

The Research on Innovative Management to Enhance the Quality of Higher Vocational Colleges in Guangxi, China

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Received: November 12, 2024

Accepted: January 10, 2025

Online Published: February 10, 2025

doi:10.5539/jel.v14n4p44

URL: <https://doi.org/10.5539/jel.v14n4p44>

Abstract

This study addresses the significant challenges faced by higher vocational colleges in Guangxi, China, particularly in educational resource allocation, teaching innovation, and quality assurance. The research introduces the 3E Model, an innovative management approach that integrates three key components: Establishing a Teaching Center (ETC), Establishing a Quality System (EQS), and Establishing a Reward Mechanism (ERM). Through a mixed-method approach, combining quantitative surveys with qualitative interviews, the study evaluates the 3E Model's effectiveness in enhancing educational quality. The findings reveal significant improvements, offering a robust framework for future management reforms in higher vocational education. The paper concludes with recommendations for broader implementation, emphasizing tailored approaches to educational management.

Keywords: innovative management, model, enhance, quality, higher vocational college

1. Introduction

In recent years, the demand for skilled professionals in China has surged, driven by rapid industrialization and technological advancement. Higher vocational education plays a critical role in meeting this demand, particularly in regions like Guangxi, where economic development is closely linked to the availability of a skilled workforce. However, higher vocational colleges in Guangxi face numerous challenges that hinder their ability to provide high-quality education. These challenges include inadequate resource allocation, outdated teaching methods, and insufficient quality assurance mechanisms.

Traditional management approaches have often been insufficient in addressing these challenges, which leads to a need for innovative solutions that can effectively enhance educational quality. This research introduces the 3E Model, a novel approach to educational management in higher vocational colleges. The 3E Model focuses on three critical aspects of management which are the establishment of a Teaching Center (ETC) to optimize resource allocation, the development of a Quality System (EQS) to ensure consistent educational outcomes, and the creation of a Reward Mechanism (ERM) to motivate and incentivize faculty and staff.

This paper aims to evaluate the effectiveness of the 3E Model in improving the educational quality of higher vocational colleges in Guangxi. Through a comprehensive analysis of survey data and the development of an evaluation model, the research seeks to provide insights into how innovative management practices can be applied to overcome the challenges faced by higher vocational colleges.

2. Research Objectives

The primary objectives of this research are as follows:

- 1) To identify the problems existing in the current management of higher vocational colleges in Guangxi and put forward the recommendations for creating the model.
- 2) To create an innovative management model for higher vocational colleges which is suitable for the actual situation of Guangxi.
- 3) To evaluate the innovative management model created.

3. Literature Review

This literature review aims to sort out the research results of innovative management in improving the quality of higher vocational colleges, in order to provide useful enlightenment and suggestions for higher vocational colleges

in Guangxi.

3.1 *Innovative Management*

3.1.1 Management

Basic Concepts of Management refers to the process of coordinating resources inside and outside the organization through functions such as planning, organizing, leading, and controlling to achieve organizational goals. Fayol (1916) proposed five functions of management—planning, organizing, commanding, coordinating, and controlling—that laid the foundation for modern management science. As management theory developed, various schools of thought, including scientific management, behavioral science, and systems management, further enriched the understanding and practical approaches to management.

With the evolution of modern management theory in the 20th century, management theory underwent significant evolution, transitioning from efficiency-focused scientific management to human relations theory, and then to strategic management with a holistic view. Mintzberg's (1979) managerial roles theory emphasized the multifaceted roles of managers in information processing, decision-making, and interpersonal relationship management, which is especially important in educational management. Recently, agile management and lean management have become crucial theories in organizational management, particularly in dealing with rapid changes and uncertainties.

3.1.2 Innovation

The definition and importance of innovation is a core driver of social progress and economic development. Schumpeter (1934) was the first to propose the innovation theory, which includes the introduction of new products, the adoption of new processes, the exploration of new markets, the acquisition of new resources, and the implementation of new organizational forms. This theory laid the foundation for subsequent innovation research. Drucker (1985) further pointed out that innovation is not limited to technology but should also include innovation in management, organization, and strategy to cope with the constantly changing external environment.

The types of innovation are typically divided into incremental innovation and radical innovation. Incremental innovation refers to small improvements based on existing technologies or management models, while radical innovation involves entirely new ideas or methods. For higher vocational colleges, incremental innovation can be reflected in optimizing teaching methods and curriculum content, while radical innovation may include a complete overhaul of the school-enterprise cooperation model or the introduction of entirely new educational technologies.

3.2 *Combination of Innovation and Management (Innovative Management)*

Innovation management refers to managing through innovation to enhance organizational competitiveness and adaptability. Innovation management involves not only technological innovation but also innovation in management models, organizational structures, and business processes (Drucker, 1985). In the field of education, innovation management has become increasingly important as educational institutions need to maintain their educational quality and competitiveness in a constantly changing social and technological environment.

Innovation management is widely applied in education, including innovation in teaching models, educational management, and resource allocation. According to an OECD (2014) report, innovation management helps to improve educational quality and students' satisfaction. For example, the introduction of new teaching models such as flipped classrooms and blended learning has significantly improved teaching effectiveness and student engagement by changing traditional teaching methods through innovative management approaches.

The theoretical framework for the integration of Innovation and Management can be understood through various theoretical frameworks, including dynamic capabilities theory, organizational learning theory, and knowledge management theory. Teece (2007) stated that dynamic capabilities are reflected in an organization's ability to seize market opportunities, integrate resources, and continuously innovate. This theory is especially applicable in educational management, as educational institutions need to continuously adapt to changes in the external environment, such as technological advancements, policy changes, and market demand.

Domestic and international research status on innovation management is already well-developed, particularly in the field of corporate management, involving the cultivation of innovation culture, formulation of innovation strategies, and evaluation of innovation performance. In recent years, as education has placed more emphasis on innovation management, more research has been explored on how to improve educational quality through management innovation. Senge's (1990) theory of the learning organization, proposed in *The Fifth Discipline*, has been widely applied in educational management, emphasizing the importance of organizational learning and innovation for sustainable development.

Existing research shows that many countries and regions are exploring similar management models to improve the quality of higher vocational education. For example, in the United States, community colleges optimize resource allocation by establishing centralized teaching support centers; in Germany, the dual education model emphasizes school-enterprise cooperation to ensure students' practical skills; and in Japan, they improve education quality by establishing a strict quality assurance system. These international experiences provide valuable references for the 3E model.

These practices of innovation management provide strong support for improving the educational quality of higher vocational colleges in Guangxi and offer valuable insights for educational management innovation in other regions.

3.3 Study Variables

3.3.1 Independent Variable: Innovative Management Practices

Innovative management practices refer to the introduction of new management ideas, technologies, and methods in educational management to enhance the efficiency and effectiveness of educational organizations. These practices involve not only the optimization of educational resources but also the reform of management systems, the deepening of school-enterprise cooperation, and the innovation of educational quality assurance systems.

3.3.2 Dependent Variable: Educational Quality

Definition of educational quality refers to the effectiveness of an education system in cultivating students' knowledge, skills, and attitudes. The improvement of educational quality is reflected not only in students' academic performance but also in their employability, social adaptability, and overall competence (UNESCO, 2005).

3.3.3 Control Variables: Other Factors Affecting Educational Quality

School Size

School size can influence the efficiency of resource allocation and the complexity of management. The literature shows that large institutions typically have more resources but face greater management challenges, while smaller institutions may be more flexible but have limited resources (Hoxby, 2000).

Quality of Teacher

The educational background, teaching experience, and industry practice of teachers have a direct impact on student learning outcomes. Research shows that high-quality teachers can significantly enhance teaching quality and student learning results (Rice, 2003).

3.3.4 Analysis of Relationships Between Variables

Relationship Between Innovative Management Practices and Educational Quality

The literature generally supports the positive impact of innovative management practices on improving educational quality. For example, management system reform can enhance organizational efficiency and teacher engagement, indirectly improving teaching quality (Mintzberg, 1983). Resource allocation optimization effectively utilizes existing resources to improve students' learning experiences and outcomes (Barney, 1991). The deepening of school-enterprise cooperation directly increases students' internship and practical opportunities, enhancing their employability (Porter & Kramer, 2011). Moreover, the innovation of quality assurance systems ensures high standards of teaching through external evaluations and internal controls (Deming, 1986).

3.4 Conclusion

In this study, innovative management practices serve as the independent variables that directly impact educational quality, the dependent variable. Control variables such as school size, level of regional economic development, and teacher quality play a moderating role in this relationship. Through the in-depth analysis of these variables, this research provides theoretical support for further empirical studies and practical recommendations for implementing innovative management practices to enhance educational quality of higher vocational colleges in Guangxi.

4. Methodology

4.1 Phase I Identification of Problems and Recommendations

Study background: The study was conducted in higher vocational colleges in Guangxi, China.

Participants: The study participants consisted of 47 principals from higher vocational colleges in Guangxi, China.

Sample: The sample size was 44 principals from higher vocational colleges in Guangxi, China. The sample size

was determined by using the G*Star power program.

Sampling Technique: Simple random sampling was used to select the sample. Principals were assigned unique codes to ensure anonymity. These codes were written on slips of paper, placed in a box, mixed, and drawn until the desired sample size was reached.

Research Instrument: Questionnaires.

The questionnaires are consisted of the following three parts.

Part 1 Personal information, a multiple-choice section covering position, educational background, and work experience.

Part 2 Feasibility, appropriateness, and possibility of an innovation management approach to improve the quality of higher vocational colleges in Guangxi, China. A 5-point Likert scale was used, ranging from 1 (lowest) to 5 (highest).

Part 3 Additional Suggestions, an open-ended question.

Creation and Qualification of Research Instruments: The researcher prepared a draft questionnaire based on the information obtained from the innovation management approach. The questionnaire was then reviewed and modified by the supervisor and assessed by five experts to ensure its content validity. An Index of Item Objective Congruence (IOC) greater than 0.6 was required. The questionnaire was pretested on 30 non-sample principals to assess reliability, requiring a Cronbach's alpha coefficient greater than 0.7.

4.2 Phase II Creating the Model

Objective: Based on the findings of Phase I, the focus aimed to create an innovative management model suitable for the actual situation of higher vocational colleges in Guangxi.

The Model created contains:

Establishing a teaching center.

Establishing a quality assessment system.

Establishing a reward mechanism.

4.3 Phase III Evaluating the Model

Objective: To evaluate the innovative management model created.

Evaluation Process:

User evaluation was conducted to assess the effectiveness, appropriateness, and feasibility of the model.

Data collected through user evaluation were analyzed to gauge the model's success and areas for improvement.

These three phases collectively formed the research methodology, aimed at identifying issues, developing a solution, and evaluating its effectiveness in improving the quality of higher vocational colleges in Guangxi, China.

5. Research Findings

5.1 Investigation Results

5.1.1 Description of the Questionnaire

The questionnaire survey revealed the Perceived Need Index (PNI) for various aspects of learning management within higher vocational colleges in Guangxi, China. The highest need, as indicated by a PNI of 0.30, is for "Reform of the management system and the optimization of resource allocation." This suggests that the current management system and resource allocation are not adequately aligned with the needs of the colleges. On the other hand, the lowest need, with a PNI of 0.28, is for "School philosophy and orientation innovation." This indicates that the school's philosophical underpinnings and direction are relatively well-established and require less urgent attention.

Other areas that emerged as needing improvement include:

* Deeper integration of industry and education and cooperation between schools and enterprises.

* Innovation in teaching staff construction and incentive mechanism.

* Innovation in quality assurance and evaluation system.

* Innovation in teaching content and methods.

In terms of resource allocation, the highest need, with a PNI of 0.33, is for a balanced and reasonable allocation of

educational resources such as teachers, experimental and practical training equipment, and book resources. Conversely, the lowest need, with a PNI of 0.27, is for the school's support for key and characteristic majors being significantly greater than ordinary majors. This suggests that while there is a need for better resource allocation, the differentiation between majors is already well-handled.

Regarding the need for deepening the integration of industry and education and cooperation between schools and enterprises, the highest need, with a PNI of 0.33, is for increasing the quantity and quality of cooperation projects. This highlights the importance of enhancing partnerships with industries. The second-highest need, with a PNI of 0.30, is for enhancing students' employment competitiveness and exploring new school-enterprise cooperation modes. The lowest need, with a PNI of 0.27, is for establishing a stable long-term mechanism for school-enterprise cooperation. This suggests that while the stability of partnerships is important, it is not the primary concern.

In the area of quality assurance and evaluation system innovation, the highest need, with a PNI of 0.31, is for the feedback and improvement mechanism for teaching quality and the introduction of a diversified teaching quality evaluation mechanism. The lowest need, with a PNI of 0.27, is for the current internal quality assurance system being perfect. This indicates that while the existing system is adequate, there is a need for more robust mechanisms to ensure continuous improvement in teaching quality.

In the realm of innovation in teaching content and methods, the highest need, with a PNI of 0.31, is for the introduction of actual enterprise cases and work tasks into the teaching process. This underscores the importance of practical and industry-relevant content. The second-highest need, with a PNI of 0.30, is for the inclusion of courses or majors for emerging technology fields such as artificial intelligence and big data. The lowest need, with a PNI of 0.25, is for the introduction of "double-qualified" teachers and the commendation and reward mechanism for outstanding teachers. This suggests that while the quality of teaching staff is important, it is perceived as less urgent.

5.1.2 Findings of the Model Creation

The findings of the model creation process show that the components of the innovative management model, including the establishment of a teaching center, the establishment of a quality assessment system, and the establishment of a reward mechanism, are highly regarded by respondents. The components received high scores across all dimensions, with average scores nearing the maximum of 5. This indicates that each of these components is considered highly appropriate, feasible, and effective by the evaluators. The standard deviations (SD) are generally low, reflecting a strong consensus among respondents.

The highest scores in Appropriateness, Feasibility, and Effectiveness were achieved by several components, including:

- * "Determine the objectives and principles of the reward mechanism."
- * "Formulate the reward quota and distribution plan."
- * "Formulate the process of reward declaration, evaluation, and publicity."
- * "Adjust and optimize the reward mechanism."

These components received a perfect score of 5.00 with an SD of 0.00, indicating complete consensus among the respondents regarding their appropriateness, feasibility, and effectiveness.

The second-highest scores in terms of Appropriateness were achieved by components such as:

- * "Design the reward categories and standards."
- * "Organize the declaration and material review."
- * "Hold the review meeting and publicize the results."
- * "Check the reward performance."
- * "Adjust and optimize the reward mechanism."

These components received a score of 4.98 with an SD of 0.15, indicating a high level of appropriateness.

The lowest scores, while still indicating a high level of appropriateness, were achieved by components such as:

- * "Formulate the reward quota and distribution plan."
- * "Publish reward notices and guidelines."

These components received a score of 4.96 with an SD of 0.21, indicating a slightly lower level of appropriateness compared to other components.

In terms of Feasibility, the same components as those with the highest scores in Appropriateness also received perfect scores of 5.00 with an SD of 0.00, indicating unanimous agreement regarding their feasibility.

In terms of Effectiveness, the components “Determine the objectives and principles of the reward mechanism,” “Organize the declaration and material review,” “Hold the review meeting and publicize the results,” and “Adjust and optimize the reward mechanism” received a perfect score of 5.00 with an SD of 0.00, indicating exceptional effectiveness. The component “Design the reward categories and standards” received a slightly lower score of 4.96 with an SD of 0.21, indicating high but slightly less effectiveness compared to other components.

5.1.3 Findings of the Model Evaluation

The evaluation of the innovative management model indicates that all components are regarded as highly appropriate, feasible, and effective. The components with perfect scores, particularly in Appropriateness and Feasibility, highlight areas where there is unanimous agreement among respondents. While there are slight variations in the lowest scores, the overall consensus is that these components are very well-suited for achieving the intended outcomes. The minor differences in ratings suggest areas where certain aspects might need more attention or refinement, especially in feasibility.

The data reflects a high level of agreement across all components in Appropriateness, Feasibility, and Effectiveness. The total average scores are 4.93 for Appropriateness, 4.98 for Feasibility, and 4.97 for Effectiveness, indicating that the respondents view these components as highly suitable, feasible, and effective. The standard deviations (SD) are generally low, suggesting a strong consensus among respondents.

6. Discussion & Recommendations

6.1 Discussion of the Survey Results

The survey results suggest that the current management system and resource allocation in higher vocational colleges in Guangxi need significant reform and optimization. There is a strong consensus that the school administration should implement a flat or matrix management structure to improve decision-making efficiency and execution capability, and that there should be a balanced and reasonable allocation of educational resources. Additionally, the involvement of teachers, students, and staff in the major decision-making processes involving resource allocation is deemed necessary. The school’s investment and application in information construction, as well as the alignment of resource allocation with departmental and individual work performance, are also considered important. However, there is less emphasis on the need for innovation in school philosophy and orientation.

The findings also highlight the importance of deepening the integration of industry and education and cooperation between schools and enterprises. This includes increasing the quantity and quality of cooperation projects, enhancing students’ employment competitiveness, and exploring new school-enterprise cooperation modes. These aspects are crucial for preparing students for the workforce and ensuring their employability upon graduation.

The quality assurance and evaluation system needs to be improved, particularly in terms of the feedback and improvement mechanism for teaching quality and the introduction of a diversified teaching quality evaluation mechanism. This will help ensure that teaching quality is continuously monitored and improved, contributing to the overall educational quality of the colleges.

Innovation in teaching content and methods is also essential, as indicated by the high need for introducing actual enterprise cases and work tasks into the teaching process. This will help align the curriculum with industry needs and provide students with practical skills that are in demand in the job market.

“3E innovative management mode”, namely the establishment of teaching center (ETC), the establishment of quality system (EQS) and the establishment of incentive mechanism (ERM), reflects the comprehensive method of comprehensively improving the quality of education in vocational colleges. The educational management systems in the existing literature highlight several key aspects that are consistent with the components of the 3E model. For example, research has shown that the establishment of centralized teaching centers can improve resource allocation efficiency, improve curriculum standardization, and promote collaborative teaching practices. Similarly, studies on quality assurance systems suggest their role in maintaining high educational standards and ensuring continuous improvement through regular assessment and feedback loops. The concept of the incentive mechanism is also fully supported in the literature, and the effective incentive system is associated with the improvement of teacher motivation, the innovation of teaching methods, and the improvement of the overall education quality.

To enhance the study, authors should incorporate comparative insights from other regions or backgrounds and

expand stakeholder involvement to provide a more comprehensive perspective. For example, consider broader exchanges and collaboration with stakeholders such as business representatives, industry experts, education policy makers, and students' parents in order to obtain more diverse opinions and suggestions.

6.2 Recommendations for the Model Creation

Based on the findings, it is recommended that the model creation process should focus on establishing a teaching center, a quality assessment system, and a reward mechanism. The teaching center should be designed to improve the efficiency of resource allocation and standardize course settings. The quality assessment system should include a comprehensive framework for monitoring and evaluating educational quality, ensuring that the assessment methods and procedures are clear and standardized. The reward mechanism should be structured to incentivize teachers to engage in teaching innovations and to align the school's salary system with teaching quality, research achievements, and social services.

6.3 Recommendations for the Model Evaluation

To ensure the continuous improvement of the model, it is recommended that the school regularly update the assessment indicators and involve stakeholders in the evaluation process. The feedback mechanism for teaching quality should be strengthened, and the school should actively participate in various education quality certifications. Regular internal quality self-diagnosis and improvement work should be conducted, and the school should focus on the introduction of "double-qualified" teachers with industry backgrounds and practical experience. Special incentive policies or programs should be developed to support teachers with excellent teaching quality.

7. Conclusion

In conclusion, the investigation results have highlighted the critical need for reforms in the management system and resource allocation in higher vocational colleges in Guangxi. The innovative management model, comprising the establishment of a teaching center, a quality assessment system, and a reward mechanism, has been well-received and deemed highly appropriate, feasible, and effective. The findings and recommendations provided in this study offer valuable insights for enhancing the quality of higher vocational education in Guangxi and serve as a foundation for future improvements in the region.

Exploring the scalability and adaptability of the model especially using digital tools will enhance its future relevance and impact. For example, the introduction of online learning platforms, virtual laboratories, and data analysis tools to improve teaching efficiency and quality could be considered. In addition, the real-time monitoring and feedback of teaching quality can also be realized through digital means to further improve the level of education management.

Acknowledgments

Complete the process of "innovating management and improving the quality of Guangxi higher vocational colleges" is a process full of challenges and harvest. Along the way, I got the selfless support and encouragement from all sides. Here, I am very grateful to all the gratitude for my help and encouragement. First of all, I express my heartfelt thanks to my two mentors, professors. Dr. Winnai Tomplam and Pro. Dr. Saman Asawapoom. With his profound academic attainments and rigorous academic attitude, Dr. Winnai Tomplam guided me to establish a research framework and promoted me to deeply explore the application of innovative management in higher vocational colleges in Guangxi. Pro. Dr. Saman Asawapoom, with his broad vision and passion for education, provided multidimensional insights into my research and helped me broaden the boundaries of my thinking. The wisdom, patience and care of these two mentors are the cornerstone of this difficult task.

I also want to respect my university. Here, I received a high-quality education, met a group of like-minded partners, and more importantly, I felt a strong academic atmosphere and a spirit of excellence. The resources and platforms provided by my Alma mater provide a solid support for my research work, allowing me to sail freely in the ocean of academic studies.

Besides, I also want to thank my friends. On the road of scientific research, your company and understanding makes me feel warm and happy. Whether it's a late-night academic discussion or a little sharing of everyday life, your presence fills the journey with laughter and memories.

Authors' contributions

The authors (Weijun Qin) were responsible for the design of the study, data collection, and revision. Pro. Dr. Winai Thongpuban and Prof. Dr. Saman Asawapoom, help guide me on revision. All authors read and approved the final manuscript. I have been a major contributor to this article.

Funding

Not applicable.

Competing interests

The authors declare that they have known competing personal relationships.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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