ENHANCING HIGHER EDUCATION MANAGEMENT INNOVATION WITH DIGITALIZATION: THE CASE OF HIGHER EDUCATION INSTITUTES OF GUANGXI, CHINA

Hongbo ZHOU[1] and Li RENLIANG[1]

1 National Institute of Development Administration, Thailand;
hongbo.zho@stu.nida.ac.th (H. Z.); li.renliang@nida.ac.th (L. R.)

Abstract

The research aims to explore the education management innovation, analyze the mechanisms by which these factors impact university management, and propose strategies for improving management practices. The research identifies two main categories of factors affecting management innovation: external factors, including policy support, training mechanisms, and evaluation systems, and internal factors, such as innovations in teaching models, school management practices, and digital technology implementation. The study also examines the mechanisms by which these factors influence management innovation. Policy support drives the development of innovative practices, while training and evaluation systems motivate faculty and staff, shaping the direction of innovation. The interplay between these elements facilitates the attainment of educational goals by improving teaching models, applying digital technologies, and optimizing resource allocation. Based on the findings, the study proposes strategies for enhancing educational management innovation in Chinese universities. Strengthening internal capabilities, optimizing resource allocation, expanding external collaborations, and leveraging innovation to enhance competitive advantages.
Keywords: Educational Management Innovation, Digitalization, Strategy, University

Introduction

In an era marked by rapid technological advancements and the growing complexities of societal demands, higher education management must evolve to address an increasingly dynamic set of challenges. The intersection of the knowledge economy, the information age, and the forces of globalization has reshaped the landscape of higher education, setting new expectations for the cultivation of talent and the efficiency of educational institutions (Sakdapat, 2024). Universities are no longer simply tasked with imparting knowledge; they are now expected to foster critical thinking, encourage innovation, and produce globally competitive graduates (Wattanavit & Sakdapat, 2024). Simultaneously, they must implement flexible and efficient management systems that can adapt to these shifting demands.

This research addresses a significant and timely gap by investigating the innovation of education management in the universities of Guangxi, China, under the influence of digital transformation. Unlike previous studies that focus broadly on education management or digital tools, this study homes in on the specific regional context of Guangxi and seeks to explore how universities in this province can leverage digital technologies to meet the needs of modern education. By doing so, it identifies pathways and mechanisms for innovative management practices that can improve the quality of higher education and support the cultivation of graduates equipped with both creative problem-solving skills and practical capabilities.

Digital technologies have emerged as a critical driver of innovation across sectors, and education is no exception (Janthapassa et al., 2024). On the administrative side, digital management systems enable universities to streamline operations, improve communication, and enhance decision-making processes. On the educational side, digital tools are revolutionizing how knowledge is delivered and consumed. Personalized learning platforms allow students to tailor their educational experiences to their individual needs, while virtual classrooms and online resources facilitate access to knowledge beyond traditional classroom settings. Through these tools, educators can better understand students' learning patterns, adapt teaching methods in real-time, and create more engaging, interactive learning environments.

However, while the adoption of digital tools is essential, their mere presence does not automatically translate to innovation. The true potential of digital technologies lies in how they are integrated into the broader educational management system. This study uniquely contributes to the field by not only examining the impact of digital tools but also analyzing how these technologies can be strategically embedded into the governance, operational workflows, and cultural practices of universities. The research posits that universities must go beyond simply adopting technology—they must reimagine their management processes to fully capitalize on the opportunities that digital tools provide.

The research recognizes the critical role of external and internal factors in shaping the success of educational management innovation. Policy support, training mechanisms, and evaluation systems serve as foundational elements that either facilitate or hinder the adoption of innovative practices. Government policies, for instance, provide essential financial resources and strategic direction that guide universities in their digital transformation efforts. Likewise, continuous training for faculty and administrators is necessary to build the skills and mindsets required to lead in a digital age. Evaluation systems, when properly designed, not only assess the effectiveness of these innovations but also serve as a motivational tool, driving continuous improvement.

This study is further distinguished by its focus on the specific regional and cultural context of Guangxi. Universities in this region face unique challenges and opportunities due to their geographic location, socio-economic conditions, and interactions with national and local government policies. By grounding the research in this specific context, the study provides

valuable insights into how regional universities can innovate in ways that are tailored to their circumstances, while also contributing to the broader discourse on higher education management in China.

All in all, this research positions digital management as a critical requirement for modern higher education institutions. It explores not only the potential of digital tools but also the strategic integration of these technologies into the entire educational management process. By analyzing both the external factors (such as policy and training) and the internal mechanisms (such as management practices and digital adoption) that drive innovation, the study offers a comprehensive framework for enhancing educational management in Chinese universities. The findings will not only be relevant to universities in Guangxi but will also provide broader implications for the ongoing digital transformation of higher education in China and globally.

Research Objectives

1) To explore the causes that affect the improvement of educational management innovation in universities in Guangxi.

2) To analyze the mechanism by which the above causes affect the management innovation of Guangxi universities.

3) To propose Strategies for enhancing educational management innovation at universities in Guangxi based on the causes and mechanisms that affect the improvement of educational management innovation in universities in Guangxi.

Literature Reviews

The research paper reviewed main theories related to educational management, including educational management theory, scientific management theory, interpersonal relationship theory, system theory, contingency theory, reform theory, innovation theory or concept and reviewed previous research works, including university management mode in the digital age, framework of traditional higher education management system, educational management innovation and other related research.

Du (2022) points out that technology has been a key force in reshaping the structure of higher education systems over the past two centuries, continuously driving innovation and development. In the digital age, with digital technologies at its core, the rapid development and widespread application of these technologies have profoundly transformed how people live, work, and learn. Information is now transmitted quickly and conveniently, allowing people to access and share a vast array of information more easily. Digital tools and multimedia computing are being widely used across various fields, promoting rapid social development. In the digital age, university management models have also undergone corresponding changes. Traditional management methods are no longer sufficient to meet the needs of modern universities, so they have begun adopting digital management methods to achieve more efficient, precise, and convenient administration.

Xie (2023) argues that university management digitization spans historical, present, and future perspectives, maintaining the unity of history and logic. It is important to clarify the relationship between digitization, digitalization, and intelligence. Some scholars argue that informatization is the overarching concept, with intelligence being a stage of informatization, while digitalization serves as the technological support for both.

Li (2024) points out that in recent years, the impact of information technology has propelled human society forward, significantly affecting politics, economics, and society. The wave of informatization in the education sector is mainly due to the advancement of computer, internet, digital, and intelligent technologies, which have constantly influenced and reshaped higher education governance, transitioning it from the industrial to the information age.

Hu & Zhang (2024) discusses how digital governance theory is applied in university governance, including integrating modern information technologies such as big data, cloud

computing, and blockchain for control, coordination, and management of university affairs. For instance, universities can integrate and process data, turning it into valuable assets, by collecting student data to create personalized development plans, dynamically monitoring teaching situations to improve teaching effectiveness, and reforming education evaluation systems. Overall, the transformation based on digital governance can shift university management from a broad to a refined governance model, modernizing the governance system and capacity. This shift involves two aspects: from the perspective of activity theory, analyzing the process of educational data governance in universities can help understand behavior. From the perspective of internal logic, digital resources, cybersecurity, data literacy, infrastructure, application services, and support systems are viewed as the core elements of big data governance in universities, and exploring these elements can offer optimized pathways for constructing university data governance systems.

Conceptual Framework

According to the main theories and previous research mentioned in the literature review combined with the research objectives, the conceptual framework was drawn as follows:
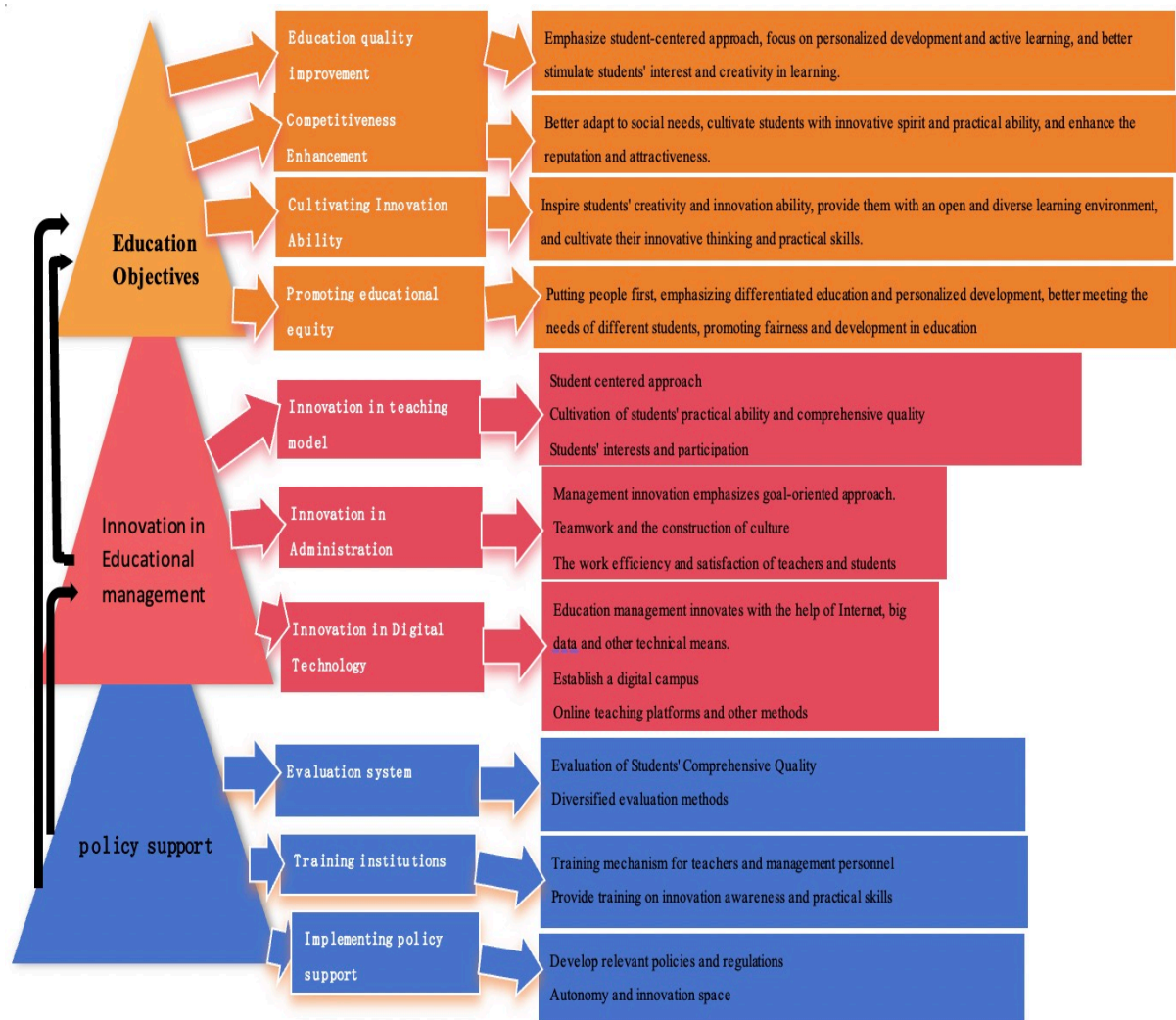

Figure 1 Education Management Innovation Conceptual Framework

Research Methodology

This study employs a qualitative research approach, utilizing three primary methods: documentary research, in-depth interviews, and focus group discussions. The methodology is

designed to explore the complexities of educational management innovation in universities within Guangxi, China, in the context of digital transformation.

Documentary Research

A comprehensive review of existing literature and documents was conducted to gather foundational knowledge and context. The sources included journals and articles on educational management and innovation, annual reports from the Guangxi Education Department, university reports detailing student performance evaluation, and university rankings. This documentary research provided an extensive background and theoretical framework for the study, offering insights into current practices and challenges in educational management.

In-Depth Interviews

Semi-structured in-depth interviews were employed as the primary data collection tool to gather nuanced perspectives from key informants. A combination of purposive sampling and snowball sampling techniques was used to identify and select participants. The interviews involved 36 key informants from three universities, including senior leaders (4 per university), teachers (4 per university), and students (4 per university). This approach allowed for a rich and diverse set of data, capturing insights from multiple stakeholder groups within each institution. The interviews aimed to explore the current state of educational management, challenges, and potential areas for innovation.

To facilitate these interviews, the researcher coordinated with university administrators, who then recommended qualified participants. Interviews were conducted in environments conducive to open discussion, such as offices for administrative staff and teachers, or more informal settings like cafes or lawns for students. Each session lasted approximately 45 minutes and was recorded with the participants' consent to ensure an accurate capture of their responses.

Focus Group Discussions

Following the in-depth interviews, focus group discussions were conducted to further validate and expand upon the findings. The focus groups included top leaders and teacher representatives from the three universities, totaling nine participants (three managers and teacher representatives from each university). These discussions employed brainstorming techniques to generate strategies for enhancing educational management innovation, fostering a collaborative environment to identify actionable solutions.

Data Collection and Analysis Process

Data Collection: The interviews and focus groups were meticulously transcribed verbatim to ensure that both verbal and non-verbal cues were captured, providing a comprehensive dataset for analysis. The transcriptions were organized systematically, ensuring that the views and emotions of participants were preserved accurately.

Data Saturation: Throughout the process, data saturation was monitored to determine when no new information or themes were emerging from additional interviews. This point of saturation indicated that sufficient data had been collected to draw meaningful conclusions about the research questions.

Inductive and Deductive Analysis: The analysis followed a structured process involving both inductive and deductive reasoning. Inductive reasoning was used to identify patterns and themes from the data, moving from specific observations to broader generalizations. Deductive reasoning complemented this by applying theoretical frameworks to interpret the findings in relation to existing knowledge.

Analysis and Synthesis: Using NVivo software, the research team organized the data into project folders categorized by universities, interviewee roles (administrators, teachers, students), and thematic elements. The data was then classified according to the research objectives, facilitating a comprehensive analysis. This process involved coding the data,

identifying key themes, and synthesizing the findings to construct a holistic understanding of educational management innovation in the context of digital transformation.

Validation: Focus group discussions served as a platform for validating the findings from the interviews. By engaging participants in a collaborative dialogue, the research aimed to ensure the credibility and reliability of the proposed strategies for enhancing educational management.

Through this multi-method qualitative approach, the study provides a deep and contextually grounded understanding of the current status and challenges of higher education management in Guangxi in the digital age. By integrating documentary research, in-depth interviews, and focus group discussions, the research offers a robust analysis of the factors and mechanisms influencing management innovation in universities, leading to the formulation of strategic recommendations for digital-era educational management.

Research Results
The Causes that Affect the Improvement of Educational Management Innovation in Universities in Guangxi

The factors affecting enhancement of education management innovation in universities in Guangxi in the digital era are analyzed, mainly from two aspects.

Firstly, among the three important external factors of policy support, training mechanisms, and evaluation systems, there are certain differences in the implementation of Guangxi universities. In terms of policy support, Guangxi universities benefit from the strong support of the national and local governments, and the formulation of relevant policies, regulations, and plans provides clear guidance and support for the development of universities. However, the implementation of autonomy and innovation space in universities is poor, and respondents believe that the government should grant more autonomy to stimulate the innovation and flexibility of universities. In terms of training mechanisms, Guangxi universities have achieved significant results in the regular training of teachers and administrative personnel, but the training of innovative consciousness and practical ability still needs to be strengthened, and respondents expect to see more problem-oriented and practice-based training activities. As for the evaluation system, Guangxi universities have done relatively well in the comprehensive quality evaluation of students and have been widely recognized, but there are still deficiencies in diversified evaluation methods, such as single evaluation methods, lack of innovation and practical evaluation, which are the areas that respondents expect to be improved. Guangxi universities have a certain foundation in policy support, training mechanisms, and evaluation systems, but they still need to be continuously improved and optimized to meet the changes in educational development and social needs.

Secondly, regarding the key internal factor of educational management innovation, Guangxi universities exhibit varying implementation statuses in the areas of teaching model innovation, school management innovation, and digital technology innovation. In terms of teaching models, Guangxi universities have successfully implemented student-centered innovations, significantly enhancing students' practical abilities and overall quality. However, there is still room for improvement in stimulating students' interest and participation, such as optimizing curriculum design to increase its appeal. On the administration level, Guangxi universities have effectively adopted a goal-oriented approach and have promoted overall development through team collaboration and the construction of school culture. Yet, the work efficiency and satisfaction of teachers and students need to be enhanced, especially by paying more attention to the voices of students and teachers and optimizing resource allocation. In the field of digital technology innovation, Guangxi universities have successfully established digital campuses and online teaching platforms, greatly improving management efficiency

and teaching quality. Nevertheless, there is a clear deficiency in the depth of innovation in educational management using the internet, big data, and other technological means, as well as in enhancing management transparency and advancing the modernization of education. In summary, while Guangxi universities have made significant progress in educational management innovation, they still need to continue their efforts in stimulating students' interest, improving the satisfaction of teachers and students, and deeply integrating digital technology.

The Mechanism by Which above Causes Affect the Management Innovation of Guangxi Universities

Policy support, training mechanisms, and evaluation systems have exerted a profound influence on the innovation of educational management in Guangxi universities. Firstly, policy support has provided directional guidance and implementation pathways for educational management innovation, solidifying the foundation of innovative practices through multifaceted support in resources such as funding and talent.

Secondly, training mechanisms have stimulated the innovative drive of teachers and administrative staff through professional training. These mechanisms not only provide them with the latest educational concepts and management methods but also optimize the innovative environment and foster a culture that encourages innovation.

Thirdly, the evaluation system has played a crucial role by clarifying the direction and objectives of innovation. By establishing scientifically sound assessment indicators and standards, the evaluation system serves an incentive function to promptly identify and promote the rectification of issues within the innovation process, providing the necessary operational safeguard for the innovation in educational management.

Together, these three elements - policy support, training mechanisms, and evaluation systems - have propelled the continuous advancement of educational management innovation in Guangxi universities, demonstrating their unique charm.

The impact of educational management innovation on educational goals is mainly reflected in three aspects.

Firstly, the innovation of teaching models has significantly improved the quality of education. By implementing student-centered teaching strategies and adopting interactive learning methods such as project-based learning and case teaching, students' learning interest and creativity are effectively stimulated. This innovation not only improves students' practical and problem-solving abilities but also promotes their comprehensive and diversified development.

Secondly, the introduction of digital technology innovation has promoted the modernization of education. Digital education methods such as online courses and virtual laboratories have made teaching no longer restricted by geography and time, thereby broadening the coverage of education and improving fairness. At the same time, intelligent teaching systems have improved learning efficiency, while real-time online interactions have strengthened communication between teachers and students.

Finally, educational management innovation has also played a positive role in promoting educational equity. Through the government's policy guidance and the active response of colleges and universities, educational resources have been more reasonably allocated, and educational opportunities for weak areas and disadvantaged groups have been improved. In addition, the diversified evaluation system and the improvement of teachers' professional quality have further promoted the realization of educational equity.

In general, innovation in educational management has comprehensively promoted the realization of educational goals through the improvement of teaching models, the application of digital technology, and the optimization of resource allocation.

The impact of policy support on education goals is mainly reflected in four aspects.

1) The formulation of policies and regulations has laid the foundation for improving education quality. It not only clarifies the goals and directions of higher education but also optimizes resource allocation and establishes a scientific teaching quality evaluation system.

2) The implementation of policies gives schools and educational institutions autonomy and innovation space, enabling them to adjust education strategies more flexibly to meet the personalized development needs of students.

3) Through systematic professional knowledge training, the government helps teachers and administrators improve their innovation awareness and practical ability, to provide high-quality and up-to-date education.

4) The establishment of a scientific evaluation system not only supervises all aspects of teaching quality and education management but also encourages schools and educational institutions to show their characteristics and advantages and promotes their continuous innovation and improvement.

These four aspects of policy support work together to ensure the realization of education goals and promote sustainable development and improvement of education.

Strategies for Enhancing Educational Management Innovation at Universities in Guangxi Based on the Causes and Mechanisms that Affect the Improvement of Educational Management Innovation in Universities in Guangxi

Ideas for improving the innovation of education management in Guangxi universities in China

Through SWOT analysis, researchers proposed a series of precise development strategies to help Guangxi universities play to their strengths and avoid weaknesses in education management innovation, seize opportunities and effectively respond to threats.

WT adopts the strategy of avoiding disadvantages and avoiding threats. Management innovation in Guangxi universities should be committed to "strengthening internal capabilities and responding to external challenges". Five major strategies were selected.

1) Strengthen communication with superiors and establish a flexible adjustment mechanism for innovation projects to respond to policy changes.

2) Set up innovation training courses to encourage teachers and students to participate in domestic and international exchanges and enhance innovation awareness and practical ability.

3) Improve the comprehensive quality evaluation system and introduce multiple evaluation methods.

4) Innovate teaching methods, enhance teacher-student interaction, set up innovation project funds, and increase student interest and participation.

5) Increase investment in education management information systems, master new technologies, and establish data security and privacy protection mechanisms.

These strategies jointly help Guangxi universities strengthen internal capabilities and effectively respond to external challenges.

ST adopts the strategy of taking advantage and responding to challenges. Management innovation of Guangxi universities should be committed to "optimizing resource allocation and consolidating advantageous position" to use their own advantages to respond to external challenges.

1) Universities should strengthen policy and legal support, make full use of policy resources of the national and local governments, optimize the innovation environment, and provide stable legal and policy guarantees for educational innovation.

2) By comprehensively promoting innovative teaching models, such as project-based learning and flipped classrooms, and establishing an incentive mechanism for teaching innovation, international exchanges and cooperation should be strengthened to improve the quality of education and international competitiveness.

3) Universities should deepen the construction of digital campuses, increase investment in improving infrastructure, optimize management processes, improve management efficiency and service levels, and create a convenient and efficient learning and living environment for teachers and students.

4) By improving the comprehensive quality evaluation system, focusing on the comprehensive development needs of students, strengthening cooperation with enterprises and industries, and attaching importance to innovation and entrepreneurship education, students' practical ability and comprehensive quality can be improved, and their employment competitiveness and future development potential can be enhanced.

OW adopts the strategy of seizing opportunities and making up for disadvantages. Management innovation of Guangxi universities should be committed to "expanding external cooperation and making up for internal deficiencies".

1) By deepening school-enterprise cooperation, establishing practical teaching bases, and introducing actual enterprise projects and resources, more practical opportunities are provided for students to make up for the disadvantages in practical teaching.

2) Universities seize the opportunity of global educational resource sharing, cooperate with high-level foreign universities, introduce advanced educational concepts, teaching methods and curriculum resources to improve their own internationalization level and cultivate students' international vision.

3) In response to the society's demand for high-quality education, Guangxi universities cooperate with local governments and social organizations to carry out social service projects, enhance their ability to serve the society through these projects, and enhance students' social responsibility and practical ability.

4) Taking advantage of the opportunities of technological development, universities cooperate with technology companies to develop intelligent education management platforms and teaching tools to improve education management efficiency and optimize the allocation of teaching resources.

SO adopts the strategy of taking advantage and seizing opportunities. Management innovation of Guangxi universities is committed to "innovation-driven development and achieving advantage expansion". To achieve this goal, universities make full use of their own advantages and seize opportunities in the education market.

1) Take advantage of the advantages of formulating relevant policies and regulations, actively strive for and make full use of opportunities for policy support to improve teaching conditions, improve teachers' treatment, and consolidate their dominant position in the education market.

2) Take advantage of the training mechanism for teachers and administrators, combine the opportunities of rapid technological development, improve teaching and management levels, and maintain a leading position.

3) Take advantage of the evaluation of students' comprehensive qualities, seize the opportunities of global educational resource sharing, introduce internationally advanced educational concepts and methods, and enhance international competitiveness.

4) By deepening the reform of the teaching model with students as the main body, meet the social demand for high-quality education, and enhance social reputation and influence.

5) Strengthen the construction of digital campuses, take advantage of the opportunities of rapid technological development and global educational resource sharing, and realize educational modernization and international development.

Conclusion and Discussion

In terms of external factors, universities have received strong government support through policies and regulations that guide development. However, they lack autonomy and

innovation space, which needs improvement. The regular training of teachers and administrators has been successful, but training in innovation awareness and practical abilities requires strengthening. While the evaluation of students' comprehensive qualities is widely recognized, evaluation methods should be diversified to increase innovative and practical assessments. Regarding internal management innovation, Guangxi universities have made breakthroughs in teaching models, school management, and digital technology, with the student-centered approach significantly improving student abilities. Nonetheless, efforts are needed to stimulate student interest and participation, enhance work efficiency and satisfaction of teachers and students. The construction of digital campuses and online platforms has achieved results, but deficiencies remain in utilizing the internet, big data, and other technologies to deeply innovate education management, improve transparency, and promote educational modernization. Overall, Guangxi universities must continue optimizing external support and internal management to meet educational development and societal needs.

There is a close interconnection between policy support, educational management innovation, and educational goals in universities. Policy support promotes the development of educational management innovation, which in turn affects the realization of educational goals. These three factors complement each other, jointly driving continuous progress and improvement of university management innovation in the digital era.

Through a SWOT analysis of ideas to enhance educational management innovation at Guangxi universities, their strengths, weaknesses, opportunities, and threats were identified. Based on this, a series of targeted development strategies were proposed. These strategies aim to leverage Guangxi universities' advantages, seize market opportunities, address internal weaknesses, and respond to external threats. Implementing these strategies is expected to help Guangxi universities stand out amid fierce market competition and achieve sustainable, stable development. Simultaneously, these strategies provide useful references for similar universities.

Guangxi universities must continually adjust and optimize their strategies to adapt to the evolving market environment and international educational needs. There is an ongoing, dynamic interplay between policy support facilitating management innovation and innovation impacting the achievement of educational objectives. Maintaining this synergy through strategic realignment will be crucial for Guangxi universities' future development and progress.

The study identified two major factors affecting the enhancement of educational management innovation in Guangxi universities during the digital age: policy support and educational management innovation.

Policy Support: This includes external factors such as the implementation of relevant policies, training mechanisms, and evaluation systems. Policy implementation consists of formulating policies and regulations, granting autonomy, and fostering innovation. Training mechanisms include teacher and administrative staff training, emphasizing innovation awareness and practical skills. Evaluation systems cover student comprehensive quality assessments and the diversification of evaluation methods. The study's findings align with previous theories discussed in Chapter 2, showing consistency with earlier research.

Policy Implementation: Theoretical foundations from the literature review support the importance of policy implementation. For example, Bolton & Nie (2010) highlight the role of multiple stakeholders, including governments and schools, in education governance, which aligns with the significance of government roles in policy support.

Training Mechanisms: Teacher and administrative training are crucial for improving educational management capabilities, but more focus on innovation training is needed.

Frederick Taylor's scientific management theory emphasizes the importance of worker (in this case, teacher) training, consistent with the study's conclusions.

Evaluation Systems: While student comprehensive quality assessments were found to be well implemented, there is a need to improve the diversity of evaluation methods. Educational quality evaluation theory supports the idea that diversified evaluation systems are necessary to enhance educational outcomes.

Educational Management Innovation: This includes three aspects: teaching model innovation, school management innovation, and digital technology innovation.

Teaching Model Innovation: Emphasizes student-centered learning, practical skills development, and engagement. Educational leadership theory, such as Jonathan's transformational leadership theory, aligns with the need for leaders to drive teaching model innovations.

University Management Innovation: Focuses on goal orientation, teamwork, and the development of school culture, enhancing the efficiency and satisfaction of both teachers and students. Scientific management theory and systems theory provide a theoretical basis for systematic school management innovation.

Digital Technology Innovation: Involves leveraging the internet, big data, and other technologies to improve management efficiency and transparency. The literature supports the conclusion that digital technology can significantly enhance educational management.

In conclusion, the study underscores the importance of digitalization as a key factor in educational management innovation, both as an enabler and a content area for innovation. Artificial intelligence and other digital tools were highlighted as essential for making educational management more feasible and effective.

The most important theoretical contribution of this study is that it emphasizes digitalization as a key factor in the innovation of educational management, both as a tool for enabling innovation and as an integral component of the innovation process itself. Artificial intelligence and other digital technologies are highlighted as essential drivers for making educational management innovation more feasible and effective.

Practical significance: Through in-depth interviews and focus groups, the study identified the strengths and weaknesses of higher education management innovation in Guangxi. A SWOT analysis was used to suggest actionable strategies for leveraging opportunities and addressing challenges.

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