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Original Research Article

Development Of a Management Model for Enhancing the Quality Education Toward Sustainable Development of Vocational Colleges in Yunnan Province, China

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ABSTRACT

This research aimed to develop a sustainable development model for enhancing the quality of vocational education in Yunnan Province, China. A mixed-methods research design was employed. The quantitative phase involved 514 vocational education teachers selected as the study sample, while the qualitative phase consisted of a focus group discussion with nine experts to validate and refine the proposed model. Data were collected using a structured questionnaire and a focus group protocol. Quantitative data were analyzed using percentage, mean, standard deviation, and the Modified Priority Needs Index (PNI Modified), whereas qualitative data were analyzed through content analysis to support the development of the model.

The findings revealed that the current state of sustainable development in vocational education was at a moderate level, whereas the desirable state was at a high level. The Modified Priority Needs Index indicated that all three dimensions of sustainable development required further improvement, with the highest priority assigned to economic sustainability, followed by social sustainability and environmental sustainability. Based on these findings, a sustainable development model for enhancing the quality of vocational education was developed. The model comprises four interrelated components: (1) the model title, (2) the principles, concepts, and objectives of the model, (3) the key components of the model, and (4) implementation guidelines. The model was subsequently evaluated by experts and found to demonstrate high levels of suitability and feasibility for application in vocational education institutions. The proposed model provides practical guidance for promoting sustainable development and improving the quality of vocational education in Yunnan Province.

Introduction

Sustainable development has become a central strategy for promoting balanced economic growth, social equity, and environmental protection worldwide. In China, sustainable development was identified as one of the four major objectives for building a Xiao Kang (moderately prosperous) society during the 16th National Congress of the Communist Party of China (CPC). Since then, sustainable development has been integrated into national policies and educational reforms, recognizing education as a key driver for achieving long-term social and economic sustainability. Yunnan Province occupies a unique position in China's sustainable development agenda. As the country's southwestern frontier, Yunnan possesses rich cultural diversity, abundant natural resources, and is recognized as one of the world's biodiversity hotspots. Moreover, its strategic location bordering several countries within the Greater Mekong Sub-region (GMS) makes it an important gateway for regional cooperation in trade, education, and sustainable development. Although Yunnan remains relatively less economically developed than many eastern provinces, substantial progress has been achieved in economic growth, social development, environmental conservation, and resource management following China's reform and opening-up policies. The implementation of sustainable development strategies in Yunnan presents significant opportunities for improving the quality of vocational education. High-quality vocational education is essential for producing skilled human resources capable of supporting regional economic transformation, technological innovation, and sustainable industrial development. As noted by Yu (2025), education quality is a critical determinant of educational outcomes and social returns; therefore, understanding disparities in educational quality across different contexts is essential for improving educational effectiveness and equity. Recent studies have emphasized that improving vocational education requires strong collaboration among governments, educational institutions, industries, and local communities. Liu (2024) argued that stakeholder engagement, policy support, and educational partnerships are fundamental mechanisms for enhancing educational quality in Yunnan Province. Such collaborative approaches are particularly important in vocational education, where curricula, teaching methods, and workforce demands must be continuously aligned with sustainable development objectives. Despite these developments, existing vocational education practices in Yunnan continue to face significant challenges. According to the World Bank (2023), cooperation for sustainable development in vocational education remains limited and largely superficial, with insufficient integration of environmental sustainability, economic development, and social responsibility into institutional management and educational practices. Most existing studies have focused on policy implementation or curriculum reform, while relatively little attention has been given to developing an integrated management model that systematically enhances educational quality through sustainable development principles. This represents an important research gap in the current literature.

This study proposes a sustainable development-based management model for enhancing the quality of vocational education in vocational colleges in Yunnan Province, China. The proposed model integrates the environmental, economic, and social dimensions of sustainable development while emphasizing stakeholder collaboration, institutional management, and continuous quality improvement. It is expected that the findings will provide practical guidance for vocational colleges, policymakers, and educational administrators seeking to strengthen

vocational education quality and contribute to sustainable regional development in Yunnan Province and the Greater Mekong Sub-region.

Literature Review and Theoretical Framework

Vocational Education Development in China

Vocational education in China can be traced back to ancient times. Time-honored apprenticeships used to take the form of passing skills from father to son, or from master to apprentice based on contracts or sectors. As early as the mid-1990s, to seek self-strength and prosperity in China, a group of people of vision created the Fujian Shipbuilding Academy, marking the formal commencement of modern vocational education in China. China's vocational education has actively adapted to the needs of socioeconomic development. It places equal emphasis on both formal schooling and vocational training, promoting a horizontal integration of vocational education with general education. This approach has also accelerated the building of a modern vocational education system designed to support lifelong learning for all. (Chen, Liu and Zheng, 2022).

Empowering a learning society for sustainability through quality education

Sustainability is a requirement of almost every system in existence. Economic models so far have seemed to be financially sustainable for the rich and economically uncertain for lower-income households. Moreover, they have proven to be uniformly unsustainable for the planet. Quality education instills in individuals the importance of environmental sustainability. It also equips them with the financial know-how to turn their skills into income, which leads to more financial stability. The economic sustainability that comes from one generation getting quality education can continue across multiple generations, provided that families emphasize education's importance. Generational emphasis on social change. (Findeisen ,2022).

Enhancing quality vocational education

Enhancing Quality Vocational Education refers to improving the standards, effectiveness, and relevance of vocational education and training (VET) to better prepare students for the workforce. This involves several key aspects: (Chen,2023) Curriculum Improvement – Updating course content to align with industry needs, technological advancements, and emerging job markets. (George, 2023) Teacher Training –Providing educators with continuous professional development to enhance their teaching methods and technical expertise. Industry Collaboration – Partnering with businesses and industries to offer real-world training, apprenticeships, and internships. (Jianling ,2024) Modern Facilities & Equipment – Ensuring that vocational schools and colleges have up-to-date tools, machinery, and digital resources. Competency-Based Learning – Focusing on hands-on skills development and practical applications rather than just theoretical knowledge. Quality Assurance & Accreditation – Implementing standards, assessments, and certifications to ensure graduates meet professional requirements. Lifelong Learning Pathways – Creating opportunities for graduates to continue learning and upgrading their skills throughout their careers. (Zhou ,2024) Therefore

enhancing quality vocational education helps bridge the skills gap, boost employability, and contribute to sustainable economic development.

Conceptual Framework

The researcher analyzed and synthetized the concepts and theories related to vocational college management, enhancing quality education and then the researcher analyzing and synthetizing the draft conceptual framework modified and approved as follows within Sustainable Development.

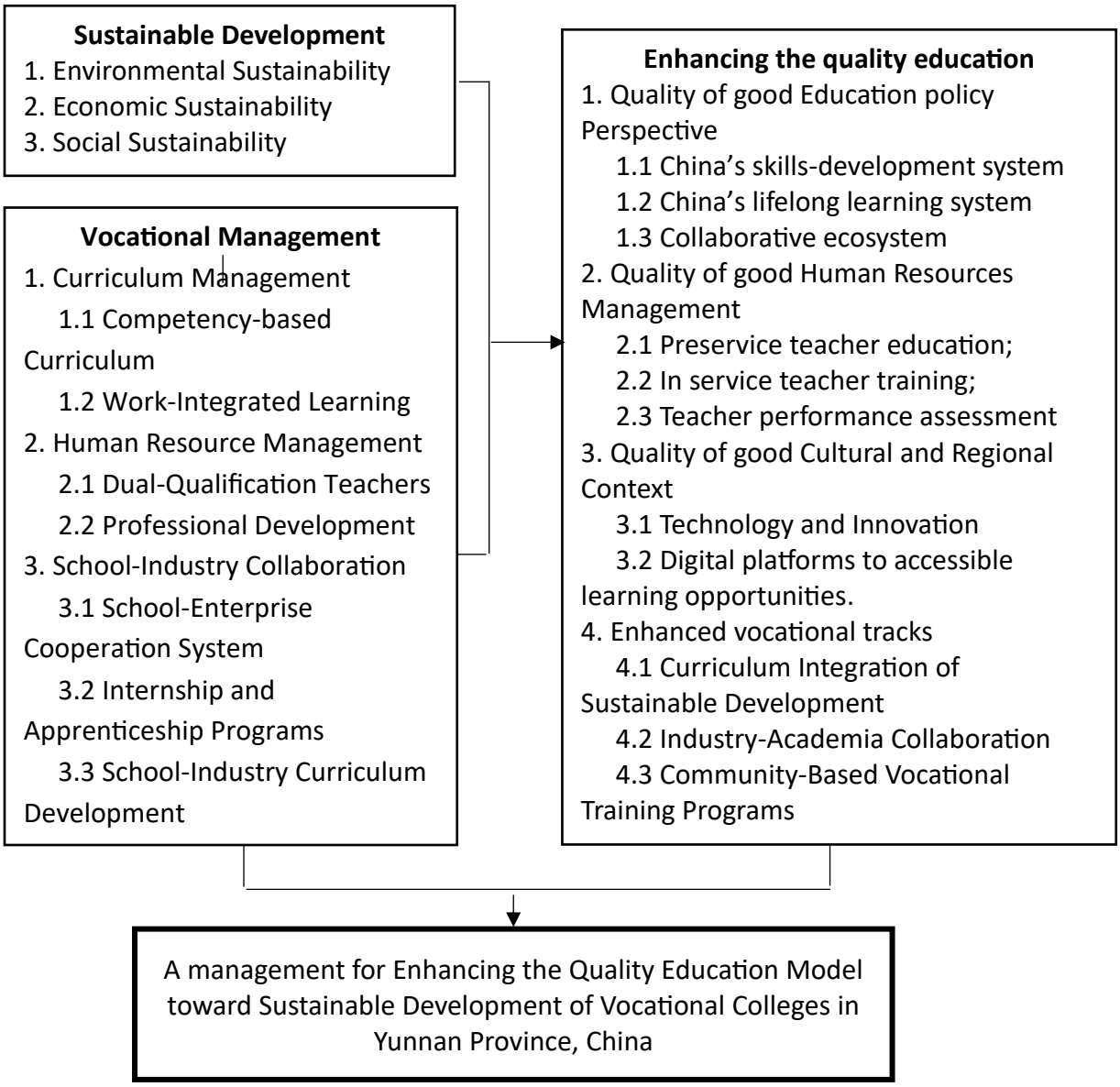

Figure 1 Conceptual Framework

Objectives

1. To study the current, desirable state and needs of management for enhancing the quality education toward Sustainable Development of Vocational Colleges in Yunnan Province, China.

2. To develop a management model for enhancing the quality education toward Sustainable Development of Vocational Colleges in Yunnan Province, China.

Methodology

Population, Sampling, Data Collection, and Data Analysis A mixed method design of quantitative and qualitative analysis is employed.

Step 1 A quantitative method design, to study the current, desirable state and identify the needs in sustainable development for enhancing quality vocational education in Yunnan Province, China as follow;

The data were collected from the group's network of Vocational College has covered Yunnan, provinces which are 6 areas and about 514 respondents, consisting of 10 education policymakers, 60 Directors of departments, 24 vocational college administrators, 60 teachers or members of vocational college, 300 students and 60 stakeholders in industry partnerships network. The research instrument used in the study was asked to complete with the five-point Likert scale. Data were analyzed using descriptive statistics (mean, standard deviation, frequency, percentage, modified priority need index (PNI modified) which shows that the sequence of PNI Modified value less than 0.20 indicates a low or non-critical need. (Witkin and Altschuld ,1995)

Step 2 The qualitative method design, to develop a model of sustainable development for enhancing quality vocational education in Yunnan Province, China, by the researcher draff the model for evaluation of the suitability and feasibility of the management model based on individual 30 expert assessments and focus group within 15 stakeholders, which present the conclusion, discussion and recommendation respectively.

Results

Table 1 Current State, Desirable State, and Needs of Management for Enhancing the Quality of Education toward Sustainable Development in Vocational Colleges in Yunnan Province, China

Management Dimension	Current State	Desirable State	PNI Modified	Priority
Overall Sustainability Dimension Management	Moderate	Highest	–	–
Economic Sustainability	Moderate	Highest	0.5991	1
Social Sustainability	Moderate	Highest	0.5265	2
Environmental Sustainability	Moderate	Highest	0.3908	3

The current and desirable states of management for enhancing the quality education toward sustainable development of Vocational Colleges in Yunnan Province, China in Sustainability Dimension Management overall view was at a moderate and highest level respectively. For the needs of

management for enhancing the quality education toward sustainable development of Vocational Colleges in Yunnan Province, China in Sustainability Dimension Management, shows that the sequence of PNI $_{Modified}$ is as follows: Economic Sustainability (PNI $_{Modified}$ =.5991), Social Sustainability (PNI $_{Modified}$ =.5265), Environmental Sustainability (PNI $_{Modified}$ =.3908) respectively. In conclusion, all three dimensions require development, with priority given to economic, followed by social, and environmental sustainability, respectively.

The Model of management for enhancing the quality education toward sustainable development of Vocational Colleges in Yunnan Province, China It consists of four parts as follows:

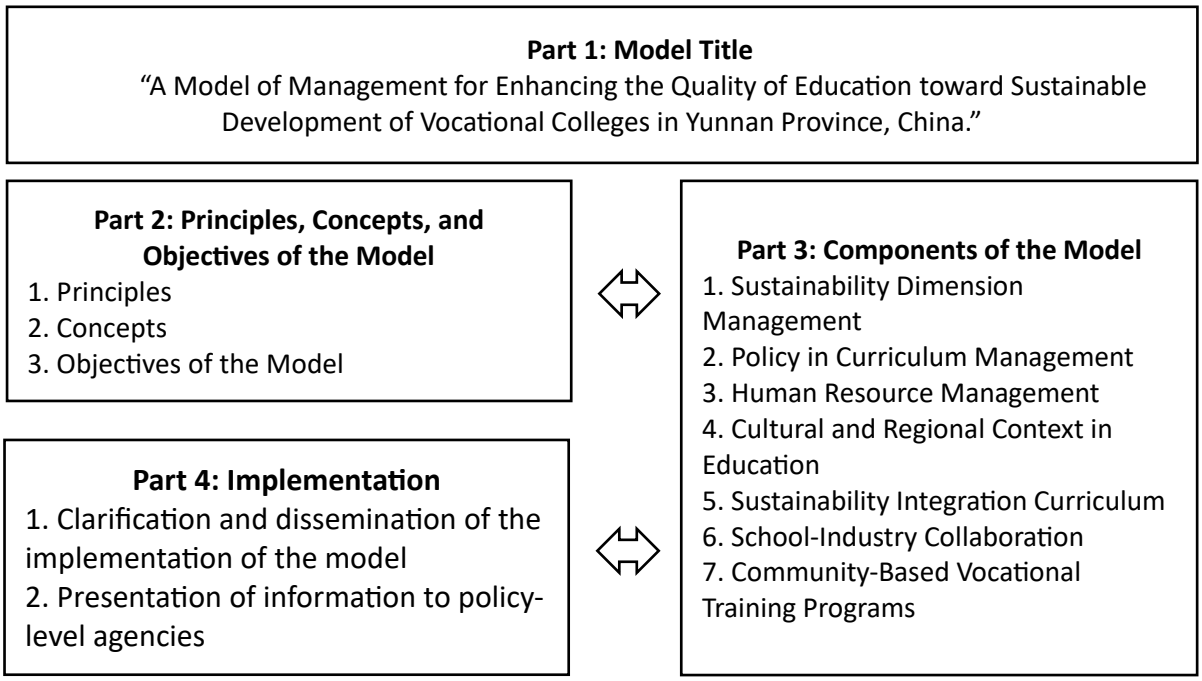

Figure 2 Model of Management

Discussion

Current State, Desirable State, and Needs for Management

The findings indicate that the current management practices of vocational colleges in Yunnan Province demonstrate moderate effectiveness in supporting quality education for sustainable development, while stakeholders expressed significantly higher expectations for the desirable state. The resulting needs assessment suggests that substantial improvements are required across strategic leadership, curriculum development, industry collaboration, digital transformation, quality assurance, and professional development. This finding is consistent with the needs assessment framework proposed by Witkin and Altschuld (1995), which emphasizes that identifying discrepancies between current and desired performance provides an evidence-based foundation for organizational improvement. The identified management needs also reflect the ongoing transformation of vocational education in China. Chen (2024) reported that Chinese higher vocational education is shifting from traditional skill training toward innovation-driven and sustainable educational systems. Similarly, the Ministry of Education (2023) has emphasized the modernization of vocational education through reforms focusing on governance, quality assurance, and industry integration. Industry

collaboration emerged as one of the highest priority needs. This result supports Zhao (2024), who argued that effective integration between education and industry is essential for improving graduates' competencies and meeting labor market demands. Likewise, Liu (2024) found that stronger cooperation between vocational institutions and industries significantly enhances students' employment competence in Yunnan Province. The increasing importance of digital transformation identified in this study is also supported by Jianling (2024), who demonstrated that digital technologies, artificial intelligence, and smart learning environments are becoming central components of modern vocational education management. UNESCO (2024) similarly emphasized that educational institutions should integrate artificial intelligence responsibly to improve teaching quality, institutional governance, and sustainable educational development. The findings regarding educational quality are consistent with Chen et al. (2022), who reported that institutional management, instructional quality, learning environments, and administrative services significantly influence student satisfaction in higher vocational education. Consequently, strengthening management systems can improve both educational quality and stakeholder satisfaction.

Development of the Management Model

Based on the identified needs, this study developed a management model designed to enhance educational quality toward sustainable development in vocational colleges. The model emphasizes strategic leadership, stakeholder participation, digital transformation, curriculum innovation, industry partnerships, quality assurance, and continuous organizational improvement. The proposed model aligns closely with international perspectives on sustainable higher education. Fodor (2021) argued that sustainable university development requires integrated governance systems that combine institutional leadership, stakeholder engagement, environmental responsibility, and continuous quality improvement. Similarly, George (2023) emphasized that higher education institutions should embed the Sustainable Development Goals (SDGs) into institutional policies, curriculum, governance, and organizational culture. The model also supports the recommendations of Fahim (2021), who demonstrated that sustainable higher education quality can be effectively improved through systematic institutional assessment, strategic planning, and continuous evaluation. Applying these principles enables vocational colleges to strengthen organizational resilience while responding to changing economic and social conditions. Another important component of the proposed model is partnership with industry and external stakeholders. Ding and Zheng (2022) concluded that educational partnerships contribute significantly to balanced and sustainable higher education development through resource sharing, collaborative innovation, and capacity building. These partnerships are particularly important for vocational education because they ensure curriculum relevance and improve graduate employability. The emphasis on employability within the proposed model is further supported by Jackson (2015), who found that work-integrated learning effectively develops graduates' employability skills when supported by strong institutional management and employer engagement. Similarly, Findeisen (2022) reported that high-quality vocational education increases students' persistence and successful transition into employment. The model also reflects international recommendations for vocational education reform. OECD (2020) emphasized that successful vocational education systems require strong governance, flexible curriculum management, employer engagement, and effective quality assurance mechanisms. Likewise, Billett (2011) argued that vocational

education should balance occupational competence with broader capabilities that enable lifelong learning and sustainable workforce development. Finally, the findings correspond with recent developments in Yunnan Province. The World Bank (2023) reported that improving vocational education is essential for expanding employment opportunities and supporting regional economic development. Yu (2025) further recommended curriculum redesign, professional development, and stronger industry partnerships as key strategies for revitalizing higher vocational education in Yunnan Province. Therefore, the management model developed in this study provides an appropriate framework for supporting sustainable educational development while addressing regional workforce needs.

Overall, the findings demonstrate that enhancing management systems is fundamental to improving educational quality and achieving sustainable development in vocational colleges. By integrating strategic leadership, quality assurance, digital innovation, industry collaboration, and stakeholder participation, vocational institutions can better respond to national education reforms and global sustainable development priorities.

Conclusion

The current states of management for enhancing the quality education toward sustainable development of Vocational Colleges in Yunnan Province, China, as the dimension of Environmental Sustainability focuses on the cultivation system of campus environmental awareness and the construction of teachers' sustainable development capabilities. Through sub items such as "Promotes awareness of environmental sustainability" and "Teachers receive training on sustainability topics", this study examines the depth of practical penetration of environmental sustainability concepts in vocational colleges. Which according with George (2023) studied Higher Education Institutions' Sustainable Development towards Agenda 2030: A Global Goals in Policy and Curriculum present to a shift in Higher Education (HE) for sustainable development towards achieving Agenda 2030 Global goals.

In conclusion, all three dimensions require development, with priority given to economic, followed by social, and environmental sustainability, respectively. Yu (2025) Revitalizing Higher Vocational Education in Yunnan, China through Curriculum Redesign, Industry Partnerships, and Professional Development Higher vocational education plays a crucial role in equipping individuals with practical skills and knowledge for successful transitions into the workforce. However, ensuring the effectiveness and relevance of higher vocational education programs requires continuous evaluation and alignment with industry needs.

Recommendations

Recommendations for Policy and Practice

1. Based on the findings, vocational colleges in Yunnan should prioritize economic sustainability, which received the lowest mean score, by strengthening school–industry partnerships, expanding work-integrated learning (WIL) and apprenticeship programs, and integrating entrepreneurship education to improve graduates' employability and economic outcomes.

2. To enhance environmental and social sustainability, institutions should embed sustainability concepts, including green skills and social responsibility, across the curriculum.

Community-based learning projects and regular teacher training on sustainability education should also be implemented to strengthen institutional and community engagement.

Contribution to the Body of Knowledge

This study contributes to the literature by providing empirical evidence on sustainability practices in vocational colleges in Yunnan Province. It highlights the need for a balanced approach to environmental, social, and economic sustainability, emphasizing that stronger industry collaboration is essential for improving economic sustainability in vocational education.

Recommendations for Future Research

Future research should employ longitudinal or comparative studies to examine sustainability practices across different regions or countries. Researchers may also investigate additional factors, such as institutional leadership, government support, innovation, and digital transformation, using mixed-methods approaches to provide deeper insights into sustainability in vocational education.

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