	
M = Team Attitude	X	0.42	0.10	4.05	0.000	Negative Regulation
	W	0.22	0.28	0.77	0.44	
	X*W	-0.10	0.05	-1.98	0.04	
M = Team Capability	X	0.42	0.10	4.32	0.000	Negative Regulation
	W	0.65	0.27	2.40	0.02	
	X*W	-0.12	0.05	-2.34	0.02	

Dependent Variable		X→M→Y				Inspection Conclusion
		Coefficient	se	t	p	
Y = Enterprise Performance	X	0.08	0.02	3.58	0.005	Regulation not Established
	M=Team Attitude	-0.05	0.29	-0.17	0.864	
	W	-0.49	0.35	-1.40	0.163	
	M*W	0.20	0.14	1.44	0.152	
Y = Enterprise Performance	X	0.08	0.02	3.58	0.005	Regulation not Established
	M = Team Capability	0.70	0.31	2.25	0.025	
	W	-0.49	0.35	-1.40	0.163	
	M*W	-0.14	0.16	-0.87	0.385	

Note: X = Competitive Culture, W = life Cycle

Table 5 Mediating Effects Corresponding to Different Values of Moderating Variables

Dependent Variable	Regulating Variable W	X→M→Y				Inspection Conclusion
		Effect	Se	BootLLCI	BootULCI	
M = Team Attitude	Low (-1SD)	0.06	0.03	-0.01	0.11	W = Low score The intermediary is not significant.
	Mean	0.07	0.02	0.04	0.11	
	High (+1SD)	0.07	0.02	0.03	0.11	
M = Team Capability	Low (1SD)	0.15	0.03	0.09	0.21	Effect Growth > Maturity > Decline
	Mean	0.09	0.02	0.05	0.13	
	High (+1SD)	0.05	0.02	0.01	0.09	

Note: X = Competitive Culture, W = Life Cycle

4.3 Summary of the Results

The empirical results of this study provide comprehensive evidence supporting the proposed theoretical framework that links competitive culture, team characteristics, and corporate performance. Overall, the findings demonstrate that competitive culture plays a significant role in shaping team attitudes and Team Capability, which in turn influence corporate performance. In addition, the enterprise life cycle partially moderates the relationship between competitive culture and team characteristics, further illustrating the dynamic nature of organizational development. The correlation analysis results show that competitive culture is significantly and positively correlated with team attitude, team capability, and corporate performance. Similarly, both team attitude and team capability exhibit significant positive relationships with corporate performance. These results provide preliminary support for the assumption that a stronger competitive culture is associated with more positive team dynamics and better organizational outcomes. In contrast, the enterprise life cycle shows significant negative correlations with team attitude, team capability, and corporate performance, suggesting that as enterprises move toward later life cycle stages, these positive organizational characteristics tend to decline.

The regression analysis further confirms the direct effects proposed in the hypotheses. Competitive culture significantly and positively influences team attitude and team capability,

indicating that a strong competitive environment within organizations can enhance employees' psychological engagement as well as their professional and collaborative capabilities. Moreover, both team attitude and team capability have significant positive effects on corporate performance, demonstrating that employee satisfaction, participation, commitment, and capability development contribute directly to improved organizational outcomes. Competitive culture also has a direct positive effect on corporate performance, suggesting that market-oriented cultural values and performance-driven management systems can enhance operational efficiency and competitiveness. The mediation analysis reveals that team attitude and team capability play parallel mediating roles in the relationship between competitive culture and corporate performance. Competitive culture not only directly improves corporate performance but also indirectly influences performance through the psychological empowerment of employees and the enhancement of professional and collaborative capabilities. The indirect effects through team attitude and team capability are both statistically significant, and although the effect of team capability is slightly stronger than that of team attitude, the difference between the two mediating effects is not statistically significant.

The moderation analysis further indicates that the enterprise life cycle significantly moderates the impact of competitive culture on team attitude and team capability. Specifically, the positive influence of competitive culture on team characteristics weakens as enterprises move from the growth stage to the maturity and decline stages. However, the enterprise life cycle does not significantly moderate the relationship between team characteristics and corporate performance. Additional analysis shows that the mediating effect of team capability is strongest during the growth stage and gradually weakens across later stages, whereas the mediating effect of team attitude is not significant in the growth stage but becomes significant in the maturity and decline stages. These findings highlight the importance of considering organizational development stages when designing cultural and management strategies aimed at improving corporate performance.

5. Conclusion, Discussion, and Recommendation

5.1 Conclusion

This study constructs a theoretical model of “competitive culture – team characteristics (attitude and ability) – enterprise performance” based on resource dependence theory, social identity theory, and regulatory focus theory. Through empirical analysis of China's top 100 retail chain enterprises, the study verifies the dual-path impact mechanism of competitive culture on enterprise performance and examines the moderating role of the enterprise life cycle. The findings indicate that competitive culture significantly and positively influences both team attitudes and Team Capability. In particular, competitive culture enhances employee satisfaction through fair performance feedback mechanisms such as compensation equity and transparent career development opportunities, which is consistent with the findings of Kim et al. (2009). However, excessive competition, such as unclear elimination systems, may undermine employee commitment, especially in declining enterprises. Competitive culture also improves professional capability through mechanisms such as promotion focus and the pressure for skill renewal. Nevertheless, strong individual competition mechanisms may hinder knowledge sharing, particularly in the maturity stage when organizational inertia becomes more prominent. Furthermore, team attitudes and Team Capability play differentiated mediating roles in the relationship between competitive culture and enterprise performance. The psychological empowerment pathway through team attitudes contributes 15.91 percent to corporate performance, although it is not significant in the growth stage where enterprises rely more on resource acquisition than emotional commitment. In contrast, the capability-based pathway contributes 19.32 percent to performance and demonstrates the strongest effect during the growth

stage, confirming the importance of strengthening core capabilities during this phase. The results also show that competitive culture has a significant positive direct effect on enterprise performance through mechanisms such as market drive, performance incentives, and cost optimization, with a direct contribution accounting for 64.20 percent of the total effect. In addition, the parallel mediating roles of team attitudes and capabilities indicate that competitive culture improves corporate performance through both psychological empowerment and skill upgrading channels. Finally, the enterprise life cycle significantly moderates the influence of competitive culture on team attitudes and Team Capability, but it does not significantly moderate the relationship between team characteristics and enterprise performance.

5.2 Discussion

The findings of this study provide several important theoretical insights. First, the research clarifies the boundary conditions of competitive culture by demonstrating that its influence on team attitudes is stronger than its influence on Team Capability, although both effects are moderated by the enterprise life cycle. This result refines the “goal–assessment–incentive” mechanism proposed by Zhang De (2009) and suggests that organizational culture tends to shape employees’ psychological attitudes more directly than behavioral capabilities. However, capabilities demonstrate higher efficiency in transmitting performance outcomes, indicating that skill development and collaboration mechanisms are critical for transforming cultural values into tangible performance results. Second, the study reveals a dual-channel driving mechanism through which competitive culture affects corporate performance. By integrating both attitude and capability pathways, the research confirms the full transmission chain of “culture – attitude/capability – performance,” providing empirical evidence for how organizational culture translates into measurable outcomes. This finding helps address the long-standing theoretical question regarding the mechanism through which corporate culture influences performance. Third, the research deepens the understanding of the dynamic adaptation of competitive culture across different enterprise life cycle stages. The results show that during the growth stage, enterprises rely primarily on capability channels to improve performance, as rapid market expansion requires strong professional and collaborative skills. During the maturity stage, enterprises must balance both attitude and capability management due to organizational inertia and complex internal structures. In the decline stage, the positive effects of competitive culture weaken as resource constraints and declining morale limit its effectiveness. These findings provide empirical support for stage-differentiated cultural management strategies and extend existing life cycle theories.

5.3 Recommendation

Based on the research findings, several practical recommendations can be proposed for enterprise managers and policymakers. First, enterprises should adopt differentiated strategies in constructing competitive culture according to their life cycle stage. For enterprises in the growth stage, management should focus on capability development by strengthening skill training, cross-departmental collaboration, and digital competencies in order to enhance market expansion and operational efficiency. For mature enterprises, managers should maintain a balance between attitude management and capability development by optimizing incentive systems such as equity-based rewards, transparent career pathways, and fair evaluation systems to sustain employee commitment and motivation. For enterprises in the decline stage, cultural mechanisms alone may not be sufficient to drive performance improvement; instead, companies should consider strategic transformation measures such as mergers and acquisitions, business restructuring, or digital transformation to restore competitiveness. Second, enterprises should optimize the management of team characteristics. From the perspective of team attitudes, organizations should avoid rigid and overly competitive

mechanisms, such as strict elimination systems, which may reduce employee satisfaction and commitment. Instead, companies should implement fair performance feedback systems and create opportunities for employee participation, particularly addressing the needs and expectations of younger generations of employees. From the perspective of Team Capability, organizations should design shared key performance indicators (KPIs) to reduce knowledge hiding and strengthen collaborative behavior. Benchmarking mechanisms and continuous professional development programs can further enhance the overall capability level of teams. Finally, at the policy level, government authorities can support enterprise transformation by improving the market competition environment and encouraging enterprises to shift from “involution-type competition” to value-creating competition. Policy initiatives such as improving modern enterprise systems and providing training subsidies for skill development can help enterprises, especially those in the growth stage, overcome resource constraints and enhance their long-term competitiveness. Despite its contributions, this study has several limitations. The sample focuses primarily on China’s top 100 retail chain enterprises, which may limit the generalizability of the findings. Future studies could expand the sample to include small and medium-sized retail enterprises. Additionally, the measurement of team capability focuses mainly on collaboration and professional skills; future research could incorporate other dimensions such as innovative adaptability. Finally, the cross-sectional nature of the data limits the ability to capture dynamic changes over time. Future research may adopt longitudinal or panel data approaches to examine how competitive culture and team characteristics evolve across different life cycle stages.

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Research on the Planning and Implementation of Art Public Welfare Activities under the Linkage of Universities and Communities

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Abstract

This study examines the collaborative mechanism and implementation pathways of art-based public welfare activities through partnerships between universities and local communities. Using a mixed-methods research design, the study integrates qualitative and quantitative approaches to explore how multi-stakeholder collaboration supports community cultural development and enhances the social service function of higher education institutions. The qualitative phase adopted a grounded theory approach and conducted semi-structured interviews with 12 key participants, including university teachers, students, community managers, and residents. The interview framework was developed based on collaborative governance theory, social capital theory, and career construction theory, focusing on participation motivation, role positioning, collaboration mechanisms, cognitive experiences, and sustainability of participation. The quantitative phase collected 370 valid questionnaires from four groups: college students, teachers, community managers, and community residents. The survey included 15 Likert-scale items measuring social responsibility, collaborative effectiveness, and willingness to continue participating in art public welfare activities. Statistical analysis was conducted using SPSS 26.0. The reliability and validity tests indicated strong internal consistency, with a KMO value of 0.942 ($p < 0.001$). Factor analysis extracted two main dimensions, collaborative effectiveness and willingness to continue participating, explaining 68.85% of the cumulative variance. Correlation analysis revealed a significant positive relationship between the ability to balance artistic expression with community needs and participants' willingness to continue engagement ($r = 0.684$, $p < 0.01$). Multiple linear regression results showed that teacher guidance ($\beta = 0.409$, $p < 0.001$) and community feedback ($\beta = 0.296$, $p < 0.01$) significantly predicted student capability development, while expression adaptation and reflective growth were key drivers of sustained participation. The findings highlight the importance of structured collaboration mechanisms and social support systems in promoting sustainable university–community partnerships. The study contributes to understanding how art education can extend beyond academic settings to support community cultural development and social engagement.

Keywords: University–Community Collaboration, Art Public Welfare, Collaborative Governance, Social Capital, Community Cultural Development

1. Introduction

1.1 Background and Importance of the Problem

In recent decades, the role of universities has gradually expanded beyond the traditional missions of teaching and research toward a broader commitment to social engagement and community development. Within this transformation, universities are increasingly expected to function as socially responsible institutions that contribute to cultural enrichment, civic participation, and sustainable social development. In many countries, particularly in rapidly developing societies, higher education institutions have been encouraged to actively integrate their academic resources with community needs in order to strengthen the public cultural service system and promote inclusive social progress (Wang Kaihong et al., 2016). In the context of China's ongoing promotion of the "Cultural Power" strategy and the development of "Social Service-Oriented Universities," universities have been positioned as key actors in cultural dissemination, social innovation, and public cultural service provision. The concept of a cultural power emphasizes strengthening cultural confidence, expanding cultural participation, and improving the accessibility of cultural resources for citizens. Universities, as centers of knowledge production and artistic creativity, possess significant advantages in cultural resources, professional expertise, and youth participation. Therefore, establishing effective collaborative mechanisms between universities and communities has become an important pathway for improving the accessibility and quality of public cultural services (Wang Kaihong et al., 2016).

Among the many forms of university-community cooperation, art public welfare activities have gradually emerged as an effective approach to integrating artistic education with social service. Art public welfare activities refer to non-profit cultural initiatives organized by universities or social organizations that aim to promote cultural participation, artistic appreciation, and community engagement through exhibitions, workshops, performances, creative projects, and educational outreach programs. Compared with traditional public cultural activities, art public welfare activities often emphasize creativity, inclusiveness, and participatory interaction, allowing residents to actively engage in artistic expression rather than simply acting as passive audiences. The distinctive features of art public welfare activities, such as visual expressiveness, emotional resonance, and participatory engagement, enable them to play a vital role in bridging the gap between academic institutions and local communities. Through collaborative art projects, universities can provide professional artistic knowledge and educational resources, while communities contribute local cultural experiences and social networks. This interaction not only enhances community cultural vitality but also enriches students' practical learning experiences and strengthens universities' social responsibility functions. In this sense, art public welfare initiatives create a mutually beneficial relationship that integrates talent cultivation, social service, and cultural development (Chen Han, 2020).

Furthermore, community-based art initiatives can also contribute to grassroots governance and social cohesion. Cultural participation has been widely recognized as an important factor in strengthening community identity, promoting social inclusion, and encouraging civic engagement. When residents participate in artistic activities such as mural painting, community performances, or creative workshops, they often develop stronger connections with their neighborhood and fellow residents. Such experiences help foster a shared cultural identity and increase residents' sense of belonging and collective responsibility toward community development (Xue Juan, 2017). Despite these potential benefits, the collaboration between universities and communities in organizing art public welfare activities still faces a number of practical challenges. First, many existing projects rely on relatively simple and temporary planning models, often limited to short-term volunteer activities or one-time events. These activities may generate temporary enthusiasm but lack continuity and

systematic planning, which limits their long-term impact on community cultural development. Second, the implementation paths of such activities are often unclear, and coordination among stakeholders, including universities, local governments, community organizations, and residents, remains insufficient. Without clear mechanisms for collaboration and resource integration, art public welfare initiatives may struggle to achieve sustainable development (Xue Juan, 2017).

Another critical issue lies in the unequal distribution of cultural resources and social capital within society. According to the theory of social capital, cultural participation and access to artistic resources are often influenced by individuals' social networks, educational backgrounds, and economic conditions (Bourdieu, 1986). Communities with limited cultural infrastructure and fewer cultural institutions may experience difficulties in accessing high-quality artistic resources. As a result, art public welfare projects organized by universities are expected to play a compensatory role in addressing these inequalities by bringing artistic education and cultural resources to underserved communities. However, although many art public welfare initiatives have achieved preliminary success in fostering collaboration among multiple stakeholders, there remains a lack of systematic research on their planning mechanisms, implementation pathways, and governance structures. In particular, the four-party collaborative model involving universities, communities, residents, and policy resources has not been sufficiently explored in existing studies. Understanding how these stakeholders interact and how their resources can be effectively integrated is essential for designing sustainable and impactful art public welfare programs (Chen Han, 2020). Therefore, it is necessary to conduct a comprehensive study that systematically examines the planning logic, operational mechanisms, and collaborative governance structures of art public welfare activities conducted through university–community partnerships. By integrating theoretical analysis with empirical investigation, such research can provide valuable insights into how universities can better fulfill their social service mission while simultaneously enhancing community cultural development.

1.2 Research Question

Based on the background and research gaps identified above, this study seeks to explore the mechanisms through which university–community collaboration can effectively support the planning and implementation of art public welfare activities. In particular, the research focuses on understanding how different stakeholders, such as teachers, students, residents, government institutions, and social organizations, interact within collaborative cultural initiatives and how these interactions influence the effectiveness and sustainability of such activities. The study is guided by the following research questions:

1) How do the planning pathways of art public welfare activities influence community cultural development and residents' cultural participation?

This question aims to examine how different activity planning models and participatory designs affect community engagement and residents' sense of cultural participation.

2) How do the professional competencies of university teachers and students influence the effectiveness of art public welfare activities?

This question investigates the role of professional knowledge, artistic expertise, and curriculum integration in improving project quality and enhancing the educational and social value of the activities.

3) How do social support systems and collaborative governance mechanisms influence the sustainability and effectiveness of university–community art public welfare activities?

This question explores the roles of policy support, enterprise participation, and resident collaboration

in strengthening multi-stakeholder cooperation and ensuring the long-term impact of art public welfare initiatives.

By addressing these research questions, the study seeks to provide a deeper understanding of how art public welfare activities can serve as effective platforms for university–community collaboration and community cultural development.

1.3 Research Objective

In order to address the research questions outlined above, this study aims to systematically analyze the planning logic and implementation mechanisms of art public welfare activities conducted through university–community collaboration. A mixed-methods approach combining qualitative and quantitative analysis is adopted in order to obtain comprehensive insights into the collaborative processes and operational dynamics involved in these initiatives. The specific objectives of this study are as follows:

- 1) To examine the relationship between the planning pathways of art public welfare activities and community cultural development.
- 2) To evaluate the influence of teachers' and students' professional competencies on the effectiveness of art public welfare activities.
- 3) To analyze the role of social support systems and collaborative governance in promoting sustainable university–community art public welfare activities.

Through achieving these objectives, the research is expected to contribute both theoretically and practically to the fields of community cultural development, public art education, and university social service. The findings will provide valuable insights for universities, policymakers, and community organizations seeking to design sustainable and effective art public welfare initiatives.

2. Literature Review

2.1 Related Concepts and Theories

2.1.1 University Social Service and Community Engagement

The social service function of universities has gradually evolved into one of the core missions of higher education institutions, alongside teaching and research. In recent decades, universities have increasingly been expected to contribute directly to societal development by addressing community needs, supporting cultural development, and promoting public welfare initiatives. This transformation reflects a shift from a traditional model of knowledge production and dissemination toward a more collaborative model of knowledge co-creation and social engagement (Wang et al., 2024). Within this transformation, the concept of university–community engagement has received growing attention. Community engagement refers to the process through which universities collaborate with local communities to address social, cultural, and economic challenges. Such engagement often involves partnerships with community organizations, local governments, and residents to promote shared development goals. According to Austin (2000), effective university–community collaboration can be understood through the strategic alliance model, which emphasizes mutual benefit, resource sharing, and long-term cooperation between participating organizations.

In the Chinese policy context, the importance of university social service has been explicitly emphasized in the National Medium- and Long-Term Education Reform and Development Plan Outline (2010–2020), which encourages higher education institutions to actively participate in social governance and public cultural services (Kaihong et al., 2016). This policy framework highlights the role of universities in promoting cultural dissemination, community education, and civic engagement. In particular, art education institutions possess unique advantages in contributing to community cultural development. Artistic disciplines combine creative expression, cultural interpretation, and social interaction, making them highly suitable for community-based activities. Juan (2017) argues that art majors in universities naturally possess strong potential to serve local public cultural needs; however, a systematic service pathway must be established to effectively integrate educational objectives with social service functions.

2.1.2 Art Public Welfare Activities

Art public welfare activities refer to cultural and artistic initiatives designed to serve the public interest rather than commercial objectives. These activities typically involve exhibitions, workshops, performances, community art projects, and cultural festivals that encourage residents to participate in artistic creation and appreciation. Such activities not only provide access to cultural resources but also promote community engagement, cultural identity, and social cohesion. Scholars have widely recognized the social value of art participation. Early studies by Matarasso (1997) demonstrated that community-based art activities can generate positive social outcomes, including increased civic participation, improved social networks, and strengthened community identity. Similarly, Kay (2000) emphasized that participatory arts initiatives contribute to community cohesion by fostering shared cultural experiences and enhancing residents' sense of belonging.

In the context of public welfare art, Rong (2022) argues that art activities have a dual function: they serve both as a cultural governance tool and as an extension of the university education system. On the one hand, community art projects activate local cultural ecosystems by encouraging residents to participate in artistic expression and cultural exchange. On the other hand, such activities provide valuable opportunities for students to apply their professional skills in real-world contexts. In practice, universities often integrate art public welfare activities into their educational systems through courses, student clubs, and cultural outreach programs. For example, Guo Yuan (2019) examined projects that combined university art clubs with intangible cultural heritage programs, demonstrating that integrating academic courses, extracurricular activities, and community festivals can effectively enhance residents' cultural experiences and strengthen local cultural identity. However, despite these positive outcomes, the sustainability of art public welfare initiatives remains a challenge. Han (2020) points out that without stable institutional support and effective feedback mechanisms, it is difficult to maintain long-term collaboration between universities and communities. As a result, many art public welfare activities remain short-term or project-based rather than becoming integrated components of community cultural governance.

2.1.3 Collaborative Governance Theory

Collaborative governance provides an important theoretical framework for understanding how multiple stakeholders can jointly address complex social issues. Collaborative governance refers to a decision-making process in which public institutions, private organizations, and community actors work together to achieve shared policy goals through collective action and resource integration. Recent research highlights the importance of collaborative governance in university–community partnerships. Sun and Wang (2024) emphasize that effective collaboration requires the participation of diverse stakeholders, including universities, government agencies, enterprises, and

local residents. Such multi-party collaboration can enhance resource integration, improve decision-making efficiency, and increase the sustainability of public initiatives.

Man (2019) further argues that universities should move beyond the traditional role of education resource providers and become active participants in community governance. This transformation requires the establishment of institutionalized cooperation mechanisms, such as joint decision-making platforms, community advisory boards, and shared resource systems. Empirical studies have also demonstrated the effectiveness of collaborative governance models in community cultural initiatives. Donghui (2016) found that universities can integrate into local governance networks by establishing community art spaces or implementing “art + volunteer service” programs, which enable students to participate in community development activities. Similarly, Du Pengju (2016) proposed a dual-channel collaborative model involving university students and community workers, which can simultaneously promote talent development and community empowerment. Despite these theoretical advancements, most collaborative governance studies have focused on sectors such as healthcare, social work, and public administration. Research examining how art education can be systematically integrated into collaborative governance structures remains relatively limited (Man, 2019). Therefore, further research is needed to explore how art-based public welfare initiatives can function within broader governance systems.

2.2 Literature Surveys

Existing studies on art public welfare activities and university–community collaboration provide valuable insights but also reveal several limitations. One major challenge is the lack of systematic evaluation mechanisms for assessing the social impact of artistic initiatives. Merli (2002) argues that measuring the social value of art participation is inherently complex because many outcomes, such as community cohesion and cultural identity, are intangible and difficult to quantify. As a result, many university-led art public welfare projects tend to be short-term and fragmented, lacking long-term strategic planning (Juan, 2017). Without clear evaluation indicators, universities may find it difficult to demonstrate the effectiveness of their social service activities or justify continued institutional investment. Another limitation concerns the insufficient recognition of community agency in collaborative research. In many university-led projects, communities are often treated as passive recipients of cultural services rather than active participants in project design and implementation. Xin and Zanhua (2015) argue that effective community engagement requires the establishment of interactive feedback mechanisms that allow residents to contribute ideas, evaluate project outcomes, and influence future program development. Furthermore, existing research often lacks interdisciplinary theoretical integration. Studies of art public welfare initiatives tend to focus primarily on cultural or educational perspectives, while neglecting insights from fields such as public administration, sociology, and governance studies. Consequently, there is a shortage of comprehensive analytical frameworks that combine qualitative cultural analysis with quantitative evaluation methods (Xin and Zanhua, 2015). These research gaps highlight the need for a more systematic approach to studying art public welfare activities within university–community partnerships.

2.3 Conceptual Framework

Based on the theoretical foundations and research gaps identified in the literature review, this study proposes a conceptual framework for analyzing the effectiveness of art public welfare activities in the context of university–community collaboration.

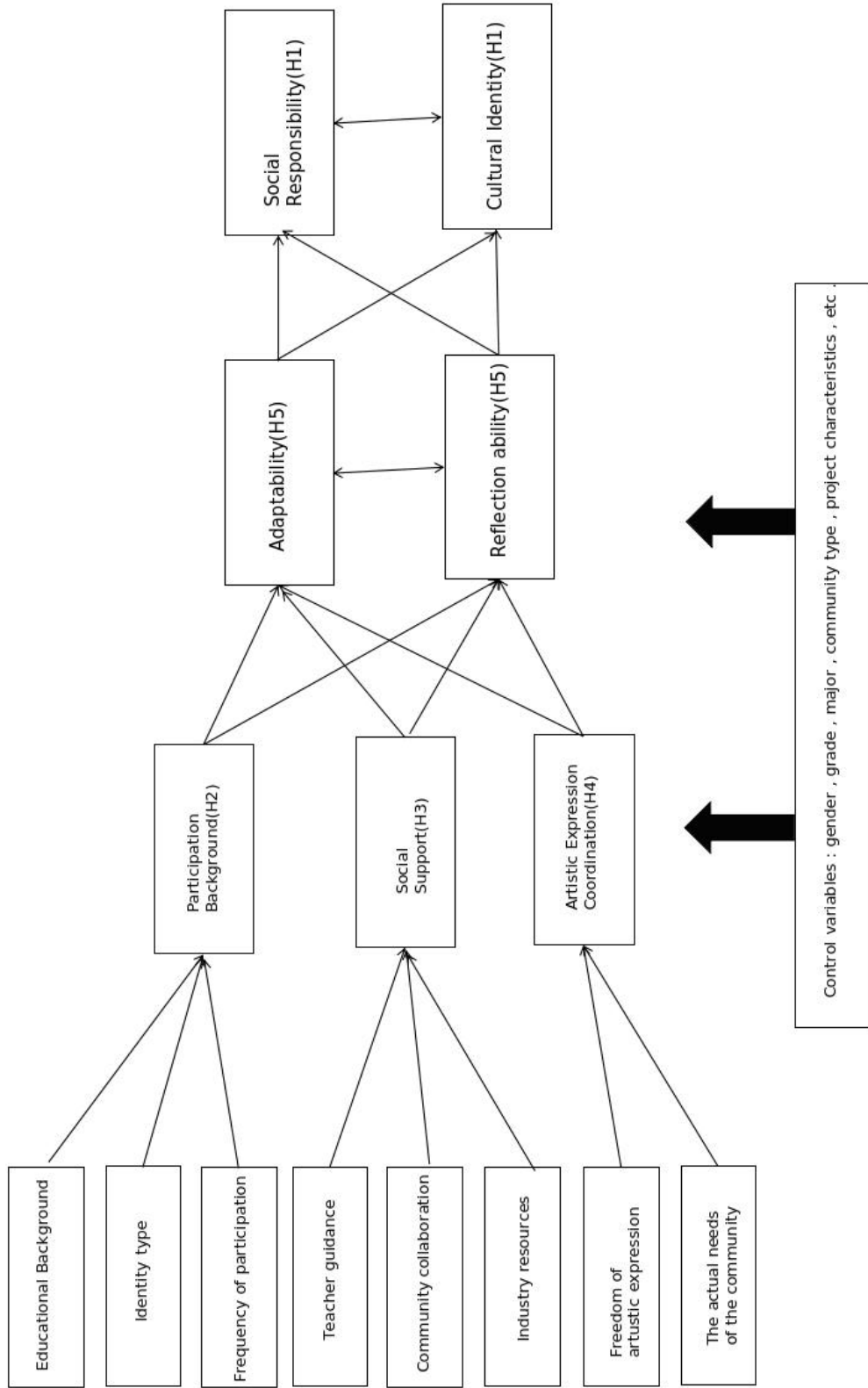


Figure 1 Research Framework

2.4 Research Hypothesis

Based on the conceptual framework and previous studies, the following research hypotheses are proposed:

H1: Art public welfare activities have a significant positive impact on participants' sense of social responsibility and cultural identity.

H2: Participants' educational background, identity type, and participation frequency significantly influence their role construction and behavioral performance in art public welfare activities.

H3: The social support system, including policy support, enterprise participation, and community collaboration, has a significant positive impact on activity synergy and participation satisfaction.

H4: The degree of coordination between artistic expression and community needs is positively associated with sustained participation willingness and project effectiveness.

H5: Adaptive and reflective abilities mediate the relationship between collaborative mechanisms and sustained participation in art public welfare activities.

These hypotheses aim to examine how different factors influence the effectiveness and sustainability of university–community collaborative art initiatives. Through empirical analysis, the study seeks to provide evidence-based insights for improving the planning, implementation, and governance of art public welfare activities.

3. Research Methods

3.1 Research Design

This study adopts a mixed-methods research design that integrates both qualitative and quantitative approaches in order to comprehensively examine the planning mechanisms and implementation pathways of art public welfare activities under the linkage between universities and communities. The qualitative phase is designed to explore the collaborative mechanisms, participation motivations, and governance processes involved in these activities, while the quantitative phase aims to empirically test the relationships among the variables identified from the qualitative findings. By combining exploratory qualitative analysis with quantitative statistical testing, the study seeks to provide a systematic understanding of the collaborative model and its impact on social responsibility, cultural identity, and sustained participation. The qualitative component of this study is based on grounded theory methodology. Semi-structured interviews were conducted with 12 core participants, including three university teachers, four students, two community managers, and three residents, as shown in Table 1. The interview outline was designed based on collaborative governance theory, social capital theory, and career construction theory, forming the theoretical foundation for the interview framework as shown in Figure 1. The interview questions focused on five key dimensions, including the background and motivation for participation, role positioning and practical pathways, collaboration mechanisms and resource support, cognitive experiences and relationship reconstruction, and sustainable development and capacity building.

Table 1 Summary of Variable Involved in the Modle

Variable Types	Examples	Role in the Model
Independent Variables	Participation Background (H2), Social Support (H3), Artistic Expression Coordination (H4)	Directly Affect the Dependent Variable
Mediating Variable	Adaptability and Reflective Growth (H5)	Explain the Pathways of Action / Mediating Regulation
Dependent Variable	Social Responsibility, Cultural Identity (H1)	The Final Results of the Model
Control Variables	Gender, Grade, Major, Community Class Type, Project Features, etc	Eliminate Distractions and Enhance Explanatory Power

The interview data were collected through on-site audio recordings and subsequently transcribed for analysis. The qualitative data were analyzed using a three-stage coding process consisting of open coding, axial coding, and selective coding. During the open coding stage, a total of 328 initial concepts were extracted from the interview transcripts, which were then grouped into 19 subcategories. In the axial coding stage, these subcategories were further integrated into six main themes, including personal background and participation motivation, collaborative planning and organizational practice, educational guidance and value identification, social capital and sustainable mechanisms, difficulties and response strategies, and role perception and relationship reconstruction. In the final selective coding stage, the analysis identified the core category of “collaborative embedding of artistic co-creation mechanisms,” revealing a dynamic developmental pathway characterized by “motivation guidance - role construction - value balance.” To enhance theoretical saturation and improve the robustness of the qualitative findings, three representative cases were selected for cross-case comparison. These cases include the “Red Wall Theory” community mural project, the “Chuanyin • Duobei 1kg” teaching activity, and the “Tea Pavilion Flower Sea” art festival. Through comparative analysis of these cases, the study examines the differentiated collaborative logic between shallow and deep levels of university–community linkage. Based on the qualitative findings, a research structural model of art public welfare activities under university–community collaboration was developed (see Figure 2). The variables included in the model consist of independent variables such as participation background, social support, and coordination of artistic expression; the mediating variable of adaptability and reflective growth; dependent variables including social responsibility and cultural identity; and several control variables such as gender, grade, major, community type, and project characteristics.

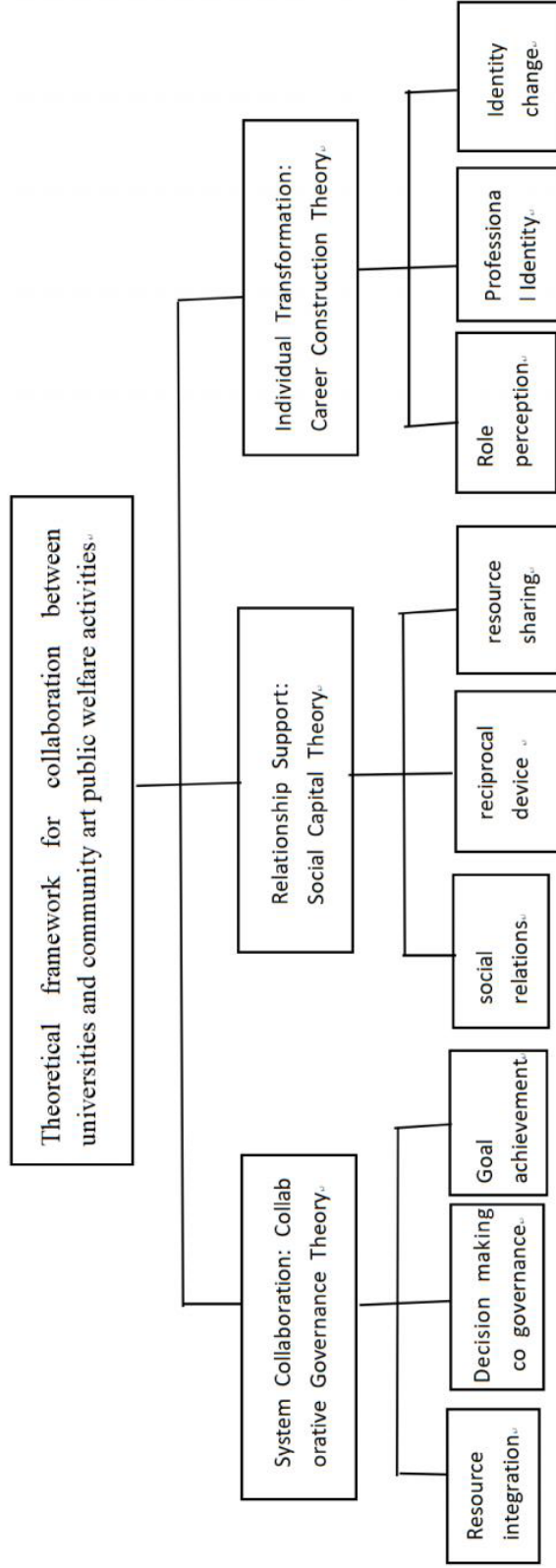


Figure 2 Collaborative Theory Diagram

3.2 Population and Sample

The quantitative phase of the study targeted individuals who had participated in art public welfare activities organized through collaboration between universities and local communities. The research population therefore includes university teachers, students, community administrators, and community residents who were directly involved in these activities. To obtain representative data from different stakeholder groups, a questionnaire survey was conducted among participants from these categories. A total of 370 valid responses were collected and included in the final dataset. Among these respondents, 208 were university students, 61 were university teachers, 43 were community managers, and 58 were community residents. The inclusion of multiple stakeholder groups allows the study to capture diverse perspectives on the implementation and effectiveness of art public welfare activities, as well as the collaborative mechanisms underlying university–community partnerships.

3.3 Research Instruments

The primary research instrument used in the quantitative phase of this study was a structured questionnaire. The questionnaire was developed based on the findings of the qualitative research and relevant theoretical literature related to collaborative governance, social capital, and community cultural development. The questionnaire consists of a set of measurement items designed to capture key constructs in the research model, including social responsibility, cultural identity, collaborative effectiveness, social support mechanisms, and willingness to continue participating in art public welfare activities. All measurement items were assessed using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). In addition to the main measurement variables, the questionnaire also included demographic questions such as gender, academic grade, major, participant role, and type of community project. These variables were used as control variables in the statistical analysis in order to minimize the influence of external factors and improve the explanatory power of the research model.

3.4 Data Collection

Data collection for this study was carried out in two stages corresponding to the qualitative and quantitative research components. In the qualitative stage, semi-structured interviews were conducted with selected participants who had direct experience in art public welfare projects implemented through university–community collaboration. The interviews were conducted face-to-face, recorded with the participants' consent, and later transcribed for systematic coding and analysis. In the quantitative stage, the questionnaire survey was distributed to individuals who had participated in university–community art public welfare activities. The questionnaires were administered through both online and offline channels to ensure broader participation and improve the response rate. After screening the collected responses for completeness and accuracy, a total of 370 valid questionnaires were retained for further statistical analysis.

3.5 Statistics Used for Data Analysis

The quantitative data collected in this study were analyzed using SPSS 26.0. Several statistical techniques were applied to examine the relationships among the variables and to test the proposed research hypotheses. First, descriptive statistical analysis was conducted to summarize the demographic characteristics of the respondents and provide an overview of the data distribution. Second, reliability analysis using Cronbach's alpha was performed to assess the internal consistency of the measurement scales. Third, validity analysis, including exploratory factor analysis, was

conducted to examine the construct validity of the questionnaire. In addition, correlation analysis was used to evaluate the relationships between the key variables in the research model. Regression analysis was further applied to test the proposed hypotheses and to examine the effects of independent variables on the dependent variables. Mediation analysis was also conducted to explore the mediating role of adaptability and reflective growth in the relationship between collaborative mechanisms and sustained participation. Through these statistical analyses, the study aims to provide empirical evidence regarding the effectiveness of art public welfare activities under the collaborative linkage between universities and communities.

4. Data Analysis and Findings

4.1 Introduction

This chapter presents the results of the quantitative analysis conducted to examine the relationships among the key variables in the research model. The analysis is based on data collected through a questionnaire survey of participants involved in art public welfare activities organized under the collaboration between universities and communities. A total of 370 valid responses were obtained, including 208 university students, 61 teachers, 43 community managers, and 58 community residents. These respondents represent the main stakeholder groups participating in the implementation and management of art public welfare activities. The questionnaire was developed based on the qualitative findings of this study and relevant theoretical frameworks. It included 15 items measured using a five-point Likert scale, designed to evaluate key constructs such as social responsibility, collaborative effectiveness, and willingness to continue participating in art public welfare activities. The statistical analysis was conducted using SPSS 26.0, and several analytical methods were applied, including reliability analysis, validity analysis, correlation analysis, regression analysis, and mediation effect testing. These analyses were conducted to evaluate the reliability and validity of the measurement scales and to test the proposed research hypotheses.

4.2 Data Analysis of the Quantitative Data

First, reliability and validity tests were conducted to evaluate the internal consistency and construct validity of the measurement scale. The results indicate that the scale demonstrates very high internal consistency, as shown in Table 2. The Kaiser–Meyer–Olkin (KMO) value was 0.942, and the Bartlett’s test of sphericity was statistically significant ($p < 0.001$), confirming that the data are suitable for factor analysis and that the scale has good construct validity. Factor analysis extracted two major factors, namely “willingness to continue participating” and “collaborative effectiveness.” These two factors explained 68.85% of the cumulative variance, indicating that the measurement items effectively capture the core dimensions of the research model.

Table 2 Reliability Analysis

Cronbach's Reliability Analysis				
Item Number	Total Correlation of Correction Items	Item Deleted Alpha Coefficient	Cronbach Alpha Coefficient	
Q5	0.719	0.908	0.917	
Q6	0.113	0.953		
Q7	0.761	0.908		
Q8	0.811	0.905		
Q9	0.846	0.904		
Q10	0.749	0.907		
Q11	0.855	0.903		
Q12	0.779	0.906		
Q13	0.823	0.905		
Q14	0.841	0.904		
Q15	0.872	0.903		
Q16	0.83	0.905		
Q17	0.498	0.915		
Q18	0.382	0.919		
Note: Standardized Cronbach Alpha Coefficient is 0.943.				

Second, correlation analysis was performed to examine the relationships between the key variables. The results show that several variables were significantly correlated with each other. In particular, the ability to balance artistic expression with community needs demonstrated a strong positive correlation with willingness to continue participating ($r = 0.684$, $p < 0.01$). This finding suggests that when art public welfare activities successfully integrate artistic creativity with community demands, participants are more likely to maintain long-term engagement and commitment to the activities.

Third, multiple linear regression analysis was conducted to test the core research hypotheses. The results indicate that the social support system plays a significant role in predicting student capability development. Specifically, teacher guidance ($\beta = 0.409$, $p < 0.001$) and community feedback ($\beta = 0.296$, $p < 0.01$) were found to significantly influence students' ability growth, providing empirical support for Hypothesis H3. Furthermore, expression adaptation ($\beta = 0.372$, $p < 0.001$) and reflective growth ($\beta = 0.237$, $p = 0.005$) were identified as key factors influencing participants' willingness to continue participating, supporting Hypotheses H4 and H5. However, the collaborative effectiveness of the teacher group did not reach a statistically significant level ($p > 0.05$), suggesting that there may be differences in how collaborative mechanisms operate across different participant groups.

Fourth, mediation analysis was conducted to examine the mediating role of reflective growth and expression adaptation in the relationship between collaborative mechanisms and sustained participation. The results indicate that reflective growth has a partial mediating effect between collaborative mechanisms and participants' willingness to continue participating in art public welfare activities. This finding suggests that when participants reflect on their experiences and internalize the values gained through collaboration, their motivation to remain engaged in the activities increases. In contrast, the mediating effect of expression adaptation was not statistically significant, indicating that although artistic adaptation contributes to participation, its influence is primarily direct rather than mediated through other psychological mechanisms.

4.3 Summary of the Results

The quantitative analysis provides empirical evidence supporting several key aspects of the research model. First, the reliability and validity tests confirm that the measurement scale used in this study has strong internal consistency and construct validity, making it suitable for further statistical analysis. Second, correlation analysis demonstrates that the integration of artistic expression with community needs is strongly associated with participants' willingness to continue participating in art public welfare activities. Third, the regression analysis highlights the important role of social support systems, particularly teacher guidance and community feedback, in promoting students' capability development and enhancing the effectiveness of collaborative art projects. In addition, expression adaptation and reflective growth are identified as significant factors influencing sustained participation. Finally, the mediation analysis reveals that reflective growth partially mediates the relationship between collaborative mechanisms and sustained engagement, emphasizing the importance of cognitive internalization and reflective learning in maintaining long-term participation. Overall, these findings confirm that the effectiveness of art public welfare activities under university–community collaboration is influenced by a combination of social support mechanisms, artistic coordination with community needs, and participants' reflective learning processes. These results provide empirical support for the proposed conceptual framework and offer valuable insights into how collaborative art initiatives can promote both community cultural development and participant engagement.

5. Conclusion, Discussion, and Recommendation

5.1 Conclusion

This study systematically explored the collaborative mechanism and implementation pathways of art public welfare activities under the linkage between universities and communities through a mixed-methods research approach. Based on 370 valid questionnaires and in-depth interviews with 12 core participants, the findings indicate that the effective integration of university professional resources and community cultural needs is a critical prerequisite for the successful implementation of art public welfare projects. The empirical results demonstrate that the systematic level of activity planning ($\beta = 0.372$, $p < 0.001$) directly influences residents' participation and satisfaction. The study verifies the effectiveness of the four-party collaborative model of "university leadership – community collaboration – resident co-construction – resource complementarity." This model enhances the effectiveness of community cultural governance and strengthens the social service value of universities through three key mechanisms: the transformation and application of professional skills among teachers and students, the establishment of a social support system, and the dynamic balance between artistic expression and community needs.

The findings further reveal that the social support system plays a decisive role in the sustainability of art public welfare projects. Teacher guidance and community feedback significantly predict students' capability development, while the transformation of residents from "passive recipients" to "cultural co-builders" demonstrates that the ability to balance artistic creativity with community needs serves as a core driving force for sustained participation. However, the results also reveal structural limitations within the current collaboration mechanism. In particular, the expected role transition of university teachers from "educators" to "project planners" did not reach a statistically significant level. This reflects a structural mismatch between the supply of artistic resources within universities and the cultural needs of communities, especially in the context of curriculum systems that still emphasize theoretical instruction over practical engagement. Furthermore, the study identifies shortcomings in the internalization of social values within current projects. Although residents generally recognize the positive impact of art public welfare activities on the community's cultural atmosphere, the relationship between students' perceived social responsibility and their actual behavioral investment remains relatively weak. This finding highlights a gap between cognitive awareness and behavioral commitment, suggesting the need for stronger integration between service-learning experiences, community feedback, and curriculum design.

5.2 Discussion

The findings of this study provide empirical support for several important theoretical perspectives. First, the results confirm the explanatory power of collaborative governance theory, social capital theory, and career construction theory in understanding cross-sector collaboration between universities and communities. The collaborative governance framework emphasizes the importance of multi-stakeholder cooperation and shared decision-making in addressing complex social issues. In the context of art public welfare activities, this study demonstrates how universities, communities, residents, and external resources can collectively contribute to community cultural development. Quantitative analysis shows that the balance between artistic expression and community needs, as well as positive feedback from the community, significantly predicts participants' willingness to continue engaging in art public welfare activities. These findings correspond with qualitative interview results showing that residents gradually transform from passive cultural consumers into active cultural co-builders. This transformation reflects the accumulation of social capital through collaborative cultural practices, which strengthens trust, social networks, and shared values within communities.

The study also supports career construction theory, which emphasizes the role of practical experiences in shaping professional identity development. Students participating in art public welfare projects often face the challenge of balancing aesthetic ideals with social practicality. Through continuous interaction with community members and the need to adapt artistic expression to real-world contexts, students gradually reconstruct their professional identity and develop a deeper understanding of the social role of art. This process corresponds to Savickas' concept of practice-driven identity construction, in which individuals build career identities through adaptive engagement with real-life challenges. However, the research also reveals structural contradictions within the current collaboration mechanism. The transition of university teachers from traditional educators to collaborative planners has not yet produced significant measurable effects. Interview results indicate that many teachers still face the dilemma of "emphasizing theoretical teaching while lacking opportunities for practical engagement." This phenomenon reflects Bourdieu's concept of cultural capital transformation barriers, where the artistic resources available within universities are not always effectively aligned with community cultural demands.

The comparison of case studies further illustrates this point. For example, the “Tea Pavilion Flower Sea” art festival, which involved deeper collaboration among government, universities, and enterprises, demonstrated stronger sustainability than the “Red Wall Theory” community mural project, which relied on relatively shallow cooperation. The success of the former project can be attributed to the establishment of an institutionalized social capital network that integrates multiple resources and stakeholders. Another important finding concerns the insufficient internalization of social responsibility among participants. Although community residents recognized the positive impact of art activities on local cultural life, the quantitative results did not show a strong statistical relationship between students’ perceptions of social responsibility and their actual behavioral engagement. This cognitive–behavioral gap suggests that art public welfare activities need to move beyond short-term volunteer projects and adopt a more systematic service-learning framework, integrating social issues such as intangible cultural heritage preservation into academic curricula.

5.3 Recommendation

Based on the findings of this study, several recommendations can be proposed to enhance the effectiveness and sustainability of art public welfare activities within university–community collaborations.

First, universities should strengthen the integration between academic curricula and community service practices. Art public welfare projects should not be treated as isolated extracurricular activities but should instead be embedded within teaching systems through service-learning models. By incorporating real community issues, such as cultural heritage preservation and local cultural development, into course design, universities can establish a closed-loop system that connects community service, feedback mechanisms, and teaching improvement.

Second, it is necessary to build institutionalized collaboration platforms between universities and communities. Establishing joint art funds supported by universities, local governments, and enterprises can provide stable financial resources for art public welfare activities. At the same time, community residents should be actively involved in project planning and evaluation processes in order to strengthen their role as cultural co-creators.

Third, policy-level support should be enhanced by adopting collaborative governance frameworks. Following the collaborative governance model, universities and communities should establish long-term partnership mechanisms that enable resource sharing, joint decision-making, and mutual evaluation. For example, resident satisfaction indicators can be incorporated into the evaluation system of university social service performance in order to ensure that projects genuinely respond to community needs.

Finally, future research should address the limitations of the current study. The sample used in this research is primarily concentrated in universities located in Hunan Province, which may limit the generalizability of the findings. Future studies should expand comparative research across urban and rural communities and examine how different regional contexts influence university–community collaboration. In addition, longitudinal studies are needed to track the long-term impact of participation in art public welfare activities on students’ career choices and professional development.

By addressing these issues, universities can gradually overcome the limitations of “ivory tower education” and establish more sustainable models of community engagement. Through collaborative governance, resource integration, and educational innovation, art public welfare

activities can simultaneously promote aesthetic education, social responsibility, and community cultural development.

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Research on the Application of AI Empowering Aesthetic Teaching of Chinese Language in Vocational Schools

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Abstract

The integration of artificial intelligence (AI) technologies into education has created new opportunities for improving the effectiveness of aesthetic teaching in classical Chinese poetry, particularly in vocational schools where students often face cognitive challenges in interpreting abstract literary imagery. This study aims to explore how AI-assisted multimodal teaching can enhance students' aesthetic perception, emotional resonance, and creative engagement with classical Chinese poetic imagery. A multimodal imagery teaching framework based on deep learning algorithms was constructed to support visualization, situational simulation, and adaptive learning in poetry instruction. Using a quasi-experimental research design, the study compared an experimental group that used culturally adaptive AI tools with a control group that followed traditional teaching methods. The quantitative results indicate that students in the experimental group achieved significantly higher levels of perceived aesthetic perception (SPA) and emotional resonance experience (EER) than those in the traditional classroom. The findings confirm the hypothesis that culturally adaptive AI tools can effectively enhance students' aesthetic engagement with poetic imagery. Further analysis reveals a significant positive relationship between the regulation intensity of "blank space" in AI-generated imagery and improvements in students' emotional resonance, suggesting that moderate visualization combined with imaginative space is essential for aesthetic learning. Stratified regression results also show that the instructional benefits of AI intervention are particularly significant for students with lower academic foundations, indicating that AI-supported visualization can reduce cognitive barriers in vocational education contexts. Qualitative classroom observations and interview data further reveal that AI-driven imagery visualization and situational simulation can shorten the cognitive process required for understanding poetic artistic conception. However, excessive concretization of AI-generated content may lead to the masking of textual ambiguity and reduced imaginative participation for some students. Overall, the study demonstrates that AI technologies function most effectively as cognitive scaffolds rather than replacements for teachers. Effective integration requires a balanced teaching model in which teachers guide interpretation, regulate technological intervention, and support students' independent aesthetic expression. These findings provide practical implications for the development of AI-assisted humanities education and contribute to the broader discussion of technology-enhanced aesthetic learning in vocational education.

Keywords: Artificial Intelligence in Education, Classical Chinese Poetry Teaching, Aesthetic Perception, Emotional Resonance, Vocational Education

1. Introduction

1.1 Background and Importance of the Problem

The rapid development of digital technology is reshaping the global education system, and artificial intelligence (AI) has gradually evolved from a supplementary instructional tool to a key participant in the educational ecosystem. AI technologies, including machine learning, natural language processing, and generative models, have demonstrated strong potential in enhancing learning efficiency, personalizing instruction, and expanding the forms of knowledge representation (Chen et al., 2020). In recent years, the integration of AI into education has not only transformed pedagogical approaches but has also provided new opportunities for interdisciplinary learning and creative expression. Particularly in language education, AI technologies enable interactive learning environments, multimodal content generation, and intelligent tutoring systems that support students in developing linguistic competence and cultural literacy (Okonkwo, 2023). Within the context of China's educational system, vocational education plays a crucial role in cultivating skilled professionals who support industrial and economic development. However, Chinese language teaching in vocational schools has long encountered structural challenges. Many vocational school students have relatively weak language foundations and limited exposure to classical literature, which restricts their ability to comprehend the cultural depth and artistic conception embedded in traditional texts (Sun and Wang, 2024). Classical Chinese poetry, as an important component of Chinese cultural heritage, emphasizes imagery, symbolism, and emotional resonance. Yet these abstract literary characteristics often create cognitive barriers for vocational students who tend to rely more on concrete and practical thinking patterns. As a result, students frequently struggle to interpret poetic imagery and appreciate the aesthetic dimensions of literary works (Mengnan, 2021).

Another major challenge lies in the traditional teaching approach used in many vocational classrooms. Chinese language instruction often relies on the "lecture–memorization" model, where teachers explain the text and students passively memorize annotations and translations. Although this method may support basic comprehension, it rarely stimulates students' aesthetic imagination or emotional engagement with literary texts (Sun and Wang, 2024). Furthermore, many teachers lack systematic training in aesthetic education and digital pedagogy, which limits their ability to integrate innovative teaching strategies or technological tools into classroom practice (Sun Chao, 2023). Consequently, the teaching of classical poetry frequently becomes a mechanical process of textual interpretation rather than a dynamic exploration of imagery, meaning, and emotional experience. In this context, AI technologies offer promising possibilities for transforming poetry teaching and aesthetic education. Recent developments in generative AI, such as large language models and AI-based image generation systems, enable the creation of multimodal learning materials that combine text, image, and audio elements. These technologies can visually represent poetic imagery, generate emotional voice interpretations, and construct immersive learning scenarios that help students better understand the artistic conception of classical poetry (Baomin and Manqi, 2025). For example, AI-generated images can translate abstract poetic metaphors into vivid visual scenes, thereby reducing students' cognitive load and facilitating deeper comprehension of literary symbolism (Donghong, 2022). Similarly, language models can provide structural guidance for writing, helping students practice sentence patterns and gradually transfer their understanding of poetry into expressive language (Zawakki, 2019).

At the policy level, the Chinese government has actively promoted the integration of digital technologies into education. The Action Plan for Improving the Quality and Quality of Vocational Education (2020–2023) emphasizes the importance of incorporating artificial intelligence and digital innovation into teaching practices to enhance educational quality and foster creative talent

development (Wang et al., 2024). This policy framework provides strong institutional support for exploring technology-enhanced humanities education, including the application of AI in Chinese language teaching. Despite these advancements, significant gaps remain in existing research. Most current studies focus primarily on the instrumental role of AI in improving language skills such as vocabulary acquisition, grammar learning, and automated assessment. However, relatively little attention has been given to the deeper pedagogical mechanisms through which AI may contribute to aesthetic education, particularly in the teaching of classical literature (Okonkwo, 2023). In vocational Chinese education, empirical studies examining how AI can systematically support the aesthetic appreciation of poetic imagery are still limited. Moreover, the integration of AI also raises potential concerns. Scholars have argued that excessive reliance on AI-generated visualizations may constrain students' imaginative capacity and lead to a form of "aesthetic substitution," where technology replaces rather than stimulates human creativity (Kiseleva, 2023). These concerns highlight the need for a balanced approach that integrates technological innovation with humanistic guidance. Therefore, exploring how AI can be effectively integrated into the aesthetic teaching of classical poetry in vocational schools is both a theoretical and practical issue. By examining the interaction between technology, cognition, and aesthetic experience, this study seeks to provide new insights into the role of AI in humanities education and contribute to the development of innovative teaching models for vocational Chinese language learning.

The teaching of classical Chinese poetry in vocational education presents unique pedagogical challenges due to the gap between the abstract aesthetic structure of poetry and the practical learning orientation of vocational students. Classical poetry relies heavily on imagery, symbolism, and emotional expression, which require readers to engage in imaginative interpretation and cultural reflection. However, vocational students often have limited exposure to classical literature and insufficient training in aesthetic appreciation, making it difficult for them to fully grasp the artistic conception embedded in poetic texts (Mengnan, 2021). Traditional instructional approaches further exacerbate this challenge. In many classrooms, poetry teaching focuses primarily on explaining vocabulary, grammatical structures, and historical background, while the aesthetic dimensions of poetry, such as imagery, rhythm, and emotional resonance, receive relatively little attention. This approach not only reduces students' engagement but also limits their ability to experience the cultural and emotional richness of classical literature (Sun and Wang, 2024).

The emergence of AI technologies provides an opportunity to address these issues by introducing multimodal and interactive learning experiences. AI-generated images, voice narration, and scenario simulation can transform static textual interpretation into dynamic aesthetic exploration, allowing students to visualize poetic imagery and engage more deeply with the emotional atmosphere of literary works (Donghong, 2022). However, the educational implications of such technological interventions remain underexplored. Understanding how AI influences students' perception of artistic conception, emotional expression, and language transfer abilities is therefore essential for developing effective teaching strategies. Furthermore, the integration of AI into humanities education raises important pedagogical questions regarding the balance between technological assistance and human creativity. While AI may enhance students' comprehension and engagement, excessive reliance on technological visualization may also reduce the space for imagination and independent interpretation (Kiseleva, 2023). For this reason, investigating the role of teacher guidance in mediating the relationship between AI technology and students' aesthetic development becomes particularly important. Addressing these issues will not only contribute to the theoretical understanding of AI-supported aesthetic education but also provide practical insights for improving Chinese language teaching in vocational schools.

1.2 Research Question

Based on the background and research gaps identified above, this study proposes the following research questions:

- 1) How can AI technology be systematically embedded into the aesthetic teaching process of classical poetry and artistic conception in vocational schools?
- 2) Does AI intervention significantly enhance students' perception of artistic conception, emotional expression, and language transfer ability in the learning of classical poetry?
- 3) What role does teacher guidance play in regulating the relationship between AI technology and students' aesthetic learning outcomes?
- 4) Does the use of AI in poetry teaching lead to potential negative effects, such as aesthetic alienation or technological dependence among students?

1.3 Research Objective

The primary objective of this study is to explore the integration of artificial intelligence into the aesthetic teaching of classical Chinese poetry in vocational education and to develop a pedagogical model that combines technological innovation with aesthetic cognition. Specifically, this study aims to construct a “technology–cognition–aesthetics” coupled teaching model that systematically incorporates AI tools into the learning process while maintaining the essential role of teacher guidance and humanistic interpretation. More specifically, the study seeks to achieve the following objectives:

- 1) To design and implement an AI-supported teaching framework that integrates multimodal technologies, such as AI-generated imagery, voice interpretation, and language modeling, into the aesthetic teaching of classical poetry.
- 2) To examine the impact of AI intervention on students' aesthetic learning outcomes, including their perception of poetic artistic conception, emotional expression, and language transfer ability.
- 3) To analyze the mediating role of teacher guidance in balancing technological assistance and aesthetic development in the classroom.
- 4) To investigate potential risks associated with AI-assisted learning, including aesthetic alienation and technological dependence, in order to ensure the responsible and effective use of AI in humanities education.

Through these objectives, this study aims to contribute to the theoretical development of AI-assisted aesthetic education and provide empirical evidence for improving Chinese language teaching practices in vocational schools. The findings may also offer broader insights into the integration of emerging technologies into humanities education in the digital era.

2. Literature Review

2.1 Related Concepts and Theories

The rapid development of artificial intelligence (AI) has significantly transformed the educational landscape, evolving from early intelligent tutoring systems to comprehensive digital learning ecosystems that integrate cognitive modeling, learning analytics, and generative content technologies. Liu (2025) explained that early AI applications in education primarily focused on rule-based tutoring systems designed to provide adaptive feedback and individualized instruction. With the advancement of machine learning and natural language processing, AI has gradually evolved into complex educational systems capable of predicting learning behavior, generating learning materials, and supporting interactive learning environments. Similarly, Luo (2025) argued that this transformation represents a paradigm shift in which AI increasingly functions as an intelligent educational agent with predictive, interactive, and generative capabilities. In contemporary educational environments, AI-based systems frequently rely on learning analytics and intelligent recommendation mechanisms. Alshammari (2024) suggested that intelligent path recommendation systems construct personalized learning profiles through real-time data collection and analysis, enabling precise learning interventions tailored to individual learners. In addition, automated evaluation technologies have been widely adopted in language education. Li (2025) indicated that AI-based automated assessment tools, including essay grading systems and speech recognition technologies, can significantly improve teaching efficiency while providing immediate feedback to learners.

The emergence of generative AI represents a major breakthrough in educational technology. Song (2021) noted that large language models and AI-driven image generation tools are capable of constructing virtual learning contexts through multimodal content generation. These technologies combine textual, visual, and auditory information to create immersive learning environments, which fundamentally transform traditional content interaction models in education. In Chinese language education, the concept of aesthetic teaching is closely connected with the traditional Chinese aesthetic theory of “meaning beyond the image.” Wu (2022) emphasized those classical Chinese poetics highlights the relationship between imagery, emotion, and philosophical meaning, suggesting that the aesthetic value of literary works lies beyond literal interpretation. Within this tradition, the concept of artistic conception (*yijing*) plays a central role in understanding the aesthetic experience of poetry. Gao (2025) explained that Wang Guowei’s theory of “self-realm” and “non-self-realm” reveals how poetic imagery can evoke emotional resonance and aesthetic contemplation in readers.

Modern Chinese language education further develops this aesthetic perspective into a structured pedagogical approach. Li (2025) proposed a three-stage model of artistic conception teaching that includes the perception stage, the understanding stage, and the expression stage. In the perception stage, students activate sensory awareness through multimodal input; in the understanding stage, they interpret symbolic meanings through analytical discussion; and in the expression stage, learners externalize their emotional responses through creative language output. However, applying this theoretical model in vocational education presents significant challenges. Sun (2023) pointed out that many vocational students lack sufficient cultural background knowledge, which limits their ability to associate poetic imagery with broader cultural meanings. In addition, teachers may face difficulties in guiding aesthetic interpretation due to insufficient training in literary aesthetics. In this context, AI technologies provide new possibilities for supporting aesthetic teaching. Kiseleva (2023) suggested that image generation systems and emotional speech synthesis technologies can visually and emotionally present poetic imagery, thereby reducing students’ cognitive load and enhancing their aesthetic engagement with literary texts.

2.2 Literature Surveys

Previous research has widely explored the integration of artificial intelligence into education, particularly in areas such as adaptive learning systems, automated assessment, and intelligent tutoring technologies. Alshammari (2024) found that AI-based learning recommendation systems can significantly improve learning outcomes by analyzing students' learning behaviors and providing personalized learning pathways. Similarly, Li (2025) reported that automated evaluation systems, such as AI-based essay scoring and speech analysis tools, enhance instructional efficiency and provide teachers with valuable data for formative assessment. In recent years, the emergence of generative AI has attracted growing attention in educational research. Song (2021) argued that large language models can simulate dialogue interactions and support students' writing development by providing sentence structure guidance and contextual suggestions. At the same time, AI image generation tools enable the visualization of abstract learning content, which helps students understand complex ideas through visual representation.

Despite these technological advancements, the application of AI in Chinese language teaching remains relatively limited, particularly in vocational education. Jin (2005) highlighted that the Chinese language curriculum in vocational schools often suffers from an imbalance between instrumental learning objectives and humanistic educational values. Traditional teaching practices tend to emphasize language knowledge and examination skills while neglecting aesthetic appreciation and creative expression. Further analysis by Chen and Cheng (2025) identified three major contradictions in vocational Chinese language teaching: the cognitive gap between limited student language foundations and the complexity of literary texts, the expression gap between rigid classroom organization and the abstract nature of poetic imagery, and the professional gap between teachers' literary literacy and the aesthetic requirements of modern curriculum standards.

Although the Chinese Language Curriculum Standards for Secondary Vocational Schools (2023 Edition) clearly emphasize aesthetic appreciation and creative expression as core educational objectives, teaching practice often remains dominated by the traditional annotation-based teaching model. Feng (2025) explained that teachers frequently focus on vocabulary explanation and thematic summaries while overlooking the creation of artistic conception and emotional engagement. As a result, students experience limited opportunities to develop aesthetic perception and creative thinking. The wave of digital transformation has further highlighted the necessity of reforming teaching practices. Nie (2022) suggested that integrating digital tools into language education can help shift the teaching paradigm from text analysis to artistic conception experience. In addition, Wang (2021) demonstrated that AI-based speech recognition systems can analyze students' reading performance and generate emotional feedback maps that assist teachers in adjusting instructional strategies.

In the context of classical poetry teaching, multimodal AI systems have shown particular potential. Zawakki (2019) proposed an interactive "poetry-image-sound" model that combines image visualization with emotional speech synthesis, allowing students to experience poetic imagery through multiple sensory channels. Comparative studies also reveal different research focuses between international and domestic scholars. Wang and Li (2024) found that international studies tend to emphasize algorithm optimization and learning behavior prediction, whereas Chinese research focuses more on the integration of AI technologies with specific teaching scenarios and localized educational practices, especially within vocational education contexts.

2.3 Conceptual Framework

Based on the literature review, this study proposes a conceptual framework that integrates AI technology, teacher guidance, and students' aesthetic learning outcomes in vocational Chinese language education. The framework is grounded in the theoretical perspectives of technology-enhanced learning and aesthetic education. In this framework, AI intervention functions as the primary independent variable. AI technologies, including generative text models, image generation tools, and multimodal learning systems, are expected to support students' understanding of classical poetry by visualizing abstract imagery, providing interactive learning contexts, and assisting language expression. These technological tools can facilitate students' engagement with poetic texts and enhance their aesthetic perception. The dependent variables include three dimensions of aesthetic learning outcomes:

- Perception of artistic conception, which refers to students' ability to understand and visualize poetic imagery.
- Emotional expression, which refers to students' capacity to interpret and articulate the emotional atmosphere of poetry.
- Language transfer ability, which refers to students' ability to apply poetic language structures in their own writing and expression.

Furthermore, teacher guidance is proposed as a mediating variable that influences the relationship between AI technology and students' aesthetic learning outcomes. Teachers play a crucial role in interpreting literary meaning, guiding students' imagination, and ensuring that technological tools support rather than replace human creativity. Finally, the conceptual framework also considers potential negative outcomes of AI-assisted learning. Kiseleva (2023) warned that excessive reliance on AI-generated content may restrict students' imaginative space and lead to aesthetic alienation or technological dependence. Therefore, understanding both the positive and negative impacts of AI intervention is essential for developing balanced and effective AI-supported teaching strategies.

2.4 Research Hypothesis

Based on the theoretical framework and previous studies, the following research hypotheses are proposed:

H1: AI intervention positively influences students' aesthetic learning outcomes in classical poetry teaching.

H1a: AI intervention positively affects students' perception of artistic conception.

H1b: AI intervention positively affects students' emotional expression ability.

H1c: AI intervention positively affects students' language transfer ability.

H2: Teacher guidance mediates the relationship between AI intervention and students' aesthetic learning outcomes.

H3: Excessive reliance on AI technology may lead to negative educational outcomes.

H3a: Excessive reliance on AI leads to aesthetic alienation.

H3b: Excessive reliance on AI leads to technological dependence.

3. Research Methodology

3.1 Research Design

This study adopts a mixed-method research design within an interpretive paradigm, using an explanatory approach to systematically examine the intervention mechanism and teaching effects of artificial intelligence (AI) technology in the aesthetic teaching of classical Chinese poetry in vocational schools. The mixed-method design integrates qualitative and quantitative approaches in order to obtain a comprehensive understanding of the educational phenomenon under investigation. The qualitative component of the study employs multiple data collection methods, including in-depth interviews, focus group discussions, and on-site classroom observations. These methods are used to explore how AI technologies influence teaching processes, classroom interaction patterns, and students' aesthetic learning experiences. The qualitative stage aims to uncover the mechanisms through which AI technology reshapes teachers' instructional strategies and students' aesthetic perception and expression. The quantitative component of the study is conducted through a structured questionnaire survey designed to empirically test the relationships identified in the qualitative stage. Specifically, the survey examines the impact of AI-supported learning experiences on students' aesthetic abilities and analyzes the mediating role of teacher guidance. The overall research framework follows the analytical logic of "structure–behavior–perception–reflection." This framework focuses on understanding how classroom structures change with technological intervention, how teaching and learning behaviors evolve, how students perceive aesthetic experiences, and how teachers reflect on the integration of AI into their instructional practices. The theoretical foundation of the study integrates constructivist learning theory, reception aesthetics, and post-human educational perspectives. Constructivist learning theory emphasizes that learners actively construct knowledge through interaction with learning environments. Reception aesthetics highlights the role of readers in interpreting literary works and generating aesthetic meaning through engagement with textual imagery. Meanwhile, post-human educational perspectives emphasize the collaborative relationship between human educators and intelligent technologies in contemporary learning environments. Through this theoretical integration, the study aims to capture the dynamic process of teacher teaching strategy reconstruction, student aesthetic experience generation, and technological embedding within the classroom.

3.2 Population and Sample

The population of this study consists of teachers and students from a vocational school located in Liuzhou, Guangxi, China, where AI-assisted teaching approaches have been introduced in Chinese language courses. For the qualitative stage of the research, purposive sampling was used to select participants who had direct experience with AI-supported classical poetry teaching. The qualitative sample included four Chinese language teachers and four students. The teacher participants were required to have at least three years of experience teaching classical Chinese poetry and to have applied AI technology in their teaching practice during the previous two semesters. The student participants were selected by considering diversity in language proficiency levels, gender differences, and frequency of participation in AI-supported classrooms, ensuring a variety of perspectives regarding the learning experience. For the quantitative stage, the study targeted students from Grade 1 to Grade 3 in the same vocational school. A questionnaire survey was conducted through the Wenjuanxing online platform, which is commonly used for educational data collection in China. A total of 509 valid questionnaires were collected, resulting in a response rate of 99.8%, indicating a high level of student participation and providing a reliable dataset for statistical analysis.

3.3 Research Instruments

This study employs several research instruments to collect qualitative and quantitative data. For the qualitative stage, semi-structured interview guides, focus group discussion protocols, and classroom observation forms were developed. The interview guide was designed around four main themes: (1) teaching context and AI usage experience, (2) reconstruction of teaching processes with AI participation, (3) the impact of AI on students' aesthetic cognition and expression, and (4) teaching challenges and ethical reflections associated with AI integration. To stimulate participants' contextual memory and encourage reflective responses, a three-minute AI multimodal teaching video titled "Drinking" was played before the interviews began. Each interview lasted between 30 and 50 minutes, and all interviews were audio-recorded and transcribed into text. The interview data resulted in eight textual corpora totaling approximately 40,000 words. In addition, focus group discussion protocols were developed to capture collective viewpoints and interaction dynamics among participants. Two focus group discussions were conducted: one involving the teacher group ($n = 4$) and another involving the student group ($n = 4$). Each discussion lasted approximately 90 minutes, and audio and video recordings were made throughout the session. Structured observation forms were used to record participants' nonverbal behaviors and interaction patterns during the discussions. For classroom observation, a non-intrusive observation protocol was used to document the teaching process in a classical poetry lesson. The observed lesson incorporated an AI image generation platform to reproduce poetic imagery, an emotion synthesis speech system for musical recitation, and an AI dialogue model embedded within interactive classroom activities. For the quantitative stage, a structured questionnaire was designed based on the core categories identified in the qualitative analysis and the proposed research hypotheses (H1a–H3b). The questionnaire contained 24 items measured using a five-point Likert scale, where 1 indicates strongly disagree and 5 indicates strongly agree. The measurement variables included four main constructs. The first variable was AI-supported learning experience, which measured the role of AI in enhancing students' perception of artistic conception, emotional expression, and language transfer ability. The second variable was teacher guidance, which examined the role of teachers' explanations, comments, and instructional guidance in helping students interpret AI-generated content and improve their expression. The third variable was students' aesthetic ability, operationalized through the dimensions of artistic conception perception, emotional expression, and language transfer ability. The fourth variable was potential negative effects, which measured students' perceptions of aesthetic alienation and technological dependence associated with AI-supported learning.

3.4 Data Collection

Data collection for this study was conducted in two stages corresponding to the qualitative and quantitative components of the research design. In the qualitative stage, in-depth interviews, focus group discussions, and classroom observations were conducted at a vocational school in Liuzhou City. Eight semi-structured interviews were carried out with four teachers and four students. Before each interview, participants viewed a short AI-assisted teaching video in order to activate their contextual memory and stimulate discussion about AI-supported poetry teaching. Each interview session lasted between 30 and 50 minutes and was audio-recorded and transcribed for analysis. Two focus group discussions were subsequently organized to supplement the findings from the individual interviews. The teacher focus group included participants with 2 to 15 years of teaching experience and varying levels of technological familiarity. The student focus group was designed to ensure diversity in grade level, academic achievement, and personality traits, allowing for heterogeneous viewpoints and dynamic discussion. In addition, non-intrusive classroom observations were conducted during a 45-minute classical poetry lesson. The observation focused on three analytical dimensions: technology intervention nodes, student response patterns, and teacher–

student–AI interaction structures. The classroom activities were recorded and later analyzed as sequences of “technology input – student response – teacher feedback.” In the quantitative stage, questionnaires were distributed to students from Grades 1 to 3 through the Wenjuanxing online platform. Students completed the questionnaire electronically using mobile devices or computers. After the data collection process was completed, 509 valid responses were obtained for statistical analysis.

3.5 Statistics Used for Data Analysis

Both qualitative and quantitative analytical methods were employed in this study. For the qualitative data, the study applied the grounded theory three-stage coding method, which includes open coding, axial coding, and selective coding. This method was used to identify conceptual categories and relationships within the interview transcripts. Focus group discussion data were analyzed using NVivo 14 software, applying discourse analysis and thematic clustering techniques. Classroom observation data were analyzed using the event annotation method, which decomposes classroom activities into sequences consisting of technology input, student response, and teacher feedback. For the quantitative data, several statistical techniques were employed. Reliability analysis was conducted using Cronbach’s alpha coefficient to assess the internal consistency of the questionnaire scale. Construct validity was evaluated through the Kaiser–Meyer–Olkin (KMO) test and Bartlett’s test of sphericity to determine whether the dataset was suitable for factor analysis. In addition, descriptive statistical analysis was used to calculate the mean and standard deviation for each measurement item in order to describe students’ perceptions of AI-supported learning experiences, teacher guidance, aesthetic ability, and potential negative effects. Finally, multiple linear regression analysis was applied to test the proposed research hypotheses and examine the relationships among AI-supported learning experiences, teacher guidance, students’ aesthetic abilities, and potential negative outcomes.

4. Data Analysis and Findings

4.1 Introduction

This chapter presents the results of both qualitative and quantitative analyses conducted in this study. The qualitative analysis explores how AI technologies influence the aesthetic teaching of classical Chinese poetry in vocational schools by examining teaching practices, classroom interaction patterns, and students’ aesthetic learning experiences. The quantitative analysis further verifies the relationships among AI-supported learning experiences, teacher guidance, students’ aesthetic abilities, and potential negative outcomes. Together, these analyses provide a comprehensive understanding of the educational impact of AI integration in vocational Chinese language classrooms.

4.2 Data Analysis of the Qualitative Data

The qualitative analysis was conducted using grounded theory coding procedures. During the open coding stage, 78 initial concepts were identified from the interview transcripts. These concepts were subsequently grouped into five major categories: AI enhances the understanding of poetic imagery, AI promotes student subjectivity expression, AI reconstructs the teaching role of teachers, AI enhances classroom participation and aesthetic motivation, and hidden concerns and misreading risks brought by AI intervention. During the axial coding stage, the relationships among these categories were further analyzed and organized into broader analytical dimensions. Three core axes were identified: the reconstruction of students’ understanding paths of artistic conception, the

generation mechanism of students' aesthetic expression, and the reconstruction of teachers' roles within human-machine collaborative teaching environments.

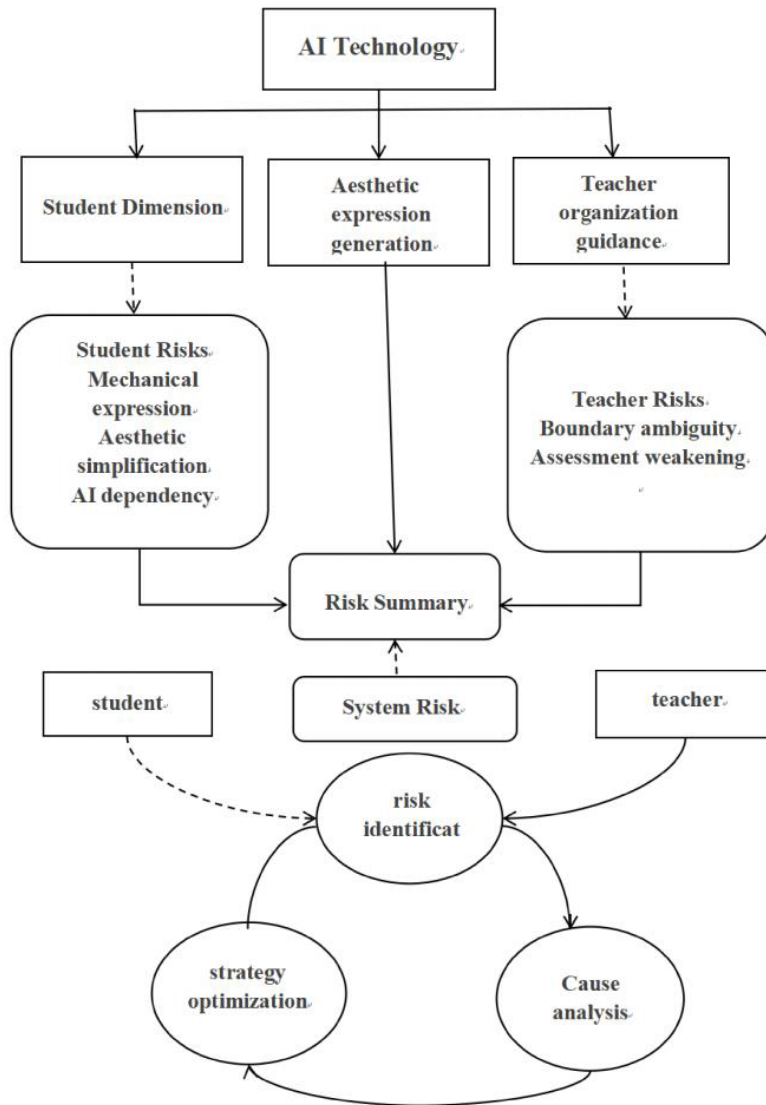


Figure 1 Theoretical Model

In the selective coding stage, these analytical dimensions were integrated into a conceptual model describing the aesthetic teaching mechanism supported by AI technology. The resulting model consists of three interconnected components: perception, expression, and organization, forming a three-dimensional teaching mechanism for AI-assisted aesthetic education in vocational Chinese language classrooms. The focus group discussions provided additional insights into the role of AI in poetry teaching. Participants generally agreed that AI-generated images and emotional speech synthesis systems help students visualize abstract poetic imagery and improve comprehension.

However, the discussions also revealed debates about whether AI-generated visualizations can truly reproduce the synesthetic aesthetic experience traditionally associated with classical Chinese poetry. Classroom observation results further confirmed these findings. The analysis identified 12 typical teaching event sequences, demonstrating that AI-supported multimodal teaching increased classroom participation and stimulated students' aesthetic curiosity. However, excessive visual concretization of poetic imagery sometimes reduced students' imaginative engagement, leading to a phenomenon described as imaginative substitution inhibition.

4.3 Data Analysis of the Quantitative Data

The quantitative data were analyzed to examine the reliability and validity of the measurement instrument and to test the research hypotheses. The reliability analysis using Cronbach's alpha produced a coefficient of $\alpha = 0.679$, with a standardized alpha value of 0.714, indicating an acceptable level of internal consistency for exploratory research. Construct validity was assessed using the Kaiser–Meyer–Olkin (KMO) test and Bartlett's test of sphericity. The results showed a KMO value of 0.821, indicating that the sampling adequacy was suitable for factor analysis. Bartlett's test was statistically significant ($\chi^2 = 9456.365$, $df = 276$, $p < 0.001$), confirming that the correlation matrix was appropriate for factor analysis and that the questionnaire had satisfactory construct validity. Descriptive statistical analysis indicated that students generally had positive perceptions of AI-supported learning experiences and believed that AI technologies enhanced their ability to understand poetic imagery and express emotions. Multiple linear regression analysis was conducted to test the proposed hypotheses. The results indicated that AI-supported learning experience had a significant positive effect on students' aesthetic ability, including artistic conception perception (H1a), emotional expression (H1b), and language transfer ability (H1c). The analysis also showed that teacher guidance played an important mediating or moderating role in the relationship between AI-supported learning experiences and students' aesthetic development, supporting Hypothesis H2. At the same time, the regression results revealed that higher levels of AI intervention were associated with potential negative outcomes, including aesthetic alienation (H3a) and technological dependence (H3b).

4.4 Summary of the Results

The findings of this study indicate that AI technologies play a significant role in enhancing the aesthetic teaching of classical Chinese poetry in vocational schools. AI-supported multimodal tools help students visualize poetic imagery, improve comprehension, and stimulate emotional engagement with literary texts. In addition, AI integration increases classroom participation and encourages students to express their personal interpretations of poetic works. The results also highlight the important role of teacher guidance in ensuring the effective use of AI technologies. Teachers act as facilitators who help students interpret AI-generated content and transform technological assistance into meaningful aesthetic learning experiences. However, the study also identifies potential risks associated with excessive reliance on AI technologies. While AI-generated visualizations enhance comprehension, they may also reduce students' imaginative engagement with poetic imagery and lead to aesthetic alienation or technological dependence. Overall, the results suggest that effective human–machine collaboration between teachers and AI technologies is essential for achieving balanced and meaningful improvements in aesthetic education within vocational Chinese language classrooms.

5. Conclusion, Discussion, and Recommendation

5.1 Conclusion

This study empirically verifies the important role of artificial intelligence (AI) technology in addressing cognitive bottlenecks in the aesthetic teaching of classical Chinese poetry in vocational schools. By constructing a multimodal imagery teaching framework based on deep learning algorithms, the study explores how AI tools can support students' aesthetic perception, emotional resonance, and creative expression in poetry learning. The results of the quantitative analysis show that students in the experimental group who used culturally adaptive AI tools achieved significantly higher scores in students' perceived aesthetic perception (SPA) and emotional resonance experience (EER) than those in the traditional teaching group. This finding supports the expectation of Hypothesis H1, which suggests that culturally adaptive AI tools can generate a synergistic effect in enhancing students' aesthetic understanding of poetic imagery. Furthermore, the empirical results confirm the central inference of Hypothesis H2, demonstrating a significant positive correlation ($\beta = 0.61$) between the regulation intensity of blank space within AI tools and the degree of improvement in emotional resonance. This finding aligns with qualitative evidence indicating that excessive concretization of imagery may inhibit students' imagination, reinforcing the applicability of the theoretical mechanism proposed by Mei (2020), which emphasizes maintaining a balance between visual concretization and abstract thinking in aesthetic education. The stratified regression analysis further reveals that the gain effect of AI-assisted teaching is particularly prominent among students with lower academic foundations. The improvement observed in this group significantly exceeds that of students with higher academic foundations, confirming the expectation of Hypothesis H3 regarding the specific needs of vocational education student populations.

Cross-validation between classroom observation data and interview findings indicates that AI-driven imagery visualization and situational simulation effectively shorten the cognitive cycle involved in students' comprehension of poetic artistic conception. However, non-intrusive classroom observations also reveal that approximately 14% of students experienced "text ambiguity masking" due to excessive concretization of AI-generated outputs, highlighting the necessity of implementing the threshold design principle of the "white space algorithm" in AI-supported teaching environments. The qualitative analysis further develops a three-dimensional teaching mechanism model consisting of perception, expression, and organization. This model demonstrates that the empowering value of AI lies not in replacing teachers but in reconstructing the collaborative relationship between humans, technology, and the learning environment. Within this model, teachers shift from the role of knowledge transmitters to that of AI coordinators and feedback facilitators, while students' aesthetic subjectivity is activated through AI-supported imagery reconstruction and imitation-based creative practices. Despite these contributions, the study has several limitations. The sample is concentrated in vocational schools in Guangxi, and the long-term effects of AI-assisted teaching were not tracked. Future research should expand cross-regional validation and explore algorithm optimization strategies for personalized emotional adaptation in the era of large-scale AI models. Overall, the findings suggest that AI serves as an effective cognitive scaffold for aesthetic conception, bridging the gap between the abstract nature of classical texts and the relatively weak cognitive foundations of vocational school students. However, the sustainable effectiveness of technological interventions ultimately depends on teachers' commitment to humanistic educational values and the dynamic management of ethical risks.

5.2 Discussion

The findings of this study contribute to the ongoing discussion regarding the role of artificial intelligence in aesthetic and humanities education. The results demonstrate that AI-assisted multimodal teaching can effectively enhance students' understanding of poetic imagery and emotional engagement with classical Chinese poetry. By combining visual, auditory, and interactive elements, AI technologies provide students with a more immersive learning experience, which helps reduce cognitive barriers associated with abstract literary texts. However, the findings also reveal the importance of maintaining a balance between technological support and students' imaginative autonomy. The qualitative data emphasize that excessive visualization generated by AI tools may lead to "imaginative substitution inhibition," where students rely heavily on technological representations rather than developing their own interpretations of poetic imagery. This phenomenon highlights the pedagogical challenge of integrating AI technologies without undermining the creative and interpretive processes that are central to aesthetic education.

The study also confirms that AI-supported teaching is particularly beneficial for students with weaker academic backgrounds, which is a common characteristic of vocational education contexts. AI-driven visualization and situational simulation reduce the cognitive difficulty associated with interpreting classical texts, allowing students to engage more actively with literary content. In this sense, AI technologies can function as cognitive scaffolds that support students' entry into complex aesthetic experiences. At the same time, the findings reinforce the importance of teacher mediation in AI-assisted classrooms. Rather than replacing teachers, AI technologies reshape their roles within the teaching process. Teachers become facilitators who coordinate technological tools, guide students' interpretation of AI-generated content, and ensure that technological assistance supports rather than replaces students' independent aesthetic exploration. This perspective responds to concerns that instrumental rationality may erode aesthetic autonomy, suggesting instead that technology can empower aesthetic learning when guided by humanistic educational principles.

5.3 Recommendation

The application of artificial intelligence technology in the aesthetic teaching of classical Chinese poetry in vocational schools should be guided by the core principle of "humanistic guidance, technological empowerment, and dynamic balance." Building an effective teaching ecology requires collaboration among teachers, technology developers, and educational institutions. At the instructional level, teachers should gradually transform their roles from traditional knowledge transmitters to AI collaborative teaching designers and aesthetic value guides. Teachers need to accurately manage the scale of technological intervention in the classroom by using AI multimodal tools to activate students' initial perception of poetic imagery while guiding them to move beyond technological representations and develop deeper individual aesthetic experiences. Through inspiring dialogue, personalized feedback, and cultural interpretation, teachers can help students engage critically with AI-generated content. In addition, schools should develop a dual-track lesson preparation framework integrating technology and humanities, clarifying the instrumental role of AI in constructing learning scenarios while maintaining the leading role of teachers in guiding emotional resonance. Systematic school-based training programs should also be implemented to strengthen teachers' ability to critically evaluate AI-generated content and prevent risks related to cultural misinterpretation or superficial aesthetic experiences.

At the technological development level, AI education platforms should strengthen cultural adaptation and ethical design. Developers should integrate the aesthetic logic of classical Chinese poetry into AI systems by establishing knowledge graphs of traditional cultural imagery to improve

the symbolic accuracy of generated images. Language generation modules should also incorporate style verification mechanisms to ensure that emotional tone and literary style remain consistent with classical poetic traditions. Furthermore, developers should focus on designing “blank space” interactive tools, which intentionally preserve incomplete visual elements in AI-generated imagery in order to stimulate students’ imaginative participation. Emotional computing systems could also be developed to generate “empathy index reports” through speech analysis, providing teachers with additional information to support targeted instructional interventions. At the same time, anti-dependency mechanisms should be introduced in AI platforms to gradually reduce writing assistance prompts as students’ usage frequency increases, encouraging a transition from technological reliance to independent creative expression.

Finally, curriculum design should follow the principle that technology serves the development of students’ aesthetic subjectivity. A three-stage integration pathway can be implemented within the curriculum. At the perception stage, AI tools can be used to reduce the cognitive threshold for understanding poetic imagery while simultaneously introducing imagery deconstruction exercises to cultivate students’ critical aesthetic awareness. At the expression stage, a cyclical learning model of “AI initial draft – teacher–student collaborative evaluation – individual reconstruction” can be adopted. In this model, the duration of technological assistance should be strictly limited to no more than 40% of the creative process, ensuring that students retain autonomy over their own expression. In higher grade levels, additional non-technological creative tasks can be introduced to further strengthen independent aesthetic expression. At the ethical cognition stage, curriculum designers should embed technology reflection workshops that encourage students to critically examine the authenticity of AI-generated content and reflect on the value of originality in artistic creation. Through these strategies, AI technologies can be integrated into aesthetic education in a way that supports both technological innovation and the preservation of humanistic educational values.

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A Case Comprehensive Review of Performance Budget Evaluation Research in China Education Institutions

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Abstract

Budget performance evaluation has become an important mechanism for improving financial management and governance efficiency in public sector organizations, particularly in higher education institutions. With the expansion of higher education systems and increasing public investment in universities, governments and educational institutions are under growing pressure to ensure that financial resources are allocated effectively and used efficiently. This study aims to examine the theoretical foundations, development trends, and practical implications of budget performance evaluation in public colleges and universities. The research adopts a qualitative research design based on an extensive review and analysis of relevant academic literature, policy documents, and previous empirical studies related to public sector performance management and higher education financial governance. The study integrates several theoretical perspectives, including public economics, new institutional economics, principal-agent theory, stakeholder theory, and performance management theory, in order to construct a comprehensive analytical framework for understanding budget performance evaluation in higher education institutions. The findings indicate that budget performance evaluation plays a significant role in strengthening accountability, improving resource allocation efficiency, and supporting strategic decision-making in universities. Effective performance evaluation systems enable institutions to link financial inputs with organizational outputs such as teaching quality, research productivity, and administrative performance. However, the study also reveals several challenges in current practices, including the overreliance on quantitative indicators, limited integration between performance evaluation and budget allocation processes, and insufficient institutional capacity for performance management. In addition, the complexity of university governance structures and the diversity of stakeholder interests often make it difficult to design evaluation systems that fully capture institutional performance. The study suggests that improving budget performance evaluation requires stronger theoretical integration, more comprehensive evaluation indicators, and better alignment between performance information and financial decision-making processes. Strengthening institutional governance mechanisms and enhancing administrative capacity are also essential for the successful implementation of performance-based budgeting in higher education institutions. Overall, the study contributes to the understanding of public sector performance management and provides useful insights for policymakers and university administrators seeking to improve financial governance and promote the sustainable development of higher education systems.

Keywords: Budget Performance Evaluation, Higher Education Finance, Public Sector Governance, Performance Management, University Budget Management

1. Introduction

1.1 Background and Importance of the Problem

Government budget performance management is a systematic process that requires effective institutional arrangements to regulate behavior, reduce transaction costs, and improve the efficiency of public resource allocation. Institutions play a critical role in shaping economic and administrative activities by providing rules and constraints that guide human interaction within economic systems (North, 1990). Effective institutional design should therefore emphasize simplicity, clarity, and operational precision while maintaining a balance between openness, flexibility, and institutional stability. The theoretical understanding of institutions in economics has evolved over time. Early economic thinkers such as Smith highlighted the importance of moral norms and social rules in maintaining social order in market economies. In *The Theory of Moral Sentiments*, Smith argued that universal rules and moral sentiments were necessary to sustain harmony in a free market society (Smith, 1759). However, under the influence of classical economic liberalism, the role of institutions was not extensively emphasized in mainstream economic analysis for a long period. After the Second World War, the rise of Keynesian economics led to the expansion of government intervention in economic activities. While this intervention aimed to stabilize economic systems, it also generated public concerns regarding bureaucratic inefficiency and the growing scale of government institutions (Coase, 1960). These debates led scholars to reconsider the role of institutions in shaping economic performance and social governance.

New Institutional Economics (NIE) emerged as an important theoretical framework that integrates institutional analysis into economic studies. Scholars in this field view institutions as scarce and valuable resources that structure incentives and coordinate economic behavior (North, 1990). Institutions are designed to reduce uncertainty, promote fair competition, and ensure that economic systems operate efficiently under conditions of limited resources. North (1990) defined institutions as “humanly devised constraints that structure political, economic, and social interaction.” Similarly, Cowgill and Shmueli (2000) described institutions as rule systems supported by enforcement mechanisms and punitive power. These institutions consist of three major components: formal institutions such as laws and regulations, informal institutions such as cultural norms and social values, and enforcement mechanisms that ensure compliance. Informal institutions, including moral beliefs, cultural traditions, and social values, often serve as the foundation upon which formal institutional structures are developed. Over time, these informal norms may evolve into codified rules and legal systems that guide social behavior and organizational governance (North, 1990). Within the framework of New Institutional Economics, institutional change can occur through several pathways. North identified two major forms of institutional change: induced change and coercive change. In addition, institutional transformation may follow either radical or gradual paths depending on the political and economic context. North emphasized that most institutional change occurs gradually through a continuous process of feedback, adaptation, and incremental reform.

In many cases, formal institutions are established and enforced by the state. Through policy implementation and regulatory enforcement, governments shape institutional traditions and governance mechanisms within society. Therefore, institutional reforms should be implemented gradually and adapted to national conditions through pilot programs, experimentation, and policy learning. From the perspective of New Institutional Economics, the state plays a central role in economic development by providing security, enforcing property rights, and establishing institutional frameworks that facilitate market transactions (Coase, 1960; North, 1990). Coase's property rights theory highlights that clearly defined and enforceable property rights can significantly improve economic efficiency and reduce transaction costs. North further argued that the economic

performance of a country depends largely on its institutional arrangements and the structure of property rights established by the state. However, the role of government in economic development is complex and sometimes paradoxical. On one hand, governments can promote economic growth through effective institutional frameworks; on the other hand, institutional inefficiencies, rent-seeking behavior, and policy errors may hinder economic performance (North, 1990).

This paradox is reflected in North's observation that "the state is both the key to economic development and the source of economic decline." Government decision-making is often constrained by limited information and bounded rationality, which means that policy-making frequently involves a process of trial and error. Therefore, the effectiveness of public governance largely depends on whether governments can design institutional systems that provide appropriate incentives and ensure the protection of property rights. Because institutions function as public goods, their supply and demand are influenced by various political, economic, and social factors. Understanding how institutional design and institutional change influence government performance management is therefore an important research topic in public administration and economic governance.

1.2 Research Question

Based on the theoretical perspective of New Institutional Economics, this study seeks to explore how institutional arrangements influence government budget performance management. The research addresses the following questions:

- 1) How do institutional frameworks affect the effectiveness of government budget performance management?
- 2) What roles do formal and informal institutions play in shaping public sector performance management systems?
- 3) How can institutional design improve the efficiency, accountability, and transparency of government budget management?

1.3 Research Objective

The objectives of this study are as follows:

- 1) To examine the theoretical foundations of government budget performance management based on New Institutional Economics.
- 2) To analyze the role of institutional arrangements in improving government budget performance management systems.
- 3) To propose institutional mechanisms that enhance the effectiveness, accountability, and efficiency of government financial governance.

2. Literature Review

2.1 Related Concepts and Theories

2.1.1 Principal–Agent Theory

Principal–Agent theory explains the relationship between owners (principals) and managers (agents) when decision-making authority is delegated within organizations. The theory emerged from studies of corporate governance where ownership and management rights are separated, with principals retaining residual claims while agents are responsible for operational decision-making (Jensen & Meckling, 1976). Principal–Agent theory is grounded in game theory and focuses on problems arising from asymmetric information between principals and agents. Information asymmetry occurs when one party possesses more information than the other, which may lead to opportunistic behavior. Two major forms of information asymmetry have been identified: adverse selection and moral hazard. Adverse selection occurs before a contract is signed, when principals cannot fully evaluate the capabilities or intentions of agents. Moral hazard occurs after the contract is established, when agents may pursue their own interests rather than those of the principals (Arrow, 1985; Eisenhardt, 1989). In a principal–agent relationship, conflicts of interest arise because the utility functions of principals and agents may differ. Agents may attempt to maximize personal benefits such as income, prestige, or job security, while principals aim to maximize organizational performance or economic returns (Jensen & Meckling, 1976). To address these conflicts, organizations often combine incentive mechanisms with monitoring and regulatory mechanisms. However, excessive monitoring may result in high administrative costs and reduce organizational efficiency (Eisenhardt, 1989).

To reduce these problems, scholars propose the concept of incentive compatibility, which aims to align the interests of principals and agents so that agents' actions naturally promote the objectives of principals. Incentive-compatible mechanisms typically include performance-based compensation, transparent reporting systems, and accountability frameworks (Holmström, 1979). In higher education institutions, especially public colleges and universities, the budget system reflects a complex principal–agent relationship. Governments or educational authorities act as principals responsible for allocating public funds, while university administrators serve as agents responsible for managing financial resources and implementing institutional policies. Within universities, additional principal–agent relationships exist between university leadership and academic departments, creating multiple layers of delegation and accountability (Lane, 2007). These relationships may lead to internal information asymmetry, inconsistent utility functions among stakeholders, and imbalances in authority, which can cause moral hazard and adverse selection in budget management processes. When designing performance budgeting systems in colleges and universities, administrators must therefore consider principal–agent issues and establish mechanisms that reduce information asymmetry and align organizational objectives. Performance budgeting systems can help address these challenges by linking financial resource allocation with measurable outcomes. By establishing clear performance indicators, improving transparency, and strengthening monitoring systems, universities can reduce opportunistic behavior and promote efficient use of public resources (Robinson & Last, 2009).

2.1.2 New Institutional Economics

Government budget performance management is a systematic administrative process that requires effective institutional arrangements to regulate behavior and reduce transaction costs. Institutional design should aim for clarity, efficiency, and operational feasibility while maintaining a

balance between stability and flexibility (North, 1990). The concept of institutions has long been discussed in economic theory. Early economists such as Smith emphasized the role of moral norms and social rules in maintaining social order in market economies. In *The Theory of Moral Sentiments*, Smith argued that shared moral principles and social norms were necessary to sustain cooperation and economic exchange within society (Smith, 1759). Despite this early recognition, institutions did not become a central focus in mainstream economic analysis for many years. Under the influence of classical economic liberalism, economists mainly emphasized market mechanisms and price systems. However, after the Second World War, the rise of Keynesian economics and the expansion of government intervention led scholars to reconsider the role of institutional arrangements in economic governance (Coase, 1960).

New Institutional Economics (NIE) emerged as a theoretical framework that integrates institutional analysis into economic theory. Scholars in this field argue that institutions are scarce and valuable resources that shape incentives and coordinate human behavior in economic systems (North, 1990). Institutions help reduce uncertainty, facilitate cooperation, and improve the efficiency of resource allocation in environments characterized by limited information and scarce resources. North (1990) defined institutions as “humanly devised constraints that structure political, economic, and social interaction.” Similarly, Cowgill and Shmueli (2000) described institutions as rule systems supported by enforcement mechanisms and punitive authority. According to this perspective, institutions consist of three major components: formal institutions such as laws and regulations, informal institutions such as social norms and cultural values, and enforcement mechanisms that ensure compliance. Informal institutions often serve as the foundation for formal institutional structures. Social beliefs, moral norms, and cultural traditions shape behavioral expectations and eventually evolve into formal legal frameworks that regulate economic and political activities (North, 1990).

Institutional change is another central concept in New Institutional Economics. North proposed that institutional change may occur through two major mechanisms: induced change and coercive change. Induced change occurs when individuals and organizations voluntarily modify institutional arrangements to improve efficiency, while coercive change results from external pressures such as government intervention or political reforms. Institutional change can also occur through radical or gradual pathways. Radical change involves rapid transformation triggered by major political or economic disruptions, whereas gradual change occurs through incremental adjustments and continuous feedback processes. North emphasized that most institutional changes in society occur gradually through a process of experimentation, learning, and policy refinement (North, 1990). Formal institutions are typically established and enforced by the state. Through legislation, regulatory frameworks, and policy implementation, governments shape institutional structures that influence economic performance and social governance. Therefore, institutional reforms should be implemented gradually according to national conditions, often through pilot programs and policy experimentation.

From the perspective of New Institutional Economics, the fundamental role of the state is to provide security, enforce property rights, and establish institutional frameworks that facilitate economic transactions (Coase, 1960). Coase’s property rights theory highlights that clearly defined and enforceable property rights significantly improve economic efficiency by reducing transaction costs. North further argued that the economic performance of a country largely depends on the quality of its institutional arrangements and the structure of property rights established by the state (North, 1990). However, the role of government in economic development is complex. Governments may promote economic growth through effective policies, but institutional inefficiencies such as rent-seeking behavior can also undermine economic performance. North described this phenomenon

as a paradox in which the state can be both the driving force of economic development and a source of economic decline. Because government decision-making is constrained by limited information and bounded rationality, policy reforms often involve a process of trial and error (North, 1990).

Institutions can also be viewed as public goods whose supply and demand are influenced by political, economic, and social factors. Institutional innovation therefore requires not only legal reforms but also changes in social ideology and collective values. North emphasized that ideology functions as an informal institution that significantly influences the development of formal institutional systems. Transaction cost theory is another key component of New Institutional Economics. Unlike neoclassical economics, which assumes frictionless markets, NIE recognizes that economic transactions involve costs related to information search, negotiation, contract enforcement, and monitoring (Coase, 1960). Coase's theorem demonstrates that transaction costs play a decisive role in determining how resources are allocated within an economy. North extended the concept of transaction costs to the political market, arguing that well-designed political institutions can reduce transaction costs and promote fair competition. Although transaction costs are difficult to measure precisely, studying them helps researchers understand how institutional arrangements influence governance efficiency and policy outcomes (North, 1990).

2.1.3 Stakeholder Theory

Stakeholder theory was formally introduced by Freeman (1984) and proposes that organizations should consider the interests of all stakeholders rather than focusing exclusively on shareholder value. Stakeholders include individuals or groups who can affect or are affected by an organization's activities. These stakeholders may include shareholders, creditors, employees, customers, government agencies, local communities, and the media. Each stakeholder group has legitimate interests and expectations regarding organizational performance and decision-making (Freeman, 1984). In the context of higher education institutions, stakeholders include students, faculty members, administrative staff, government agencies, parents, alumni, and society at large. The development of universities influences these stakeholders, while stakeholders simultaneously shape the strategic direction and governance of universities. Applying stakeholder theory to university financial management emphasizes the importance of balancing the interests of different stakeholders when allocating resources. A performance budgeting system can help achieve this balance by ensuring that financial decisions are transparent, equitable, and aligned with institutional objectives. Furthermore, stakeholder participation enhances accountability and strengthens governance structures within higher education institutions. By incorporating stakeholder perspectives into performance evaluation systems, universities can improve the effectiveness of financial management and support long-term institutional development (Freeman, 1984).

2.1.4 Performance Budget Reform Theory

Performance budgeting is a public financial management approach that links budget allocation with measurable performance outcomes. The concept was first proposed by the New York City Bureau of Municipal Research in 1907 as part of efforts to improve government accountability and administrative efficiency (Robinson & Last, 2009). The evolution of performance budgeting in the United States can be divided into two major stages. The first stage emerged in the 1940s and focused on linking budget allocation with program outputs. The second stage developed during the 1990s with the introduction of results-based budgeting, which emphasized performance outcomes and policy effectiveness (Joyce, 2003). Cothran identified three major characteristics of entrepreneurial budgeting: task orientation, performance evaluation, and the use of quantifiable goals and indicators. Martin further summarized four key characteristics of modern performance budgeting

systems: centralized control of strategic objectives, decentralized implementation mechanisms, accountability for outcomes, and improved transparency and communication.

Williams emphasized the importance of performance evaluation in government budgeting processes, arguing that performance assessment enhances accountability and improves resource allocation efficiency (Williams, 2003). Similarly, research conducted by the Government Accountability Office (GAO) shows that performance budgeting can promote program evaluation and enhance transparency in public administration. Scholars in China have also examined the development of performance budgeting systems. Niu Meili (2003) analyzed the evolution of budget reform in the United States and argued that government budget reform has shifted from a focus on control to management and planning functions. Ma Hai (2004) examined the characteristics of performance budgeting systems in Europe and the United States and proposed a performance contract-based budgeting model. Other scholars, including Zhan Guobin (2005), Chen Gong (2006), and Fu Daozhong (2006), analyzed international experiences in performance budgeting in countries such as the United Kingdom, the United States, and Australia. Their studies emphasize the importance of institutional reform, performance culture, and administrative capacity in the successful implementation of performance budgeting systems.

3. Research Methodology

3.1 Research Design

This study adopts a qualitative research design to examine the integration of performance evaluation and budget resource allocation in public colleges and universities. Qualitative research is appropriate for exploring complex governance systems, institutional arrangements, and administrative processes because it allows researchers to obtain in-depth insights into participants' perspectives, experiences, and interpretations (Creswell & Creswell, 2018). The research is grounded in several theoretical perspectives, including principal-agent theory, stakeholder theory, new institutional economics, and performance budgeting theory. These theoretical frameworks provide a foundation for analyzing how institutional arrangements, stakeholder relationships, and incentive mechanisms influence budget performance management in higher education institutions. The qualitative approach focuses on understanding how performance budgeting systems operate in practice within universities and how administrators and stakeholders perceive their effectiveness. Through interviews and document analysis, the study explores the processes of budget allocation, performance evaluation, and institutional governance. This research follows an exploratory and descriptive design. The exploratory aspect aims to identify key factors influencing the implementation of performance budgeting systems, while the descriptive component seeks to explain how these systems function in the context of public higher education institutions.

3.2 Population and Sample

The population of this study consists of administrators, financial officers, and academic managers working in public colleges and universities. These individuals are directly involved in financial planning, budgeting processes, performance evaluation, and institutional governance. A purposive sampling method is employed to select participants who possess relevant knowledge and experience in university financial management and performance budgeting systems. Purposive sampling is commonly used in qualitative research to ensure that participants can provide rich and meaningful information related to the research objectives (Patton, 2015). The sample includes senior administrators, financial management personnel, and department managers who are responsible for

budgeting, resource allocation, and performance assessment within their institutions. These participants provide valuable insights into the practical challenges and institutional dynamics associated with performance budgeting in higher education. The selected participants represent different administrative levels within universities, which allows the study to capture multiple perspectives regarding the effectiveness of performance budget systems and their impact on institutional governance.

3.3 Research Instruments

The primary research instrument used in this study is a semi-structured interview guide. Semi-structured interviews allow researchers to explore participants' perspectives while maintaining flexibility to ask follow-up questions and obtain detailed explanations (Creswell & Creswell, 2018). The interview questions are developed based on the theoretical frameworks and research objectives of the study. The interview guide focuses on several key topics, including:

- The current budgeting system used in public colleges and universities.
- The implementation of performance evaluation mechanisms in budget management.
- Challenges associated with resource allocation and financial accountability.
- The role of institutional arrangements in improving budget performance.
- Stakeholder participation in financial decision-making processes.

In addition to interviews, document analysis is conducted to examine institutional policies, financial reports, and performance evaluation documents related to university budgeting systems. Document analysis helps triangulate the findings and enhances the credibility of the research.

3.4 Data Collection

Data collection is conducted through semi-structured interviews and document review. Interviews are carried out with selected participants who have experience in university budget management and financial governance. Each interview is conducted either face-to-face or through online communication platforms, depending on participant availability. Interviews typically last between 30 and 60 minutes and are recorded with the consent of participants to ensure accuracy in data analysis. During the interviews, participants are encouraged to share their experiences and perspectives regarding the implementation of performance budgeting systems, institutional challenges, and opportunities for improving financial governance in higher education institutions. In addition to interviews, relevant documents such as financial management guidelines, performance evaluation reports, and university policy documents are reviewed. These documents provide contextual information and support the analysis of institutional practices related to budget performance management. The combination of interviews and document analysis allows the researcher to collect comprehensive qualitative data and strengthen the validity of the findings through methodological triangulation.

3.5 Data Analysis

The qualitative data collected from interviews and documents are analyzed using thematic analysis. Thematic analysis is a widely used qualitative method that involves identifying, analyzing, and interpreting patterns or themes within textual data (Braun & Clarke, 2006). The data analysis process follows several stages. First, interview recordings are transcribed and reviewed to ensure accuracy. Second, the researcher conducts initial coding to identify key concepts and ideas emerging from the data. Third, similar codes are grouped into broader themes that reflect major patterns related

to budget performance management and institutional governance. The themes identified in the analysis are interpreted in relation to the theoretical frameworks used in the study, including principal–agent theory, stakeholder theory, and new institutional economics. This theoretical interpretation helps explain how institutional structures, incentive mechanisms, and stakeholder relationships influence the effectiveness of performance budgeting systems. To ensure reliability and validity, the researcher carefully reviews the data multiple times and compares findings from different sources. The use of multiple data sources strengthens the credibility of the analysis and ensures that the conclusions are well supported by empirical evidence.

4. Data Analysis and Findings

4.1 Introduction

This chapter presents the analysis and interpretation of qualitative data collected in this study. The purpose of the analysis is to examine how performance budgeting systems are implemented in public colleges and universities and how institutional arrangements influence the allocation of financial resources and performance evaluation. The data were obtained from semi-structured interviews with university administrators, financial officers, and department managers who are directly involved in budgeting and performance management. In addition, relevant institutional documents such as financial policies, performance evaluation reports, and budgeting guidelines were analyzed to support the interpretation of the interview data. The qualitative analysis aims to identify patterns, themes, and relationships that explain the effectiveness of performance budgeting systems within higher education institutions. The results are interpreted through the theoretical perspectives of principal–agent theory, stakeholder theory, and new institutional economics. These theoretical frameworks provide insights into how information asymmetry, institutional rules, and stakeholder relationships affect financial governance in universities. The findings are organized into several major themes that emerged during the analysis process. These themes include institutional governance structures, information asymmetry in financial management, performance evaluation mechanisms, stakeholder participation, and the integration of performance evaluation with budget resource allocation.

4.2 Data Analysis of the Qualitative Data

4.2.1 Institutional Governance and Budget Management Structures

The analysis indicates that institutional governance structures play a fundamental role in determining the effectiveness of budget management systems in public colleges and universities. Participants consistently emphasized that clear administrative structures, well-defined responsibilities, and transparent procedures are essential for ensuring efficient resource allocation. Many interviewees noted that universities with formalized budgeting regulations and standardized financial procedures tend to demonstrate stronger accountability and more consistent decision-making processes. In these institutions, budgeting decisions are typically guided by strategic planning documents, annual operational plans, and institutional development objectives. From the perspective of new institutional economics, these findings highlight the importance of formal institutions such as rules, regulations, and governance structures in reducing uncertainty and coordinating organizational behavior. When institutional rules are clearly defined and consistently enforced, administrative units are more likely to follow standardized procedures and comply with performance requirements. However, the study also reveals that institutional effectiveness depends not only on formal regulations but also on informal institutional factors such as organizational

culture and leadership attitudes. In several universities, participants indicated that informal norms and leadership styles significantly influence the implementation of budgeting policies. For example, supportive leadership and collaborative organizational culture often encourage departments to participate actively in performance budgeting initiatives. These findings suggest that both formal and informal institutional factors contribute to the effectiveness of performance budgeting systems in higher education institutions.

4.2.2 Information Asymmetry in University Financial Management

Another major theme emerging from the qualitative analysis is the existence of information asymmetry within university financial management systems. Information asymmetry occurs when different administrative units possess unequal access to financial information, performance data, or decision-making authority. Several participants reported that senior administrators often rely on financial reports provided by individual departments when making budget allocation decisions. However, the accuracy and completeness of these reports may vary depending on the capacity and incentives of departmental administrators. As a result, decision-makers may not always have complete information regarding the actual performance or financial needs of different units. This issue is consistent with the predictions of principal-agent theory. In the context of university governance, government authorities act as principals who allocate financial resources to universities, while university administrators function as agents responsible for managing these resources. Within the university itself, additional layers of principal-agent relationships exist between senior administrators and departmental managers.

Because agents often possess more detailed information about their activities than principals, they may have opportunities to manipulate or selectively disclose information. This may lead to inefficient resource allocation or reduced accountability in budget management. Participants indicated that improving information transparency and strengthening reporting mechanisms are essential strategies for addressing information asymmetry. Many universities have introduced digital financial management systems and performance monitoring platforms to enhance transparency and improve data accuracy. These technological tools allow administrators to track financial expenditures, monitor performance indicators, and evaluate program outcomes more effectively. By reducing information gaps between different administrative levels, universities can improve the reliability of financial decision-making.

4.2.3 Performance Evaluation Mechanisms in Budget Management

Performance evaluation mechanisms represent another critical component of performance budgeting systems. The analysis shows that many universities have begun incorporating performance indicators into their budgeting processes to improve accountability and resource allocation efficiency. Participants explained that performance indicators are commonly used to assess areas such as teaching quality, research productivity, student outcomes, and administrative efficiency. Budget allocations are increasingly linked to these indicators, encouraging departments to improve their performance in order to secure financial support. From a management perspective, performance evaluation systems provide valuable information that helps administrators assess the effectiveness of institutional programs and allocate resources strategically. When performance indicators are aligned with institutional objectives, they can guide universities toward achieving long-term development goals. However, several participants also highlighted challenges associated with performance measurement. One concern is that some academic activities, such as educational quality, intellectual development, and social impact, are difficult to measure using quantitative indicators. Overreliance on measurable indicators may lead institutions to prioritize easily quantifiable outcomes while

neglecting broader educational objectives. Another challenge involves the design of performance indicators. If indicators are poorly designed or insufficiently aligned with institutional goals, they may create unintended incentives or encourage strategic behavior among departments. These findings suggest that performance evaluation systems must be carefully designed to ensure that they promote meaningful improvements in institutional performance rather than merely generating statistical outcomes.

4.2.4 Stakeholder Participation and Financial Transparency

Stakeholder participation emerged as another important factor influencing the effectiveness of university budget management. The study found that universities that encourage participation from multiple stakeholders tend to demonstrate higher levels of transparency and institutional trust. Stakeholders in higher education institutions include faculty members, students, administrators, government agencies, and the broader community. Each of these groups has legitimate interests in the allocation and use of financial resources within universities. Participants reported that involving academic departments and faculty representatives in budgeting discussions helps improve communication and reduce misunderstandings regarding financial decisions. When stakeholders understand how budgets are allocated and how performance indicators are evaluated, they are more likely to support institutional policies and strategic initiatives. From the perspective of stakeholder theory, these findings highlight the importance of balancing the interests of different stakeholder groups in organizational decision-making. Transparent budgeting processes that incorporate stakeholder feedback can enhance institutional legitimacy and improve governance outcomes. Furthermore, several participants emphasized that transparent financial reporting and open communication channels are essential for maintaining accountability. Universities that regularly publish financial reports and performance evaluation results tend to build stronger trust among stakeholders and demonstrate greater organizational credibility.

4.2.5 Integration of Performance Evaluation and Budget Resource Allocation

The integration of performance evaluation with budget resource allocation represents a central objective of performance budgeting systems. The analysis indicates that universities are increasingly attempting to link financial resources with measurable institutional outcomes. Participants explained that performance-based funding mechanisms are often used to reward departments that demonstrate strong performance in areas such as research output, student achievement, and community engagement. These incentive systems are intended to encourage departments to align their activities with institutional strategic goals. However, the study also reveals that the relationship between performance evaluation and budget allocation is not always straightforward. In many cases, universities maintain a hybrid budgeting model that combines traditional incremental budgeting with performance-based funding. This hybrid approach allows institutions to maintain stability in their basic operating budgets while gradually introducing performance-related incentives. Participants noted that such systems provide flexibility and reduce the risk of financial instability that might arise from sudden changes in funding allocation. From an institutional perspective, the gradual integration of performance evaluation and budget allocation reflects the evolutionary nature of institutional reform. Rather than implementing radical changes, universities often adopt incremental strategies that allow administrators to experiment with new budgeting mechanisms while maintaining organizational stability.

4.3 Summary of the Results

The findings of this study reveal several key factors that influence the effectiveness of performance budgeting systems in public colleges and universities. First, institutional governance structures play a crucial role in shaping financial management practices. Clear rules, transparent procedures, and well-defined administrative responsibilities contribute significantly to the effectiveness of budget management systems. Second, information asymmetry between different administrative levels remains a major challenge in university financial governance. Improving data transparency and implementing digital financial management systems can help reduce information gaps and enhance decision-making accuracy. Third, performance evaluation mechanisms are increasingly integrated into university budgeting processes. When carefully designed, performance indicators can guide resource allocation and encourage departments to improve institutional performance. However, performance measurement systems must be balanced to avoid overemphasis on quantitative metrics. Fourth, stakeholder participation contributes significantly to financial transparency and organizational accountability. Involving faculty members, administrators, and other stakeholders in budgeting processes strengthens institutional trust and enhances governance effectiveness. Finally, the integration of performance evaluation and budget allocation is gradually transforming financial management practices in higher education institutions. Although performance-based funding mechanisms are becoming more common, many universities continue to use hybrid budgeting models that combine traditional and performance-oriented approaches. Overall, the results suggest that effective performance budgeting systems require a comprehensive approach that integrates institutional reforms, transparent information systems, stakeholder participation, and carefully designed performance evaluation mechanisms. These elements collectively contribute to improving financial governance and supporting the long-term development of public colleges and universities.

5. Conclusion, Discussion, and Recommendation

5.1 Conclusion

This study examined the theoretical foundations and practical implications of budget performance evaluation in public higher education institutions, particularly in the context of China. Through a comprehensive review of relevant literature and qualitative analysis, the study explored how institutional arrangements, governance structures, and performance evaluation mechanisms influence the effectiveness of budget management in universities. The research integrates several theoretical perspectives, including public economics, new institutional economics, principal-agent theory, stakeholder theory, and performance budget reform theory. These theoretical frameworks provide a multidimensional understanding of how budget performance evaluation systems function within complex institutional environments. Public economics highlights the role of government in allocating public resources efficiently, while new institutional economics emphasizes the importance of institutional rules, governance structures, and transaction cost reduction in improving administrative efficiency. Principal-agent theory explains the potential conflicts and information asymmetry that arise between government authorities, university administrators, and academic departments in the management of public funds. Stakeholder theory further expands the analysis by emphasizing the need to consider the interests and expectations of multiple stakeholders involved in higher education governance.

The findings of this study demonstrate that budget performance evaluation plays a critical role in improving financial accountability, transparency, and resource allocation efficiency within

public colleges and universities. Effective performance budgeting systems allow universities to link financial resources with institutional outcomes, such as teaching quality, research productivity, and administrative performance. When properly implemented, performance budgeting mechanisms encourage universities to use public funds more efficiently and align financial management practices with institutional development strategies. However, the study also reveals several limitations and challenges associated with current budget performance evaluation systems. One major issue is the relatively weak theoretical integration within existing research. Although various theoretical frameworks have been applied, there remains a need for a more systematic and comprehensive theoretical model that can fully explain the relationship between institutional governance, performance evaluation, and budget allocation.

Another challenge involves the limited diversity of evaluation techniques used in budget performance assessment. Many institutions rely heavily on quantitative indicators, which may not fully capture the complexity of educational performance and institutional contributions to society. Additionally, the integration of performance information with the budgeting process remains insufficient in some universities, reducing the practical impact of performance evaluation results on financial decision-making. Overall, this study highlights the importance of developing a more integrated and effective budget performance evaluation system in public higher education institutions. Such systems should combine theoretical insights with practical management tools to improve financial governance and support the sustainable development of higher education.

5.2 Discussion

The findings of this study contribute to the broader discussion of performance budgeting and financial governance in public sector organizations. In particular, the research highlights the importance of institutional design and governance mechanisms in shaping the effectiveness of budget performance evaluation systems. From the perspective of new institutional economics, the effectiveness of budget performance management depends largely on the institutional environment in which universities operate. Clearly defined rules, transparent procedures, and effective enforcement mechanisms are essential for ensuring accountability and reducing administrative inefficiencies. Institutional reforms that strengthen governance structures and clarify administrative responsibilities can significantly improve the implementation of performance budgeting systems. The study also confirms the relevance of principal-agent theory in understanding financial governance within higher education institutions. Universities operate within complex hierarchical systems in which government authorities delegate financial responsibilities to university administrators, who in turn allocate resources to academic departments. These layered principal-agent relationships create potential risks of information asymmetry, opportunistic behavior, and inefficient resource allocation. Performance evaluation systems can help mitigate these risks by improving information transparency and establishing incentive mechanisms that align the interests of different stakeholders.

Furthermore, the research emphasizes the importance of stakeholder participation in budget management processes. Universities serve multiple stakeholders, including students, faculty members, government agencies, and society at large. Effective budget management must therefore balance the interests of these groups while ensuring that financial resources are allocated in ways that support institutional missions and long-term development goals. The findings also suggest that performance budgeting reforms should be implemented gradually and adapted to the specific institutional contexts of universities. Rather than adopting rigid or purely quantitative evaluation systems, institutions should develop flexible frameworks that combine quantitative indicators with qualitative assessments. Such balanced approaches can better reflect the multidimensional nature of higher education performance. Finally, the study underscores the growing importance of integrating

performance information into strategic decision-making processes. When performance evaluation results are effectively incorporated into budgeting decisions, universities can improve resource allocation efficiency and strengthen accountability mechanisms. However, achieving this integration requires continuous institutional learning, administrative capacity building, and policy support.

5.3 Recommendation

Based on the findings and discussion of this study, several recommendations can be proposed to improve budget performance evaluation systems in public higher education institutions.

First, future research should strengthen theoretical foundations by developing a more systematic and comprehensive framework for analyzing budget performance evaluation in higher education. Integrating insights from multiple theoretical perspectives—including public economics, institutional economics, and organizational governance—can help build a more robust conceptual model for understanding financial management in universities.

Second, universities should further develop and refine performance evaluation techniques. In particular, evaluation systems should incorporate both financial and non-financial indicators to capture the diverse dimensions of institutional performance. While quantitative indicators such as research output and graduation rates are important, qualitative indicators related to educational quality, social impact, and innovation should also be included.

Third, greater efforts should be made to integrate performance evaluation results with the budgeting process. Performance information should play a central role in guiding financial decisions and resource allocation. Universities should establish mechanisms that ensure performance evaluation results are regularly reviewed and incorporated into strategic planning and budget formulation processes.

Fourth, policymakers and university administrators should strengthen institutional capacity for performance management. This includes improving data management systems, enhancing transparency in financial reporting, and providing training for administrators involved in budgeting and performance evaluation.

Finally, future studies should expand the scope of research by employing diverse research methods, including quantitative analysis, case studies, and comparative studies across institutions or regions. Such research can provide deeper insights into how different institutional contexts influence the effectiveness of performance budgeting systems.

Through continuous theoretical exploration and practical innovation, it is expected that a more scientific, rational, and efficient budget performance evaluation system can be established. Such a system will not only improve financial governance in higher education institutions but also contribute to the sustainable development and long-term competitiveness of the higher education sector.

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A Study on the Double-Edged Effects of Electronic Performance Monitoring on Employees' Organizational Citizenship Behavior

by

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Abstract

With the rapid advancement of digital technologies, electronic performance monitoring (EPM) has become an increasingly common management tool in modern organizations. While EPM can enhance managerial efficiency and provide real-time performance feedback, its influence on employee behavior remains a subject of debate. This study investigates the mechanism through which electronic performance monitoring affects employees' organizational citizenship behavior (OCB) by examining the mediating roles of challenge stressors and hindrance stressors. Drawing on the challenge–hindrance stress framework and conservation of resources theory, this research proposes that EPM can generate both positive and negative stress responses among employees, which in turn influence their willingness to engage in extra-role behaviors. A quantitative research design was employed using a questionnaire survey method. Data were collected from employees working in a tertiary hospital and several high-tech enterprises in Chengdu, China. A total of 300 questionnaires were distributed, and 246 valid responses were obtained for analysis. Structural equation modeling (SEM) and mediation analysis were applied to test the proposed hypotheses. The results indicate that electronic performance monitoring has a significant positive effect on both challenge stressors and hindrance stressors. Challenge stressors were found to positively influence organizational citizenship behavior, whereas hindrance stressors negatively affected such behaviors. Furthermore, mediation analysis revealed that both challenge stressors and hindrance stressors significantly mediate the relationship between electronic performance monitoring and organizational citizenship behavior, but in opposite directions. These findings demonstrate that electronic performance monitoring has a “double-edged sword” effect on employee behavior. When employees perceive monitoring as supportive and developmental, it encourages motivation, resource investment, and extra-role contributions. However, when monitoring is perceived as excessive or intrusive, it can create psychological pressure and reduce employees' willingness to engage in discretionary organizational behaviors. This study contributes to the literature by extending the application of the challenge–hindrance stress framework in digital monitoring contexts and providing empirical evidence of the dual effects of electronic performance monitoring. The findings also offer practical implications for organizations seeking to design monitoring systems that balance performance management with employee well-being.

Keywords: Electronic Performance Monitoring, Challenge Stressors, Hindrance Stressors, Organizational Citizenship Behavior, Digital Management

1. Introduction

1.1 Background and Importance of the Problem

At the 20th National Congress of the Communist Party of China, General Secretary Xi Jinping emphasized the importance of accelerating the development of the digital economy and comprehensively promoting the construction of Digital China. In 2023, the State Council issued the Overall Layout Plan for the Construction of Digital China, which further highlighted digital transformation as a strategic foundation for enhancing national competitiveness and achieving sustainable economic development. Under this policy guidance, enterprises are encouraged to actively follow the trend of digitalization and informatization, accelerate their digital transformation processes, and achieve higher-quality development through digital technology empowerment. In this context, digital transformation has become a key strategy for enterprises seeking to enhance their competitiveness and adapt to rapidly changing market environments (Vial, 2019). With the rapid development of digital technologies, many organizations have begun integrating advanced information systems into their management practices. In particular, electronic performance monitoring (EPM) has gradually become an important tool in modern human resource management. Electronic performance monitoring refers to the use of technological systems to observe, record, and evaluate employees' work-related activities and performance (McNall and Stanton, 2009). In recent years, the number of Chinese enterprises adopting electronic performance monitoring has continued to increase, and the forms of monitoring have become increasingly diverse. These monitoring methods include tracking employees' online activities such as emails, text messages, audio and video calls, screenshots, browsing histories, and social media usage, as well as monitoring offline activities such as face-to-face interactions and location information (McNall and Stanton, 2009).

From a managerial perspective, electronic performance monitoring can provide organizations with valuable information regarding employee productivity, task completion, and communication patterns. Such digital monitoring systems can help improve organizational efficiency, strengthen information security, and reduce operational costs. Previous studies have shown that monitoring systems can increase employee accountability and encourage compliance with organizational rules and performance standards (Ball, 2010). Consequently, many enterprises regard electronic monitoring as an important managerial tool for enhancing operational performance and strengthening organizational control. However, despite these potential benefits, electronic performance monitoring may also generate negative psychological responses among employees. Excessive monitoring can lead employees to perceive a lack of trust from management and a potential invasion of personal privacy. These perceptions may result in increased work pressure, reduced job satisfaction, and lower organizational commitment (Fischer and Riedl, 2022). In some cases, employees may even experience emotional exhaustion or develop resistance toward organizational monitoring practices. A well-known example occurred in late 2021 when Gome Group publicly punished several employees for watching videos and listening to music during working hours. This incident attracted widespread public attention and sparked intense discussions both within organizations and across society. The case highlights the controversies and challenges associated with the practical implementation of electronic performance monitoring systems in modern organizations. While such monitoring technologies can enhance management efficiency, they may also generate tensions between organizational control and employee autonomy.

Therefore, organizations must carefully consider how to implement electronic monitoring systems in a balanced and responsible manner. On the one hand, enterprises need to leverage digital monitoring technologies to improve performance management and enhance organizational productivity. On the other hand, they must ensure that monitoring practices comply with legal and

ethical standards while maintaining employee trust and motivation. Employees, meanwhile, must gradually adapt to working environments characterized by digital monitoring while protecting their legitimate rights and privacy. Although electronic performance monitoring has attracted increasing scholarly attention, most existing studies have been conducted in Western cultural contexts. Empirical research based on surveys, interviews, and experiments has largely focused on Western employees, and research findings derived from these contexts may not be directly applicable to other cultural environments (Ball, 2010). In China, where organizational culture, management styles, and employee expectations differ from those in Western societies, localized research on electronic performance monitoring remains relatively limited. Therefore, examining the impact of electronic performance monitoring within the Chinese cultural context is of significant theoretical and practical importance. In particular, understanding how electronic monitoring influences employees' organizational citizenship behavior (OCB) can provide valuable insights for organizations undergoing digital transformation. Organizational citizenship behavior refers to discretionary employee behaviors that go beyond formal job requirements and contribute positively to organizational effectiveness (Organ, 1988). Investigating the relationship between electronic performance monitoring and organizational citizenship behavior, as well as the mediating role of challenge and hindrance stressors, can help organizations design monitoring systems that improve performance while maintaining employee well-being.

1.2 Research Question

Based on the background discussed above, this study aims to address the following research questions:

- 1) How does electronic performance monitoring influence employees' organizational citizenship behavior in Chinese enterprises?
- 2) What roles do challenge stressors and hindrance stressors play in the relationship between electronic performance monitoring and organizational citizenship behavior?
- 3) How can organizations design electronic performance monitoring systems that improve performance outcomes while minimizing negative psychological effects on employees?

1.3 Research Objective

The main objective of this study is to examine the relationship between electronic performance monitoring and organizational citizenship behavior within the context of digital management in China. In addition, the study aims to explore the mediating role of challenge-hindrance stressors in this relationship. Specifically, the objectives of this study are as follows:

- 1) To examine the impact of electronic performance monitoring on employees' organizational citizenship behavior.
- 2) To analyze the mediating role of challenge stressors and hindrance stressors in the relationship between electronic performance monitoring and organizational citizenship behavior.
- 3) To provide theoretical insights and practical recommendations for organizations seeking to design effective electronic performance monitoring systems while maintaining employee well-being and motivation.

2. Literature Review

2.1 Related Concepts and Theories

2.1.1 Cognitive Appraisal Theory of Stress

The Cognitive Appraisal Theory of Stress, also referred to as the Transactional Theory of Stress, was first proposed by Lazarus and Folkman (1984) to explain the subjective psychological process through which individuals evaluate stressful situations and determine coping responses. According to this theory, stress does not arise solely from the individual or the environment but from the interaction between the two. Lazarus and Folkman (1987) argued that individuals and environments should not be analyzed independently when examining stress processes; rather, they must be understood as interrelated systems. In this framework, the meaning of a potential threat emerges from the interaction between a particular individual and a specific environmental condition. For example, a situation cannot be considered a threat solely because of environmental characteristics. A threat only exists when a particular individual perceives that the environmental conditions may endanger their well-being or interests. Therefore, the concept of threat becomes meaningful only when both the characteristics of the environment and the perceptions of the individual are considered simultaneously (Lazarus and Folkman, 1987).

When the theory of stress appraisal was introduced into organizational research, it significantly improved scholars' understanding of stress mechanisms in the workplace. It explains why the same job characteristics, such as high job demands or strict electronic performance monitoring, can produce different psychological and behavioral outcomes for different employees. Some employees may interpret such conditions as opportunities for growth and development, while others may perceive them as threats that hinder personal progress. Building on this theoretical foundation, scholars developed the challenge–hindrance stressor framework, which classifies work stressors into two categories: challenge stressors and hindrance stressors (LePine et al., 2005). Challenge stressors include work demands such as workload, time pressure, and job responsibility. Although these demands require high effort, they are associated with potential personal gains such as learning, achievement, and career advancement. Hindrance stressors, in contrast, include organizational politics, role ambiguity, and bureaucratic procedures that obstruct personal development and goal attainment. Empirical research has shown that challenge stressors are often positively associated with job satisfaction, organizational commitment, and performance outcomes, even though they may temporarily increase fatigue. Hindrance stressors, on the other hand, are consistently linked to negative outcomes such as emotional exhaustion, job dissatisfaction, and turnover intentions. This theoretical distinction has advanced the understanding of workplace stress by moving beyond the traditional assumption that all stress is inherently harmful.

2.1.2 Conservation of Resources Theory

The Conservation of Resources (COR) theory, proposed by Hobfoll (1989), provides another important framework for understanding stress in organizational settings. The theory assumes that individuals are motivated to obtain, retain, protect, and cultivate valuable resources. These resources may include personal characteristics, conditions, energies, or objects that individuals value because they help achieve important goals. According to COR theory, stress occurs when individuals perceive a threat of resource loss, experience actual resource loss, or fail to gain expected resources after investing effort (Hobfoll, 1989). This assumption also helps explain the evolution of human psychological and behavioral responses to stressful situations (Hobfoll et al., 2018). The theory emphasizes two major processes: resource conservation and resource acquisition. Based on these

processes, four fundamental principles have been proposed. The first principle is the primacy of resource loss, which states that resource loss has a stronger psychological impact than resource gain (Hobfoll et al., 2018). The second principle is the resource investment principle, which suggests that individuals must invest resources in order to protect against future resource losses, recover from losses, or gain additional resources (Hobfoll, 2011). The third principle is the gain paradox, which indicates that resource gains become particularly valuable when individuals are experiencing resource losses. The fourth principle is the desperation principle, which suggests that individuals may adopt defensive or even irrational behaviors when their resources are severely depleted (Halbesleben et al., 2014; Hobfoll et al., 2018).

Hobfoll (2001) further extended the theory by proposing several corollaries. One important corollary is the initial resource effect, which suggests that individuals with abundant initial resources are better able to cope with resource loss and are more capable of acquiring additional resources. In contrast, individuals with limited resources are more vulnerable to further losses. Another corollary is the loss spiral, which refers to the tendency for individuals who experience resource losses to become trapped in a cycle of continuing resource depletion. Conversely, individuals with abundant resources may experience a gain spiral, where resource acquisition leads to the accumulation of additional resources over time (Hobfoll et al., 2018).

2.2 Literature Surveys

2.2.1 Electronic Performance Monitoring and Challenge Stressors

During the cognitive appraisal process, employees interpret electronic performance monitoring as a work-related stimulus that may generate stress reactions (Ravid et al., 2023). Individuals evaluate whether such monitoring affects their well-being through subjective interpretations of task demands (Lazarus and Folkman, 1984). These evaluations may result in three possible perceptions: irrelevant, challenge, or hindrance (Crawford et al., 2010). When employees perceive electronic performance monitoring as a developmental management tool, they are more likely to view it as an indicator of organizational trust. Such perceptions can improve job satisfaction and organizational commitment (Wells et al., 2007) and strengthen employees' trust in their organizations (Alder et al., 2008). Under these circumstances, employees tend to interpret monitoring-related stress as a challenge stressor rather than a hindrance. Challenge stressors can stimulate employees' motivation, enhance self-efficacy, and promote positive emotions. They can also improve job performance and personal development (Sun et al., 2018; Wang et al., 2022). Furthermore, when employees perceive uncertainty as an opportunity to solve problems creatively, they are more likely to engage in challenging job demands and respond positively to workplace stress (Yi et al., 2022).

2.2.2 Challenge Stressors and Organizational Citizenship Behavior

From the perspective of the Conservation of Resources theory, challenge stressors can encourage individuals to actively invest resources in work activities. According to the Job Demands–Resources (JD-R) model, challenge stress can function as a positive resource that motivates employees to engage in organizational citizenship behavior. When employees successfully cope with challenge stressors, they accumulate valuable psychological resources such as self-efficacy, positive emotions, and social support. These resources enable employees to invest additional time and energy in helping colleagues or contributing to organizational goals beyond their formal responsibilities. As a result, challenge stressors can stimulate organizational citizenship behavior and strengthen positive organizational outcomes. Moreover, the resource acquisition spiral suggests that employees who

demonstrate organizational citizenship behavior may receive recognition and social rewards, which further strengthen their resource base and encourage continued positive behavior.

2.2.3 Electronic Performance Monitoring and Hindrance Stressors

Electronic performance monitoring may also generate hindrance stress when employees perceive monitoring as excessive or controlling. If employees believe that monitoring is primarily intended to detect misconduct, they may develop negative emotional reactions (Wells et al., 2007). Such perceptions can increase psychological stress and reduce perceptions of procedural fairness (Fischer and Riedl, 2022; McNall and Stanton, 2011). Research has shown that monitoring systems can intensify stress when task complexity is high or when performance standards are strict (Schleifer et al., 1996). When employees feel that their privacy is violated, they may experience psychological resistance (Yost et al., 2019). Similar concerns have also been observed among job applicants, who often express privacy concerns about organizations that employ strict electronic monitoring practices (Siegel et al., 2021). Employees who lack control over monitoring systems are particularly likely to perceive higher levels of privacy invasion and lower procedural fairness compared with those who have some degree of control (McNall and Stanton, 2011).

2.2.5 Hindrance Stressors and Organizational Citizenship Behavior

According to Conservation of Resources theory, employees attempt to protect their limited resources when facing potential resource losses (Hobfoll, 2001). Work stressors can deplete valuable resources such as time, energy, and emotional stability. For example, interpersonal conflict can reduce social resources, while excessive workload can reduce time and energy resources. When resources become scarce, employees often adopt resource conservation strategies. One common strategy is to reduce discretionary effort at work. Trougakos et al. (2015) argued that employees may strategically decide not to invest their remaining resources in activities that are not formally required. Organizational citizenship behavior is typically considered an extra-role activity that requires additional time and energy. Bergeron (2007) suggested that employees often reduce their participation in such behaviors when resources are limited. Since organizational citizenship behaviors are not always formally rewarded, employees may prefer to allocate their resources toward in-role performance rather than extra-role contributions (Schmidt and DeShon, 2007).

2.3 Conceptual Framework

Based on the theoretical foundations and previous literature, this study proposes a conceptual framework in which electronic performance monitoring influences employees' organizational citizenship behavior through the mediating mechanisms of challenge stressors and hindrance stressors. Electronic performance monitoring can generate different cognitive evaluations among employees. When interpreted positively, it can function as a challenge stressor that enhances motivation and encourages employees to engage in organizational citizenship behaviors. Conversely, when perceived negatively, electronic monitoring may become a hindrance stressor that depletes resources and discourages employees from engaging in extra-role behaviors.

2.4 Research Hypothesis

Based on the above theoretical analysis and literature review, the following hypotheses are proposed:

H1: Electronic performance monitoring has a positive impact on employee challenge stressors.

H2: Challenge stressors have a positive impact on employees' organizational citizenship behavior.

H3: Challenge stressors play a mediating role between electronic performance monitoring and employees' organizational citizenship behavior.

H4: Electronic performance monitoring has a positive effect on employee hindrance stressors.

H5: Hindrance stressors have a negative impact on employees' organizational citizenship behavior.

H6: Hindrance stressors play a mediating role between electronic performance monitoring and employees' organizational citizenship behavior.

3. Research Methodology

3.1 Research Design

This study adopted a quantitative research design using a questionnaire survey to investigate the relationship between electronic performance monitoring, challenge–hindrance stressors, and organizational citizenship behavior. The research aimed to examine the mediating roles of challenge stressors and hindrance stressors in explaining how employees' perceptions of electronic performance monitoring influence their organizational citizenship behavior. A structured questionnaire was used as the primary research instrument. The questionnaire included measurement scales adapted from previous empirical studies to ensure validity and reliability. All items were measured using a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). This scale allows respondents to express their level of agreement with each statement and has been widely used in organizational behavior research.

3.2 Population and Sample

The population of this study consisted of medical staff working in tertiary hospitals and employees working in high-tech enterprises in Chengdu, China. These organizations were selected because electronic performance monitoring systems are widely applied in hospital operating rooms as well as in research, development, and production processes within technology enterprises. Employees in these organizations generally possess relatively high educational backgrounds and are able to clearly understand the questionnaire items related to electronic monitoring and workplace stress. Therefore, their responses provide valuable insights into the practical application and effects of electronic performance monitoring in modern organizational settings. A total of 300 questionnaires were distributed through offline surveys, with 100 questionnaires distributed to each participating organization or unit. Among these, 272 questionnaires were returned, representing a response rate of 90.67%. After excluding questionnaires with missing values, repetitive responses, or obvious response patterns, 246 valid questionnaires were retained for further analysis. The final effective response rate was 82%.

3.3 Research Instruments

The questionnaire consisted of three main constructs: electronic performance monitoring, challenge–hindrance stressors, and organizational citizenship behavior. The measurement items were adapted from well-established scales used in previous research.

Independent Variable: Electronic Performance Monitoring

Electronic performance monitoring refers to employees' perceptions of the organizational purposes behind the implementation of monitoring systems. According to prior research, employees' perceptions of monitoring purposes can generally be classified into two categories: developmental monitoring and preventive monitoring (Wells et al., 2007). Developmental electronic performance monitoring refers to monitoring practices designed to improve employee performance through feedback, evaluation, and performance improvement mechanisms. Employees who perceive monitoring as developmental often interpret it as organizational support for career development. Preventive monitoring, on the other hand, focuses primarily on preventing non-work-related behaviors, which may cause employees to perceive a lack of trust from the organization. In this study, electronic performance monitoring was measured using the Perceived Purpose Scale developed by Wells et al. (2007). The scale was further adapted according to the Chinese context based on the translation and revision by Peng Zhen et al. (2022). A total of six items were used to measure employees' perceptions of electronic performance monitoring. All items were rated using a 7-point Likert scale ranging from strongly disagree to strongly agree.

Mediating Variables: Challenge Stressors and Hindrance Stressors

Challenge stressors and hindrance stressors were used as mediating variables in this study. Challenge stressors refer to work demands that, although potentially stressful, provide opportunities for learning, achievement, and personal growth. Hindrance stressors, in contrast, represent work conditions that obstruct personal development and hinder goal achievement. The measurement scales for challenge stressors and hindrance stressors were adopted from LePine et al. (2016). Each construct was measured using 10 items, which have been validated in previous research and shown to demonstrate good reliability and validity. Similar to the other constructs, responses were measured on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Dependent Variable: Organizational Citizenship Behavior

Organizational citizenship behavior (OCB) refers to voluntary behaviors performed by employees that are not explicitly required by the formal reward system but contribute positively to organizational effectiveness (Williams and Anderson, 1991).

Previous studies have conceptualized organizational citizenship behavior using either two-dimensional structures (Smith et al., 1983; Williams and Anderson, 1991) or multidimensional structures (Farh et al., 2004; Podsakoff et al., 1997). In this study, the measurement of organizational citizenship behavior was based on the scale developed by Lam et al. (2016), which has been widely used in empirical studies including diary-based research designs. The scale includes six items measuring employees' willingness to engage in extra-role behaviors that benefit the organization and their colleagues. Responses were measured using a 7-point Likert scale ranging from strongly disagree to strongly agree.

3.4 Data Collection

Data were collected using a combination of offline and online questionnaire distribution methods. Offline questionnaires were distributed directly to medical staff in a tertiary hospital and employees in cooperative high-tech enterprises in Chengdu. The online questionnaires were distributed through digital platforms to increase accessibility and response convenience. Participants were informed about the purpose of the study and assured that their responses would remain confidential and used solely for academic research purposes. Respondents voluntarily completed the questionnaires, and anonymity was guaranteed to reduce potential response bias. After the data collection process was completed, all returned questionnaires were carefully reviewed. Questionnaires with significant missing data, repetitive response patterns, or obvious regular answering patterns were removed to ensure the quality and reliability of the dataset.

3.5 Statistics Used for Data Analysis

The collected data were analyzed using statistical analysis methods commonly applied in organizational behavior research. Descriptive statistics were first used to summarize the demographic characteristics of the respondents and the general distribution of the variables. Reliability analysis was conducted to assess the internal consistency of the measurement scales. Correlation analysis was then performed to examine the relationships among electronic performance monitoring, challenge stressors, hindrance stressors, and organizational citizenship behavior. Furthermore, regression analysis and mediation analysis were conducted to test the proposed research hypotheses and examine the mediating roles of challenge stressors and hindrance stressors in the relationship between electronic performance monitoring and organizational citizenship behavior.

4. Data Analysis and Findings

4.1 Introduction

This section presents the empirical analysis of the collected data in order to examine the relationships among electronic performance monitoring, challenge stressors, hindrance stressors, and organizational citizenship behavior. The analysis includes reliability and validity testing, common method bias testing, descriptive statistical analysis, correlation analysis, structural equation modeling, and mediation effect analysis. A total of 246 valid questionnaires were used for the analysis. Statistical techniques were applied to ensure the reliability and validity of the measurement model and to test the proposed hypotheses. The results provide empirical evidence for understanding the mechanisms through which electronic performance monitoring influences employees' organizational citizenship behavior.

4.2 Data Analysis of the Quantitative Data

4.2.1 Reliability and Validity Test

In this study, the internal consistency coefficient Cronbach's α was used for reliability testing. The reliability evaluation follows the criteria proposed by DeVellis (1991). As shown in Table 1, the Cronbach's α coefficients of electronic performance monitoring, challenge stressors, hindrance stressors, and organizational citizenship behavior are all greater than 0.90, indicating excellent internal consistency. In addition, the Average Variance Extracted (AVE) was used to assess convergent validity. The results show that the AVE values of all variables are greater than 0.50,

indicating that the measurement model has good convergent validity. Therefore, the overall reliability and validity of the questionnaire are acceptable for academic research.

Table 1 Reliability and Validity Test

Name	Item	Cronbach's α Coefficient	AVE
Electronic Performance Monitoring	6	0.911	0.635
Challenging Stressor	10	0.952	0.610
Obstructive Stressor	10	0.958	0.601
Organizational Citizenship Behavior	6	0.901	0.605

4.2.2 Common Method Bias Test

To test whether common method bias existed in the data, this study adopted Harman's single-factor test. This method includes all measurement items in an unrotated exploratory factor analysis. If a single factor emerges or the first factor explains the majority of the variance, it indicates potential common method bias. The exploratory factor analysis was conducted on the main variables of this study, including electronic performance monitoring, challenge stressors, hindrance stressors, and organizational citizenship behavior. The results show that the variance explained by the first factor is 19.451%, which does not dominate the total variance. Therefore, common method bias does not significantly affect the theoretical model of this study.

4.2.3 Descriptive Statistical Analysis

Descriptive statistical analysis was conducted to understand the general distribution characteristics of the variables. The mean and standard deviation were used to measure the average level and dispersion of each variable. A higher mean value indicates a higher overall level of the variable among respondents, while the standard deviation reflects the degree of variability in responses. The descriptive statistics of the variables are presented in Table 2.

Table 2 Descriptive Statistical Analysis Scale

Name	Sample Size	Minimum Value	Maximum Value	Average	Standard Deviation	Median
Electronic Performance Monitoring	246	1.5	7	5.043	1.225	5.113
Challenging stressor	246	1.5	6.9	5.158	1.048	5.4
Obstructive stressor	246	1.3	6.8	4.577	1.221	4.9
Organizational Citizenship Behavior	246	1.32	6.83	5.328	1.184	5.667

4.2.4 Correlation Analysis

Pearson correlation analysis was used to examine the relationships among electronic performance monitoring, challenge stressors, hindrance stressors, and organizational citizenship behavior.

Table 3 Correlation Analysis

	Electronic Performance Monitoring	Challenging Stressor	Obstructive Stressor	Organizational Citizenship Behavior
Electronic Performance Monitoring	1			
Challenging stressor	0.433***	1		
Obstructive stressor	0.349***	0.107*	1	
Organizational Citizenship Behavior	0.369***	0.361***	-0.357***	1

Note: *p < 0.05, ** p < 0.01, *** p < 0.001

The results indicate that electronic performance monitoring is significantly positively correlated with both challenge stressors and hindrance stressors. The correlation coefficients between electronic performance monitoring and challenge stressors, hindrance stressors, and organizational citizenship behavior are 0.433, 0.349, and 0.369, respectively. These results suggest that electronic performance monitoring is positively associated with both types of stress and with organizational citizenship behavior.

4.2.5 Structural Equation Model Analysis

To test the theoretical model, structural equation modeling (SEM) was conducted. Before testing the structural relationships, the measurement model was evaluated through a goodness-of-fit test. Following common practice in empirical research, multiple fit indices were used to evaluate the model, including χ^2/df , RMSEA, CFI, TLI, and SRMR. The results are presented in Table 4.

Table 4 Model Fit Test

Adaptation Index	χ^2	df	χ^2/df	RMSEA	CFI	TLI	SRMR
Standard	-	-	< 3	< 0.08	> 0.9	> 0.9	< 0.1
Measurement Value	795.074	455	1.737	0.042	0.956	0.942	0.072

The results show that $\chi^2/df = 1.737$, which is less than the threshold value of 3. The RMSEA value is 0.042, which is below 0.08. The CFI (0.956) and TLI (0.942) both exceed 0.90, while SRMR = 0.072. These results indicate that the overall model fit is acceptable and the theoretical model is supported.

4.2.6 Direct Effect Analysis

Table 5 Direct Effect Analysis

Path	Estimate	S.E.	Est./S.E.	P-Value	Std. Estimate
Challenging Stressor ← Electronic Performance Monitoring	0.48	0.072	6.632	0.000	0.463
Obstructive stressor ← Electronic Performance Monitoring	0.426	0.087	4.597	0.000	0.371
Organizational Citizenship Behavior ← Challenging stressor	0.414	0.055	7.233	0.000	0.434
Organizational Citizenship Behavior ← Hindrance stressor	-0.343	0.045	-7.649	0.000	-0.457

The results show that electronic performance monitoring has a significant positive effect on challenge stressors ($\beta = 0.463$, $p < 0.05$), supporting Hypothesis H1. Electronic performance monitoring also has a significant positive effect on hindrance stressors ($\beta = 0.371$, $p < 0.05$), supporting Hypothesis H4. Furthermore, challenge stressors have a significant positive effect on organizational citizenship behavior ($\beta = 0.434$, $p < 0.05$), supporting Hypothesis H2. In contrast, hindrance stressors have a significant negative effect on organizational citizenship behavior ($\beta = -0.457$, $p < 0.05$), supporting Hypothesis H5.

4.2.7 Mediation Effect Analysis

This study adopted the three-step regression approach proposed by Baron and Kenny (1986) to test mediation effects. Additionally, the Bootstrap sampling method with 5,000 resamples was used to improve the robustness of the results.

Table 6 Mediation Effects of Challenge/Hindrance Stress

Path	Estimate	S.E.	Est./S.E.	P-Value	Lower	Upper
Electronic Performance Monitoring → Challenging Stressors → Organizational Citizenship Behavior	0.195	0.044	4.472	0.000	0.110	0.289
Electronic Performance Monitoring → Hindrance Stressors → Organizational Citizenship Behavior	-0.143	0.025	-5.84	0.000	-0.192	-0.099

The results indicate that electronic performance monitoring is significantly positively correlated with challenge stressors ($r = 0.433$, $p < 0.001$), and challenge stressors are positively correlated with organizational citizenship behavior ($r = 0.361$, $p < 0.001$). The bootstrap analysis shows that the indirect effect is 0.195, with a 95% confidence interval of [0.110, 0.289], which does not include zero. Therefore, challenge stressors significantly mediate the relationship between electronic performance monitoring and organizational citizenship behavior, supporting Hypothesis

H3. Similarly, electronic performance monitoring is positively correlated with hindrance stressors, while hindrance stressors are negatively correlated with organizational citizenship behavior. The indirect effect through hindrance stressors is -0.143 , with a 95% confidence interval of $[-0.192, -0.099]$, which also excludes zero. This indicates that hindrance stressors significantly mediate the relationship between electronic performance monitoring and organizational citizenship behavior, supporting Hypothesis H6.

4.3 Summary of the Results

The empirical analysis confirms the proposed research hypotheses and reveals several important findings. First, electronic performance monitoring significantly influences employees' stress perceptions, generating both challenge stressors and hindrance stressors. Second, challenge stressors positively influence organizational citizenship behavior, while hindrance stressors negatively affect such behaviors. Third, both challenge stressors and hindrance stressors play significant mediating roles in the relationship between electronic performance monitoring and organizational citizenship behavior. These results demonstrate that electronic performance monitoring has a dual impact on employee behavior, depending on how employees cognitively evaluate the monitoring system. When monitoring is perceived as supportive and developmental, it can stimulate challenge stress and encourage employees to engage in organizational citizenship behavior. However, when monitoring is perceived as intrusive or excessive, it may create hindrance stress that reduces employees' willingness to perform extra-role behaviors.

5. Conclusion, Discussion, and Recommendation

5.1 Conclusion

This study examined the influence of electronic performance monitoring (EPM) on employees' organizational citizenship behavior (OCB) within the context of digital management. By integrating the challenge–hindrance stressor framework and resource-based perspectives, the research investigated how different stress perceptions mediate the relationship between EPM and employee extra-role behavior. The results demonstrate that electronic performance monitoring generates two distinct types of stress responses among employees: challenge stressors and hindrance stressors. When employees perceive monitoring as developmental or supportive, they are more likely to interpret it as a challenge stressor. Under this perception, employees tend to invest more time, effort, and resources in their work in order to achieve higher performance outcomes and organizational recognition. As a result, both in-role and extra-role behaviors, including organizational citizenship behavior, are strengthened. In contrast, when employees perceive electronic monitoring as excessive, intrusive, or controlling, it tends to generate hindrance stress. Hindrance stress depletes employees' psychological resources and creates feelings of pressure, distrust, and emotional exhaustion. Under such conditions, employees are more likely to adopt defensive coping strategies, reduce discretionary effort, and limit their engagement in organizational citizenship behaviors. Overall, the study confirms that electronic performance monitoring has a “double-edged sword” effect on organizational citizenship behavior. The positive pathway operates through challenge stressors that stimulate motivation and resource investment, while the negative pathway operates through hindrance stressors that trigger psychological withdrawal and resource conservation. Therefore, the behavioral outcomes of digital monitoring depend largely on employees' cognitive appraisal of the monitoring system and the organizational context in which it is implemented.

5.2 Discussion

The findings of this study contribute to the existing literature in several important ways. First, this research extends the application of challenge–hindrance stress theory in the context of digital monitoring systems. Previous studies often viewed electronic monitoring primarily as a source of employee anxiety or workplace pressure. However, the results of this study demonstrate that monitoring systems can simultaneously generate both positive and negative stress responses depending on employees’ perceptions and situational factors. This confirms the coexistence of challenge stress and hindrance stress in digital monitoring environments. Second, this study provides empirical evidence for the “double-edged sword” effect of electronic performance monitoring. Traditional research tends to examine either the positive or negative consequences of monitoring separately. In contrast, this study integrates both perspectives within a unified analytical framework and verifies that EPM can stimulate both beneficial and harmful outcomes through different stress mechanisms. On the one hand, monitoring systems can enhance employees’ motivation by providing clear performance goals, real-time feedback, and opportunities for skill improvement. These elements encourage employees to treat monitoring as a developmental tool, which can strengthen their willingness to contribute to the organization beyond formal job requirements. On the other hand, when monitoring becomes overly intensive or intrusive, employees may perceive it as a threat to privacy and autonomy. Continuous monitoring of work activities, strict performance standards, and constant reminders may lead employees to remain in a prolonged state of psychological tension. Over time, this situation can increase fatigue, reduce work satisfaction, and encourage employees to withdraw from discretionary behaviors such as helping colleagues or voluntarily supporting organizational initiatives. Third, the study reconstructs the stress-mediated pathway framework explaining how digital monitoring affects employee behavior. The results confirm that challenge stressors and hindrance stressors independently mediate the relationship between electronic performance monitoring and organizational citizenship behavior, but in opposite directions. Challenge stress encourages employees to internalize responsibility and actively contribute to organizational goals, whereas hindrance stress leads to psychological withdrawal and reduced willingness to engage in extra-role behaviors. This finding challenges the traditional linear assumption that stress uniformly decreases performance and instead supports a stress-type–behavior response matching mechanism.

5.3 Recommendation

Based on the findings of this study, several managerial recommendations can be proposed to help organizations maximize the positive effects of electronic performance monitoring while minimizing its negative consequences.

First, organizations should emphasize the developmental purpose of monitoring systems. Managers should clearly communicate that electronic performance monitoring is designed to support employee development, improve work efficiency, and provide constructive feedback rather than simply control employee behavior. Transparent communication can help employees interpret monitoring practices as challenge stressors rather than hindrance stressors.

Second, enterprises should maintain a balanced level of monitoring intensity. Excessive monitoring may increase feelings of surveillance and privacy invasion, which can generate hindrance stress. Therefore, organizations should carefully design monitoring systems that provide useful performance feedback while respecting employees’ autonomy and privacy.

Third, organizations should combine monitoring with supportive management practices. Providing training programs, performance coaching, and constructive feedback based on monitoring results can help employees improve their capabilities and perceive monitoring as an opportunity for growth. Such supportive measures can transform monitoring into a positive motivational tool that encourages employees to engage in organizational citizenship behaviors.

Finally, future research could further explore contextual factors that influence employees' perceptions of monitoring, such as organizational culture, leadership style, and perceived organizational support. Investigating these factors may provide deeper insights into how digital monitoring systems can be implemented more effectively in modern organizations.

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A Study on the Impact of Digital Marketing on Enhancing Brand Value

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Abstract

With the rapid development of digital technologies and the increasing popularity of online consumption platforms, digital marketing has become an essential strategy for enterprises seeking to enhance brand competitiveness and market value. In the beverage industry, especially in the rapidly growing milk tea market, brands rely heavily on digital platforms to engage consumers, strengthen brand relationships, and improve brand value. However, existing studies mainly focus on the direct relationship between digital marketing and brand performance, while the underlying mechanism through which digital marketing influences brand value, particularly the mediating role of brand trust, remains insufficiently explored. Therefore, this study takes COCO Milk Tea as a case to investigate the relationship between digital marketing, brand trust, and brand value from the perspective of the 4I theory. Based on the theoretical framework of “Digital Marketing–Brand Trust–Brand Value,” this study employs a quantitative research approach using questionnaire survey data collected from consumers of COCO Milk Tea. A total of 500 questionnaires were distributed, and 432 valid responses were obtained. Statistical analysis methods including descriptive statistics, Pearson correlation analysis, multiple regression analysis, and mediation effect testing using the Bootstrap method were applied to analyze the relationships among the variables. The results indicate that digital marketing has a significant positive impact on brand value. In addition, digital marketing significantly enhances brand trust, which in turn positively affects brand value. The mediation analysis further demonstrates that brand trust plays a partial mediating role in the relationship between digital marketing and brand value. These findings confirm that effective digital marketing strategies can improve brand value not only directly but also indirectly by strengthening consumer trust in the brand. This study enriches the theoretical understanding of digital marketing and brand management by integrating the 4I theory into the analysis of brand value enhancement. At the practical level, the findings provide useful implications for beverage enterprises and other consumer brands seeking to strengthen brand value through digital marketing strategies.

Keywords: Digital Marketing, Brand Trust, Brand Value, 4I Theory, Consumer Behavior

1. Introduction

1.1 Background and Importance of the Problem

The rapid development of digital technologies has fundamentally transformed the marketing environment and consumer purchasing behavior. With the widespread adoption of mobile internet, social media platforms, and digital payment systems, consumer purchasing scenarios have gradually shifted from traditional offline channels to integrated online–offline digital ecosystems. Digital marketing has therefore become one of the most important strategies for enterprises seeking to strengthen brand competitiveness and maintain sustainable growth in the digital economy (Sjödin et al., 2025). In many industries, companies increasingly rely on digital marketing tools such as social media engagement, online advertising, mobile applications, and live-stream commerce to interact with consumers and enhance brand awareness. In particular, digital marketing plays a crucial role in shaping consumer perceptions and building brand relationships. Previous research indicates that digital marketing activities can significantly influence consumers' attitudes, brand engagement, and purchase intentions by providing interactive experiences and personalized information (Kannan, 2025). Through digital channels, firms are able to communicate brand values more effectively, strengthen emotional connections with consumers, and cultivate long-term brand loyalty. Consequently, digital marketing is increasingly viewed as a key driver of brand value creation in modern markets. Evidence from global brands further illustrates the importance of digital marketing in enhancing brand value. For example, Apple's brand value reached approximately \$352 billion in 2024, with a brand premium exceeding 40%, demonstrating how effective digital marketing strategies can significantly influence consumer perception and brand positioning (Wei, 2025). Such success highlights the critical role of digital marketing in shaping consumer trust, strengthening brand identity, and ultimately increasing brand value. In the food and beverage industry, especially within the rapidly expanding tea beverage market, digital transformation has become a crucial competitive factor. Chain tea brands increasingly depend on online ordering platforms, social media marketing, and digital customer engagement to reach younger consumers. It is estimated that by 2025, the proportion of online orders for chain tea brands such as COCO will exceed 60%, indicating that digital marketing channels have become the primary interface between brands and consumers (Sjödin et al., 2025). As consumer lifestyles become more digitalized, tea beverage brands must continuously innovate their digital marketing strategies in order to maintain relevance and competitiveness.

Despite the growing importance of digital marketing, existing research has primarily focused on the direct relationship between digital marketing and brand value, while relatively limited attention has been given to the psychological mechanisms that mediate this relationship. In particular, consumer trust has been widely recognized as a crucial factor influencing brand loyalty and brand equity, yet the mediating role of trust in the digital marketing–brand value relationship remains insufficiently explored (Morozan, 2023). Understanding how digital marketing influences brand trust and subsequently enhances brand value is therefore an important research issue. COCO, as a representative chain tea brand, provides a suitable context for investigating this issue. The company has implemented various digital marketing practices, including social media operations, mini-program stores, and live-stream sales channels. These digital initiatives have supported its rapid business growth. In the second quarter of 2025, COCO reported revenue of 169 million yuan, representing a year-on-year increase of 17.1%, and operates more than 3,500 stores nationwide. These figures indicate that digital marketing has become a central component of the brand's business strategy. Therefore, analyzing how COCO utilizes digital marketing to enhance brand trust and ultimately increase brand value can provide important insights for both academic research and managerial practice. By exploring the transmission mechanism between digital marketing, brand

trust, and brand value, this study aims to contribute to the existing literature while offering practical guidance for tea beverage enterprises undergoing digital transformation (Birong et al., 2024).

1.2 Research Question

Based on the research background, this study seeks to address the following research questions:

- 1) How does digital marketing influence brand value in the tea beverage industry?
- 2) What role does consumer brand trust play in the relationship between digital marketing and brand value?
- 3) Does brand trust act as a mediating mechanism through which digital marketing enhances brand value for chain tea brands such as COCO?

1.3 Research Objective

The main objective of this study is to explore the relationship between digital marketing and brand value by examining the mediating role of brand trust in the context of the tea beverage industry. Specifically, the study aims to achieve the following objectives:

- 1) To analyze the impact of digital marketing on brand trust among consumers of chain tea brands.
- 2) To examine the influence of brand trust on brand value.
- 3) To investigate the mediating role of brand trust in the relationship between digital marketing and brand value.
- 4) To provide practical recommendations for tea beverage enterprises, such as COCO, to enhance brand value through effective digital marketing strategies.

2. Literature Review

2.1 Related Concepts and Theories

2.1.1 Digital Marketing

Digital marketing refers to the use of digital technologies and internet-based platforms to promote products, services, and brand communication with consumers. With the rapid development of information technology, digital marketing has evolved into a comprehensive marketing approach that integrates multiple channels such as social media platforms, mobile applications, search engines, and online advertising (Kannan and Li, 2025). Compared with traditional marketing methods, digital marketing allows firms to reach consumers more efficiently through data-driven strategies, personalized communication, and interactive engagement. Recent studies indicate that digital marketing not only improves marketing efficiency but also strengthens customer relationships and brand engagement. Through the use of digital platforms, enterprises can deliver customized marketing content, interact directly with consumers, and gather real-time feedback, which enhances

marketing effectiveness and customer satisfaction (Morozan, 2023). In academic research, digital marketing is often conceptualized using the 4I theory, which emphasizes four important characteristics: integration, interaction, personalization, and proactivity. These dimensions highlight the ability of digital marketing to integrate multiple communication channels, encourage interactive engagement between brands and consumers, provide personalized experiences, and stimulate proactive consumer participation.

2.1.2 Brand Trust

Brand trust refers to the degree to which consumers believe that a brand is reliable, credible, and capable of fulfilling its promises. Trust plays a fundamental role in shaping consumer–brand relationships and is considered a key determinant of brand loyalty and long-term customer commitment (Kotler, 2022). When consumers perceive a brand as trustworthy, they are more likely to develop emotional attachment, recommend the brand to others, and maintain repeat purchasing behavior. Previous studies suggest that brand trust can be understood from multiple dimensions, including consumer trust, market trust, partnership trust, and social trust. These dimensions reflect consumers' evaluation of a brand's competence, reputation, cooperative reliability, and social responsibility (Gu, 2024; Crane and Matten, 2016). In the context of digital marketing, trust is particularly important because online environments often involve information asymmetry and uncertainty. Effective digital marketing strategies can enhance transparency, provide useful information, and create positive online interactions, thereby strengthening consumer trust in the brand.

2.1.3 Brand Value

Brand value, also referred to as brand equity, represents the additional value that a brand brings to a product or service beyond its functional attributes. According to Aaker's brand equity theory, brand value is reflected through factors such as brand loyalty, brand awareness, perceived quality, and brand associations (Aaker, 2021). A strong brand value enables companies to achieve higher price premiums, increased market share, and stronger competitive advantages. Scholars have developed multidimensional approaches to measuring brand value, including financial, market, and consumer perspectives. From a financial perspective, brand value reflects the brand's ability to generate higher profits and price premiums. From a market perspective, it represents the brand's competitive position and recognition in the market. From a consumer perspective, brand value reflects consumers' emotional attachment, loyalty, and willingness to recommend the brand to others (Smith, 2023; Klein, 2024). In the digital era, digital marketing plays an increasingly important role in shaping these aspects of brand value by strengthening brand awareness, consumer engagement, and trust relationships.

2.2 Literature Surveys

Existing research has widely examined the role of digital marketing in influencing consumer behavior and brand performance. Many scholars have demonstrated that digital marketing strategies, including social media marketing, online advertising, and digital content creation, can significantly enhance brand awareness and customer engagement (Kannan and Li, 2025). Through interactive platforms, consumers are able to communicate directly with brands, share experiences, and participate in brand-related activities, which strengthens the relationship between consumers and brands. Several studies have also explored the relationship between digital marketing and brand value. For example, Morozan (2023) argues that digital marketing provides enterprises with effective tools to increase brand visibility and improve brand competitiveness in modern markets. By utilizing

digital communication channels, companies can enhance brand exposure, build emotional connections with consumers, and ultimately increase brand value.

Another important stream of research focuses on the role of brand trust in consumer decision-making. Scholars have consistently found that trust significantly influences consumers' attitudes toward brands and their purchase intentions. When consumers trust a brand, they are more willing to maintain long-term relationships and recommend the brand to others (Kotler, 2022). Furthermore, trust can reduce perceived risks associated with online purchasing, which is particularly important in digital marketing environments. However, despite these advances, many existing studies mainly focus on the direct relationship between digital marketing and brand value, while relatively few studies examine the mediating mechanism through which digital marketing influences brand value via brand trust. The internal mechanism linking these variables therefore remains insufficiently explored. To address this research gap, the present study constructs a conceptual model that examines the mediating role of brand trust in the relationship between digital marketing and brand value.

2.3 Conceptual Framework

Based on the theoretical analysis and literature review, this study proposes a conceptual framework that explains how digital marketing influences brand value through the mediating role of brand trust. In this framework, digital marketing is considered the independent variable, brand value is the dependent variable, and brand trust acts as the mediating variable. According to the 4I theory, digital marketing enhances brand communication effectiveness through integration of channels, interactive engagement, personalized content, and proactive consumer participation. These characteristics allow companies to create meaningful digital experiences that improve consumer perceptions of the brand. As a result, consumers are more likely to develop trust toward the brand. Once brand trust is established, consumers tend to show stronger loyalty, greater willingness to recommend the brand, and higher acceptance of premium prices. These behaviors contribute to the enhancement of brand value in terms of financial performance, market recognition, and consumer loyalty. Therefore, brand trust is expected to serve as a key mechanism through which digital marketing contributes to brand value growth. The conceptual model proposed in this study can therefore be summarized as follows: Digital Marketing → Brand Trust → Brand Value

2.4 Research Hypothesis

Based on the literature review and conceptual framework, the following research hypotheses are proposed.

H1: Digital marketing has a significant positive effect on brand value.

Digital marketing enables companies to strengthen brand visibility, enhance customer engagement, and build stronger relationships with consumers through interactive digital platforms. Previous studies have shown that effective digital marketing strategies can directly enhance brand competitiveness and market influence, thereby increasing brand value (Kannan and Li, 2025).

H2: Digital marketing has a significant positive effect on brand trust.

Digital marketing activities, such as transparent communication, personalized content, and interactive engagement, can increase consumers' perceptions of reliability and credibility. As a result, consumers are more likely to trust brands that actively communicate and engage with them through digital channels (Morozan, 2023).

H3: Brand trust has a significant positive effect on brand value.

When consumers trust a brand, they are more willing to maintain long-term relationships with it, pay price premiums, and recommend the brand to others. These outcomes contribute directly to improvements in brand value from both financial and consumer perspectives (Kotler, 2022).

H4: Brand trust mediates the relationship between digital marketing and brand value.

Digital marketing not only influences brand value directly but also indirectly through its impact on brand trust. By improving consumers' perceptions of brand reliability and credibility, digital marketing strengthens brand trust, which subsequently enhances brand value.

3. Research Methodology

3.1 Research Design

This study adopts a quantitative research design to investigate the relationship between digital marketing, brand trust, and brand value in the context of COCO Milk Tea. A structured questionnaire survey was employed as the primary research instrument to collect data from consumers who have experience purchasing COCO Milk Tea products. The study is based on the conceptual framework of Digital Marketing → Brand Trust → Brand Value, which aims to examine the direct effect of digital marketing on brand value as well as the mediating role of brand trust. The research model incorporates digital marketing as the independent variable, brand value as the dependent variable, and brand trust as the mediating variable. The questionnaire items were developed based on existing theoretical frameworks and prior studies related to digital marketing, brand trust, and brand value. All measurement items were designed using a structured scale to ensure consistency and reliability in the data collection process.

3.2 Population and Sample

The population of this study consists of consumers who have purchased COCO Milk Tea products and have experience with the brand's digital marketing activities. The survey targeted COCO Milk Tea consumers in the Southwest region of China. Data collection was conducted between December 2024 and March 2025. A total of 500 questionnaires were distributed, and 432 valid questionnaires were returned, resulting in an effective response rate of 86.4%. The sample characteristics show that 28.47% of respondents were under 25 years old, 35.18% were aged 25–30, totaling 63.65%, while 22.45% were aged 31–40, and 13.90% were aged 41 years or older. These results indicate that the respondents are relatively young, which is consistent with the core consumer demographic of COCO Milk Tea. Regarding consumption frequency, 38.42% of respondents consumed COCO Milk Tea 1–2 times per week, and 29.63% consumed 3–4 times per month, accounting for 68.05% of the total sample. High-frequency consumers (three times or more per week) accounted for 15.74%, while low-frequency consumers (twice a month or less) accounted for 16.21%. This indicates that most respondents have regular consumption behavior and are familiar with the brand's digital marketing activities.

Table 1 Statistical Characteristics of Sample Data

Category	Subdivision	Frequency	Percentage (%)
Age	25 Under of the Age	123	28.47
	25–30 Age	152	35.18
	31–40 Age	97	22.45
	41 Years Old and Above	60	13.90
Gender	Male	185	42.82
	Female	247	57.18
Consumption Frequency	3 Times or More Per Week	68	15.74
	1–2 Times Per Week	166	38.42
	3–4 Times per Month	128	29.63
	2 Times or Less Per Month	70	16.21
City	First-Tier City	114	26.39
	New First-Tier City	136	31.48
	Third-Tier and Lower Cities	78	18.06

3.3 Research Instruments

The research instrument used in this study was a structured questionnaire, which was developed based on established measurement scales from previous academic studies. The questionnaire consists of three main constructs: digital marketing, brand value, and brand trust.

3.3.1 Measurement of Digital Marketing

In recent years, scholars have conducted extensive research on the multidimensional structure of digital marketing. A comprehensive measurement framework has been established that includes dimensions such as digital marketing content, digital marketing social media, digital marketing advertising, digital marketing activities, and digital marketing channels. Studies such as Chen et al. (2023) confirm the explanatory power of these dimensions in evaluating marketing effectiveness. Based on these studies, this research adopts Liu (2024)'s multidimensional measurement framework and incorporates the core principles of the 4I theory, which includes integration, interaction, personalization, and proactivity. Digital marketing in this study is divided into five dimensions with 10 measurement items. These dimensions capture the effectiveness of digital marketing in different contexts. For example, digital marketing content focuses on the influence of brand content dissemination, while digital marketing social media emphasizes consumer interaction and word-of-mouth communication. Digital marketing advertising highlights personalized targeting based on data analysis, and digital marketing channels evaluate the consistency of brand experiences across online and offline platforms (Shin & Aiken, 2023).

Table 2 Measurement of Digital Marketing

Variable	Secondary Variable	Number	Item	Source
Digital Marketing	Digital Marketing Content	A1	The content released by COCO Milk Tea can provide me with practical information.	Zhao et al. (2023)
		A2	The professionalism and fun of the content released by COCO Milk Tea make me willing to keep following them.	
	Digital Marketing Social Media	A3	COCO milk tea has a high level of discussion on social media platforms.	
		A4	I will proactively share the content that COCO Milk Tea posts on social media.	
	Digital Marketing Advertising	A5	The product recommendations pushed by COCO Milk Tea match my needs well.	
		A6	COCO Milk Tea's advertising is highly targeted and does not bother me.	
	Digital Marketing Campaign	A7	I enjoy participating in the online interactive activities initiated by COCO Milk Tea.	
		A8	COCO Milk Tea can respond promptly to my feedback or questions on digital platforms.	
	Digital Marketing Channels	A9	The product information and service experience of COCO Milk Tea are consistent across online and offline channels.	
		A10	I can easily switch between different channels of the COCO Milk Tea business.	

3.3.2 Measurement of Brand Value

Brand value has been widely studied from financial, market, and consumer perspectives. Scholars such as Smith (2023), Klein (2024), and Kotler and Armstrong (2022) have developed multidimensional frameworks for evaluating brand value enhancement. This study adopts Aaker's (2021) brand equity framework and measures brand value using three dimensions and nine items. The financial dimension evaluates price premium and profitability, the market dimension reflects brand recognition and market competitiveness, and the consumer dimension measures loyalty and emotional attachment (Zhang, 2024; Lee, 2024).

Table 3 Measurement of Brand Value

Variable	Secondary Variable	Code	Item	Source
Brand Value Enhancement	Financial Dimension	B1	Compared to similar brands, I am willing to pay a higher price for COCO milk tea.	Smith (2023)
		B2	I believe that COCO Milk Tea's profitability is continuously improving.	
	Market Dimension	B3	The market recognition of COCO milk tea is continuously increasing.	
		B4	The brand is gaining more and more popularity on social media.	
		B5	I believe that COCO milk tea's market competitiveness is continuously increasing.	
	Consumer Dimension	B6	I would prioritize choosing COCO milk tea over other alternative brands.	
		B7	I would recommend COCO milk tea to others.	
		B8	I have a strong emotional attachment to COCO milk tea.	
		B9	I think the user base of COCO milk tea is continuously expanding.	

3.3.3 Measurement of Brand Trust

Brand trust has been conceptualized as a multidimensional construct involving reliability, credibility, and the ability of a brand to fulfill its promises. Previous research identifies several key dimensions of brand trust, including consumer trust, market trust, partnership trust, and social trust (Kashmiri, 2025). Based on Kotler's (2022) multidimensional framework, this study developed a brand trust measurement scale consisting of nine items across four dimensions. These dimensions capture consumers' perceptions of brand competence, reputation, collaboration reliability, and social responsibility (Gu, 2024; Crane & Matten, 2016; Wang, 2025).

Table 4 Measurement of Brand Trust

Variable	Secondary Variable	Number	Item	Source
Brand Trust	Consumer Trust	C1	I believe that the product quality of COCO milk tea is reliable.	Kotler (2022)
		C2	I think COCO Bubble Tea truly focuses on the needs of consumers.	
	Market Trust	C3	COCO Bubble Tea has a high level of professionalism in the industry.	
		C4	COCO Bubble Tea has a good reputation in the market.	
	Trust in Cooperative Relationship	C5	The cooperation between COCO Milk Tea and its partners is reliable.	
		C6	COCO Milk Tea is willing to share necessary information with partners.	
	Social Trust	C7	COCO Milk Tea actively fulfills its social responsibilities.	
		C8	Public reviews of COCO Bubble Tea are mostly positive.	
		C9	COCO Milk Tea demonstrates a responsible attitude on social issues.	

3.4 Data Collection

Data were collected using a structured questionnaire distributed to COCO Milk Tea consumers between December 2024 and March 2025. The survey was conducted both online and offline to increase response diversity and reliability. A total of 500 questionnaires were distributed to consumers who had experience purchasing COCO Milk Tea products and interacting with the brand's digital marketing platforms. After screening for completeness and validity, 432 questionnaires were retained for analysis, yielding an effective response rate of 86.4%.

3.5 Statistics Used for Data Analysis

The data collected from the questionnaire were analyzed using statistical analysis methods to examine the relationships among digital marketing, brand trust, and brand value. The following statistical techniques were used:

- Descriptive statistical analysis to summarize demographic characteristics and key variable distributions.
- Correlation analysis to examine the relationships between digital marketing, brand trust, and brand value.
- Regression analysis to test the direct effects among the variables.
- Mediation analysis using the Bootstrap method to examine the mediating role of brand trust in the relationship between digital marketing and brand value.

These statistical methods help ensure the reliability and validity of the research results and provide empirical evidence for testing the proposed hypotheses.

4. Data Analysis and Findings

4.1 Introduction

This section presents the empirical analysis of the research data collected from consumers of COCO Milk Tea. The purpose of this analysis is to examine the relationships among digital marketing, brand trust, and brand value, as well as to test the proposed research hypotheses. A total of 432 valid questionnaires were used in the analysis. The statistical analysis was conducted using SPSS software. Several analytical methods were employed, including descriptive statistics, Pearson correlation analysis, multiple regression analysis, and mediation effect testing using the Bootstrap method. These analytical techniques help to explore the relationships among variables and determine whether brand trust mediates the relationship between digital marketing and brand value. The analysis is divided into several parts. First, descriptive statistics are used to understand the basic distribution characteristics of the variables. Second, correlation analysis is conducted to determine the relationships among digital marketing, brand trust, and brand value. Third, regression analysis is applied to examine the direct effects among the variables. Finally, mediation analysis is performed to test whether brand trust plays a mediating role between digital marketing and brand value.

4.2 Data Analysis of the Quantitative Data

4.2.1 Descriptive Statistics of Variable Data

Descriptive statistical analysis was conducted to examine the distribution characteristics of the main variables in this study, including digital marketing, brand value, and brand trust. The analysis includes the minimum value, maximum value, mean, standard deviation, kurtosis, and skewness. Based on the analysis results, brand trust has the highest mean value (3.526), indicating that respondents generally perceive COCO Milk Tea as reliable and trustworthy. The mean value of brand value is 3.402, suggesting that consumers have a relatively positive evaluation of the brand's overall value and competitiveness in the market. Digital marketing has a mean value of 3.315, indicating that respondents moderately agree that COCO Milk Tea's digital marketing activities are effective. Overall, the mean values of the variables range from 3.315 to 3.526, indicating that consumers generally hold positive perceptions toward COCO Milk Tea's digital marketing performance and brand-related indicators. Furthermore, the skewness values are negative and relatively close to zero, suggesting that the data distribution is slightly left-skewed but still within an acceptable range. The kurtosis values are also close to zero, indicating that the distribution of the data approximates normality and meets the assumptions required for further statistical analysis.

Table 1 Statistical Characteristics of Variable Data

Variable	Sample Size	Minimum Value	Maximum Value	Average	Standard Deviation	Kurtosis	Skewness
Digital Marketing	432	1.20	4.90	3.315	0.987	-1.123	-0.685
Brand Value	432	1.25	4.95	3.402	0.943	-1.076	-0.598
Brand Trust	432	1.40	5.00	3.526	0.905	-1.018	-0.547

4.2.2 Correlation Analysis

Pearson correlation analysis was conducted to examine the relationships among the key variables in this study, including digital marketing, brand trust, and brand value. Correlation analysis helps determine both the strength and direction of the relationships among variables. The results indicate that digital marketing is significantly positively correlated with brand value ($r = 0.523$, $p < 0.01$). This suggests that improvements in digital marketing activities are associated with increases in brand value. In addition, digital marketing shows a strong positive correlation with brand trust ($r = 0.567$, $p < 0.01$), indicating that effective digital marketing strategies can enhance consumers' trust in the brand. Furthermore, brand trust is strongly positively correlated with brand value ($r = 0.615$, $p < 0.01$). This result implies that higher levels of consumer trust in a brand are associated with stronger brand value. These findings provide preliminary evidence supporting the proposed relationships among the variables and justify further regression analysis.

Table 2 Correlation Test of Variables

Variable	Digital Marketing	Brand Trust	Brand Value
Digital Marketing	1		
Brand Trust	0.567**	1	
Brand Value	0.523**	0.615**	1

Note: * $p < 0.05$, ** $p < 0.01$

4.2.3 Regression Analysis

4.2.3.1 Direct Effect Test

To examine the direct relationships among digital marketing, brand trust, and brand value, this study employed multiple regression analysis. Control variables such as age, gender, consumption frequency, and city were first included to eliminate potential interference effects. Model 1 includes only control variables, while Model 2 introduces digital marketing as an independent variable to examine its impact on brand value. Model 3 introduces brand trust to test its direct effect on brand value. The results show that the regression model including digital marketing (Model 2) has an F value of 15.681 ($p < 0.001$) and an R^2 value of 0.214, which is significantly higher than Model 1 ($R^2 = 0.014$). This indicates that digital marketing significantly improves the explanatory power of the model. The regression coefficient of digital marketing on brand value is $\beta = 0.431$ ($p < 0.001$), demonstrating that digital marketing has a significant positive effect on brand value. In Model 3, when brand trust is introduced into the regression model, the results show that brand trust has a significant positive effect on brand value ($\beta = 0.398$, $p < 0.001$). The model's F value is 13.258 ($p < 0.001$) and $R^2 = 0.188$, indicating that brand trust significantly contributes to the prediction of brand value.

Table 3 Results of the Direct Effect Test

Variable	Model 1 Brand Value	Model 2 Digital Marketing	Model 3 Brand Trust
Constant	3.518**	2.112**	2.311**
Age	-0.033	-0.027	-0.030
Gender	0.042	0.035	0.038
Consumption frequency	0.069	0.056	0.063
City	0.028	0.026	0.028
Digital Marketing	-	0.431***	-
Brand Trust	-	-	0.398***
R ²	0.014	0.214	0.188
Adjusted R ²	-0.001	0.197	0.175
F	0.875	15.681***	13.258***

Note: *p<0.05, **p<0.01, ***p<0.001

4.2.3.2 Test of the Effect of Digital Marketing on Brand Trust

To examine whether digital marketing significantly affects brand trust, a regression model was constructed with brand trust as the dependent variable and digital marketing as the independent variable. The results show that digital marketing significantly predicts brand trust ($\beta = 0.467$, $p < 0.001$). The model's F value is 18.325 and $R^2 = 0.244$, indicating that digital marketing explains approximately 24.4% of the variance in brand trust.

Table 4 Test of the Direct Effect of Digital Marketing on Brand Trust

Variable	Brand Trust
Constant	1.985**
Age	-0.026
Gender	0.033
Consumption frequency	0.058
City	0.023
Digital Marketing	0.467***
R ²	0.244
Adjust R ²	0.230
F	18.325***

4.2.3.3 Mediation Effect Test

To further investigate the mediating role of brand trust in the relationship between digital marketing and brand value, this study employed the Bootstrap method using the PROCESS plugin in SPSS. The Bootstrap method was conducted with 5,000 resampling iterations to obtain more robust confidence intervals. The results show that digital marketing significantly predicts brand value and brand trust. When brand trust is included in the model, both digital marketing and brand trust remain significant predictors of brand value, indicating a partial mediation effect.

Table 5 Test of the Mediation Model of Brand Trust

Variable	Brand Value	Brand Value	Brand Trust
	t	P	t
Digital Marketing	8.654	0	5.321
Brand Trust			6.789
R ²	0.3821		0.4567
F	156.789		189.012

To further verify the mediation effect, Bootstrap confidence intervals were calculated. The results are shown in Table 6.

Table 6 Analysis of the Mediating Effect of Brand Trust

Variable	Effect (β)	BootSE	BootLLCI	BootULCI
Digital Marketing → Brand Value (Direct Effect)	0.325	0.0567	0.2134	0.4367
Digital Marketing → Brand Trust → Brand Value (Indirect Effect)	0.287	0.0456	0.1987	0.3756
Digital Marketing → Brand Value (Total Effect)	0.612	0.0523	0.5087	0.7156
Digital Marketing → Brand Value (Alternative Direct Effect)	0.312	0.0589	0.1956	0.4287

The confidence intervals for both the direct effect and the mediating effect do not include zero, indicating that the effects are statistically significant. This confirms that digital marketing influences brand value both directly and indirectly through brand trust. The direct effect accounts for approximately 53.10% of the total effect, while the mediating effect accounts for about 46.90%.

4.3 Summary of the Results

Based on the empirical analysis conducted in this study, several important findings can be summarized. First, descriptive statistical analysis shows that consumers generally have positive perceptions of COCO Milk Tea’s digital marketing activities, brand trust, and brand value. Among these variables, brand trust has the highest mean score, indicating that consumers generally believe the brand is reliable and credible. Second, correlation analysis reveals significant positive relationships among digital marketing, brand trust, and brand value. Digital marketing is strongly associated with both brand trust and brand value, while brand trust is also significantly correlated with brand value. Third, regression analysis confirms that digital marketing has a significant positive effect on brand value. In addition, brand trust also significantly influences brand value, indicating that trust plays a critical role in enhancing brand performance. Finally, mediation analysis demonstrates that brand trust partially mediates the relationship between digital marketing and brand value. Digital marketing not only directly increases brand value but also indirectly enhances brand value by strengthening consumers’ trust in the brand. Overall, the results support the proposed research hypotheses and highlight the important role of digital marketing in building brand trust and improving brand value for chain beverage brands such as COCO Milk Tea.

5. Conclusion, Discussion, and Recommendation

5.1 Conclusion

This study takes COCO Milk Tea as a case and applies the theoretical perspective of the 4I theory to explore the mechanism through which digital marketing influences brand value. Using questionnaire survey data from consumers and employing statistical analysis methods, the study systematically analyzes the relationships among digital marketing, brand trust, and brand value. The findings provide both theoretical insights and practical implications for enterprises seeking to improve brand value through digital marketing strategies.

First, the study verifies the theoretical framework of “Digital Marketing → Brand Trust → Brand Value,” demonstrating that digital marketing significantly contributes to brand value enhancement both directly and indirectly. Empirical results indicate that digital marketing has a significant positive effect on brand value. This suggests that effective digital marketing strategies can enhance the financial performance, market competitiveness, and consumer loyalty associated with a brand.

Second, the study confirms the important mediating role of brand trust in the relationship between digital marketing and brand value. The results show that digital marketing not only directly influences brand value but also indirectly enhances brand value by strengthening consumer trust. This finding highlights that building consumer trust is a critical mechanism through which digital marketing contributes to brand development.

Third, from the perspective of the 4I theory, digital marketing influences brand value through four important dimensions: integration, interaction, personalization, and initiative. The integration dimension improves brand recognition consistency by connecting multi-channel data and creating a unified brand experience. The interaction dimension enhances emotional connections between consumers and the brand through communication and user participation. The personalization dimension allows brands to meet individual consumer needs through data-driven marketing strategies and precise customer profiling. Finally, the initiative dimension encourages user-generated content (UGC), which expands brand communication and strengthens brand influence. The coordinated effects of these dimensions contribute to improvements in financial premium capability, market influence, and consumer loyalty, thereby driving overall brand value growth.

Furthermore, this study enriches the theoretical understanding of digital marketing in the context of brand value enhancement. Existing research often focuses on the direct effects of digital marketing or adopts general theoretical frameworks such as the technology acceptance model. In contrast, this study integrates the 4I theory to analyze the internal mechanisms linking digital marketing and brand value. By clarifying the explanatory power of the 4I framework and identifying the different influences of digital marketing dimensions on brand trust, this research fills an important theoretical and empirical gap and provides new directions for future studies on differentiated marketing effects. Overall, the findings confirm that digital marketing serves as a core driving force for enhancing brand value in the digital economy. For chain beverage brands such as COCO Milk Tea, digital marketing strategies that strengthen consumer interaction, trust, and engagement can significantly contribute to sustainable brand development.

5.2 Discussion

The results of this study provide several important insights for both academic research and practical brand management.

First, the findings reinforce the growing importance of digital marketing in shaping brand perception and consumer behavior in the digital era. As consumer purchasing scenarios increasingly shift toward online platforms, brands must adopt digital marketing strategies that effectively communicate brand value and establish emotional connections with consumers.

Second, the significant mediating role of brand trust highlights the importance of trust-building in digital environments. Consumers today are exposed to large volumes of marketing information through social media and digital platforms. In such environments, trust becomes a critical factor that influences consumers' perceptions of brand reliability, credibility, and authenticity. The results indicate that digital marketing strategies should not only focus on promotional activities but also emphasize transparency, reliability, and consumer engagement in order to build long-term trust.

Third, the study expands the application of the 4I theory in digital marketing research. The four dimensions, interaction, integration, personalization, and initiative, collectively shape how digital marketing strategies influence consumer perceptions and brand value. Interaction encourages consumers to participate in brand-related discussions and activities, strengthening emotional attachment to the brand. Integration ensures consistency across multiple digital channels, which enhances brand recognition and credibility. Personalization enables companies to deliver targeted marketing messages that better match consumer needs, while initiative motivates consumers to actively share brand experiences and generate content. These dimensions together create a dynamic digital marketing ecosystem that supports brand growth.

In addition, the findings suggest that digital marketing effectiveness varies across different dimensions and consumer contexts. This indicates that companies should design differentiated digital marketing strategies rather than treating digital marketing as a single unified variable. Understanding the specific mechanisms through which each dimension influences brand trust and brand value can help enterprises allocate marketing resources more effectively.

5.3 Recommendation

Based on the findings of this study, several practical recommendations can be proposed for enterprises seeking to enhance brand value through digital marketing.

First, companies should strengthen multi-channel digital integration to ensure consistent brand communication across online and offline platforms. By integrating data from social media, e-commerce platforms, and offline stores, brands can provide consumers with a unified and seamless brand experience, thereby improving brand recognition and trust.

Second, enterprises should emphasize interactive digital marketing strategies. Encouraging consumer participation through social media engagement, interactive campaigns, and online communities can enhance emotional connections between consumers and the brand. Interactive communication not only increases consumer involvement but also strengthens brand loyalty and trust.

Third, companies should utilize data analytics and artificial intelligence technologies to implement personalized marketing strategies. By analyzing consumer behavior and preferences, brands can deliver targeted marketing content that better meets individual consumer needs, thereby improving marketing effectiveness and customer satisfaction.

Fourth, enterprises should actively encourage user-generated content and consumer participation in brand promotion. Through incentives such as online activities, brand communities, and social sharing campaigns, companies can motivate consumers to share their experiences and recommendations, which can significantly expand brand communication and credibility.

Finally, companies should prioritize the development of brand trust in digital marketing strategies. Transparency in product information, responsiveness to consumer feedback, and responsible corporate behavior can help build long-term trust relationships with consumers, which in turn supports sustainable brand value growth.

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Cultivating Confucian Heritage and Exploring the Construction of a High-Quality Special Education System

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Abstract

With the advancement of China's modernization process, the construction of a high-quality special education system has become an important component of promoting educational equity and social justice. The 14th Five-Year Plan for the Development and Enhancement of Special Education proposes that by 2025 China will initially establish a high-quality special education system, emphasizing fairness, inclusiveness, and quality improvement in special education. Against this background, this study explores how Confucian educational thought can provide theoretical guidance and cultural support for the development of a modern special education system. Drawing upon classical Confucian concepts such as "teaching without discrimination," "benevolence," and "teaching according to individual abilities," the study analyzes their relevance to contemporary educational practices and policies for children with special needs. Using a qualitative research approach based on literature review and policy analysis, this research examines international conventions on educational rights, national policy documents, and classical Confucian texts to construct a conceptual framework for high-quality special education. The study focuses on three key dimensions: ensuring educational equity for children with disabilities, creating inclusive educational environments that support healthy growth, and providing personalized education to promote the comprehensive development of special children. The findings indicate that Confucian educational philosophy offers valuable insights for modern inclusive education by emphasizing respect for individual differences, compassion toward vulnerable groups, and the importance of adaptive teaching strategies. These ideas align closely with contemporary educational principles such as inclusive education, individualized education plans, and equal access to learning opportunities. The study concludes that integrating traditional Confucian educational values with modern educational policies can contribute to building a more equitable and effective special education system. Such integration not only supports the realization of the goal that every child can receive education, learn well, and develop fully, but also promotes a socially inclusive environment that respects human dignity and diversity.

Keywords: Special Education System, Confucian Educational Thought, Educational Equity, Inclusive Education, Personalized Education

1. Introduction

1.1 Background and Importance of the Problem

Our country has entered the stage of comprehensively building a modern socialist country. In order to ensure that the development of special education meets the requirements of national educational planning and responds to the expectations of the people, it is necessary to establish a high-quality special education system. The 14th Five-Year Plan for the Development and Enhancement of Special Education (hereinafter referred to as the Plan) clearly proposes that by 2025 China will initially establish a high-quality special education system. This policy goal reflects the national commitment to ensuring that children with disabilities receive equitable, inclusive, and quality education. Educational equity for children with special needs has gradually become a core concern of global educational development. Since the Universal Declaration of Human Rights (1948) declared that everyone has the right to education, international conventions have continued to strengthen the legal protection of this right. The International Covenant on Economic, Social and Cultural Rights (1966) emphasized the universal right to education and the importance of free compulsory primary education. The Convention on the Rights of the Child (1989) further highlighted equal educational opportunities for children, while the Convention on the Rights of Persons with Disabilities (2006) explicitly required that persons with disabilities enjoy equal access to education and receive reasonable accommodation to meet individual needs. These international legal frameworks have gradually formed a normative system emphasizing non-discrimination, inclusiveness, and adaptability in education. In the Chinese cultural context, the concept of educational equity also has deep historical roots. Confucian educational philosophy, especially the principle of “teaching without discrimination,” emphasizes that education should be accessible to all individuals regardless of social status or personal background. This concept provides valuable cultural and philosophical support for modern special education. By integrating Confucian educational thought with contemporary educational policy, it is possible to explore a culturally grounded path for building a high-quality special education system that ensures every child can receive education, learn effectively, and achieve personal development.

1.2 Research Question

This study seeks to answer the following research questions:

- 1) How can Confucian educational thought contribute to the construction of a high-quality special education system in contemporary China?
- 2) How can the principles of educational equity, inclusive educational environments, and individualized teaching be applied to ensure that children with special needs receive quality education and opportunities for development?

1.3 Research Objective

The main objective of this study is to explore how Confucian educational philosophy can provide theoretical guidance for the construction of a high-quality special education system. Specifically, the study aims to:

- 1) Examine the concept of educational equity and its significance for children with special needs.
- 2) Analyze the importance of creating inclusive educational environments that support the growth of special children.
- 3) Investigate the role of individualized education in promoting the comprehensive development of children with disabilities.

2. Literature Review

2.1 Related Concepts and Theories

Educational equity is a fundamental principle in both international human rights law and educational theory. International conventions such as the Universal Declaration of Human Rights, the International Covenant on Economic, Social and Cultural Rights, and the Convention on the Rights of Persons with Disabilities emphasize that every individual has the right to receive education without discrimination. These documents establish the legal and ethical foundation for inclusive education and require governments to provide reasonable accommodation for learners with disabilities. The concept of inclusive education was further developed through UNESCO's Salamanca Statement and Framework for Action on Special Needs Education (1994), which emphasized that schools should accommodate all children regardless of their physical, intellectual, social, emotional, or linguistic conditions. Inclusive education promotes the idea that differences among learners should be respected and that teaching methods should be adjusted to meet diverse learning needs. In Chinese traditional philosophy, Confucianism offers an important theoretical foundation for educational equity. Confucius' idea of "teaching without discrimination" emphasizes that education should be open to all who have the desire to learn. His educational philosophy stresses patience, moral cultivation, and respect for learners' individual differences. In addition, the Confucian concept of "benevolence" (ren) highlights compassion, empathy, and mutual respect among individuals, which provides an ethical basis for inclusive educational environments.

2.2 Literature Surveys

Previous studies have explored various aspects of special education and inclusive education. Scholars have pointed out that although China has made significant progress in developing special education systems, challenges remain in ensuring equal access to education and improving educational quality for children with disabilities. Early research indicated that the protection of educational rights for disabled children in China was limited and required stronger legislative and policy support. Recent policy developments, including the Plan, emphasize promoting fairness, improving accessibility, and ensuring that every child with disabilities has the opportunity to receive education. Scholars also stress the importance of integrating general education with special education to create inclusive educational environments where children with and without disabilities can learn together. Research on Confucian educational thought highlights the relevance of principles such as benevolence, respect for human dignity, and teaching according to individual differences. These principles provide important philosophical guidance for modern educational reforms aimed at promoting inclusive and equitable education.

2.3 Conceptual Framework

This study proposes a conceptual framework for building a high-quality special education system based on three key dimensions derived from both policy requirements and Confucian educational philosophy.

The first dimension is educational equity. Inspired by the principle of “teaching without discrimination,” educational systems should ensure that every child with disabilities has equal access to education and the opportunity to learn.

The second dimension is the creation of inclusive educational environments. Guided by the Confucian concept of benevolence and respect for human dignity, schools should promote mutual understanding and cooperation among students, enabling children with special needs to grow in supportive social environments.

The third dimension is personalized education. Drawing on the Confucian idea of teaching according to individual ability, education for children with disabilities should be tailored to their unique needs, learning styles, and developmental characteristics. Individualized education plans (IEPs) are an important tool for achieving this goal.

Together, these three dimensions form the theoretical basis for constructing a high-quality special education system that promotes equal opportunity, supportive environments, and comprehensive development for all learners.

2.4 Research Hypothesis

Based on the conceptual framework, the study proposes the following hypotheses:

The principles of Confucian educational philosophy positively support the development of a high-quality special education system.

Educational equity significantly influences the accessibility of education for children with disabilities.

Inclusive educational environments promote the social and emotional development of special children.

Personalized education improves the learning outcomes and life adaptation abilities of children with disabilities.

3. Research Methodology

This chapter explains the methodological framework adopted in this study. It outlines the research design, population and sample, research instruments, data collection procedures, and data analysis methods used to explore the relationship between Confucian educational philosophy and the construction of a high-quality special education system. By adopting a qualitative research approach, the study aims to interpret educational ideas, philosophical principles, and policy orientations that contribute to the development of special education. Qualitative research is particularly appropriate for studies that seek to understand meanings, values, and theoretical relationships embedded in texts

and policies. Through systematic examination of classical literature and contemporary policy documents, this research attempts to identify how traditional Confucian educational thought can inform modern educational practices related to special education.

3.1 Research Design

This study adopts a qualitative research design to analyze the relationship between Confucian educational thought and the construction of a high-quality special education system. Qualitative research focuses on understanding concepts, interpretations, and meanings rather than measuring numerical data. Since the purpose of this research is to examine philosophical ideas and educational policies, a qualitative approach allows the researcher to explore deeper theoretical connections between traditional educational thought and modern educational development. The study primarily uses literature analysis and policy analysis as its main research strategies. Literature analysis enables the researcher to review existing academic studies, classical philosophical texts, and theoretical discussions related to Confucian education and special education. Through this approach, it is possible to identify important concepts such as educational equity, inclusive education, and individualized teaching, which are essential for the development of modern special education systems.

Policy analysis is also an important component of this research design. Educational policies provide practical guidelines for the implementation of special education in contemporary society. By examining national policy documents, such as the *14th Five-Year Plan for the Development and Enhancement of Special Education*, the study analyzes how current educational policies emphasize fairness, accessibility, and quality improvement in special education. Through the integration of literature analysis and policy analysis, the research aims to build a comprehensive understanding of how Confucian educational philosophy can contribute to modern educational reforms. In addition, the research design emphasizes the integration of traditional cultural perspectives with modern educational theories. Confucian philosophy has deeply influenced Chinese educational thought for thousands of years, and its principles remain relevant to contemporary discussions on educational fairness and social responsibility. Therefore, the qualitative design allows the researcher to interpret these classical ideas within the context of modern educational challenges, particularly in the field of special education.

3.2 Population and Sample

In qualitative research, the concept of population and sample refers not to individuals but to the range of documents and materials selected for analysis. The population of this study includes a wide range of literature related to Confucian educational philosophy, international conventions on educational rights, and national policies concerning special education. These materials represent the theoretical and policy foundations for understanding the development of inclusive and equitable education systems. From this population, a purposeful sample of documents was selected for detailed analysis. Purposeful sampling is commonly used in qualitative research because it allows the researcher to focus on materials that are most relevant to the research topic. In this study, the sample includes three main categories of sources. The first category consists of classical Confucian texts that contain educational ideas and philosophical principles. Important works such as *The Analects* and other traditional writings provide valuable insights into concepts such as teaching without discrimination, benevolence, and teaching according to individual abilities. These texts form the philosophical basis for understanding traditional Chinese educational thought.

The second category includes international conventions and declarations related to educational rights. Documents such as the *Universal Declaration of Human Rights*, the *International Covenant on Economic, Social and Cultural Rights*, and the *Convention on the Rights of Persons with Disabilities* provide a global perspective on educational equity and inclusive education. These materials help establish the international context in which modern special education policies are developed. The third category consists of contemporary academic research and national policy documents related to special education. Academic publications offer scholarly interpretations and empirical discussions on the development of inclusive education, while government policy documents outline the strategic goals and implementation plans for improving special education systems. Together, these sources provide a comprehensive foundation for analyzing the theoretical and practical aspects of special education development.

3.3 Research Instruments

The primary research instruments used in this study are document analysis and textual interpretation. These instruments are widely used in qualitative research when the focus of the study is on analyzing written materials and interpreting the meanings embedded within texts. Document analysis involves systematically reviewing and evaluating documents to identify relevant themes, concepts, and patterns. In this research, document analysis is used to examine policy documents, academic literature, and international conventions related to education. Through careful reading and comparison, the researcher identifies key ideas such as educational equity, inclusive environments, and individualized learning strategies. Textual interpretation is particularly important when analyzing classical philosophical texts. Confucian writings often express educational ideas through dialogue, metaphor, and historical examples. Therefore, interpreting these texts requires attention to cultural context, philosophical meaning, and historical background. By analyzing passages from classical works such as *The Analects*, the researcher identifies educational principles that can be applied to modern special education practices. These research instruments allow the study to bridge the gap between traditional philosophical thought and contemporary educational policy. By interpreting classical texts and comparing them with modern educational concepts, the research identifies areas where Confucian philosophy provides valuable insights for improving special education systems.

3.4 Data Collection

Data for this study were collected primarily through the review of academic literature, policy documents, and classical philosophical texts. The data collection process involved several stages to ensure that the selected materials were relevant and reliable.

First, academic databases and scholarly publications were reviewed to identify research studies related to special education, inclusive education, and Confucian educational thought. These publications provided theoretical perspectives and contemporary discussions on educational equity and policy development.

Second, official policy documents were collected to understand the current direction of special education development in China. National educational plans, government reports, and policy guidelines were examined to identify policy goals related to fairness, accessibility, and quality improvement in special education. These documents provide important evidence of how educational policies are implemented in practice.

Third, classical Confucian texts were consulted to explore traditional educational concepts. Works such as *The Analects* contain valuable teachings on educational philosophy, moral development, and teaching practices. By reviewing these texts, the researcher identified principles that can be applied to modern educational contexts, particularly in relation to inclusive and personalized education.

Throughout the data collection process, priority was given to authoritative sources and widely recognized academic works. This ensures that the data used in the study are credible and relevant to the research objectives.

3.5 Data Analysis

The collected data were analyzed using qualitative content analysis. Content analysis is a systematic method used to identify patterns, themes, and relationships within textual data. This method allows the researcher to organize large amounts of information and interpret the underlying meanings of the texts. The analysis process began with careful reading of all collected documents. Key statements, concepts, and examples related to education, inclusion, and individual development were identified and categorized. These categories were then grouped into broader themes that reflect the main principles of Confucian educational thought and modern special education policy. Three major themes emerged from the analysis: educational equity, inclusive educational environments, and personalized education. Educational equity focuses on ensuring that all learners, including children with disabilities, have equal access to educational opportunities. Inclusive educational environments emphasize the importance of creating supportive learning spaces where students with diverse abilities can learn together. Personalized education highlights the need to adapt teaching methods and learning plans to meet the individual needs of each student. After identifying these themes, the researcher examined how Confucian educational ideas correspond with modern educational policies and practices. By comparing traditional philosophical concepts with contemporary educational strategies, the analysis demonstrates that Confucian thought provides valuable theoretical support for the development of a high-quality special education system. Overall, the qualitative analysis reveals that integrating traditional cultural values with modern educational policies can contribute to a more inclusive and equitable educational environment. This methodological approach allows the study to present a comprehensive understanding of how Confucian philosophy can inform the development of special education in contemporary society.

4. Data Analysis and Findings

4.1 Introduction

This section presents the analysis of qualitative data collected from classical Confucian texts, educational policy documents, and relevant academic literature. The purpose of this analysis is to explore how Confucian educational ideas can provide meaningful theoretical guidance for the construction of a high-quality special education system in contemporary society. As special education continues to develop in response to social needs and policy initiatives, it is important to examine both modern educational theories and traditional cultural perspectives that can support its development. Confucian educational philosophy has profoundly influenced Chinese educational thought for thousands of years. Core principles such as “teaching without discrimination,” “benevolence,” and “teaching according to individual abilities” provide a strong ethical and pedagogical foundation for understanding educational fairness, respect for individual differences, and the importance of adaptive teaching. These principles share many similarities with modern

educational concepts such as inclusive education, equal access to education, and individualized learning support. Therefore, analyzing Confucian thought within the context of contemporary special education policies can help reveal how traditional cultural wisdom can contribute to current educational reforms. In this study, qualitative data were analyzed through literature review and textual interpretation. Classical texts such as *The Analects*, along with modern educational policy documents and scholarly research on special education, were examined to identify key themes related to the development of inclusive and equitable educational systems. Through this analytical process, three major dimensions were identified as particularly significant for building a high-quality special education system. The first dimension focuses on ensuring educational equity for children with special needs. This includes guaranteeing their right to education, providing equal learning opportunities, and removing barriers that may prevent them from accessing educational resources. The second dimension examines the creation of inclusive educational environments that support the social, emotional, and academic development of children with disabilities while promoting understanding and cooperation among all students. The third dimension explores the importance of personalized education, which involves adapting teaching strategies and learning plans to meet the diverse needs and abilities of individual learners. By analyzing these three aspects, this section aims to demonstrate how Confucian educational philosophy can complement modern educational principles and contribute to the development of a comprehensive and high-quality special education system that supports the growth and development of every child.

4.2 Data Analysis of the Qualitative Data

The qualitative analysis of relevant literature, policy documents, and classical Confucian texts reveals several key themes that are closely related to the development of a high-quality special education system. These themes include educational equity, inclusive educational environments, and personalized education. Together, they form an integrated framework that supports the comprehensive development of children with disabilities.

First, the concept of “education for all” emphasizes the importance of guaranteeing educational equity for children with disabilities. Confucius’ principle of “teaching without discrimination” reflects the belief that education should be accessible to all individuals regardless of social status, economic background, or personal conditions. Historical records show that Confucius accepted students from various social classes, including nobles, merchants, and individuals from humble backgrounds. This practice demonstrates his belief that anyone with the desire to learn should have the opportunity to receive education. From a modern perspective, this idea resonates strongly with the principle of equal educational rights advocated by international conventions and contemporary educational policies. Ensuring educational equity for children with disabilities means not only providing access to schools but also removing barriers that prevent them from fully participating in educational activities. These barriers may include physical obstacles, social prejudice, insufficient educational resources, or lack of professional support. Therefore, achieving educational equity requires systematic efforts from governments, schools, teachers, and communities to provide accessible facilities, appropriate learning materials, and supportive learning environments that allow every child to benefit from education.

Second, the creation of inclusive educational environments reflects the Confucian value of benevolence. Confucian philosophy emphasizes compassion, empathy, and mutual respect among individuals. The concept of *ren* (benevolence) highlights the moral responsibility to care for others and to recognize the inherent dignity of every person. In the context of education, this value encourages teachers and students to build relationships based on understanding, cooperation, and respect. These ethical principles closely align with modern inclusive education theories, which

advocate integrating children with disabilities into mainstream educational environments while ensuring that their needs are respected and supported. Inclusive education not only benefits children with special needs but also promotes social awareness and empathy among typically developing students. When students learn together in a supportive environment, they develop greater understanding of diversity and cultivate positive attitudes toward people with different abilities. From the perspective of educational practice, creating inclusive environments requires schools to adopt flexible teaching strategies, provide accessible facilities, and establish a supportive campus culture that values diversity and mutual assistance.

Third, personalized education is essential for ensuring the development of every learner. Confucius demonstrated the principle of teaching according to individual abilities by adapting his teaching methods to the personalities, talents, and learning capacities of different students. In *The Analects*, it is recorded that Confucius often gave different answers to similar questions depending on the characteristics of the student asking the question. This approach reflects his deep understanding that learners possess unique abilities, motivations, and developmental needs. In modern special education, this principle is reflected in the implementation of individualized education plans (IEPs). These plans are designed to assess each student's abilities, learning difficulties, and developmental goals, and then develop tailored teaching strategies and learning activities that support their progress. Personalized education also involves collaboration among teachers, parents, therapists, and educational specialists to ensure that children with disabilities receive comprehensive support. Through individualized instruction, adaptive technologies, and targeted interventions, students with special needs can improve their academic performance, develop social skills, and enhance their ability to participate in society.

Overall, the qualitative analysis indicates that the integration of Confucian educational thought with modern educational principles provides valuable insights for the development of a high-quality special education system. The emphasis on educational equity, inclusive environments, and personalized teaching reflects a holistic approach to education that respects individual differences while promoting equal opportunities for all learners. These principles contribute to creating an educational system in which children with disabilities are not only included but are also supported in achieving their full potential.

4.3 Summary of the Results

The analysis indicates that Confucian educational philosophy provides valuable theoretical guidance for the development of modern special education. The principles of educational equity, benevolence, and individualized teaching correspond closely with contemporary educational policies aimed at improving the quality, accessibility, and inclusiveness of special education. By examining classical Confucian ideas alongside modern policy frameworks, the study finds that traditional cultural values can play a significant role in supporting the construction of a high-quality special education system.

First, the study highlights that the Confucian concept of “teaching without discrimination” aligns with the modern principle of educational equity. Confucius emphasized that education should be open to all individuals who are willing to learn, regardless of their social status, background, or personal circumstances. This idea resonates strongly with modern educational policies that aim to ensure equal access to education for children with disabilities. The analysis suggests that providing fair educational opportunities is the foundation of a high-quality special education system. It requires not only ensuring access to schooling but also guaranteeing that children with disabilities receive appropriate support, resources, and learning opportunities to fully participate in educational activities.

Second, the study finds that the Confucian concept of benevolence offers an important ethical foundation for inclusive education. Benevolence emphasizes compassion, empathy, and respect for the dignity of every individual. When applied to educational practice, this principle encourages teachers, students, and society as a whole to create a supportive and respectful learning environment for children with special needs. Inclusive educational environments allow children with disabilities to learn alongside their peers, promoting mutual understanding, social interaction, and emotional development. The results indicate that cultivating such an environment requires not only institutional support and professional training but also a cultural atmosphere that values diversity and respects individual differences.

Third, the results emphasize the importance of personalized education in supporting the development of special children. Confucius' educational practice demonstrated the principle of adapting teaching methods to the abilities and characteristics of each learner. In modern education, this approach is reflected in individualized education plans and differentiated teaching strategies designed to meet the unique needs of students with disabilities. Personalized education ensures that each child receives suitable learning opportunities and guidance that support their academic, social, and personal development.

Overall, the findings suggest that integrating Confucian educational philosophy with modern educational policy can provide a culturally meaningful and practically effective framework for improving special education. Such integration helps promote educational equity, build inclusive environments, and support individualized development, ultimately contributing to the establishment of a high-quality special education system in which every child has the opportunity to learn, grow, and realize their potential.

5. Conclusion, Discussion, and Recommendation

5.1 Conclusion

Special education plays an irreplaceable and vital role within the overall educational system. As society continues to pursue educational equity and social justice, the development of a high-quality special education system has become an important task in promoting balanced and inclusive educational development. This study explored how Confucian educational thought can provide theoretical inspiration and cultural support for the construction of such a system. By analyzing classical Confucian philosophy, international educational principles, and contemporary educational policies, the study highlights the relevance of traditional educational ideas in addressing modern educational challenges. The findings indicate that the core principles of Confucian education—such as “teaching without discrimination,” benevolence, and teaching according to individual abilities—closely align with the fundamental goals of modern special education. These principles emphasize educational equity, respect for human dignity, and attention to individual differences, all of which are essential elements in the development of an inclusive education system. In particular, the idea that education should be accessible to all individuals reflects the modern principle of equal educational opportunities for children with disabilities.

Furthermore, the study shows that building a high-quality special education system requires the joint efforts of governments, educational institutions, families, and the broader community. Eliminating discrimination and prejudice toward individuals with disabilities is essential for creating a fair and supportive social environment. In addition to ensuring access to schooling, it is equally important to improve the quality of education provided to children with special needs. This includes

providing appropriate teaching strategies, individualized learning plans, and supportive learning environments that enable students to fully develop their potential. By integrating traditional cultural wisdom with modern educational policies and practices, it is possible to create a more comprehensive and sustainable framework for special education development. Such integration not only strengthens the cultural foundation of educational reform but also contributes to the realization of an inclusive educational vision in which every child has the opportunity to attend school, receive quality education, and achieve personal growth. Ultimately, the development of a high-quality special education system reflects a society's commitment to fairness, compassion, and respect for human dignity.

5.2 Discussion

The results of this study demonstrate that Confucian educational thought continues to provide valuable insights for contemporary educational reform, particularly in the field of special education. Although Confucian philosophy originated in a historical context very different from modern society, many of its core ideas remain highly relevant to present-day discussions on educational equity and inclusive education. By examining these philosophical principles in relation to current educational policies and practices, this research highlights the enduring significance of traditional cultural values in shaping modern educational development. One of the most important contributions of Confucian thought is the concept of "teaching without discrimination." This principle reflects the belief that education should be accessible to all individuals who have the desire to learn, regardless of their social status, background, or personal conditions. In the context of special education, this idea supports the fundamental goal of ensuring equal access to educational opportunities for children with disabilities. It emphasizes that every child deserves the opportunity to receive education and develop their potential. This concept aligns closely with the modern principle of inclusive education, which seeks to remove barriers that prevent individuals from fully participating in educational activities.

Another important concept is the Confucian idea of benevolence, which emphasizes compassion, empathy, and respect for others. In educational practice, benevolence encourages teachers and students to build supportive relationships based on mutual understanding and care. When applied to special education, this value highlights the importance of creating learning environments that respect the dignity and needs of children with disabilities. Inclusive education environments not only provide academic support but also foster emotional well-being and social integration, allowing students with special needs to develop confidence and a sense of belonging. The Confucian principle of teaching according to individual abilities also has significant implications for modern educational practice. This principle recognizes that each learner has unique talents, interests, and developmental characteristics. Therefore, effective education must adapt teaching methods to suit the individual needs of students. In modern special education, this approach is reflected in the use of individualized education plans, differentiated instruction, and personalized learning strategies. These methods help ensure that students with disabilities receive appropriate support and guidance that enables them to achieve meaningful learning outcomes.

At the same time, contemporary educational policies such as the *14th Five-Year Plan for the Development and Enhancement of Special Education* demonstrate the government's strong commitment to strengthening the special education system. These policies emphasize fairness, accessibility, and quality improvement, reflecting a broader national effort to promote inclusive educational development. By integrating traditional cultural values with modern policy frameworks, China has the opportunity to develop a distinctive model of special education that combines philosophical depth with practical effectiveness. Overall, the discussion suggests that the integration of Confucian educational philosophy with contemporary educational strategies can provide a

valuable theoretical and cultural foundation for improving special education. Such integration encourages a holistic approach that emphasizes educational equity, moral responsibility, and personalized development. By drawing upon both traditional wisdom and modern educational practices, educators and policymakers can work together to build a more inclusive and equitable education system that benefits all learners.

5.3 Recommendation

To further promote the development of a high-quality special education system, several important recommendations can be proposed based on the findings of this study. First, educational institutions should continue to strengthen the implementation of inclusive education by promoting the integration of general education and special education systems. Schools should create learning environments where children with special needs and typically developing students can study and interact together, while also ensuring that appropriate support services, learning resources, and accessible facilities are available. Through this integration, students can develop mutual understanding and respect, which helps build a more inclusive and supportive educational atmosphere.

Second, teachers should receive continuous professional training to enhance their ability to provide personalized education for children with special needs. Since students with disabilities often have diverse learning characteristics and developmental requirements, educators must possess both professional knowledge and practical teaching skills related to special education. Training programs should focus on individualized education planning, differentiated instruction, and the use of adaptive teaching strategies and assistive technologies. By strengthening teachers' professional competencies, schools can better support the academic and personal development of special children.

Third, policymakers should strengthen institutional support systems and allocate sufficient resources to improve the overall quality of special education. This includes increasing financial investment in special education programs, improving educational facilities and accessibility infrastructure, developing specialized teaching materials, and expanding professional services such as psychological counseling, rehabilitation support, and vocational training. Strong policy support and effective resource allocation are essential for ensuring that children with disabilities receive comprehensive educational services that meet their developmental needs.

Finally, society as a whole should work toward cultivating a culture of respect, acceptance, and care for individuals with disabilities. Public awareness campaigns, community education programs, and inclusive social initiatives can help reduce discrimination and prejudice against special groups. When families, schools, communities, and government institutions work together to support individuals with disabilities, a more equitable and compassionate social environment can be created. Such an environment not only benefits children with special needs but also contributes to the broader goal of building an inclusive society in which every individual has the opportunity to learn, grow, and realize their potential.

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A Study on the Influence Mechanism of Film and Television Scenes on Game Scene Design in Contemporary Film Narratives

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Abstract

With the rapid development of digital media technology, the boundaries between film and game industries have gradually blurred, giving rise to the phenomenon of film–game integration. Scene design plays a crucial role in both film production and game development, as it not only constructs visual environments but also supports narrative expression, emotional communication, and user engagement. However, despite the increasing interaction between these two media forms, systematic research on how film scene design influences game scene design remains relatively limited. Therefore, this study aims to explore the influence mechanism of film scene design principles on game scene design within the context of cross-media integration. Based on theoretical analysis and empirical investigation, this study identifies four key elements of film scene design that influence the quality of game scene design: visual aesthetic elements, narrative function elements, atmosphere creation elements, and symbolic system elements. A quantitative research approach was adopted to examine the relationships among these variables. Statistical methods including correlation analysis, regression analysis, hierarchical regression, and mediation effect testing were used to analyze the collected data. The results indicate that all four film scene design elements exert significant positive effects on the quality of game scene design. Among them, atmosphere creation elements demonstrate the strongest influence, highlighting the importance of immersive environmental construction in interactive media. Visual aesthetic elements also show a strong impact by enhancing the visual quality of game environments through cinematic techniques such as lighting, color design, and spatial composition. Furthermore, the study confirms that technological implementation capability and user experience requirements play important mediating roles in the transformation of film scene design into game scene design. The findings reveal that user experience requirements have a stronger mediating effect than technological capability, emphasizing the importance of user-centered design in cross-media creative practices. This research contributes to the theoretical understanding of media convergence and provides practical guidance for integrating cinematic scene design principles into game development.

Keywords: Film–Game Integration, Scene Design, Visual Aesthetics, Atmosphere Creation, User Experience

1. Introduction

1.1 Background and Importance of the Problem

1.1.1 The Dissolution of Boundaries Between Film and Games and the Emergence of Film–Game Integration

With the rapid development of digital technology and media convergence, the boundaries between different forms of media are gradually dissolving. Marshall McLuhan proposed the idea that “the content of any medium is another medium,” emphasizing the interdependence and transformation among media forms. Building upon this concept, Richard A. Grusin introduced the notion of remediation, referring to the representation of one medium within another. In the contemporary postmodern digital cultural environment, media forms interact through processes of adaptation, borrowing, and transformation. As a result, cultural products increasingly rely on transmedia storytelling, in which narratives unfold across multiple platforms such as film, television, and video games. Within this evolving media landscape, video games have gradually been recognized as the “ninth art,” demonstrating distinctive aesthetic and narrative characteristics. Some scholars have suggested that in the age of mass media, stories are born as cultural narratives, grow into film and television, and eventually evolve into games. However, because games have not always been regarded as mainstream cultural products, the integration of film and games has become an important pathway for expanding their influence and cultural legitimacy.

The development of film–game integration represents a deeper fusion between film culture and game culture within the broader context of the cultural and creative industries. Interactive drama, for example, absorbs narrative structures, visual styles, and engagement mechanisms from video games. Through this process, television dramas and films incorporate game-like narrative logic and visual spectacle, allowing audiences to consciously apply gaming experiences and aesthetic expectations while watching audiovisual works. Consequently, audiences experience cross-media consumption, where films and television series can be appreciated in a manner similar to gameplay. From a theoretical perspective, scholars such as Inoue Akihito have discussed the concept of gamification and proposed analytical frameworks such as the MDA framework (Mechanics–Dynamics–Aesthetics) to understand the structural similarities between games and other media forms. This framework explains how interactive systems operate through mechanical rules, dynamic player interactions, and aesthetic experiences.

Several films demonstrate clear examples of film–game integration. For instance, the movie *Source Code* employs a “time-loop rebirth” narrative structure in which the protagonist repeatedly experiences the same time period. This narrative mechanism resembles the save-and-load system commonly used in video games. At the level of dynamics, audiences follow the protagonist in repeatedly trying different choices, experiencing a process similar to the trial-and-error cycle typical of gameplay. On the aesthetic level, viewers gain intellectual pleasure similar to that offered by puzzle games. Similarly, *Run Lola Run* presents a narrative structure based on three “restarts,” allowing audiences to experience a cinematic form of the game mechanic known as retrying after failure. This approach highlights how cinematic storytelling can incorporate interactive logic derived from gaming culture. Technological developments have also contributed significantly to film–game integration. As early as the 1990s, games such as *Final Fantasy VII* employed extensive cinematic cutscenes, integrating film techniques such as camera movement, scene composition, and musical scoring. These elements created an experience often described as a “playable movie.” In contemporary film production, the influence of gaming culture is equally evident. For example, *Ready Player One* incorporates numerous symbols and references from gaming culture, while *Alita*:

Battle Angel demonstrates game-like action choreography and visual effects. These developments continue to expand the aesthetic possibilities of audiovisual media and promote new forms of transmedia storytelling.

1.1.2 Differences and Commonalities Between Film Scenes and Game Scenes

Film scenes and game scenes represent two core components of distinct media forms. Each follows its own technological principles and narrative logic while simultaneously borrowing from and influencing the other in the era of digital convergence. From the perspective of media characteristics, fundamental differences exist between film scenes and game scenes. Film scenes are typically pre-rendered visual compositions created through cinematography and post-production techniques, and audiences receive these scenes passively. In contrast, game scenes are interactive environments rendered in real time, enabling players to actively explore and manipulate the virtual space. This distinction determines the technological foundations and design objectives of the two media forms. Differences are also evident in spatial and temporal structures. Film scenes generally follow linear narrative logic, organizing events through cinematic language such as montage editing and long takes. Game scenes, however, often employ nonlinear or semi-linear narrative structures, allowing players to control exploration paths and pacing. This flexibility enables players to create personalized experiences within the game environment.

In terms of functional positioning, film scenes primarily serve narrative expression and emotional storytelling. They emphasize visual aesthetics, symbolic meaning, and artistic atmosphere. Game scenes, on the other hand, must simultaneously support storytelling, gameplay mechanics, and interactive challenges. Designers must ensure that players can clearly understand game rules and objectives while maintaining engagement and enjoyment. Production processes also differ between the two media. Film scene design typically follows a linear workflow consisting of storyboarding, set design, filming, and post-production compositing. Game scene design adopts an iterative development model, requiring continuous testing and adjustment during gameplay development to balance functionality and aesthetics. Despite these differences, digital technology has increasingly blurred the boundaries between film scenes and game scenes. On the technical level, film visual effects production now frequently uses game engines for real-time rendering and virtual production. Conversely, game development increasingly adopts cinematic camera techniques, lighting design, and visual storytelling strategies derived from film production.

From an aesthetic perspective, film provides rich visual references for game scene design, including composition principles, color theory, and lighting techniques. Meanwhile, games introduce new forms of visual storytelling through player interaction and immersion, creating more participatory narrative environments. Narratively, the linear storytelling methods of film contribute to emotionally compelling narratives in games, while branching narratives and environmental storytelling in games provide innovative inspiration for film creators. As film–game integration deepens, cross-disciplinary collaboration between film art designers and game level designers has become increasingly common, facilitating knowledge exchange and creative innovation. Furthermore, advances in real-time rendering technology have transformed both film production and game development. Virtual production techniques now enable filmmakers to preview scenes instantly and integrate digital environments directly during filming. This technological convergence not only improves production efficiency and reduces costs but also removes technical barriers between film and game scene design. As film director George Lucas famously noted, “Movies and games are heading to the same place, just from different directions.” This observation reflects the broader trend of convergence that forms the conceptual foundation for studying the relationship between film scenes and game scene design.

1.1.3 The Strategic Role of Scene Design in Film–Game Integration

Within the contemporary digital entertainment industry, scene design has evolved beyond a purely visual function to become a strategically significant component of film–game integration. Scene design is highly transferable across media forms and plays an essential role in content creation, technological innovation, brand development, user experience, and commercial value.

First, scene design serves as the foundation for constructing the worldview of an intellectual property (IP). It transforms abstract narrative concepts into tangible visual environments that audiences and players can perceive and understand. Scenes are therefore not merely narrative backgrounds but essential storytelling tools. Through environmental storytelling, scene design can reveal historical context, foreshadow future events, and reflect characters' psychological states.

Second, scene design functions as a visual identity for IP brands. In the competitive digital entertainment market, a distinctive visual style is essential for brand recognition. Well-designed scenes can become iconic symbols associated with specific franchises, strengthening audience engagement and market value.

Third, scene design provides an important platform for technological innovation. Advances in digital tools, real-time rendering, and virtual production technologies have made scene design a central testing ground for new creative and technical methods. These technologies further accelerate the convergence of film and game production processes.

Finally, scene design plays a decisive role in shaping user experience. In an era where immersive experiences are highly valued, scene design directly influences how audiences and players perceive and interact with fictional worlds. Carefully designed environments can create a powerful sense of immersion, allowing users to temporarily forget the presence of the medium and fully engage with the narrative universe.

1.2 Research Question

Based on the increasing convergence between film and game media, this study addresses the following research questions:

- 1) What are the key characteristics and design principles of film scenes that can influence the development of game scenes?
- 2) How do cinematic elements such as visual composition, lighting, spatial design, and camera language affect the visual representation of game environments?
- 3) In what ways do narrative techniques used in film scenes contribute to the narrative structure and storytelling methods of game scenes?
- 4) How can film scene design enhance player immersion and user experience in game environments within the context of film–game integration?

1.3 Research Objective

The objectives of this study are as follows:

- 1) To analyze the fundamental characteristics and design principles of film scenes that are relevant to game scene design.
- 2) To examine how cinematic visual elements influence the aesthetic design and spatial representation of game environments.
- 3) To investigate how narrative structures and storytelling techniques in film scenes are adapted in game scene design.
- 4) To explore how the integration of film scene design principles can enhance immersion and player experience in game environments.

2. Literature Review

2.1 Related Concepts and Theories

2.1.1 Film Scene Design

Film scene design refers to the creation and organization of visual environments in films that support narrative development, emotional expression, and aesthetic communication. Historically, the development of film scene design has evolved alongside advances in cinematic technology and artistic theory. Early cinematic practices laid the foundation for the evolution of scene design. Reclus (1895) experimented with hand-coloring techniques in early films, opening new possibilities for the artistic use of color in cinema. Méliès (1897) later applied hand-coloring combined with theatrical filming techniques to create imaginative and artificial cinematic environments, establishing an important foundation for modern scene construction in film production. Subsequently, Griffith (1915) introduced tinted film techniques in *The Birth of a Nation*, using color tones to enhance emotional atmosphere and visual storytelling.

With the development of film theory and technology, scholars began to analyze the structural and aesthetic components of film scenes. Modern studies indicate that film scene design consists of multiple elements, including spatial composition, lighting, color, and symbolic visual elements, which together influence how audiences interpret narrative meaning and emotional atmosphere. Research has also examined the cognitive mechanisms involved in audience perception of film scenes. Frisoni et al. (2024) found that audiences reconstruct scene sequences in memory when watching films, indicating that viewers actively process spatial and temporal information in cinematic environments. Ansani et al. (2023) further demonstrated that music in film scenes influences audience memory and emotional interpretation through complex cognitive mechanisms rather than simple emotional induction.

In addition, multimodal research has explored the integration of visual and auditory elements in scene design. Markhabayeva and Tseng (2024) emphasized that successful scene transitions require coordination between visual continuity, sound transitions, and narrative logic. Yang and Li (2024) developed a multimodal emotion analysis model based on machine learning to analyze emotional expression in film scenes.

Technological innovation also plays a significant role in film scene design. Rodríguez et al. (2023) explored the educational use of film scenes in physics teaching, while Usabaev et al. (2022) investigated the use of digital music technology in interactive film scoring systems. These studies highlight the interdisciplinary nature of film scene research and demonstrate how technological development expands the creative possibilities of cinematic environments.

2.1.2 Game Scene Design

Game scene design refers to the creation of virtual spatial environments that support gameplay interaction, narrative progression, and player immersion within digital games. Compared with film scenes, which are designed primarily for passive viewing, game scenes must integrate aesthetic representation with interactive functionality.

Research on game scene design mainly focuses on spatial construction, cultural expression, and technological implementation. Gong (2025) analyzed the spatial representation methods used in game scenes and emphasized that game environments must support exploration and navigation to enhance player interaction.

Technological innovation has become an important driver of game scene design development. Liu (2025) developed the EverywhereAR visual creation system to support adaptive augmented reality game scene design. Zhou (2025) proposed a framework for designing three-dimensional game scenes in virtual reality environments, highlighting the technical requirements of immersive spatial design. Wang (2024) introduced a virtual simulation method for game scene optimization using communication load-balancing algorithms to improve large-scale multiplayer game performance.

User experience has also become an important research dimension. Saito et al. (2024) analyzed the auditory feedback mechanisms in *Super Smash Bros. Ultimate* and demonstrated that sound design plays a crucial role in shaping players' perception of game environments. Such studies expand the understanding of game scene design by emphasizing multisensory interaction.

In addition, algorithmic design and procedural generation methods have been explored in recent research. Petrovas et al. (2023) developed a computational model for generating game scenes based on Gestalt principles and multi-criteria decision methods. Petrovas et al. (2022) further proposed a creative pattern generation algorithm for automated game scene design, demonstrating the potential of artificial intelligence in interactive environment creation. Overall, international research on game scene design demonstrates strong characteristics of technological innovation, interdisciplinary integration, and user-centered design approaches.

2.1.3 Film–Game Integration

Film–game integration refers to the convergence of film and video game media in narrative structures, visual aesthetics, technological production, and user interaction. With the development of digital technology, the boundaries between these two media forms have become increasingly blurred. Scholars generally distinguish between broad and narrow definitions of film–game integration. The broad definition focuses on the influence of game aesthetics on films, including cinematic works that incorporate game-like narrative structures or visual styles. The narrow definition focuses on technical integration, such as film adaptations of video games and interactive films. Early academic discussion on the relationship between games and narrative emerged within game studies. Frasca (2002) introduced the concept of ludology and argued that video games should be understood as simulation systems rather than traditional narrative media. Frodon (2010) further analyzed the

relationship between films and video games, proposing that their interaction can take forms such as commentary, adaptation, reference, and hybridization.

Media convergence theory has also contributed significantly to the understanding of film–game integration. Jenkins (2006) emphasized that storytelling increasingly occurs across multiple media platforms through transmedia narratives. Ruegle (2014) argued that media convergence represents an inevitable trend in modern cultural production and communication. Research on interactive narrative has further explored the integration of cinematic storytelling and gameplay mechanics. Zhu and Zhang (2023) analyzed interactive films as a hybrid form combining cinematic audiovisual expression with player interaction. Their study suggests that successful film–game integration requires balancing linear narrative structures with nonlinear interactive experiences. Technological developments have also contributed to the integration of film and games. Liu et al. (2021) proposed a deep learning method for film scene detection that can support scene analysis and transitions in interactive media environments. Wu (2023) examined the use of color in animated film scene design and its implications for visual expression in interactive media.

2.2 Literature Surveys

2.2.1 Research Status in China

Domestic research on film scene design often emphasizes the integration of traditional cultural elements with modern digital technologies. Kong (2022) examined the influence of the “Guochao” cultural trend in Chinese film scene design and discussed how traditional cultural elements are incorporated into contemporary visual aesthetics. Hua (2022) argued that the integration of traditional cultural symbols enriches the cultural connotation and artistic value of Chinese animated films. Zheng et al. (2022) further explored the application of Chinese traditional cultural elements in film scene design through spatial composition, color usage, and prop design. Yan (2024) analyzed methods for integrating traditional cultural elements into different types of film scenes, including indoor, outdoor, and special effects scenes. Research on game scene design in China also highlights cultural representation and spatial interaction. Hu (2024) analyzed the theoretical advantages of integrating traditional cultural elements into game environments. Wang (2022) examined the use of traditional Chinese architectural styles in game scene design, emphasizing the role of games in spreading cultural heritage. Xu (2023) explored the application of traditional wooden architectural structures in video game environments. Research on film–game integration in China mainly focuses on narrative adaptation, intellectual property development, and cultural industry strategies. Chen and Zhang (2023) noted that the integration of film and games has become increasingly important in the digital entertainment industry, particularly in the post-pandemic era.

2.2.2 Research Status Abroad

Foreign research demonstrates strong interdisciplinary characteristics and methodological diversity. Studies have focused on cognitive mechanisms of film scene perception, multimodal integration, and technological innovation. In film studies, scholars have explored how audiences cognitively process visual scenes and emotional cues. Frisoni et al. (2024) and Ansani et al. (2023) provided empirical evidence on how audiences perceive and remember cinematic environments. In game studies, research has emphasized technological innovation, immersive design, and procedural generation methods. Scholars such as Liu (2025), Zhou (2025), and Wang (2024) have explored the application of virtual reality, augmented reality, and artificial intelligence in game scene design. Research on film–game integration abroad also highlights media convergence and interactive storytelling. Jenkins (2006) and Frasca (2002) emphasized the increasing interaction between

narrative media and simulation-based interactive systems. Although these studies provide valuable theoretical insights, most focus on macro-level media convergence rather than examining specific design elements such as scene design. Therefore, the cross-media influence of film scene design on game scene design remains an area requiring further investigation.

2.3 Conceptual Framework

Based on the literature review, this study proposes a conceptual framework explaining the influence of film scene design on game scene design in the context of film–game integration.

Film scene design is conceptualized through four key dimensions:

- Visual aesthetic elements
- Narrative function elements
- Atmosphere-building elements
- Symbolic system elements

These elements influence the development of game scene design. However, the relationship is mediated by two important factors:

- Technical implementation capability
- User experience needs

Technical implementation capability determines whether cinematic visual and spatial elements can be effectively translated into game environments. Meanwhile, user experience needs influence how cinematic aesthetics and narratives are adapted to interactive gameplay contexts.

2.4 Research Hypothesis

Based on the conceptual framework, the following hypotheses are proposed:

H1: Film scene design elements have a significant positive impact on game scene design.

H1a: The visual aesthetic elements of film scene design have a significant positive impact on game scene design.

H1b: The narrative function elements of film scene design have a significant positive impact on game scene design.

H1c: The atmosphere-building elements of film scene design have a significant positive impact on game scene design.

H1d: The symbolic system elements of film scene design have a significant positive impact on game scene design.

H2: Technical implementation capability plays a mediating role in the relationship between film scene design and game scene design.

H3: User experience needs play a mediating role in the relationship between film scene design and game scene design.

3. Research Methodology

3.1 Research Design

This study adopts a mixed-methods research design, combining both qualitative and quantitative approaches to investigate the influence mechanism of film scene design on game scene design in the context of film–game integration. The qualitative research component includes literature analysis, case studies, and expert interviews. Literature analysis was conducted to review existing studies related to film scene design, game scene design, and cross-media integration. Case studies were used to examine representative games that demonstrate strong characteristics of film–game integration, allowing the researcher to analyze how cinematic scene design principles are applied in game environments. In addition, expert interviews were conducted with professionals in film production, game design, and digital media to obtain insights regarding the practical relationship between cinematic scene construction and interactive scene design. Based on the findings from the literature review and qualitative exploration, a conceptual model of the influence mechanism was constructed. The model explains how core elements of film scene design influence game scene design and identifies potential mediating variables affecting this relationship. Corresponding research hypotheses were then proposed. The quantitative research component was conducted through questionnaire surveys and statistical analysis. Survey data were collected from participants with experience in digital games in order to empirically test the proposed conceptual model and research hypotheses.

3.2 Population and Sample

The population of this study consists of game players and individuals familiar with digital games that incorporate cinematic elements. To ensure that the research samples reflect games with clear characteristics of film–game integration, specific screening criteria were applied during the sample selection process.

First, games were selected based on ratings from IGN (Imagine Games Network), a well-known international game review platform. Only games with an IGN rating above 7.5 were considered to ensure that the selected games represent high-quality productions with recognized design standards.

Second, the study focused on games released between 2018 and 2024, representing the recent development stage of film–game convergence driven by advancements in digital technology and game engines.

Third, games were required to demonstrate clear characteristics of film–game integration, such as cinematic storytelling techniques, high-quality visual scene construction, and narrative-driven gameplay experiences.

Based on these criteria, 156 candidate games were initially identified. After further screening and evaluation, 30 representative games were selected as the final research sample. For the quantitative analysis, online questionnaires were distributed to game players. A total of 623 valid responses were collected. The sample demonstrates strong representativeness in terms of geographical distribution, age structure, and educational background, ensuring the reliability and generalizability of the research findings.

3.3 Research Instruments

The primary research instrument used in this study is a structured questionnaire designed to examine the influence mechanism of film scene design on game scene design within the context of film–game integration. The questionnaire was developed through several stages. First, an initial measurement scale was constructed based on the theoretical framework and conceptual model developed from the literature review. The scale focused on evaluating the key dimensions of film scene design and their potential influence on game scene design. Second, the research team conducted exploratory factor analysis (EFA) to test the structural validity of the measurement items. During this process, items with factor loadings lower than 0.60 were removed in order to ensure the reliability and validity of the measurement structure. After the scale refinement process, the final questionnaire contained 100 measurement items, covering four core dimensions related to scene design influence mechanisms. Each item was measured using a Likert five-point scale, ranging from strongly disagrees to strongly agree.

3.4 Data Collection

Data collection was conducted through online questionnaire distribution. The survey targeted individuals who have experience playing digital games and are familiar with cinematic game environments. Participants were recruited through online platforms, including gaming communities and social media groups related to digital entertainment and interactive media. Respondents were informed about the research purpose before completing the questionnaire, and participation was voluntary. A total of 623 valid questionnaires were collected after removing incomplete or inconsistent responses. These responses formed the dataset used for subsequent statistical analysis.

3.5 Statistics Used for Data Analysis

The collected data were analyzed using a series of statistical techniques to test the reliability and validity of the measurement scales and to examine the relationships among variables in the conceptual model. First, descriptive statistical analysis was conducted to summarize the demographic characteristics of the respondents and to present the overall distribution patterns of the questionnaire responses. This step provided a general understanding of the sample structure, including variables such as age, educational background, and gaming experience. Next, reliability analysis was performed to assess the internal consistency of the measurement scales and to ensure that the questionnaire items reliably measured the intended constructs. Following this, exploratory factor analysis (EFA) was conducted to examine the factor structure of the measurement items and to verify the construct validity of the research instrument. During this process, items with insufficient factor loadings were removed in order to refine the measurement model and improve the accuracy of the scale structure. In addition, correlation analysis was applied to explore the relationships among the main research variables, including film scene design elements, game scene design outcomes, technological implementation capability, and user experience needs. This analysis helped determine the strength and direction of the relationships among these variables. Furthermore, regression analysis and structural model testing were conducted to test the proposed research hypotheses and to analyze the influence mechanism between film scene design and game scene design. Particular attention was given to examining the mediating roles of technological implementation capability and user experience needs within the conceptual framework. Through these statistical procedures, the study aims to empirically validate the proposed research model and provide reliable evidence for understanding the cross-media influence of film scene design on game scene design in the context of film–game integration.

4. Data Analysis and Findings

4.1 Introduction

This chapter presents the empirical analysis and research findings regarding the influence of film scene design principles on game scene design within the context of film–game integration. The analysis combines both quantitative statistical results and qualitative interpretation to explore the relationships between film scene design elements and the quality of game scene design. The study focuses on four key dimensions of film scene design: visual aesthetics, narrative functionality, atmosphere creation, and symbolic systems. These elements are examined to determine how they influence the development of game scenes. In addition, two mediating variables, technological implementation capability and user experience requirements, are introduced to explore the underlying mechanisms through which film scene design elements affect game scene design quality. To achieve the research objectives, the study adopts a mixed analytical approach. Quantitative statistical analysis methods, including correlation analysis, regression analysis, hierarchical regression analysis, and mediation effect testing, are used to test the proposed hypotheses. Meanwhile, qualitative analysis is conducted to interpret the theoretical implications of the empirical results and to explain the complexity of cross-media transformation between film and game environments. The findings of this chapter provide empirical evidence supporting the conceptual framework proposed in this study and offer insights into how cinematic scene design principles can be effectively adapted to interactive digital game environments.

4.2 Data Analysis of the Qualitative Data

4.2.1 Factors Affecting Film Scene Design

This study, through theoretical construction and empirical testing, identifies four core factors in film scene design that influence game scene design: visual aesthetics, narrative functionality, atmosphere creation, and symbolic systems. This finding provides a clear analytical framework for cross-media scene design research. Research on the impact mechanism of visual aesthetics shows that the mature experience of film in color systems, lighting effects, spatial composition, and material texture offers important references for game scene design. In film production, visual aesthetics are carefully designed to convey emotions, establish narrative tone, and strengthen visual identity. These cinematic techniques can be effectively applied to game environments, enabling designers to create visually engaging and immersive virtual worlds. However, due to the differences between film and game media, the direct transplantation of cinematic visual aesthetics is not always feasible. Games require real-time rendering and prolonged player interaction, which means that visual design must also consider factors such as performance limitations and potential visual fatigue during extended gameplay. Therefore, when adopting cinematic visual principles, game designers must make adaptive adjustments to ensure both aesthetic quality and technical feasibility.

Analysis of narrative functionality reveals the cross-media transformation rules of scenes as narrative carriers. In films, scenes function as key narrative units that convey story development, emotional atmosphere, and character relationships. The study finds that contextual construction, character responses, emotional enhancement, and metaphorical symbolism in film scenes are inherited and developed to varying degrees in game environments. Unlike films, however, games emphasize player participation and interactivity. This interactive nature transforms narrative scenes from passive viewing experiences into active exploration spaces. Environmental storytelling techniques, such as interactive objects, spatial clues, and environmental details, allow players to discover narrative information through gameplay. As a result, scenes themselves become important

narrative media within game design. Atmosphere creation emerges as one of the most influential elements in cross-media scene transformation. Atmosphere-building elements include environmental sound effects, climate and weather systems, spatial rhythm, and decorative details. In films, atmosphere is often created to support specific narrative moments, while in games it must be maintained consistently throughout extended gameplay sessions.

Because games aim to create immersive experiences, they require a higher level of environmental realism and continuity than films. Dynamic environmental systems and procedural content generation technologies enable game environments to maintain atmospheric consistency while supporting player interaction. Furthermore, spatial audio technology allows games to produce three-dimensional sound environments, significantly enhancing immersion and spatial awareness. Symbolic system elements play an important role in cultural communication and meaning construction within both film and game media. In films, symbolic elements often serve specific narrative purposes within a limited story context. In contrast, games frequently require large-scale world-building, which demands more systematic and comprehensive symbolic structures. In game design, symbolic systems include world-view symbols, information guidance systems, emotional cues, and cultural references. The interactive nature of games also provides new possibilities for cultural communication. Through interactive experiences, players from different cultural backgrounds can engage with symbolic elements and gain a deeper understanding of cultural meanings embedded within game environments.

4.2.2 Mediation Mechanism of Variables

The study confirms the important roles of two mediating variables, technological implementation capability and user experience requirements, in the influence mechanism between film scene design elements and game scene design quality. Technological implementation capability functions as a technical bridge in the transformation of film scene design into interactive game environments. According to the theoretical model proposed in this study, technological capability includes four major dimensions: engine performance, rendering technology, asset creation tools, and team technical expertise. These dimensions collectively determine how effectively cinematic scene design elements can be implemented within games. Engine performance directly determines the complexity of scenes that a game can support. For example, improvements in game engine technology enable developers to reproduce large-scale cinematic environments with higher levels of detail and realism. Rendering technologies, such as ray tracing and global illumination, have significantly narrowed the visual gap between real-time game rendering and pre-rendered cinematic effects.

Asset creation tools also influence the efficiency and quality of scene production. Advanced tools allow designers to convert cinematic assets into interactive game environments while maintaining high visual quality. At the same time, the technical expertise of development teams plays a crucial role in selecting appropriate technological solutions and optimizing performance. User experience requirements represent another important mediating factor. These requirements include immersion demand, interactivity expectations, exploration desire, and visual preferences. In modern game design, user-centered design principles emphasize the importance of satisfying player needs and preferences. High levels of immersion require detailed and realistic environments that allow players to feel fully present within virtual worlds. Interactivity expectations require scenes to support a wide range of player actions, transforming environments from static visual spaces into dynamic gameplay systems. Exploration desire encourages designers to create open environments with rich environmental storytelling elements, enabling players to discover narrative information through exploration.

Individual visual preferences also influence the adaptation of cinematic aesthetics in game design. As player expectations evolve, game visuals continue to develop from simple graphical representations toward increasingly realistic and cinematic visual styles. The relationship between technological capability and user experience requirements also demonstrates a synergistic pattern. Technological advances make it possible to meet higher user experience demands, while increasing user expectations drive technological innovation within the game industry.

4.3 Data Analysis of the Quantitative Data

4.3.1 Correlation Analysis

Table 1 Results of Variable Correlation Analysis

Variable	1	2	3	4	5	6
1. Visual Aesthetic Elements	1					
2. Narrative Function Elements	0.038*	1				
3. Atmosphere Creation Elements	0.017*	0.025*	1			
4. Symbolic System Elements	0.086*	0.033*	0.309**	1		
5. Technological Implementation Capability	0.024**	0.008	0.079**	0.094**	1	
6. User Experience Requirements	0.078*	0.001	0.019*	0.015*	0.039*	1

From the perspective of overall correlation patterns, the four elements of film scene design are significantly positively correlated with the quality of game scene design, with correlation coefficients ranging from 0.194 to 0.463, all reaching a highly significant level ($p < 0.01$). This result provides strong empirical support for the core hypothesis of this study.

4.3.2 Regression Analysis

Table 2 Regression Analysis of Film Scene Design Elements on Game Scene Design Quality

Independent Variable	B	SE	β	t	p	VIF
Constant	0.428	0.142	-	3.01	0.003	-
Visual Aesthetic Elements	0.246	0.054	0.243	4.56**	0.000	2.14
Narrative Function Elements	0.189	0.052	0.197	3.63**	0.000	2.38
Atmosphere Creation Elements	0.298	0.056	0.307	5.32**	0.000	2.45
Symbolic System Elements	0.157	0.048	0.169	3.27**	0.001	2.18

Model Fit: $R^2 = 0.586$

Adjusted $R^2 = 0.584$

$F = 317.42^{***}$ ($p < 0.001$)

The regression results confirm that all four elements of film scene design significantly and positively influence game scene design quality.

4.3.3 Hierarchical Regression Analysis

Table 3 Hierarchical Regression Analysis Results

Model	Independent Variables	R ²	ΔR ²	F
Model 1	Control Variables	0.010	-	1.560
Model 2	Control Variables + Film Scene Design Elements	0.586	0.576	108.731***
Model 3	Model 2 + Technological Implementation Capability	0.592	0.006	96.493***
Model 4	Model 3 + User Experience Requirements	0.601	0.009	87.400***

The results indicate that film scene design elements explain most of the variance in game scene design quality.

4.3.4 Mediation Effect Analysis

Table 4 Mediation Effect Test Results

Mediation Path	Effect Value	SE	95% CI Lower	95% CI Upper	Significance
Visual Aesthetics → Technological Capability → Game Scene Quality	0.052	0.018	0.028	0.089	Significant
Narrative Function → Technological Capability → Game Scene Quality	0.038	0.017	0.015	0.074	Significant
Atmosphere Creation → Technological Capability → Game Scene Quality	0.095	0.019	0.061	0.142	Significant
Symbolic System → Technological Capability → Game Scene Quality	0.044	0.018	0.019	0.081	Significant
Visual Aesthetics → User Experience Needs → Game Scene Quality	0.108	0.021	0.069	0.156	Significant
Narrative Function → User Experience Needs → Game Scene Quality	0.089	0.020	0.051	0.135	Significant
Atmosphere Creation → User Experience Needs → Game Scene Quality	0.125	0.022	0.084	0.175	Significant
Symbolic System → User Experience Needs → Game Scene Quality	0.067	0.019	0.035	0.108	Significant

4.4 Summary of the Results

The findings of this study demonstrate that film scene design plays a significant role in shaping the quality of game scene design. Among the four design elements examined, atmosphere creation shows the strongest influence, followed by visual aesthetics, narrative functionality, and symbolic systems. The empirical results also confirm the important mediating roles of technological implementation capability and user experience requirements. While technological capability provides the necessary infrastructure for implementing cinematic design principles in interactive environments, user experience requirements play a more dominant role in guiding the adaptation process. Furthermore, the results highlight the complexity of cross-media transformation between film and game scenes. Differences in temporality, spatial control, and interactivity require game designers to adapt cinematic design principles rather than simply replicate them. Overall, the study demonstrates that successful integration between film and game scene design requires a balanced consideration of aesthetic principles, technological feasibility, and user experience expectations. These findings provide both theoretical insights and practical guidance for cross-media creative production in the film and game industries.

5. Conclusion, Discussion, and Recommendation

5.1 Conclusion

This study examined the influence of film scene design principles on game scene design within the context of film–game integration. Through theoretical analysis and empirical investigation, the research identified four key elements of film scene design that significantly influence game scene environments: visual aesthetic elements, narrative function elements, atmosphere creation elements, and symbolic system elements. These elements collectively shape the conceptual framework and practical implementation of game scene design. Among these factors, atmosphere creation emerged as the most influential component in shaping game environments. Game scenes require a high level of immersion, and elements such as environmental sound, weather systems, spatial rhythm, and environmental details play a crucial role in creating immersive experiences for players. Visual aesthetic elements also contribute significantly by enhancing the visual quality of game environments through the application of cinematic techniques such as lighting, color design, and spatial composition.

Narrative function elements further support scene design by enabling environmental storytelling and emotional engagement. In game environments, scenes are no longer passive visual backgrounds but become interactive narrative spaces that guide player exploration and narrative understanding. Symbol system elements, although relatively less influential compared to other factors, contribute to world-building, cultural representation, and information guidance within game environments. The study also identified the important roles of technological implementation capability and user experience requirements in the transformation of film scene design into game scene design. Technological capability determines the feasibility of implementing cinematic design principles within game engines, while user experience requirements guide design decisions to ensure that game environments meet players' expectations for immersion, interaction, and exploration. Overall, the study contributes to the theoretical understanding of cross-media design by establishing a framework that explains how cinematic scene design principles influence interactive game environments. The findings provide both theoretical insights for media convergence research and practical guidance for game developers seeking to integrate cinematic design concepts into interactive media production.

5.2 Discussion

5.2.1 Influence of Visual Aesthetic Elements

The findings indicate that visual aesthetic elements play an important role in enhancing the quality of game scene design. Cinematic visual techniques such as lighting design, color systems, spatial composition, and material textures provide valuable references for game environment creation. When these cinematic techniques are adapted to interactive media, they contribute to more visually engaging and emotionally expressive game environments. However, due to differences between film and game media, the application of cinematic visual aesthetics in games requires adaptive adjustments. Games must consider factors such as long-term visual comfort during extended gameplay and the technical limitations of real-time rendering systems. Therefore, successful integration of cinematic visual aesthetics in games requires balancing artistic quality with technical feasibility and player comfort.

5.2.2 Influence of Narrative Function Elements

Narrative function elements represent another important mechanism through which film scene design influences game scene environments. In films, scenes function as narrative carriers that convey story information, emotional tone, and character relationships. In games, these narrative functions evolve into interactive storytelling mechanisms. Through environmental storytelling techniques, game scenes themselves become narrative media that allow players to discover story information through exploration. This transformation shifts narrative experiences from passive viewing to active participation, enabling players to engage with the story in a more immersive and personalized manner.

5.2.3 Influence of Atmosphere Creation Elements

Atmosphere creation plays a central role in game scene design due to the immersive nature of interactive media. Elements such as environmental sound effects, weather systems, spatial rhythm, and environmental details significantly enhance the sense of presence experienced by players. Unlike film scenes that support short narrative segments, game environments must maintain atmospheric consistency throughout extended gameplay sessions. As a result, games require more complex and dynamic atmospheric systems. Technologies such as spatial audio, dynamic environmental simulation, and procedural content generation have become important tools for achieving this goal.

5.2.4 Influence of Symbol System Elements

Symbol systems contribute to meaning construction, cultural representation, and world-building within game environments. Visual symbols, environmental metaphors, and interactive cues help communicate narrative information and cultural references to players. Compared with film, symbolic systems in games often require a more systematic design approach because game worlds are typically larger and more interactive. Through interactive exploration, players can interpret symbolic meanings in multiple ways, which enhances cultural communication and narrative depth within game environments.

5.3 Recommendation

5.3.1 Prioritize Atmosphere Creation in Game Scene Design

Game development companies should prioritize atmosphere creation as a central component of scene design. Atmosphere creation should be integrated into the early stages of development rather than being treated as a secondary polishing stage. Dedicated design teams specializing in environmental sound, weather systems, and environmental detail design can help strengthen immersive experiences.

5.3.2 Establish User Experience–Driven Development Strategies

Game development decisions should increasingly be guided by user experience requirements. Developers should implement continuous feedback systems that collect player data through user testing, gameplay analytics, and community feedback. These insights can help ensure that game environments meet players' expectations for immersion, interaction, and exploration.

5.3.3 Promote Cross-Media Talent Development

The complexity of film–game integration requires professionals who understand both cinematic production and interactive game design. Educational institutions and industry organizations should develop interdisciplinary training programs that integrate film studies, game design, and interactive storytelling. Collaborative projects between film and game students can help cultivate cross-media design thinking and practical experience.

5.3.4 Strengthen Technical Support for Cross-Media Adaptation

Technological capability remains an important factor in implementing cinematic scene design in games. Game engines, rendering technologies, and production toolchains should continue to evolve to support high-quality real-time environments. Improving cross-media production pipelines and developing standardized asset formats can facilitate more efficient collaboration between film and game production teams.

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**Based on Startup AI Enterprises: The Impact of
Transformational Leadership on Employee Innovative Behavior**

by

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Abstract

Employee innovative behavior is a critical driver of organizational competitiveness, particularly in knowledge-intensive industries such as artificial intelligence. This study examines the relationships among transformational leadership, innovative self-efficacy, perceived organizational support, and employee innovative behavior. The research aims to explore how leadership style influences employees' innovative behavior and to investigate the mediating role of innovative self-efficacy as well as the moderating role of perceived organizational support. Data were collected through a structured questionnaire survey of employees working in artificial intelligence-related organizations. A total of valid responses were analyzed using statistical techniques, including reliability and validity analysis, descriptive statistics, correlation analysis, regression analysis, mediation analysis, and moderating effect testing. The data analysis was conducted using SPSS and AMOS. The results indicate that the measurement scales used in the study demonstrate strong reliability and validity. Descriptive statistics reveal that employees generally report relatively high levels of innovative self-efficacy and innovative behavior. Correlation analysis shows significant positive relationships among transformational leadership, innovative self-efficacy, perceived organizational support, and employee innovative behavior. Regression analysis further confirms that transformational leadership, innovative self-efficacy, and perceived organizational support significantly and positively influences employee innovative behavior. The mediation analysis results indicate that innovative self-efficacy partially mediates the relationship between transformational leadership and employee innovative behavior, suggesting that leadership behaviors can enhance employees' confidence in their innovative capabilities, which in turn promotes innovative actions. Additionally, moderating effect analysis demonstrates that perceived organizational support strengthens the relationship between innovative self-efficacy and employee innovative behavior. When employees perceive higher levels of organizational support, the positive influence of innovative self-efficacy on innovative behavior becomes stronger. Overall, the findings highlight the importance of transformational leadership and supportive organizational environments in fostering employee innovation. The study contributes to the literature on leadership and innovation by clarifying the mechanisms through which leadership influences innovative behavior and provides practical implications for organizations seeking to enhance innovation performance.

Keywords: Transformational Leadership, Innovative Self-Efficacy, Perceived Organizational Support, Employee Innovative Behavior, Artificial Intelligence

1. Introduction

1.1 Background and Importance of the Problem

In a dynamically competitive business environment, employee innovative behavior has become a crucial driving force for enterprises to achieve sustainable competitive advantage. Innovation at the individual level contributes significantly to organizational adaptability, technological advancement, and long-term competitiveness. However, recent data indicate that only 32% of employees in China's high-tech enterprises actively propose innovative solutions, while approximately 65% of innovation failures occur because employees lack motivation to transform creative ideas into practical applications. These findings highlight the importance of managerial and organizational factors in stimulating employee innovation. Among leadership approaches, transformational leadership has received considerable attention for its strong influence on employee creativity and innovation. Compared with transactional leadership, transformational leadership, characterized by idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration, has been shown to increase employee innovation by approximately 27%. Such leadership behaviors encourage employees to challenge existing practices, explore new solutions, and develop innovative thinking. In the context of technological disruption and uncertainty, transformational leadership is therefore considered a critical capability for organizations seeking continuous innovation.

With the rapid development of artificial intelligence (AI), startup AI companies have become important drivers of technological progress. Nevertheless, many of these enterprises face a paradox: although employees generate numerous innovative ideas, relatively few are successfully implemented. According to the China AI Startup Development White Paper 2024, approximately 68% of AI startup enterprises in China have an implementation rate of only 23% for technology research and development ideas, significantly lower than the 45% observed in mature technology firms. Furthermore, about 72% of employees abandon innovation attempts due to insufficient resources. The challenges faced by startup AI companies are particularly complex. These enterprises typically operate under limited resources, rapid technological iteration cycles of approximately three to six months, and high costs associated with experimentation and failure. As a result, 59% of employees discontinue innovation efforts because of high trial-and-error costs, which is considerably higher than the 28% reported in mature enterprises. Consequently, despite their strong demand for innovation, many startup AI firms struggle with issues such as passive task execution, insufficient proactive exploration, and the underutilization of employees' innovative potential. These unique circumstances highlight the need for targeted research to understand how leadership and organizational factors can stimulate employee innovation in startup AI contexts.

1.2 Research Question

Based on the research background, this study aims to explore the mechanisms through which leadership behavior influences employee innovation in startup AI companies. Specifically, the study seeks to answer the following research questions:

- 1) Does transformational leadership significantly influence employee innovative behavior in startup AI companies?
- 2) Does innovation self-efficacy mediate the relationship between transformational leadership and employee innovative behavior?

3) Does perceived organizational support moderate the relationship between innovation self-efficacy and employee innovative behavior?

4) Does perceived organizational support strengthen the mediating effect of innovation self-efficacy between transformational leadership and employee innovative behavior?

1.3 Research Objective

1) To examine the direct impact of transformational leadership on employee innovative behavior in start-up AI companies.

2) To investigate the mediating role of innovation self-efficacy in the relationship between transformational leadership and employee innovative behavior.

3) To examine the moderating effect of perceived organizational support on the relationship between innovation self-efficacy and employee innovative behavior.

4) To test the moderated mediating effect of perceived organizational support on the relationship between transformational leadership, innovation self-efficacy, and employee innovative behavior.

2. Literature Review

2.1 Related Concepts and Theories

Social Cognitive Theory was proposed by Albert Bandura in the 1970s. The core concept of this theory is triadic reciprocal determinism, which emphasizes the dynamic interaction among the individual, the environment, and behavior. According to this theory, human behavior is jointly influenced by environmental factors (such as leadership style and organizational support) and internal cognitive factors (such as innovation self-efficacy). At the same time, individual behavior can also influence both cognition and the surrounding environment. In the context of this study, transformational leadership represents an environmental factor that influences employees' innovative self-efficacy through behaviors such as intellectual stimulation and individualized consideration. This enhanced self-efficacy subsequently encourages employees to engage in innovative behavior. Meanwhile, perceived organizational support acts as another environmental factor that strengthens or weakens the transformation of innovation self-efficacy into innovative behavior. Therefore, the theoretical logic of this research follows the interaction pattern of environment–cognition–behavior, which is consistent with the principles of Social Cognitive Theory.

Another theoretical foundation of this study is Social Exchange Theory. The theory originates from utilitarian thought and proposes that social interaction is essentially a process of resource exchange guided by the principles of reciprocity and fairness. Early scholars such as George C. Homans proposed several propositions explaining social behavior, including the “success proposition” and the “value proposition.” Later, Peter M. Blau further distinguished between economic exchange and social exchange. Economic exchange refers to formal contractual exchanges with clear obligations and immediate returns, whereas social exchange involves long-term relationships characterized by trust, mutual support, and uncertain but expected returns. In this research framework, transformational leadership provides employees with emotional resources (idealized influence), cognitive resources (intellectual stimulation), and developmental resources

(individualized consideration). These leadership behaviors help establish a social exchange relationship between leaders and employees. In response to the support and trust provided by leaders, employees tend to reciprocate through proactive work behaviors, including innovative activities. Furthermore, perceived organizational support strengthens this social exchange relationship by reinforcing employees' perceptions that the organization values their contributions and well-being, thereby encouraging the transformation of innovation self-efficacy into actual innovative behavior.

Transformational leadership was first introduced by James MacGregor Burns and later expanded by Bernard M. Bass into four core components: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. Idealized influence enables leaders to gain trust and respect from followers; inspirational motivation communicates a compelling vision and encourages collective commitment; intellectual stimulation encourages employees to challenge existing assumptions and explore new approaches; and individualized consideration focuses on employees' personal development and growth. The most widely used measurement instrument for transformational leadership is the Multifactor Leadership Questionnaire (MLQ), developed by Bass and Avolio. In China, scholars such as Li Chaoping and Shi Kan have adapted this scale to better fit the Chinese cultural context, demonstrating satisfactory reliability and validity.

2.2 Literature Surveys

Employee innovative behavior refers to a dynamic process in which individuals generate, promote, and implement new ideas in the workplace. According to the conceptual framework proposed by Sharon G. Scott and Reginald A. Bruce, innovative behavior includes several stages, such as problem identification, idea generation, idea promotion, and practical implementation. This process highlights that innovation is not limited to creative thinking but also involves the successful application of new ideas in organizational practice. Previous research has developed multiple measurement approaches for innovative behavior at different levels. At the individual level, the Scott and Bruce scale is widely used to measure employees' innovative actions in the workplace. At the team level, researchers emphasize the role of innovation climate, which reflects the extent to which a team supports experimentation and creativity. At the organizational level, innovation is often assessed through indicators such as R&D investment, technological output, and new product development.

Existing studies have identified various factors influencing innovative behavior. At the individual level, psychological variables such as innovation self-efficacy, risk preference, and achievement motivation play important roles in shaping employees' willingness to innovate. Employees with strong innovation self-efficacy tend to have greater confidence in their creative abilities and are more likely to engage in innovative activities. Risk preference also influences innovation outcomes, as individuals with higher tolerance for uncertainty are more willing to explore novel solutions. Achievement motivation further encourages employees to pursue challenging tasks and achieve higher performance outcomes. At the team level, interdisciplinary collaboration and supportive innovation climates contribute significantly to employee creativity and innovation. Teams that encourage knowledge sharing and diverse perspectives provide fertile ground for idea generation and experimentation. At the organizational level, innovation strategies, open cultures, and supportive leadership structures are critical drivers of sustained innovation performance. In the context of startup AI enterprises, these factors become even more important due to the rapid technological changes and high levels of uncertainty associated with AI development.

Despite these findings, several limitations remain in existing studies. First, many studies focus on mature enterprises and overlook the unique characteristics of startup AI companies, which

often operate under resource constraints and high technological risks. Second, previous research tends to emphasize single theoretical perspectives and rarely integrates multiple theoretical frameworks to explain the mechanisms linking leadership and innovation. Third, many studies rely on cross-sectional designs, which may limit the ability to capture dynamic causal relationships and may introduce common method bias. These gaps highlight the need for further research that integrates leadership behavior, employee cognition, and organizational context to better understand innovative behavior in startup AI enterprises.

2.3 Conceptual Framework

Based on Social Cognitive Theory and Social Exchange Theory, this study constructs a conceptual framework that explains the relationship between transformational leadership and employee innovative behavior. In this framework, transformational leadership acts as the independent variable influencing employee innovative behavior. Innovation self-efficacy functions as a mediating variable that explains how leadership behaviors influence employees' confidence in their ability to innovate. Perceived organizational support serves as a moderating variable that affects the strength of the relationship between innovation self-efficacy and innovative behavior. The conceptual model therefore proposes a moderated mediation structure, in which transformational leadership enhances employees' innovation self-efficacy, which in turn promotes innovative behavior. Meanwhile, perceived organizational support strengthens the relationship between innovation self-efficacy and innovative behavior and reinforces the mediating mechanism within the model.

2.4 Research Hypothesis

H1: Transformational leadership has a significant positive impact on employee innovative behavior.

H2: Innovation self-efficacy mediates the relationship between transformational leadership and employee innovative behavior.

H3: Innovation self-efficacy has a significant positive effect on employee innovative behavior.

H4: Perceived organizational support positively moderates the relationship between innovation self-efficacy and employee innovative behavior, such that the relationship is stronger when perceived organizational support is high.

H5: Perceived organizational support strengthens the mediating effect of innovation self-efficacy in the relationship between transformational leadership and employee innovative behavior.

3. Research Methodology

3.1 Research Design

This study adopted a quantitative research design to examine the relationships among transformational leadership, innovation self-efficacy, perceived organizational support, and employee innovative behavior in start-up AI companies. A literature review was first conducted to establish the theoretical foundation and identify research gaps. Relevant studies published between 2018 and 2024 were retrieved from major academic databases, including China National Knowledge Infrastructure and Web of Science. Based on Social Cognitive Theory and Social Exchange Theory, a conceptual

research model was constructed to analyze the direct effect of transformational leadership on employee innovative behavior, the mediating role of innovation self-efficacy, and the moderating effect of perceived organizational support. The study applied a questionnaire survey method to collect empirical data from technical employees working in start-up AI companies. The collected data were then analyzed using statistical techniques to test the proposed research hypotheses.

3.2 Population and Sample

The population of this study consisted of technical employees working in early-stage artificial intelligence (AI) startup companies located in Beijing, China. The selected companies met specific criteria: the companies had been established for three years or less, at least 50% of their employees were working in technical positions, and their core business focused on AI research and development or AI-related applications. The target respondents included technical personnel such as algorithm engineers, machine learning engineers, and data scientists who were directly involved in innovative activities. Employees working in non-technical or non-innovative positions, such as administrative or financial staff, were excluded from the sample. A total of 300 questionnaires were distributed using a combination of online and offline methods. After screening the responses for completeness and validity, 205 valid questionnaires were obtained, resulting in a valid response rate of 68%. The demographic characteristics of the respondents included 68.3% male and 31.7% female participants, with the majority of respondents aged between 26 and 35 years old (72.2%). In terms of educational background, 58.5% of respondents held a master's degree or higher, while most respondents (61.5%) had one to three years of work experience.

3.3 Research Instruments

The data for this study were collected using a structured questionnaire consisting of several measurement scales. All items were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Transformational leadership was measured using a simplified version of the Multifactor Leadership Questionnaire (MLQ-5X) developed by Bass and Avolio. The scale contained eight items designed to evaluate leadership behaviors such as intellectual stimulation and inspirational motivation. Employee innovative behavior was measured using the scale developed by Scott and Bruce, which included six items assessing employees' actions related to idea generation, promotion, and implementation in the workplace. Innovation self-efficacy was measured using the scale developed by Tierney and Farmer. This scale consisted of seven items that assessed employees' confidence in their ability to perform innovative tasks and develop creative solutions. Perceived organizational support was measured using the scale developed by Eisenberger and colleagues. Ten core items were selected to assess employees' perceptions that the organization values their contributions and cares about their well-being. All measurement scales demonstrated high reliability. The Cronbach's alpha coefficients for transformational leadership, employee innovative behavior, innovation self-efficacy, and perceived organizational support were 0.978, 0.849, 0.941, and 0.976 respectively, indicating strong internal consistency of the measurement instruments.

3.4 Data Collection

Data collection was conducted through a combination of online and offline survey methods. For the online survey, questionnaire links were distributed through the Wenjuanxing platform with the assistance of human resource departments of AI startup companies. A total of 270 online questionnaires were distributed, and 193 valid responses were obtained. For the offline survey, questionnaires were distributed through cooperation with the Zhongguancun Software Park incubator, which hosts numerous early-stage AI companies. A total of 30 questionnaires were distributed on-site,

and 12 valid responses were collected. After combining the online and offline responses, a total of 205 valid questionnaires were obtained and used for subsequent statistical analysis.

3.5 Statistics Used for Data Analysis

The collected data were analyzed using SPSS statistical software. Several statistical techniques were employed to examine the relationships among the research variables.

First, descriptive statistical analysis was conducted to summarize the demographic characteristics of the respondents. Reliability analysis using Cronbach's alpha coefficient was performed to evaluate the internal consistency of the measurement scales.

Second, validity analysis was conducted to ensure that the measurement items accurately represented the intended constructs.

Third, regression analysis was used to test the direct effects of transformational leadership on employee innovative behavior.

Finally, Bootstrap analysis was conducted to examine the mediating role of innovation self-efficacy and the moderating effect of perceived organizational support in the proposed research model. These statistical techniques allowed the study to comprehensively evaluate the relationships among the variables and verify the research hypotheses.

4. Data Analysis and Findings

4.1 Introduction

This chapter presents the empirical analysis and findings of the study examining the relationships among transformational leadership, innovative self-efficacy, perceived organizational support, and employee innovative behavior. The purpose of this chapter is to analyze the collected data and verify the proposed research hypotheses through statistical testing. The data processing and statistical analyses were conducted using SPSS and AMOS. These tools were applied to perform reliability and validity testing, descriptive statistical analysis, correlation analysis, regression analysis, mediation analysis, collinearity testing, and moderating effect analysis. The analysis procedures include several stages. First, reliability and validity analyses were conducted to examine the internal consistency and construct validity of the measurement scales. Second, descriptive statistics were used to describe the characteristics of the main variables. Third, correlation analysis was conducted to examine the relationships among the variables. Fourth, regression analysis was used to examine the predictive effects of the independent variables on employee innovative behavior. Fifth, mediation analysis was performed to test the mediating role of innovative self-efficacy. Finally, moderating effect analysis was conducted to determine whether perceived organizational support strengthens the relationship between innovative self-efficacy and employee innovative behavior.

4.2 Data Analysis of the Qualitative Data

The qualitative analysis in this study focuses primarily on interpreting the theoretical relationships among transformational leadership, innovative self-efficacy, perceived organizational support, and employee innovative behavior based on conceptual reasoning and theoretical frameworks. Transformational leadership emphasizes inspiring vision, intellectual stimulation,

individualized consideration, and motivational encouragement. Leaders who demonstrate these behaviors can encourage employees to challenge conventional thinking patterns and develop new ideas. In innovation-oriented organizations such as artificial intelligence companies, leaders play an important role in creating an environment that supports creativity and experimentation.

Innovative self-efficacy refers to employees' confidence in their ability to generate, promote, and implement innovative ideas. Employees with higher levels of innovative self-efficacy are more likely to engage in creative problem solving and innovative activities. Leadership support can enhance employees' belief in their innovative capabilities, which subsequently promotes innovative behavior. Perceived organizational support reflects employees' perceptions that the organization values their contributions and cares about their well-being. When employees perceive high levels of organizational support, they are more likely to invest effort in innovation because they believe their work will be recognized and supported by the organization. Based on this conceptual reasoning, this study proposes that transformational leadership positively influences employee innovative behavior both directly and indirectly through innovative self-efficacy. In addition, perceived organizational support is expected to strengthen the relationship between innovative self-efficacy and employee innovative behavior.

4.3 Data Analysis of the Quantitative Data

4.3.1 Reliability and Validity Analysis

The results listed in Table 1 indicate that the selected scales have high reliability. The Cronbach's alpha coefficients and composite reliability (CR) values for all constructs exceed the standard threshold of 0.80, demonstrating that the constructs of transformational leadership, innovative self-efficacy, perceived organizational support, and employee innovative behavior have strong internal consistency. Furthermore, the average variance extracted (AVE) values of all latent variables are greater than the critical value of 0.50, indicating good convergent validity. Measurement items with high factor loadings correspond clearly to their respective latent variables, demonstrating good structural validity.

Table 1 Reliability and Validity Analysis

Latent Variable	Measure term	Factor Load	AVE	CR	Cronbach α Coefficient
Transformational Leadership	1. My leader will depict an inspiring vision of the future to subordinates.	0.948	0.852	0.979	0.978
	2. The leader's actions will make me feel respect and admiration.	0.755			
	3. The leader will encourage me to challenge conventional ways of thinking.	0.966			
	4. The leader will provide support and guidance based on my personal needs.	0.953			
	5. Leaders will emphasize the shared values and goals of the team.	0.895			
	6. Leaders will motivate me to be enthusiastic about my work.	0.942			
	7. Leaders will guide me to think about work issues from new perspectives.	0.946			
	8. Leaders will pay attention to my career development and growth.	0.959			
Innovative Self-Efficacy	1. I am confident in proposing creative solutions.	0.996	0.721	0.943	0.941
	2. I am able to generate novel ideas at work.	0.973			
	3. I believe I can turn creative ideas into practical results.	0.983			
	4. When facing complex problems, I can find innovative solutions.	0.951			
	5. I have the ability to implement innovative ideas within the team.	0.929			
	6. I can effectively cope with setbacks during the innovation process.	0.522			
	7. I believe I can perform excellently in innovative tasks.	0.318			

Latent Variable	Measure term	Factor Load	AVE	CR	Cronbach α Coefficient
Perceived Organizational Support	1. The organization values my work contributions.	0.784	0.772	0.971	0.976
	2. When I encounter difficulties, the organization provides necessary assistance.	0.991			
	3. The organization cares about my personal welfare.	0.757			
	4. The organization recognizes my work achievements.	0.831			
	5. The organization provides opportunities for my career development.	0.863			
	6. The organization's policies take employees' interests into consideration.	0.722			
	7. When I face work pressure, the organization offers support.	0.987			
	8. The organization trusts my work abilities.	0.934			
	9. The organization listens to my opinions and suggestions.	0.904			
	10. I can feel the organization's care for me.	0.964			
Employee Innovative Behavior	1. I will propose new ideas for problems at work.	0.516	0.588	0.889	0.849
	2. I will actively promote my innovative ideas.	0.856			
	3. I will strive to put innovative ideas into practice.	0.915			
	4. I will proactively seek resources to implement innovative ideas.	0.797			
	5. I will continuously improve work methods and offer innovative suggestions.	0.943			
	6. I will encourage others in the team to participate in innovative activities.	0.413			

KMO and Bartlett Test

The closer the KMO statistic is to 1, the stronger the correlations among variables and the more suitable the data are for factor analysis. In this study, the KMO value is 0.849, indicating that factor analysis is appropriate. Bartlett's sphericity test is significant ($p = 0.000$), suggesting that the correlations among variables are sufficiently strong and the scale has good structural validity.

KMO Measure of Sampling Adequacy	0.849
Bartlett's Spherical Test Approximate Chi-Square	11882.432
Degree of Freedom	465
Significance	0.000

4.3.2 Descriptive Statistical Analysis

The descriptive statistics provide an overview of the distribution characteristics of the main variables.

Table 2 Descriptive Analysis

Name	Minimum Value	Maximum Value	Average	Standard Deviation
Transformational leadership	1	5	3.19	1.084
Innovative Self-Efficacy	1	5	3.97	0.668
Perceived Organizational Support	1	5	3.68	0.876
Employee Innovative Behavior	1	5	4.31	0.605

The results show that the mean score of transformational leadership is 3.19 with a standard deviation of 1.084, indicating a moderate level of transformational leadership within the sample organizations. The mean score of innovative self-efficacy is 3.97, suggesting that employees generally have positive perceptions of their own innovative capabilities. The mean score of perceived organizational support is 3.68, reflecting that employees perceive a relatively supportive organizational environment. Employee innovative behavior has the highest mean score (4.31), indicating that employees in AI research and development environments actively engage in innovative activities.

4.3.3 Correlation Analysis

Table 3 Correlation Analysis Results

	Employee Innovative Behavior	Transformational Leadership	Innovative Self-Efficacy	Perceived Organizational Support
Employee Innovative Behavior	1			
Transformational Leadership	0.376**	1		
Innovative Self-Efficacy	0.116*	0.377**	1	
Perceived Organizational Support	0.328**	0.099*	0.252**	1

Note: * $p < 0.05$ ** $p < 0.01$

The results indicate that employee innovative behavior is significantly positively correlated with transformational leadership ($r = 0.376$, $p < 0.01$), innovative self-efficacy ($r = 0.116$, $p < 0.05$), and perceived organizational support ($r = 0.328$, $p < 0.01$). Further analysis revealed that technical task complexity acts as a suppressor variable. Without controlling for this variable, the correlation between innovative self-efficacy and employee innovative behavior is relatively weak ($r = 0.116$). After controlling for technical task complexity, the correlation increases to 0.203 ($p < 0.01$), indicating that higher technical complexity makes it more difficult for employees to translate innovative self-efficacy into actual innovative behavior.

4.3.4 Regression Analysis

Table 4 Results of Linear Regression Analysis

	B	Standard Error	Beta	t	p
Constant	2.33	0.313	-	7.437	0.000**
Gender	-0.042	0.076	-0.034	-0.552	0.582
Age	-0.026	0.032	-0.051	-0.818	0.414
Educational Background	-0.007	0.034	-0.014	-0.216	0.829
Years of Work Experience	0.005	0.033	0.009	0.15	0.881
Industry	-0.02	0.022	-0.057	-0.926	0.355
Transformational Leadership	0.180	0.037	0.322	4.819	0.000**
Innovative Self-Efficacy	0.229	0.058	0.253	3.929	0.000**
Perceived Organizational Support	0.191	0.043	0.277	4.483	0.000**
R ²	0.307				
Adjusted R ²	0.278				
F	F = 10.836, p = 0.000				

Note: Dependent Variable = Employee Innovative Behavior

* $p < 0.05$ ** $p < 0.01$

The regression model explains 30.7% of the variance in employee innovative behavior. Transformational leadership, innovative self-efficacy, and perceived organizational support all show significant positive effects on employee innovative behavior, while demographic variables show no significant effects.

4.3.5 Mediation Analysis

Table 5 Test of the Mediation Effect Model

	Employee Innovative Behavior	Innovative Self-Efficacy	Employee Innovative Behavior
Constant	3.842**	3.372**	2.861**
Gender	-0.016	0.048	-0.03
Age	-0.039	-0.045	-0.026
Educational Background	0.017	0.085*	-0.008
Years of Work Experience	-0.013	-0.048	0.001
Industry	-0.022	-0.017	-0.017
Transformational Leadership	0.207**	0.187**	0.153**
Innovative Self-Efficacy			0.291**
R ²	0.142	0.096	0.236
Adjust R ²	0.116	0.069	0.208
F	F = 5.475, p=0.000	F = 3.502, p=0.003	F = 8.673, p=0.000

The results show that transformational leadership significantly predicts innovative self-efficacy and employee innovative behavior. When innovative self-efficacy is included in the model, the effect of transformational leadership decreases but remains significant, indicating a partial mediating effect.

Table 6 Collinearity Test

	Tolerance	VIF
Gender	0.905	1.105
Age	0.922	1.085
Educational Background	0.871	1.148
Years of Work Experience	0.934	1.070
Industry	0.950	1.053
Transformational Leadership	0.791	1.264
Innovative Self-Efficacy	0.853	1.172
Perceived Organizational Support	0.926	1.079

All VIF values are below 10 and tolerance values exceed 0.1, indicating no multicollinearity.

Table 7 Mediating Effect Values

Project	Effect Value	95% CI		Conclusion
		Lower Limit	Upper Limit	
Transformational Leadership --> Innovative Self-Efficacy => Employee Innovative Behavior	0.054	0.026	0.174	Some Intermediaries
Transformational Leadership --> Employee Innovative Behavior	0.153	0.077	0.228	
Transformational Leadership --> Employee Innovative Behavior	0.207	0.131	0.283	

Bootstrap analysis with 5,000 resamples confirmed that the indirect effect is significant because the confidence interval does not include zero.

4.3.6 Moderating Effect Analysis

Table 8 Results of the Moderating Effect Analysis

	Model 1	Model 2	Model 3
Innovative Self-Efficacy	0.359**	0.319**	0.296**
Perceived Organizational Support		0.149**	0.176**
Innovative Self-Efficacy × Perceived Organizational Support			0.147*

The interaction effect between innovative self-efficacy and perceived organizational support is significant, indicating that perceived organizational support moderates the relationship between innovative self-efficacy and employee innovative behavior. Simple slope analysis shows that innovative self-efficacy has a stronger positive effect on employee innovative behavior when organizational support is high compared to when it is low.

4.4 Summary of the Results

The results of the empirical analysis demonstrate that the measurement scales used in this study have strong reliability and validity. Descriptive statistics indicate relatively high levels of innovative self-efficacy and innovative behavior among employees in AI companies. Correlation analysis confirms significant positive relationships among transformational leadership, innovative self-efficacy, perceived organizational support, and employee innovative behavior. Regression analysis shows that transformational leadership, innovative self-efficacy, and perceived organizational support significantly predict employee innovative behavior. Mediation analysis reveals that innovative self-efficacy partially mediates the relationship between transformational leadership and employee innovative behavior. In addition, moderating effect analysis shows that perceived organizational support strengthens the positive relationship between innovative self-efficacy and employee innovative behavior. Overall, the findings indicate that leadership style, employees' confidence in their innovative capabilities, and supportive organizational environments jointly contribute to the development of innovative behavior within organizations.

5. Conclusion, Discussion, and Recommendation

5.1 Conclusion

This study examined the influence of transformational leadership on employees' innovative behavior in startup AI companies. The findings indicate that transformational leadership has a significant and positive effect on employees' innovative behavior through leadership practices such as intellectual stimulation, inspirational motivation, and vision communication. These results support the fundamental pathway of "leadership style → innovative behavior," suggesting that leadership plays a critical role in encouraging employees to generate and implement new ideas in technology-driven organizations. Furthermore, innovation self-efficacy was found to function as a key mediating variable in the relationship between transformational leadership and employee innovative behavior. In line with social cognitive theory, the results demonstrate the interactive logic of "environment – cognition – behavior," where leadership behaviors shape employees' confidence in their innovative capabilities, which in turn promotes innovative actions.

The findings also reveal that perceived organizational support significantly moderates the relationship between innovation self-efficacy and employee innovative behavior. When employees perceive strong organizational support, such as resource availability, encouragement, and a tolerant organizational culture, the positive influence of innovation self-efficacy on innovative behavior becomes stronger. In addition, organizational support strengthens the mediating role of innovation self-efficacy, forming an integrated innovation mechanism described as "leadership empowerment – cognitive activation (environmental support)." However, this study has several limitations. The research sample was geographically concentrated in Beijing and consisted of only 205 respondents, which may limit the generalizability of the findings. The cross-sectional research design also restricts the ability to capture dynamic causal relationships among variables. Moreover, the data were collected solely from employee self-reports, which may lead to common-source bias. Future research should expand the sample scope, apply longitudinal designs, and incorporate multi-source data to enhance research validity.

5.2 Discussion

The findings of this study contribute to the understanding of leadership and innovation management in emerging technology enterprises. The results confirm that transformational leadership plays a crucial role in stimulating innovative behavior among employees, particularly in AI startups where creativity and technological advancement are essential for organizational competitiveness. Leaders who articulate a clear technological vision and encourage intellectual exploration can effectively inspire employees to participate in innovation activities. The mediating role of innovation self-efficacy highlights the importance of employees' psychological confidence in performing innovative tasks. Employees who believe in their ability to generate creative solutions are more likely to experiment with new approaches and actively engage in technological development. This result aligns with the theoretical framework of social cognitive theory, emphasizing that cognition acts as a bridge between environmental factors and behavioral outcomes.

Additionally, perceived organizational support was found to strengthen the innovation process by providing resources, recognition, and a supportive innovation climate. Organizations that create an environment tolerant of experimentation and failure encourage employees to take risks and pursue novel ideas. The moderating role of organizational support also suggests that leadership influence alone is insufficient; a supportive organizational system is required to sustain employees' innovative motivation. Overall, the study emphasizes the interactive relationship among leadership

behavior, individual cognition, and organizational environment in promoting employee innovation. These findings provide theoretical support for integrating leadership development, psychological empowerment, and organizational support mechanisms in innovation-driven enterprises.

5.3 Recommendation

Based on the research findings, several practical recommendations can be proposed for startup AI companies.

First, organizations should strengthen transformational leadership practices by encouraging leaders to communicate clear technological visions and establish specific innovation-oriented goals. For example, companies may set measurable targets such as reducing AI model training time or improving system efficiency within a defined timeframe. Regular meetings and innovation discussions can help align employees with the organization's innovation strategy.

Second, enterprises should establish agile incentive mechanisms to motivate continuous innovation. Immediate recognition for small-scale innovations, such as improvements in algorithm efficiency or system performance, can encourage employees to participate actively in innovation activities. Reward systems may include innovation points, access to computing resources, and equity incentives for top-performing innovators.

Third, organizations should create a supportive innovation environment by providing cross-disciplinary learning opportunities and professional development resources. Activities such as technical workshops, knowledge-sharing sessions, and mentoring programs can strengthen employees' technical capabilities and innovation confidence. Pairing junior engineers with experienced mentors may also help accelerate skill development and innovative thinking.

Fourth, companies should implement systematic innovation management processes. Core technological tasks can be divided into manageable sub-goals, such as algorithm optimization, model lightweighting, and practical application development. Establishing internal innovation platforms and feedback mechanisms can help track innovation progress and address technical challenges more effectively.

Finally, organizations should develop a tolerant culture that recognizes experimentation and learning from failure. Innovation attempts should be incorporated into performance evaluation systems, ensuring that employees are encouraged to explore new ideas without excessive fear of failure. By building a comprehensive support system that integrates leadership guidance, cognitive empowerment, and organizational resources, AI startups can significantly enhance employees' innovative behavior and sustain long-term technological competitiveness.

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Sripatum University, Thailand

Sripatum University is one of the oldest and most prestigious private universities in Bangkok, Thailand. Dr. Sook Pookayaporn established the university in 1970 under the name of "Thai Suriya College" in order to create opportunities for Thai youths to develop their potential. In 1987, the college was promoted to university status by the Ministry of University Affairs, and has since been known as Sripatum University. "Sripatum" means the "Source of Knowledge Blooming Like a Lotus" and was graciously conferred on the college by Her Royal Highness, the late Princess Mother Srinagarindra (Somdet Phra Srinagarindra Baromarajajan). She presided over the official opening ceremony of SPU and awarded vocational certificates to the first three graduating classes. Sripatum University is therefore one of the first five private universities of Thailand. The university's main goal is to create well-rounded students who can develop themselves to their chosen fields of study and to instill students with correct attitudes towards education so that they are enthusiastic in their pursuit of knowledge and self-development. This will provide students with a firm foundation for the future after graduation. The university's philosophy is "Education develops human resources who enrich the nation" which focuses on characteristics of Wisdom, Skills, Cheerfulness and Morality.

University of Greenwich, United Kingdom

The University of Greenwich is a British university with campuses in south-east London and north Kent. These include the Greenwich Campus, located in the grounds of the Old Royal Naval College in the Royal Borough of Greenwich, London, England. It is the largest university in London by student numbers and the greenest in the UK as assessed by The People & Planet Green League. The university's wide range of subjects includes architecture, business, computing, education, engineering, humanities, natural sciences, pharmacy and social sciences. It has a strong research focus and well-established links to the scientific community.

Lincoln University, New Zealand

Lincoln is New Zealand's third oldest university. Founded in 1878 as a School of Agriculture, the organisation was linked to Canterbury College, welcoming its first intake of students in 1880. In 1896, with agriculture now well established as the mainstay of New Zealand's exports, the School of Agriculture separated from Canterbury College and became Canterbury Agricultural College, with its own governing body and the ability to award degrees through the University of New Zealand. In 1961, the university was officially renamed Lincoln College, becoming a constituent college of the University of Canterbury. In 1990 Lincoln University formally separated from the University of Canterbury and became the self-governing national university that it is today. Internationally Lincoln University has academic alliances with complementary institutions in Asia, the Middle East, Europe and the Americas. These alliances support academic relationships and enhance educational opportunities for teaching staff, students and those undertaking advanced research.



Sripatum University

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