DEVELOPMENT OF THE EVALUATION INDICATOR SYSTEM FOR THE EDUCATIONAL QUALITY OF APPLICATION-ORIENTED UNDERGRADUATE COLLEGES IN GUANGXI

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Thesis Title Development of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi

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ABSTRACT

This study aimed to 1) examine the current status of educational quality evaluation in application-oriented undergraduate colleges in Guangxi, 2) develop an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi, and 3) examine the system's feasibility and adaptability. A mixed-methods approach was employed, combining quantitative methods (questionnaires) with qualitative techniques (document analysis, in-depth interviews, focus group discussions, and the Delphi method). Data were collected from 661 stakeholders, including teachers, administrators, and teaching supervisors.

The findings revealed that: 1) The overall educational quality in Guangxi's application-oriented undergraduate colleges was moderate. Among the four dimensions (context, input, process, and output), the input dimension performed best, particularly in infrastructure and faculty development. In contrast, the output dimension was weakest, especially in graduate readiness and alignment with labour market needs, highlighting the necessity for a more outcome-oriented evaluation framework. 2) The evaluation system was developed through expert consultation and refined via the Delphi method. The final model comprised six first-level, 17 second-level, and 50 third-level indicators, encompassing the educational environment, development level, investment level, teacher level, school quality, and student quality. The system emphasises student-centredness, contextual

relevance, and practical applicability. 3) Expert evaluations confirmed its high feasibility and adaptability, with mean scores of 4.33 and 4.15, respectively, indicating strong consensus. These findings affirm the system's scientific rigour and practical utility as a tool for institutional assessment, policy development, and continuous quality improvement in application-oriented higher education in Guangxi.

Keywords: Evaluation Indicator System, Educational Quality, Application-Oriented Undergraduate Colleges, Feasibility and Adaptability

ชื่อเรื่อง	**การพัฒนาระบบตัวบ่งชี้การประเมินคุณภาพการศึกษาของมหาวิทยาลัยสายปฏิบัติการระดับปริญญาตรีในเขตปกครองกว่างซี**
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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อ 1) ศึกษาสถานภาพปัจจุบันของการประเมินคุณภาพการศึกษาในวิทยาลัยระดับปริญญาตรีเชิงปฏิบัติในเขตปกครองตนเองกว่างซี 2) พัฒนาระบบตัวบ่งชี้การประเมินคุณภาพการศึกษาในสถาบันดังกล่าว และ 3) ตรวจสอบความเป็นไปได้และความสามารถในการปรับใช้ของระบบตัวบ่งชี้ดังกล่าว การวิจัยใช้ระเบียบวิธีแบบผสมผสาน โดยประยุกต์วิธีการเชิงปริมาณ (แบบสอบถาม) ร่วมกับวิธีการเชิงคุณภาพ (การวิเคราะห์เอกสาร การสัมภาษณ์เชิงลึก การสนทนากลุ่ม และเทคนิคเดลฟาย) กลุ่มข้อมูลประกอบด้วยผู้มีส่วนได้ส่วนเสียจำนวน 661 คน ได้แก่ คณาจารย์ ผู้บริหาร และผู้ตรวจการสอน

ผลการวิจัยพบว่า 1) คุณภาพการศึกษาโดยรวมของวิทยาลัยระดับปริญญาตรีเชิงปฏิบัติในกว่างซีอยู่ในระดับปานกลาง โดยมิติด้านปัจจัยนำเข้ามีผลการดำเนินงานดีที่สุด โดยเฉพาะด้านโครงสร้างพื้นฐานและการพัฒนาคณาจารย์ ขณะที่มิติด้านผลลัพธ์ต่ำที่สุด โดยเฉพาะความพร้อมของบัณฑิตและความสอดคล้องกับความต้องการของตลาดแรงงาน สะท้อนถึงความจำเป็นในการพัฒนากรอบการประเมินที่มุ่งเน้นผลลัพธ์มากขึ้น 2) ระบบการประเมินได้รับการพัฒนาผ่านการปรึกษาผู้เชี่ยวชาญและปรับปรุงด้วยเทคนิคเดลฟาย จนได้แบบจำลองขั้นสุดท้ายซึ่งประกอบด้วยตัวบ่งชี้ระดับที่ 1 จำนวน 6 ตัวบ่งชี้, ระดับ 2 จำนวน 17 ตัวบ่งชี้ และระดับที่ 3 จำนวน 50 ตัวบ่งชี้ ครอบคลุมด้านสภาพแวดล้อมทางการศึกษา ระดับการพัฒนา ระดับการลงทุน คุณภาพครู คุณภาพสถาบัน และผลลัพธ์ของผู้เรียน โดยระบบนี้มุ่งเน้นผู้เรียนเป็นศูนย์กลาง มีความสอดคล้องกับบริบทและสามารถประยุกต์ใช้ได้จริง และ 3) ผลการประเมินโดยผู้เชี่ยวชาญยืนยันว่าระบบนี้มีความเป็นไปได้และความสามารถในการปรับใช้อยู่ในระดับสูง โดยมีค่าเฉลี่ย 4.32 และ 4.17 ตามลำดับ สะท้อนถึงความเห็นพ้องต้องกันอย่างชัดเจน ผลการวิจัยนี้ยืนยันถึงความถูกต้องเชิงวิชาการและคุณค่าทาง

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คำสำคัญ: ระบบตัวบ่งชี้การประเมิน, คุณภาพการศึกษา, วิทยาลัยระดับปริญญาตรีเชิงปฏิบัติ, ความเป็นไปได้และความสามารถในการปรับใช้

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Contents

Contents (Continued)

List of Figures

List of Tables

List of Tables (Continued)

Chapter 1
Introduction

Rationale

Since the year 2000, China has experienced a remarkable expansion in its higher education sector, characterized by an increasing number of enrollments and a clear trend towards the development of a more inclusive educational system. The country has made significant strides toward achieving mass higher education, making it one of the largest higher education systems globally. However, despite these advancements, China is still in the process of improving the quality of its higher education to reach the standards of global educational leaders, and ultimately to become a dominant force in the realm of higher education. The Chinese government has long recognized the importance of quality education and has continually issued policies aimed at reforming and enhancing the educational system. As part of this initiative, there has been a concerted effort to strengthen educational quality, as education is seen as a key element in national development. Quality is regarded as the ultimate goal for the development of all sectors, and in particular, higher education. With the expansion of higher education institutions across the country, the system of evaluating educational quality has become an increasingly important area for development. This growing demand for quality evaluation has called for ongoing improvements to the system.

Liao Zhixun (2007) notes that the evaluation indcator system is integral to the process of quality assessment in education. It serves as a concrete representation of the evaluation standards, allowing evaluators to properly understand and apply the value scale of specific evaluation objects. Furthermore, the evaluation indcator system facilitates the consideration of evaluation standards as a whole and lays the foundation for creating comprehensive evaluation tables. According to Shi Qiuheng et al. (2012), the improvement of higher education quality is pivotal for increasing global "soft power" and "international competitiveness." They

emphasize that the establishment of a scientifically designed evaluation system is crucial for educational success, while a poorly designed system can have detrimental effects.

The quality evaluation system for application-oriented undergraduate education in China has, in many ways, been limited by outdated frameworks. Zhao Lin et al. (2015) highlight the traditional focus on resource inputs such as faculty and teaching resources, as well as outputs like student employment rates and degrees earned. This focus tends to overlook process-based quality indicators that consider student development, motivation, engagement, and learning outcomes. This gap in evaluation has led to a somewhat narrow approach to understanding the true quality of education, limiting its ability to foster well-rounded development in students.

As Liu Zewen (2017) points out, the evaluation of educational quality in application-oriented undergraduate colleges is crucial for ensuring that the overall development of students and educators is effectively guided. With a large number of undergraduate institutions in China, especially applied colleges and universities, strengthening the quality evaluation system is necessary for improving the standards of talent cultivation and better aligning educational practices with the needs of the economy and society.

China's education reform has always emphasized quality improvement as a core goal. For instance, the "Outline of the National Medium and Long-term Education Reform and Development Plan (2010-2020)" highlighted the need for continuous quality enhancement across all levels of education. Furthermore, the Ministry of Education has advocated for strengthening process management in undergraduate education, aiming to improve overall educational quality. These measures show that China is continuously exploring ways to improve educational standards, though many of these efforts still focus on end results rather than the learning processes that contribute to those outcomes.

In 2023, the Chinese government issued the "Overall Plan for Deepening the Reform of Education Evaluation in the New Era," which highlighted the need to develop evaluation standards that are tailored to the characteristics of application-oriented undergraduate colleges. This includes a focus on professional abilities and practical application skills. Yet, despite these initiatives, there is still a lack of scientific, comprehensive, and practical evaluation frameworks in many regions, especially in ethnic minority areas like Guangxi. In these areas, educational quality evaluation tends to focus on final outcomes without giving enough attention to the learning process itself, highlighting the need for more comprehensive evaluation systems.

The development of a sound and effective quality evaluation system for application-oriented undergraduate colleges in Guangxi has therefore become an urgent issue that needs to be addressed. The aim is to ensure that education quality is accurately measured and that institutions can take steps to enhance their educational practices and outcomes. As Song Song (2021) notes, the evaluation system not only helps to improve the quality of education but also contributes to highlighting the distinctive characteristics of these institutions.

A well-constructed quality evaluation indicator system will provide critical support for improving educational quality at these colleges. Based on the context-input-process-product (CIPP) model, existing research suggests that a balanced system of indicators covering context, input, processes, and outcomes can better capture the full scope of educational quality. Previous studies, such as those by T. Loreman (2014), Sun Yaozhong (2011), and others, have explored the principles and methods of constructing such evaluation systems. However, research on the quality evaluation systems for applied undergraduate colleges in Guangxi, and especially for the ethnic regions, remains limited.

This research aims to fill this gap by developing a comprehensive set of quality evaluation indicators tailored specifically to the needs and context of applied undergraduate colleges in Guangxi. It will draw on existing research, as well as empirical methods such as interviews and expert consultations, to build a system

that better reflects the needs of both students and educators. Through this study, it is hoped that a more scientific, systematic, and practical evaluation system will be established, one that can guide the development of educational practices and ensure continuous improvement in teaching quality.

The establishment of such a system is particularly important for the future development of application-oriented undergraduate colleges in Guangxi, as it will provide a clear framework for assessing educational quality, identifying areas for improvement, and ensuring that institutions meet the evolving needs of society and the economy. Moreover, this system will serve as a valuable tool for national policymakers, allowing them to better assess the effectiveness of higher education reforms and ensure that educational practices align with broader national goals. Ultimately, this research will contribute to the larger goal of improving the quality of higher education in China, ensuring that its institutions are equipped to meet the challenges of the 21st century.

Research Questions

There are three main research questions in the study “Development of the evaluation indicator system for the educational quality of Application-Oriented Undergraduate Colleges in Guangxi”, as below:

1. What is the current Status of education quality evaluation in Guangxi's application-oriented undergraduate universities?

2. How does the evaluation indicator system develop for the educational quality of application-oriented undergraduate colleges in Guangxi?

3. To what extent is the feasibility and adaptability of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi?

Research Objectives

1. To examine the current Status of education quality evaluation in Guangxi's application-oriented undergraduate universities.

2. To develop an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

3. To examine the feasibility and adaptability of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

Scope of the Research

Population and the Sample Group

Stage 1 To examine the current Status of education quality evaluation in Guangxi's application-oriented undergraduate universities.

1.1 Use of Questionnaires to examine the Current Status of Quality Evaluation in Applied Undergraduate Education in Guangxi

Population

The research population consisted of 5,500 individuals involved in educational quality evaluation within five application-oriented undergraduate colleges in Guangxi. The population was categorised into three groups as follows:

5,000 teachers

250 school administrators

250 teaching supervisors

Sample Group

The sample group comprised 641 individuals related to the evaluation of educational quality in application-oriented undergraduate colleges. The sample size was determined using the Krejcie and Morgan table (1970), ensuring that the sample was statistically representative of the overall population.

To obtain the sample, a multistage random sampling method was applied. Initially, the application-oriented undergraduate colleges in Guangxi were stratified based on their geographical locations: northern, central, eastern, western, and

southern regions. Then, simple random sampling was used to select one college from each region to serve as the sampling unit.

This method ensures that important demographic characteristics of the population, such as gender, age, and educational level, were adequately represented. The selection of the sample adhered to scientific—principles of sampling, including randomness and representativeness, to ensure the validity and reliability of the research findings. In addition, ethical standards were strictly observed throughout the research process, with full respect for participants' rights and privacy.

Stratified Random Sampling

Based on the stratified random sampling approach, the sample group was distributed as follows:

357 teachers

152 school administrators

132 teaching supervisors

This stratification ensured balanced representation of all key stakeholder groups, thereby enabling the study to offer comprehensive and meaningful insights into the current state of quality evaluation in applied undergraduate education in Guangxi.

1.2 Interviews to Study the Components and Indicators for an Effective Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi

Investigation of Problems and Influencing Factors in the Quality Evaluation of Education in Applied Undergraduate Colleges in Guangxi

This study employed qualitative interviews to investigate the problems and influencing factors related to the quality evaluation of education in application-oriented undergraduate colleges in Guangxi. Participants were purposively selected to ensure relevance, depth of insight, and diversity of perspectives within the educational quality evaluation context.

A total of 15 key informants were selected from application-oriented undergraduate colleges in Guangxi, classified into three stakeholder groups as follows:

1) Five teachers

2) Five school administrators

3) Five teaching supervisors

The purposive sampling technique was used to identify participants with direct experience and professional expertise in educational quality evaluation. This method was chosen to ensure that the information obtained would provide rich, in-depth insights into the core challenges and contributing factors affecting the current evaluation system.

This approach allowed the researcher to gather expert opinions that are contextually grounded and practically relevant, thereby enhancing the validity and applicability of the findings for developing an effective and context-sensitive evaluation indicator system.

Stage 2 To develop an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

2.1 Focus Group Discussion on the Draft Evaluation Indicator System

Target group

The draft version of the evaluation Indicator system for educational quality in application-oriented undergraduate colleges in Guangxi was examined through a focus group discussion involving key stakeholders, including teachers, school administrators, and teaching supervisors. The discussion focused on quality assurance issues and indicators relevant to the unique context of applied undergraduate education in Guangxi.

The target group for the focus group discussion consisted of 15 participants selected though purposive sampling. The group composition was as follows:

5 teachers

5 school administrators

5 teaching supervisors

The focus group was designed to gather diverse perspectives and expert feedback in order to support a comprehensive review and refinement of the proposed evaluation indicator system.

2.2 Selection of Indicators Using the Delphi Technique

Target group

To refine and validate the evaluation indicators, the Delphi Technique was employed over two iterative rounds of data collection. A total of 17 participants were purposively selected, comprising:

1) Six teachers

2) Six school administrators

3) Five external experts

This systematic and consultative process was used to reach consensus on the indicators to be included in the educational quality evaluation system. The Delphi method was chosen for its effectiveness in synthesizing expert opinions and ensuring the relevance, clarity, and applicability of each indicator within the system.

Stage 3: To examine the feasibility and adaptability of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

Target Group

The evaluation of the educational quality indicator system for application-oriented undergraduate colleges in Guangxi was conducted to assess its suitability and feasibility. The sample consisted of five experts, selected through purposive sampling based on predetermined qualification criteria to ensure the relevance and credibility of their input.

The qualifications of the selected experts were categorized as follows:

1. Academic Administrators

1.1 Hold a master's or doctoral degree

1.2 Hold the academic rank of associate professor or higher

2. Managers of Educational Institutions

2.1 Hold a master's or doctoral degree

2.2 Hold the academic rank of associate professor or higher

3. University Teachers

3.1 Hold a master's or doctoral degree

3.2 Hold the academic rank of associate professor or higher

These experts were selected for their experience and expertise in educational management and quality assurance. Their professional insights and feedback were essential in verifying the validity, practicality, and alignment of the proposed indicator system with established educational quality standards.

The Variable

Based on a comprehensive review of literature related to the educational quality evaluation indicator system for application-oriented undergraduate colleges in Guangxi, the most frequently cited characteristics were synthesized and adopted as variables in this study.

Independent Variable

The independent variable is the educational quality evaluation indicator system for application-oriented undergraduate colleges in Guangxi, which is structured around six core components:

1. Educational environment

2. Development level

3. Input level

4.Teacher level

5. School quality

6. Student quality

Dependent variable

The dependent variable is the evaluation indicator system for educational quality in application-oriented undergraduate colleges in Guangxi.

Advantages

The quality of education in application-oriented undergraduate colleges in Guangxi necessitates the development of a scientific and systematic evaluation indicator system to serve as a practical guideline for policy implementation and assessment. In the absence of a well-structured evaluation framework, existing methods and models lack the capacity to effectively guide educational practices. This study offers several advantages:

1. Enhanced Educational Quality

This research will establish a scientific and systematic evaluation indicator system that provides a foundation for improving the quality of education in application-oriented undergraduate colleges in Guangxi.

2. Improved Management Efficiency

The proposed system will help streamline institutional management processes, enhancing the effectiveness of educational planning, monitoring, and implementation.

3. Quality Assurance and Benchmarking

The findings will support the development of a comprehensive quality assurance framework, enabling institutions to evaluate and benchmark their performance against national and international standards.

4. Support for Policy Development

Policymakers and educational authorities will be able to utilize the research findings to formulate targeted and effective policies, particularly for improving educational quality in underdeveloped and ethnically diverse regions.

5. Student-Centered Education

By incorporating process-based indicators, the system will promote a holistic view of student development, ensuring alignment with practical skills and professional competencies.

6. Guidance for External and Internal Evaluations

Institutions will be better equipped to undergo external evaluations and accreditation, while also benefiting from a structured framework for internal self-assessment and continuous improvement.

7. Contribution to National Educational Goals

This study aligns with China's national strategies to enhance the quality of higher education and supports broader goals aimed at elevating the country's status as a global leader in education.

8. Applicability Beyond Guangxi

While the focus is on Guangxi, the indicator system can serve as a model for other regions or countries with similar educational contexts, promoting best practices in quality assurance and management globally.

Definition of Terms

Evaluation Indicator System for Educational Quality refers to a structured framework of measurable indicators designed to assess key dimensions of educational quality and performance. Such a system generally incorporates defined objectives, evaluation criteria, subjects of assessment, methodological approaches, and feedback mechanisms. The core components consist of:

1. Indicator labelling
2. First-level, second-level, and third-level indicators
3. Explanatory notes
4. Weighting of each indicator

Education Quality refers to the overall effectiveness of the teaching and learning process within an educational system. It encompasses the qualifications and performance of teachers, instructional methods, learning resources, student

outcomes, and the effectiveness of knowledge and skills acquisition. Educational quality directly influences students' academic success and future opportunities, thereby necessitating continuous improvement in teaching content, pedagogy, and the learning environment. The equitable allocation of educational resources is essential to ensure that all students have access to high-quality education.

Evaluation of Higher Education Quality refers to a systematic process used to assess the extent to which higher education institutions meet societal and individual needs. It involves data collection, analysis, and evaluative judgment concerning the effectiveness and relevance of educational activities, along with the formulation of recommendations for quality enhancement.

Application-Oriented Undergraduate Colleges refers to higher education institutions that prioritise undergraduate education with an emphasis on regional service, applied disciplines, and the cultivation of highly skilled professionals to meet the needs of society.

Educational Environment refers to the physical, psychological, and organisational conditions in which learning takes place, including facilities, support services, and the overall campus atmosphere.

Development Level refers to the degree of allocation and utilisation of human, material, and financial resources to support educational activities.

Input Level refers to the financial investments and infrastructural support that contribute to building and maintaining the institutional learning environment.

Teachers Level refers to both the quantity and quality of the teaching workforce, including metrics such as the student–teacher ratio, proportion of full-time staff, academic qualifications, proportion of senior professional titles, and percentage of faculty holding postgraduate degrees.

School Quality refers to the institutional performance and reputation, often measured through indicators such as achievements in teaching competitions, institutional rankings, and recognition for educational excellence.

Student Quality refers to the extent to which education prepares students for employment and active social contribution. Key indicators include graduate employment rate, employment stability, and societal satisfaction with graduates.

Research Framework

This research focuses on the development of an educational quality indicator system for application-oriented undergraduate colleges in Guangxi. The researchers have established a conceptual framework for the study as follows.

The research framework of this research is shown in Figure 1.1.

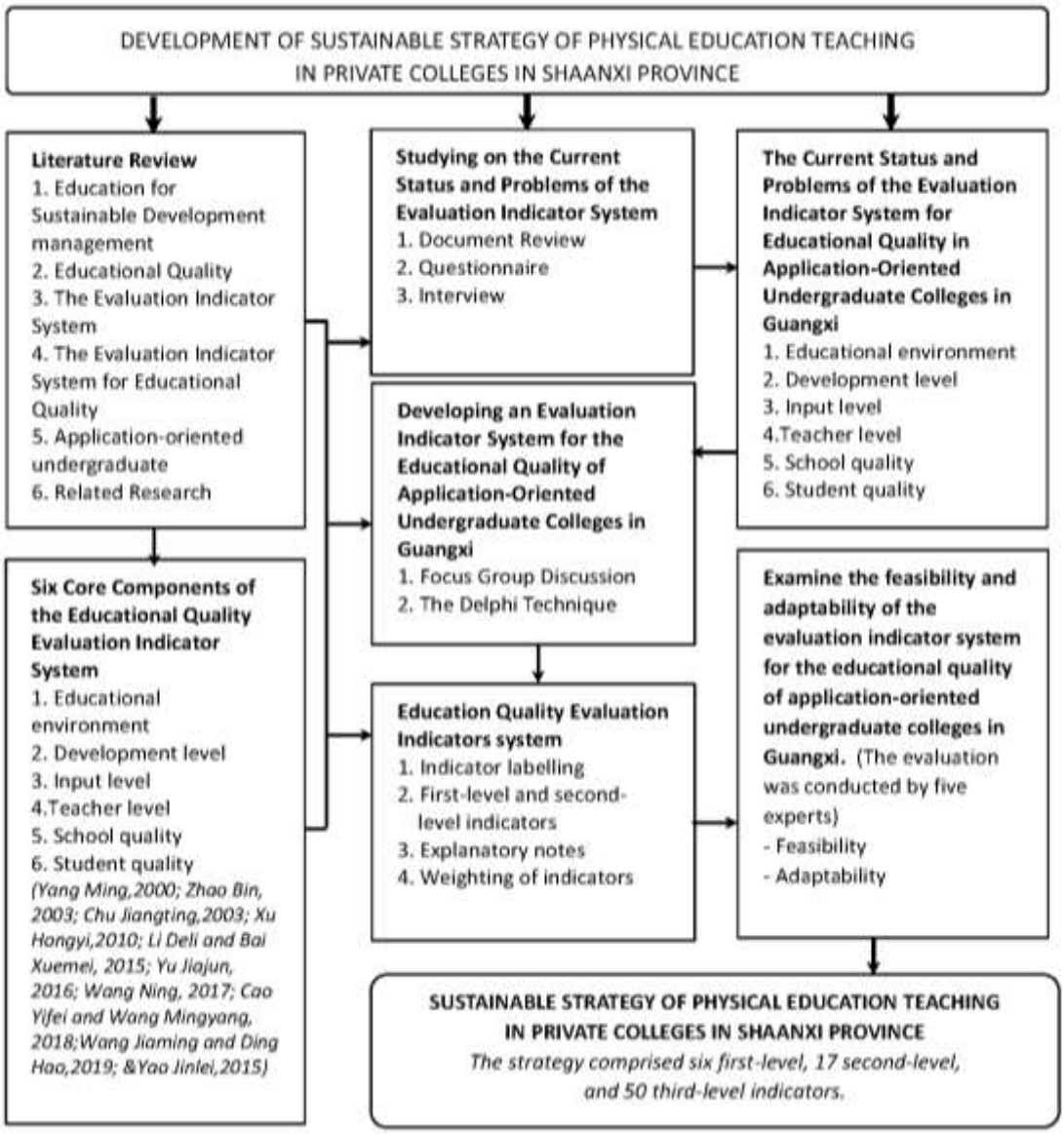

Figure 1.1 Research Framework

Chapter 2
Literature Review

Research on the Development of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi, this study refers to the theories and research results of relevant scholars at home and abroad on educational quality, evaluation indicator system, application-oriented undergraduate, etc., and then combs them in detail. On this basis, the researcher analyzed the literature and related research results from the following aspects, as follows:

1. Education for Sustainable Development Management
2. Educational Quality
3. The Evaluation Indicator System
4. The Evaluation Indicator System for Educational Quality
5. Application-oriented undergraduate
6. Related Researches

Education for Sustainable Development Management

With globalisation and sustainable development emerging as defining themes of the present era, education is widely recognised as a key driver of social transformation and long-term progress. The 2030 Agenda for Sustainable Development, adopted by the United Nations in 2015, not only provides a shared vision for global development but also establishes the direction for transforming education systems worldwide. In particular, higher education faces the challenge of effectively integrating the principles and practices of sustainable development while safeguarding educational equity and quality, which has become a central issue in international education reform.

Education for Sustainable Development (ESD), a core concept within this transformation, extends beyond the transmission of knowledge to encompass the

shaping of values and the cultivation of competencies. Its ultimate aim is to develop individuals capable of addressing complex global challenges and advancing sustainable social transformation. Accordingly, a comprehensive examination of the connotations of ESD, its competency framework, and its pathways for implementation in higher education carries both theoretical and practical significance. Such exploration provides valuable guidance for applied undergraduate institutions in constructing education quality evaluation systems aligned with the imperatives of sustainable development.

1. Education for Sustainable Development Management

Background and Context

The adoption of the 2030 Agenda for Sustainable Development by the United Nations in 2015 marked a significant milestone in global efforts to promote inclusive and sustainable growth. Central to this framework are the 17 Sustainable Development Goals (SDGs), which seek to address the interrelated challenges of economic, social, and environmental development. Notably, Goal 4 highlights the importance of ensuring inclusive and equitable quality education and fostering lifelong learning opportunities for all (UNESCO, 2017). Within the higher education sector, this goal prioritises equal access to affordable, quality tertiary education across genders, encourages the expansion of international scholarship programmes, and supports the adoption of digital platforms and distance education to improve accessibility and overall educational quality.

Integration in Higher Education

Achieving these objectives requires governments and institutions to formulate comprehensive education policies that advance online learning, strengthen research capacity, and promote international collaboration. Higher education institutions (HEIs) are increasingly recognised not merely as centres of knowledge dissemination but also as critical drivers of sustainability. Lozano (2013), in his analysis of 11 international declarations and frameworks on sustainability in higher education, identified institutional leadership, strategic vision, and systemic integration as fundamental to effective implementation. His findings underscore the

necessity for HEIs to embed sustainability across their governance structures, curricula, and outreach initiatives, thereby ensuring that education contributes directly to sustainable societal transformation.

Implications for Application-Oriented Colleges

Building upon this perspective, subsequent research by Lozano (2015) reaffirmed that leadership commitment and strategic planning constitute the foundation for sustainable outcomes in higher education. He argued that institutions should formalise their commitments through public declarations and develop long-term frameworks for sustainability integration. In this regard, application-oriented undergraduate colleges face both opportunities and challenges. By aligning their institutional quality evaluation systems with international sustainability principles, these colleges can not only enhance their educational effectiveness but also demonstrate their strategic relevance within the global higher education landscape. This alignment is particularly vital for ensuring that educational quality evaluation systems in Guangxi remain responsive to contemporary global trends and contribute meaningfully to sustainable development.

2. Concept of Education for Sustainable Development (ESD)

Conceptual Background of Education for Sustainable Development (ESD)

Education for Sustainable Development (ESD) has emerged as a forward-looking educational paradigm aimed at preparing learners to contribute to a more sustainable and equitable future. By embedding the principles of sustainable development across all levels of education, ESD equips individuals not only with academic knowledge but also with socio-emotional and behavioural competencies (UNESCO, 2020). Its scope extends beyond environmental awareness to encompass social justice, equity, and economic viability, thereby positioning education as a holistic driver of sustainable development.

Theoretical Perspectives and Values of ESD

A growing body of literature highlights ESD's value-driven foundation. Li and Geng (2017) contend that ESD emphasises values such as respect for future

generations, appreciation of cultural diversity, and responsibility for environmental stewardship. In this way, ESD functions as a transformative force that shapes learners' mindsets and decision-making processes at both local and global levels. Wang (2015) further conceptualises ESD as an educational approach that promotes scientific understanding, sustainability values, and lifelong learning, thereby contributing to balanced development across economic, social, and environmental domains. Such perspectives underline the importance of ESD in equipping individuals with the knowledge, skills, and attitudes necessary for sustainability-oriented action.

Implications for Educational Quality in Application-Oriented Colleges

Recognising the urgent need to reframe education in the 21st century, scholars such as Shi (2003), Yang (2019), and Wang (2020) identify ESD as a central theme in contemporary education reform, emphasising its crucial role in building sustainable societies. Integrating ESD into educational quality frameworks provides a strategic pathway for higher education institutions to respond effectively to global sustainability challenges. For application-oriented undergraduate colleges in Guangxi, embedding ESD principles into their evaluation systems is both timely and essential. Such alignment not only enhances the credibility and relevance of educational quality assessment but also ensures that these institutions contribute meaningfully to international sustainability goals while addressing local development needs.

3. Competencies of Education for Sustainable Development

Competency Framework for Education for Sustainable Development

Education for Sustainable Development (ESD) has been recognised by UNESCO as a transformative educational approach that equips learners to address the multifaceted challenges of sustainability. To operationalise this vision, UNESCO (2017) proposed a framework of eight core competencies designed to promote holistic intellectual and personal growth. These competencies aim to foster adaptability, systemic thinking, and global citizenship, qualities increasingly valued in the twenty-first-century workforce and society. By integrating these competencies into teaching and learning, education can serve not only as a vehicle for academic

achievement but also as a catalyst for social responsibility and sustainable development.

Core Competencies and Their Educational Significance

The eight competencies identified by UNESCO encompass: (1) critical thinking, (2) creativity, (3) communication, (4) collaboration, (5) interdisciplinary thinking, (6) self-awareness, (7) responsibility, and (8) global citizenship. Each competency is intended to enhance learners' capacity to engage in cooperative problem-solving, adopt sustainability-oriented mindsets, and act responsibly in both local and global contexts (UNESCO, 2020). According to Li and Geng (2017), these values-driven competencies foster respect for future generations, appreciation of cultural diversity, and environmental stewardship. Similarly, Lozano (2013, 2015) emphasises that embedding such competencies into higher education requires strong institutional leadership, strategic planning, and systemic integration. Together, these insights demonstrate that ESD competencies form the foundation of sustainability literacy, preparing individuals to act as agents of change across economic, social, and environmental domains.

Implications for Educational Quality in Application-Oriented Colleges

Incorporating ESD competencies into curricula, governance, and evaluation systems is crucial for aligning higher education with global sustainability agendas. For application-oriented undergraduate colleges in Guangxi, this integration offers a strategic pathway to enhance institutional quality, strengthen graduate outcomes, and contribute to regional economic and social sustainability. As Wang (2015, 2020) argues, ESD reframes the mission of higher education by expanding its functions beyond teaching and research to include leadership in promoting sustainability values and practices. Consequently, embedding ESD into evaluation indicator systems ensures that institutions not only meet international standards but also fulfil their social responsibilities. Looking ahead, the deepening of sustainable development as a global priority will reinforce the irreplaceable role of higher education in advancing both governance and social progress.

Educational Quality

1. Concept of Educational Quality

Foundations and Early Perspectives

Educational quality has been a central concern of scholars at both national and international levels, with early definitions providing the groundwork for subsequent debates. One of the pioneering perspectives was offered by Husson (1987), who described it as the extent to which educational activities undertaken in schools achieve their intended objectives. He further noted that such quality may be evaluated against fixed absolute standards or relative comparative benchmarks. Similarly, the Dictionary of Education defines educational quality in terms of the effectiveness of education, primarily reflected in the calibre of individuals produced by the system. Building upon this foundation, Astin (1991) proposed that educational quality is multidimensional, encompassing an institution's reputation, resource availability, student performance outcomes, and the added value provided through educational processes.

Contemporary Views and International Perspectives

In the global context, institutions such as UNESCO stress that quality education must foster not only cognitive development but also emotional and social capacities, thereby enabling learners to address complex real-world challenges (UNESCO, 2020). Within the Chinese academic tradition, Chen Yukun (2003) defines educational quality as the degree to which knowledge dissemination, talent cultivation, and institutional support correspond with societal needs in specific contexts. Zhu (1996) highlights its role in human capital development, Tao (1998) focuses on educational quality as the promotion of academic achievement and adaptability, while Seymour (1998) underscores the importance of infrastructure and intellectual resources. International frameworks such as ISO 8402 (1994) extend these perspectives by defining quality as a set of characteristics that meet developmental demands and wider social objectives, thereby framing education as both a personal and societal investment.

Synthesis and Implications

Taken together, these perspectives illustrate that educational quality is a complex, multidimensional construct that encompasses the effectiveness of teaching and learning, the professionalism and competence of educators, the achievements of students, and the alignment between institutional outputs and societal expectations. It reflects the capacity of educational systems to produce competent, ethical, and innovative individuals capable of contributing to social and economic progress. For application-oriented undergraduate colleges in Guangxi, improving educational quality requires a comprehensive approach involving curriculum innovation, pedagogical reform, resource optimisation, and equitable access. Such efforts not only raise institutional standards but also ensure that higher education fulfils its broader mission of advancing personal development and sustainable societal transformation.

2. Necessity of Quality in Higher Education

Perspectives of Stakeholders

The necessity of quality in higher education is underscored by its significance for four principal stakeholder groups: government authorities, economic sectors, educational institutions, and academic communities. From a political perspective, governments establish minimum quality thresholds to regulate and guide higher education in alignment with national strategic priorities. In this context, educational quality is frequently defined in terms of institutional effectiveness in meeting established benchmarks and producing competent graduates (Dictionary of Education, 2019). Economically, quality is measured by higher education's ability to respond to labour market demands, generate human capital, and create value for governments, employers, and learners alike (Shi, 2020).

Academic and Institutional Dimensions

From an academic standpoint, educational quality reflects the extent to which higher education fulfils its core missions of teaching, research, and service. This involves both structural elements such as faculty expertise, curriculum design and infrastructure, and functional dimensions including academic climate,

innovation and learning outcomes. Lu (2016) advocates a human-centred perspective of quality, emphasising education's responsibility in addressing the developmental needs of individuals and society. Similarly, Ed-wardsallis (2005) argues that competitiveness, professionalism, reliability and ethical standards must be embedded within quality frameworks, while Bogue and Hall (2005) stress the importance of institutional accountability and clarity of mission as essential components of quality assurance.

Synthesis and Implications

Taken together, these perspectives demonstrate that educational quality in higher education emerges from the interplay of political, economic, academic, and humanistic considerations. A comprehensive quality framework should therefore balance regulatory compliance, economic responsiveness, academic excellence, and human development. For application-oriented undergraduate colleges in Guangxi, sustaining and enhancing educational quality is not only a prerequisite for global competitiveness but also a responsibility towards societal progress. Maintaining rigorous quality standards ensures that higher education institutions remain resilient, relevant, and capable of advancing sustainable development, while at the same time cultivating graduates who are competent, ethical, and innovative contributors to society.

3. Research Related to Educational Quality

International research on educational quality in higher education has yielded various models and practices. In the United States, quality assurance systems emphasize student participation in course evaluation as a mechanism for institutional improvement and sustainability. These systems promote inclusivity, transparency, and continuous feedback in building quality assurance cultures. In the United Kingdom, internal quality systems focus on academic standards, course quality, and institutional autonomy, with an emphasis on student-centeredness, accountability, and diverse assurance strategies.

The European University Association asserts that improving teaching quality is driven more by internal development than external assessments. It advocates for a

model grounded in value alignment, purpose clarity, stakeholder roles, and methodological diversity, as captured in the “3W1H” model: Why, What, Who, and How. Similarly, China has implemented the National Standards for Teaching Quality in Undergraduate Education, its first national-level standard emphasizing student outcomes, output orientation, and continuous improvement. This standard balances regulatory control with institutional flexibility, providing direction for sustainable quality enhancement.

New Zealand’s approach centers on evaluating both outcome- and process-based indicators, with a focus on student achievement. These global case studies illustrate how nations adopt tailored strategies to ensure quality based on context, values, and educational goals. For application-oriented institutions, such insights are instrumental in constructing quality indicator systems that reflect local relevance and international standards.

Based on the foregoing discussion, it is evident that the theoretical foundations, significance, and global perspectives related to educational quality in higher education are both rich and multifaceted. The concept of educational quality encompasses a wide range of dimensions, including student learning outcomes, institutional resources, instructional practices, and the extent to which education aligns with societal needs. Achieving educational quality requires a careful balance among accountability, inclusiveness, and developmental objectives. Within the context of higher education, quality plays a pivotal role in fostering national progress, enhancing institutional competitiveness, and supporting student success.

The importance of educational quality extends across political, economic, academic, and personal domains. While each group of stakeholders, including governments, educational institutions, employers, and learners, may emphasize different priorities, there is a shared recognition of the need for clear standards, contextual relevance, and ongoing improvement. International practices further highlight the variety of effective models employed around the world. For example, the participatory approach in the United States, the internal assurance systems in

Europe, and the standards-based framework adopted in China each reflect context-specific yet transferable strategies for sustaining educational quality.

Taken together, these insights provide a robust foundation for designing an evaluation indicator system that is responsive to the needs and conditions of application-oriented undergraduate colleges in Guangxi. Such a system should incorporate conceptual precision, address stakeholder expectations, and draw upon global best practices to ensure both institutional effectiveness and enhanced learner outcomes.

The Evaluation Indicator System

The concept of evaluation plays a crucial role in ensuring the effectiveness and improvement of educational processes. Evaluation refers to the application of systematic criteria to measure the accuracy, efficiency, relevance, and satisfaction associated with educational practices. It integrates both qualitative and quantitative approaches and is characterized by its objectivity, comprehensiveness, and goal-oriented nature. In the context of higher education, evaluation systems help stakeholders assess educational effectiveness and guide continuous improvement.

1. Concept of Evaluation Indicator System

Foundations and Definitions

Indicator systems have become widely utilised across diverse fields such as education, psychology, medicine, political science, and sociology as tools for evaluation and judgement. They provide structured means of analysing specific aspects of practice and performance. Zhu Dequan et al. (2005), in Modern Educational Statistics and Assessment Technology, define an evaluation indicator system as a collection of indicators derived from evaluation objectives, with each indicator accompanied by criteria that serve as the benchmarks for measuring achievement. These criteria thus function as the scale against which progress, effectiveness, and quality are judged.

Educational Evaluation Perspectives

The theoretical foundation of educational evaluation underscores its role in enabling value judgements. Qiu Junping et al. (2010) characterise evaluation as a process in which evaluators investigate and analyse an object to identify its attributes and determine its value. Zhu Meng (2007) views educational evaluation as the assessment of elements, processes, and outcomes through reliable and scientific methodologies. Similarly, Zhang Jian (2014) defines educational quality evaluation as the appraisal of whether educational activities and outcomes meet established quality standards. Tian Shuxue (2018) extends this perspective, noting that evaluation involves applying scientific methods to predetermined objectives to ascertain educational merit. Collectively, these perspectives stress that evaluation is not a simple measurement exercise, but a comprehensive and systematic judgement process embedded in standards and goals.

Implications and Synthesis

These scholarly contributions demonstrate that evaluation indicator systems provide more than descriptive data: they embody an intentional process for aligning educational inputs and outcomes with quality expectations. By combining empirical measurement with value-based criteria, evaluation promotes institutional accountability, informs policy, and guides improvement. In this sense, an evaluation indicator system functions as both a diagnostic and developmental tool. For application-oriented undergraduate colleges in Guangxi, constructing such a system is essential to identifying institutional strengths, addressing weaknesses, and enhancing the overall quality of higher education provision. In summary, an evaluation indicator system represents a systematic, evidence-based, and value-driven approach to improving educational quality.

2. Concept of Quality Evaluation in Higher Education

Foundations of Quality in Higher Education

Quality in higher education is widely recognised as a multidimensional construct that spans diverse functions and domains. It encompasses institutional objectives, training goals, teaching programmes, research outcomes, academic

personnel, learning environments, and infrastructural resources. The success of higher education is often assessed through student achievements and the effectiveness of faculty performance. Zhu Meng (2007) defines higher education evaluation as a systematic process of collecting data, applying evaluation tools, and making value judgements to inform educational decision-making. Such perspectives highlight the intricate and layered nature of evaluating quality within higher education.

Evaluation as a Strategic Instrument

Quality evaluation must be closely aligned with the overarching purpose of higher education, particularly in its dual role of serving societal progress and supporting individual development. Evaluation systems should therefore be designed to gather and analyse comprehensive information, enabling institutions to adapt to evolving social, economic, and academic demands. In this sense, evaluation functions not merely as an accountability mechanism but as a strategic instrument for educational reform and innovation. By integrating empirical evidence with value-based judgement, higher education evaluation ensures that institutional practices remain relevant, effective, and responsive to broader developmental needs.

Implications for Institutional Development

Ultimately, quality evaluation in higher education aims to determine the extent to which institutions fulfil their missions of teaching, research, and service. It underpins sustainable development by aligning institutional operations with societal expectations and global trends. Moreover, by providing data-driven insights, evaluation contributes to evidence-based policy-making, enhances institutional effectiveness, and fosters a culture of continuous improvement. For application-oriented undergraduate colleges in Guangxi, establishing robust quality evaluation systems is essential for ensuring accountability, improving educational outcomes, and strengthening their contribution to regional and national development.

3. Theory of Educational Quality Evaluation

Stakeholder Perspectives in Evaluation

Theoretical models of educational quality evaluation provide the conceptual foundation for assessing and enhancing higher education. Rosovsky, an American scholar, applied the stakeholder model to higher education, identifying faculty, students, administrators, alumni, governments, and society as primary stakeholders. He argued that well-structured student evaluations play a vital role in strengthening faculty accountability and improving the quality of teaching. This model highlights the importance of considering multiple perspectives in the evaluation process, ensuring that educational quality is judged in relation to the expectations and needs of diverse constituencies.

Goal-Oriented and Systematic Approaches

Building on this, Ralph Tyler introduced the goal-oriented model of evaluation, which remains a cornerstone in the field. According to Tyler, evaluation entails the systematic collection and interpretation of information to determine the extent to which educational objectives have been achieved. This model incorporates both qualitative and quantitative evidence to assess goals, content, methods, and outcomes, positioning evaluation as an essential mechanism for continuous improvement in educational quality. Tyler's framework underscores the close link between evaluation and curriculum development, affirming its integral role in educational reform.

Decision-Oriented and Comprehensive Models

A further influential contribution is Stufflebeam's (1966) CIPP model, which evaluates Context, Input, Process, and Product. This decision-oriented approach has been widely applied in educational reform initiatives to ensure that evaluations are not merely descriptive but actively support decision-making and improvement. By combining stakeholder perspectives, goal-oriented assessment, and decision-oriented frameworks, these theories together form a comprehensive foundation for designing robust systems of educational quality evaluation. For application-oriented undergraduate colleges in Guangxi, integrating these models provides theoretical

guidance for constructing evaluation indicator systems that are systematic, purposeful, and improvement-driven.

4. Characteristics of Higher Education Quality Evaluation in Various Countries United States: Decentralisation and Autonomy

In the United States, higher education quality evaluation is characterised by decentralisation and a competitive market-driven environment. Although state governments exercise oversight, institutions retain significant autonomy in governance and academic affairs. Private institutions represent a considerable share of the system, further reinforcing diversity and independence. External evaluations, particularly accreditation processes conducted by independent agencies, play a pivotal role in assuring educational quality. The U.S. model places strong emphasis on accountability through interrelated evaluations that preserve institutional autonomy while ensuring quality standards are met.

France: Centralisation and Policy Compliance

In contrast, France adopts a highly centralised approach in which evaluation is predominantly government-driven. Higher education institutions are required to comply strictly with national policies, and assessments focus on both regulatory adherence and the effectiveness of public funding utilisation. This model prioritises the alignment of institutional operations with national development strategies, thereby reinforcing government accountability. Evaluation in the French context is thus closely tied to public resource management and societal expectations, ensuring that higher education fulfils its role as a strategic instrument of national progress.

Comparative Insights and Implications

These contrasting models illustrate the extent to which cultural, political, and administrative contexts shape higher education evaluation systems. While the U.S. system promotes institutional autonomy and relies on external accreditation to safeguard quality, the French model underscores centralised control and strict policy compliance. Despite these differences, both approaches aim to ensure transparency, efficiency, and effectiveness in higher education provision. For

application-oriented undergraduate colleges in Guangxi, these international experiences highlight the importance of balancing institutional independence with accountability, offering valuable insights for the development of a contextually appropriate evaluation indicator system.

5. Diversified Evaluation System in the United Kingdom

Pluralistic Structures and Mechanisms

The United Kingdom adopts a diversified approach to higher education quality evaluation, characterised by the involvement of multiple indicators and a wide range of stakeholders. Internal self-evaluation forms the foundation of the system, with academic staff taking primary responsibility for ensuring teaching and research standards within their institutions. These internal processes are complemented by external reviews conducted by the Quality Assurance Agency for Higher Education (QAA), an independent body that collaborates with universities to uphold and enhance academic quality across the sector.

Student-Centred and Collaborative Orientation

The British model places strong emphasis on student-centredness, institutional responsibility, and collaborative improvement. QAA provides transparent evaluations that are accessible to students, parents, policymakers, and the public, thereby fostering accountability and trust in higher education provision. This pluralistic system allows for both flexibility and responsiveness, integrating institutional self-reflection with external benchmarking. By doing so, it ensures that institutions remain dynamic and capable of adapting to the evolving demands of the higher education landscape.

Implications and Broader Significance

In conclusion, the United Kingdom's diversified evaluation system illustrates how multi-actor frameworks can effectively safeguard academic standards while promoting continuous enhancement. Its integration of internal ownership with external validation serves as a model of shared responsibility, ensuring that quality assurance is not only a regulatory requirement but also a collective commitment to improvement. For application-oriented undergraduate colleges in Guangxi, the UK's

experience offers valuable insights into how balanced systems of evaluation can combine institutional autonomy with robust accountability mechanisms, thereby advancing sustainable development in higher education.

The Evaluation Indicator System for Educational Quality

The development of a robust evaluation indicator system is foundational to assessing the quality of education, particularly within the context of application-oriented undergraduate colleges. Such systems ensure consistency, transparency, and comparability in evaluating educational practices and outcomes. The use of indicators allows educational institutions and policymakers to monitor effectiveness, identify gaps, and implement targeted improvements. This section explores the theoretical and practical underpinnings of educational evaluation indicators, their international development, and the essential components that constitute a comprehensive evaluation system.

1. Concepts and Theories of the Study of the Indicator System for the Evaluation of the Quality of Education

Foundational Perspectives on Educational Indicators

The concept of indicators in educational evaluation is rooted in the need for specificity, measurability, and relevance. Chen Yukun (1997) highlights that indicators act as precise and measurable guidelines for assessing observable educational behaviours and outcomes. Similarly, Sun Zhilin (1995) defines educational indicators as statistical tools employed to evaluate the performance and status of educational systems, providing insights into developmental trends and the overall health of the system. Clemmer et al. (1973) add to this by describing indicators as descriptors that capture the state of key variables, thereby serving as reference points for measuring progress towards defined objectives.

Systemic and Methodological Considerations

Building upon these perspectives, Wu Gang (2008) notes that indicators may be either quantitative or qualitative, depending on the nature of the evaluation subject. Le Yi (2010) underscores the systemic character of indicator systems,

pointing out that they comprise interrelated elements that function collectively within a structured framework. Qiu Junping et al. (2010) emphasise that the construction of an evaluation indicator system requires alignment between evaluation content and indicator selection, advocating for principled design and continuous optimisation. Liu Pingting (2015) further asserts that the validity and credibility of evaluation outcomes depend on whether the indicator system is comprehensive, coherent, and scientifically robust.

Synthesis and Implications

In summary, indicators are indispensable tools in educational evaluation, serving as observable and measurable benchmarks that reflect both the quality of processes and the effectiveness of outcomes. A rigorously constructed indicator system integrates multiple indicators derived from educational objectives and evaluation dimensions, enabling a holistic view of institutional performance. For application-oriented undergraduate colleges in Guangxi, the development of such a system is crucial for supporting evidence-based decision-making, promoting accountability, and guiding continuous improvement in educational quality.

2. Educational Evaluation Indicators

Global Perspectives on Evaluation Indicators

Research on educational evaluation indicators spans international policies, institutional practices, and expert perspectives. Broadly, three main areas of focus can be identified: policy-level indicator systems designed by international and national agencies, institutional applications of these indicators, and theoretical discussions concerning the construction of evaluation frameworks. Together, these perspectives highlight the complexity and diversity of approaches adopted worldwide to assess educational quality, reflecting varying political, cultural, and institutional contexts.

International Practices and Comparative Models

In the United States, the Perkins Vocational Education and Technology Act (PVETA) requires separate evaluation processes for secondary and post-secondary vocational education, with core indicators including academic achievement,

technical competencies, and employment outcomes. In the United Kingdom, the Education Inspection Framework (EIF), introduced by the British Educational Standards Agency (BESA) in 2019, encourages institutional self-assessment while also emphasising external evaluation. Its key indicators encompass student outcomes, teacher quality, curriculum effectiveness, and institutional collaboration. Visser (2015) further underscores the necessity of considering student characteristics, institutional contexts, and faculty capacity when designing and applying evaluation indicators.

Theoretical Insights and Implications

Scholars such as Liu Yumei (2011) stress that the development of indicator systems must be theoretically grounded, with indicators logically structured to capture the unique features of educational institutions. Evaluation indicators should therefore be responsive to both internal institutional characteristics and external policy demands, ensuring that assessments are comprehensive, balanced, and meaningful. For application-oriented undergraduate colleges in Guangxi, adopting such an approach is essential to ensure that indicator systems not only measure educational quality accurately but also guide institutions towards continuous improvement and alignment with broader social and economic goals

3. Components of the Evaluation Indicators of Educational Quality

Foundational Perspectives on Evaluation Components

Scholars have proposed various components that should be included in an educational quality evaluation indicator system, reflecting both national and international contexts. Yang Ming (2000) highlights financial investment and student quality as critical indicators, while Zhao Bin and Li Yanfang (2003) emphasise informatization, internationalisation, and funding. Chu Jiangting and Guo Dexia (2003) extend this view, suggesting that indicator systems should serve descriptive, explanatory, evaluative, monitoring, and predictive functions, with faculty quality, academic performance, and organisational structure at their core.

Hierarchical Frameworks and Evolving Models

Building upon these foundations, Xu Hongyi and Zhou Qunying (2010) proposed a hierarchical indicator framework encompassing four dimensions: background, input, process, and outcome, each supported by sub-indicators such as academic infrastructure and international engagement. Li Deli and Bai Xuemei (2015) advocated a balanced structure integrating student and teacher performance through input–process–output models. Similarly, Yao Jinlei (2015) and Yu Jiajun (2016) highlighted student quality, teacher effectiveness, and the educational environment as essential components. More recently, Wang Ning (2017) outlined eight categories, including faculty strength, curriculum development, and social contribution. Cao Yifei and Wang Mingyang (2018) underscored the importance of teacher team development, funding, and the learning environment, while Wang Jiaming and Ding Hao (2019) proposed a comprehensive model encompassing human resources, infrastructure, student development, and institutional progress.

Synthesis and Implications

Taken together, these perspectives present a comprehensive picture of the dimensions necessary for evaluating educational quality. A robust indicator system should balance inputs (resources), processes (teaching and management), and outcomes (student achievement and institutional impact), guided by national priorities and contextual realities. Synthesised evidence suggests that the most widely recognised components are the educational environment, development level, input level, teacher quality, school quality, and student quality, as summarised in Table 2.1. An effective evaluation indicator system therefore comprises key structural elements: indicator labelling, primary-level and secondary-level indicators, explanatory notes, and weightings for each indicator. Such a system ensures coherence, accountability, and continuous improvement, making it particularly relevant for the development of evaluation frameworks in application-oriented undergraduate colleges in Guangxi.

Table 2.1 The compoment of the evaluation indicator of the educational quality

The evaluation indicator of the educational quality	Yang Ming (2000)	Zhao Bin (2003)	Chu Jiangting (2003)	Xu Hongyi (2010)	Li Deli and Bai Xuemei (2015)	Yu Jiajun (2016)	Wang Ning (2017)	Cao Yifei and Wang Mingyang (2018)	Wang Jiaming and Ding Hao (2019)	Yao Jinlei (2015)	Total
1. Educational environment	√	√	√	√	√	√	√	√	√	√	10
2. Development level	√	√	√		√	√	√	√	√		8
3. Input Level	√			√	√	√	√	√	√	√	8
4. Teacher Level	√	√	√	√	√	√	√	√	√	√	10
5. School quality				√		√	√	√		√	5
6. Student Quality	√		√				√		√	√	5

To summarise, this study suggests that educational quality evaluation indicators should encompass key dimensions, including the educational environment, development level, input level, teacher quality, and overall educational effectiveness. An educational evaluation indicator system functions as a comprehensive framework for assessing the quality of education in colleges and universities. It incorporates essential components such as the purpose, subject, content, and outcomes of evaluation.

Such a system operates on the basis of established rules and standards, employing a series of evaluation methods and procedures that are interconnected, mutually reinforcing, and collaboratively implemented. The results of evaluation are systematically consolidated and fed back into the system to facilitate continuous improvement.

The structure of an evaluation indicator system typically comprises five core elements: labelling, primary-level indicators, secondary-level indicators, explanatory notes for each indicator, and the assigned weight of each indicator.

Application-Oriented Undergraduate Education

The concept of application-oriented undergraduate education was first introduced in China by Gong Zhenwei in 1998. Although its formal recognition as a distinct category of higher education is relatively recent, scholarly debate has expanded significantly since 2002. Nonetheless, academic consensus on a precise definition remains elusive. Broadly, application-oriented undergraduate education seeks to cultivate technically skilled professionals capable of performing practical tasks, functioning as a training ground for future engineers and practitioners. In the early 21st century, some institutions redefined themselves as application-oriented to distinguish their missions from those of traditional research universities and vocational colleges. Definitions of application-oriented undergraduate institutions typically fall into two categories: a broad definition, which includes institutions offering applied disciplines aimed at enhancing practical competencies; and a narrow definition, which emphasises service to regional economic development and the employment needs of graduates. The institutional positioning of such colleges directly influences their operational models and policy formulation, while simultaneously reflecting national and societal demands for specialised human resources in diverse sectors.

China's higher education system, shaped by distinctive national characteristics, generally comprises two principal categories: research-oriented and application-oriented institutions. Research-oriented universities prioritise academic knowledge production, whereas application-oriented institutions emphasise competency-based learning (Zhao Jinzhao & Zhang Shaowen, 2007; Wu Xiangfeng, 2007). Application-oriented education places emphasis on technical and practical knowledge (Su Kairong & Dai Lijian, 2005), emerging in response to the shift from elite to mass higher education (Hong Lin & Wang Aijun, 2006). Its key features include alignment with regional economic development, integration of academic, technical, and vocational training, and a strong focus on graduate employability. The overarching aim is to cultivate professionals with an international outlook who are able to contribute across production, management, and service sectors (Zou Xiaoping, 2004; Yi Jianhong et al.,

2007). Pan Maoyuan (2010) summarised the defining features of application-oriented undergraduate education as a focus on application, an emphasis on undergraduate-level training, teaching-oriented provision, and a close connection with local communities. In this regard, unlike research universities, application-oriented institutions prioritise the utilisation of knowledge, curriculum design aligned with local economic requirements, and social service as a central mission.

A significant milestone in the institutionalisation of application-oriented undergraduate education was the release, on 21 October 2015, of the Guiding Opinions on Transforming Some Local Undergraduate Institutions into Application-Oriented Ones by the Ministry of Education, the National Development and Reform Commission, and the Ministry of Finance. This policy highlighted the mission of cultivating technically skilled professionals, strengthening collaboration between industry and universities, and addressing regional economic demands. Institutions were encouraged to develop application-oriented curricula and specialised programmes in partnership with industry and research entities, thereby bridging the gap in applied and innovative talent and advancing higher education reform.

In conclusion, application-oriented undergraduate colleges and universities represent a distinct category within China's higher education landscape. They concentrate on undergraduate training, emphasise practical competencies, serve regional socio-economic development, and structure their curricula around both disciplinary foundations and societal needs. In Guangxi, representative institutions include Guangxi Normal University of Science and Technology, Guangxi University of Science and Technology, Nanning Normal University, Hechi University, Guilin University of Technology, Baise College, Beibuwan University, Hezhou College, Liuzhou Institute of Technology, and Guangxi Agricultural Vocational and Technical University.

Related Research

The development of higher education quality evaluation has been a global focus for several decades, particularly in countries with mature educational systems. Skolnik (2010) observed that many nations have accumulated substantial experience

in educational quality assessment and management, establishing models tailored to their specific developmental needs. Europe and the United States, in particular, have developed sophisticated frameworks supported by a network of more than two hundred international organisations dedicated to quality assurance. Dostál et al. (2012) provided methodological tools for constructing educational evaluation models, while Claudia et al. (2013) underscored the importance of quality assessment as a means of demonstrating an institution's value to society. Their research highlighted the roles of both students and evaluators in identifying areas for improvement in teaching and learning. Kahloun et al. (2017) used expert consultation to prioritise evaluation indicators, emphasising the importance of methodological rigour. Similarly, Ting et al. (2018) evaluated higher education quality from students' perspectives, identifying three key areas: teaching evaluation, student satisfaction, and engagement.

In China, the concept of educational evaluation emerged in the early 1980s. Since then, considerable progress has been made in both the theoretical and practical dimensions of higher education assessment. Sun Yaozhong (2011) examined the foundational principles of constructing robust evaluation systems, addressing issues such as unclear objectives and inadequate indicators. Niu Lijun (2016) proposed a quality assurance model that integrates governmental oversight, institutional self-assessment, and third-party evaluations. Despite these advances, Wang Ning (2017) noted a continuing reliance on foreign models and called for original theoretical contributions. Yu Zhongbiao et al. (2018) adopted a balanced scorecard approach to design an entrepreneurship education evaluation system, reflecting an integrated management perspective. Ran Hua (2016) provided a cross-cultural analysis of value orientations in educational modernisation, while Liu Liming (2022) critiqued the dominance of administrative power in research evaluation within local universities.

Several studies have applied theoretical models, particularly the CIPP framework, to the design of evaluation indicator systems. Zhang Yu (2023) used the CIPP model to compare international vocational education standards and inform

local policy development. Huang Xiaofang (2019) proposed strategies for monitoring the quality of applied undergraduate education, such as strengthening quality culture and refining institutional classification standards. Yang Shenghua (2015) developed an evaluation framework for undergraduate classroom teaching, while Sun Danyu (2020) applied Total Quality Management principles and expert surveys to validate a distance education evaluation system. Similarly, Diao Xingyue (2021) established a comprehensive set of indicators for online courses, addressing course design, technological infrastructure, and learning activities. Despite this growing body of research, studies focusing on quality evaluation systems specifically for application-oriented undergraduate colleges remain limited.

In summary, both international and domestic research highlights the importance of multidimensional, context-sensitive evaluation systems in higher education. By drawing on global standards while incorporating local adaptations, this study seeks to construct a robust evaluation indicator system tailored to the needs of application-oriented undergraduate colleges in ethnic regions. The development of such systems can enhance institutional quality, support self-improvement, and strengthen evidence-based educational governance.

The review of literature in this chapter presents an integrated perspective on the concept of educational quality and its evaluation within higher education, with particular reference to application-oriented undergraduate institutions. Educational quality is conceptualised as a multifaceted construct encompassing student learning outcomes, institutional effectiveness, and alignment with social and economic needs. Effective evaluation requires a structured system of indicators that reflect institutional missions, educational goals, and regional relevance. This chapter underscores the importance of adopting frameworks that are context-specific yet informed by global standards, ensuring that quality assurance serves not only as a measure of performance but also as a driver of continuous improvement. For application-oriented colleges in Guangxi, the development of a tailored evaluation indicator system is essential for enhancing educational outcomes, fostering innovation, and supporting sustainable regional development.

Chapter 3
Research Methodology

The purpose of this research is to study the following aspects:

1. To examine the current status of education quality evaluation in Guangxi's application-oriented undergraduate universities.

2. To develop an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

3. To examine the feasibility and adaptability of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

The researchers adopted the following research procedures, as follows:

1. The population and the sample Group
2. Research Instruments
3. Research procedures
4. Data Collection
5. Data Analysis

Research Methods and Stage

This study utilized literature analysis and questionnaires to collect data. The literature analysis method was employed to examine relevant evaluation indicator systems for educational quality both domestically and internationally. The study explores the current status and challenges of the evaluation indicator system for educational quality, develops an evaluation indicator system for educational quality in application-oriented undergraduate colleges in Guangxi, and evaluates the feasibility of the proposed strategies. The stages of this study are as follows:

Stage 1: To examine the current Status of education quality evaluation in Guangxi's application-oriented undergraduate universities.

The research process is divided into three main steps:

Step 1: Document Review

Step 2: Questionnaire Survey on the Current Status and Challenges of Quality Evaluation in Application-Oriented Undergraduate Education in Guangxi

Step 3: Interviews to Explore the Components and Indicators of an Effective Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi

Stage 2: To develop an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

The research process is divided into two main steps:

Step 1: Focus Group Discussion on the Draft Evaluation Indicator System

Step 2: Selection of Indicators Using the Delphi Technique

Stage 3: To examine the feasibility and adaptability of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

The details of the research implementation for each stage are as follows:

Stage 1: To examine the current Status of education quality evaluation in Guangxi's application-oriented undergraduate universities.

This study employs a mixed-method approach, incorporating qualitative research through field studies with document Review, in-depth interviews and quantitative research through survey methods. The research process is divided into three main steps:

Step 1 Document Review

At this stage, the researcher will identify the components and indicators of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi, determining what components and indicators should be included. The process will proceed as follows:

1.1 Data Sources

The data sources used in this study include the analysis and synthesis of documents related to concepts, theories, and research concerning the components and indicators of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi, as well as external quality assessments of these colleges.

1.2 Data Collection Tools

The tool used for data collection is a recording table for analyzing and synthesizing information on the components and indicators of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

1.3 Data Collection

Data will be collected from documents related to concepts, theories, and research concerning the components and indicators of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi, internal quality assessments within institutions, and external quality assessments of these colleges. The data will be recorded in the analysis and synthesis recording table.

1.4 Data Analysis

Data analysis will involve content analysis and the formulation of conclusions.

Step 2: Questionnaires to Study the Current Status and challenges of Quality Evaluation in Applied Undergraduate Education in Guangxi

This step focuses on investigating the current status and challenges related to the quality evaluation of applied undergraduate education in Guangxi. The process is outlined as follows:

2.1 Population and Sample Group

Population

The research population consisted of 5,500 individuals involved in the evaluation of educational quality at five application-oriented undergraduate colleges in Guangxi. The population was categorized into three groups:

- 5,000 teachers
- 250 school administrators
- 250 teaching supervisors

Sample Group

The sample group comprised 661 individuals engaged in the evaluation of educational quality in application-oriented undergraduate colleges. The sample size was determined using the Krejcie and Morgan table (1970), ensuring that the sample was statistically representative of the overall population.

To obtain the sample, a multistage random sampling method was applied. First, the application-oriented undergraduate colleges in Guangxi were stratified according to their geographical locations: northern, central, eastern, western, and southern regions. Thereafter, simple random sampling was used to select one college from each region as a sampling unit.

This method ensured that important demographic characteristics of the population, such as gender, age, and educational level, were adequately represented. The sample selection process adhered to scientific principles of randomness and representativeness, thereby enhancing the validity and reliability of the research findings. Moreover, ethical standards were strictly observed throughout the research process, with full respect for participants' rights and privacy.

Stratified Random Sampling

Based on the stratified random sampling approach, the sample group was distributed as follows:

- 357 teachers
- 152 school administrators
- 152 teaching supervisors

This stratification ensured balanced representation of all key stakeholder groups, thereby enabling the study to provide comprehensive and meaningful insights into the current state of quality evaluation in applied undergraduate education in Guangxi.

Table 3.1 Population and Sample Group

Region	University	Teachers		School Administrators		Teaching Supervisors	
		Population	Sample Group	Population	Sample Group	Population	Sample Group
Western Guangxi	Guangxi Normal University of Science and Technology	1,120	80	55	34	55	34
Central Guangxi	Guangxi University of Science and Technology	1,120	80	55	34	55	34
Soutern Guangxi	Nanning Normal University	981	70	50	30	50	30
Eastern Guangxi	Hezhou University	981	70	50	30	50	30
Northern Guangxi	Guilin university of technology	798	57	40	24	40	24
	Total	**5,000**	**357**	**250**	**152**	**250**	**152**

2.2 Research Instrument

The instrument used for data collection was a questionnaire designed to assess the current status, problems, and influencing factors of the quality evaluation in application-oriented undergraduate education. The questionnaire consisted of two parts:

Part 1: General Information of the Respondents

This section collected demographic data including gender, age, education, academic position, and work experience. It employed a checklist format.

Part 2: Opinions on the Current Status, Problems, and Influencing Factors

This section utilized a 5-point Likert rating scale to assess the respondents' opinions on the current status, problems, and influencing factors of the quality

evaluation in application-oriented undergraduate education. The scale was defined as follows:

5 indicates the highest level of perception regarding the current status, problems, and influencing factors of quality evaluation in application-oriented undergraduate education.

4 indicates a high level of perception.

3 indicates a moderate level of perception.

2 indicates a low level of perception.

1 indicates the lowest level of perception

2.3 Construction of the Research Instrument

Design Purpose

To explore the current status, problems, and influencing factors related to the quality evaluation of applied undergraduate education.

Design Framework

1. Design purpose: To understand the current status, problems and influencing factors of quality evaluation of applied undergraduate education.

2. By referring to relevant literature, research reports, and data related to variable measurement. Based on the CIPP model, the operational definitions of variables and the framework for variable measurement were established. Four thematic components were proposed: background and environment (Context), input (Input), process (Process), and results (Product). A total of 25 questions were developed.

Content Validity

The questionnaire underwent content validation through the Indicator of Item-Objective Congruence (IOC) method.

IOC Analysis: Items were rated as follows:

+1 = clearly congruent with the objective

0 = uncertain

−1 = clearly not congruent with the objective

The IOC value was calculated using the formula:

$$\text{IOC} = \frac{\sum R}{N}$$

Where:

IOC is the index of item-objective congruence

R is the expert's score

∑R Is the total score from all experts

N is the number of experts

Acceptance Criteria for IOC

An IOC value of 0.50 or higher was considered acceptable. All 25 items met the criterion, with IOC values 1.00. Therefore, all items were retained in the finalized version of the questionnaire.

Pilot Testing: v

Item Discrimination Power: Using item-total correlation; items with correlations above 0.20 were retained.

Reliability: Using Cronbach's alpha to assess internal consistency. According to Cronbach (1970), alpha values are interpreted as follows:

0.71–1.00: High reliability

0.41–0.70: Moderate reliability

Below 0.41: Low reliability

All 25 items showed discrimination indices above 0.20 and a total Cronbach's alpha coefficient exceeding 0.95, indicating high reliability and suitability for data collection.

2.4 Data Collection

The data collection was conducted using the validated questionnaire with a total sample of 661 participants, as predetermined. The process included the following steps:

1. Authorisation, The researcher obtained an official authorisation letter from the Graduate School, Bansomdejchaopraya Rajabhat University, to collect data from 357 teachers, 152 school administrators, and 152 teaching supervisors. The purpose

was to ascertain the current status of the quality evaluation of application-oriented undergraduate education. Data collection was conducted using the Rensis Likert (1932) scale.

2. Questionnaire Distribution, The questionnaires were distributed via postal mail accompanied by an official request letter. Respondents were given two options for submission:

- Return by post using a prepaid envelope.
- Complete the questionnaire online using the provided QR code.

3. Follow-up: procedures were implemented to ensure the maximum retrieval of responses. A total of 641 completed questionnaires were collected, comprising:

- 357 from teachers (100% response rate),
- 152 from school administrators (100% response rate), and
- 132 from teaching supervisors (86.84% response rate).

4. All returned questionnaires were subsequently checked for completeness and accuracy before being subjected to data analysis.

5. Data Verification

Returned questionnaires were checked for completeness and prepared for statistical analysis.

2.5 Data Analysis

After completing the data collection process as planned, the researcher conducted statistical analysis to address the first research objective:

To study the current status and problems of the evaluation indicator system for educational quality in application-oriented undergraduate colleges in Guangxi.

Qualitative data analysis

1. Theme analysis: The qualitative data collected through interviews and focus group discussions were analyzed for themes. The core themes of the quality evaluation of applied undergraduate education in Guangxi were determined, including context, input, process and product.

2. Coding system: Design and apply a coding system to code responses to open-ended questions into themes or categories. Ensure consistency in the coding system so that the frequency of each theme can be tracked and analyzed.

Quantitative data analysis

1. Statistical analysis: Statistical analysis software was used to conduct statistical analysis on the data collected from the quantitative survey, including:

2. Frequency and percentage: Analyze the information of the sample respondents. Analyze the distribution of visitors by gender, age, education, professional title (position), and work experience.

3. Mean and standard deviation method: Analyze the current status of humanistic education development in higher vocational colleges in Hunan Province. The data interpretation of the mean is based on Rensis Likert (1932). The data interpretation is as follows:

4.50 – 5.00 represents the highest level

3.50 – 4.49 represents the high level

2.50 – 3.49 represents the moderate level

1.50 – 2.49 represents the low level

1.00 – 1.49 represents the lowest level

Step 3: Interviews to Examine the Components and Indicators for an Effective Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi

3.1 Interviewees

Investigation of Problems and Influencing Factors in the Quality Evaluation of Education in Application-Oriented Undergraduate Colleges in Guangxi

This study employed in-depth interviews to examine the problems and influencing factors associated with the quality evaluation of education in application-oriented undergraduate colleges in Guangxi. Participants were purposively selected from these institutions to ensure relevance, expertise, and the ability to provide comprehensive insights.

A total of 15 individuals were selected, categorised as follows:

- Five teachers
- Five school administrators
- Five teaching supervisors

The qualifications of the selected experts were categorised as follows:

Academic Administrators

- Possess a master's or doctoral degree
- Hold the academic rank of associate professor or above

Managers of Educational Institutions

- Possess a master's or doctoral degree
- Hold the academic rank of associate professor or above

University Teachers

- Possess a master's or doctoral degree
- Hold the academic rank of associate professor or above

These experts were selected on the basis of their extensive experience and recognised expertise in educational management and quality assurance. Their professional insights and evaluative feedback were instrumental in confirming the validity, practicality, and alignment of the proposed indicator system with established standards of educational quality. The selected samples are presented as follows:

Table 3.2 List of Interviewees

NO	Education Institutions	Interviewee	Reason
1	Guangxi Normal University of Science and Technology	3	The best application-oriented undergraduate colleges in Western Guangxi
2	Guangxi University of Science and Technology	3	The best application-oriented undergraduate colleges in Central Guangxi
3	Nanning Normal University	3	The best application-oriented undergraduate colleges in Soutern Guangxi
4	Hezhou University	3	The best application-oriented undergraduate colleges in Eastern Guangxi
5	Guilin university of technology	3	The best application-oriented undergraduate colleges in Northern Guangxi
	Total	**15**	

3.2 Research Instruments

Interview form

The researchers structured the interviews as follows:

1. Design purpose: Understand the problems and influencing factors of the quality evaluation of applied undergraduate education in Guangxi

2. Design idea: To present the information provided by the interviewees through structured interviews. The interview content focuses on the problems and influencing factors of the quality evaluation of applied undergraduate education in Guangxi, including the advantages, disadvantages, opportunities, threats and improvement directions that affect development.

3.3 Construction of the Research Instrument

Interview form IOC test: Sent to authoritative experts in the industry, and the experts tested the scope of the IOC. The content analysis table and interview outline were submitted to 5 authoritative experts in the industry to check the content validity, and the experts were asked to consider the consistency and applicability of each question based on appropriate and inappropriate operations, and the definition and suggestions for improving the interview outline were solicited. Then the index (project goal consistency index: IOC) and operational definition corresponding to each question were calculated, and it was found that the index of each question was 1.00, indicating that each question was consistent with the operational definition.

Stage 2: To develop an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

The research process is divided into two main steps:

Step 1: Focus Group Discussion on the draft evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

1.1 Target group

The draft of the Guangxi Applied Undergraduate Education Quality Evaluation Indicator System was analyzed through a focus group discussion involving teachers, school administrators, and teaching supervisors. The discussion focused on issues related to quality assurance and indicators of educational quality in application-oriented undergraduate colleges in Guangxi.

The target group for the focus group discussion comprised 15 participants selected through purposive sampling. The group included:

- Five teachers
- Five school administrators
- Five teaching supervisors

The qualifications of the selected experts were categorised as follows:

Academic Administrators

- Possess a master's or doctoral degree
- Hold the academic rank of associate professor or above

Managers of Educational Institutions

- Possess a master's or doctoral degree
- Hold the academic rank of associate professor or above

University Teachers

- Possess a master's or doctoral degree
- Hold the academic rank of associate professor or above

These experts were selected on the basis of their extensive experience and recognised expertise in educational management and quality assurance. Their professional insights and evaluative feedback were instrumental in affirming the validity, practicality, and alignment of the proposed indicator system with established educational quality standards.

The focus group was designed to elicit diverse perspectives and ensure a comprehensive evaluation of the proposed indicator system.

Table 3.3 List of Focus Group Interviewees

NO	Education Institutions	Focus group Interviewee	Reason
1	Guangxi Normal University of Science and Technology	3	The best application-oriented undergraduate colleges in Western Guangxi
2	Guangxi University of Science and Technology	3	The best application-oriented undergraduate colleges in Central Guangxi
3	Nanning Normal University	3	The best application-oriented undergraduate colleges in Soutern Guangxi
4	Hezhou University	3	The best application-oriented undergraduate colleges in Eastern Guangxi
5	Guilin university of technology	3	The best application-oriented undergraduate colleges in Northern Guangxi
	Total	**15**	

1.2 Research Instruments

Focus Group Interview Form

Based on the results of the questionnaire survey and analysis of Current Status and challenges of Quality Evaluation in Applied Undergraduate Education in Guangxi, a corresponding structured focus group interview form was developed from.

1.3 Data collection

The method of data collection for Aim 2: To develop an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi, the steps are as follows

1. The results from the first stage are used to develop an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

2. Requesting Official Documentation: The researcher obtained an official letter from the Graduate School of Bansomdejchaopraya Rajabhat University to formally invite participants to join the discussion.

3. Conducting the Discussion: Before the discussion, the researcher explained the background and significance of the study, the research process, and presented the draft an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

The discussion involved expert critiques on key components of the draft evaluation indicator system for the educational quality, including based on the six components of educational quality, which are:

1. The educational environment
2. Development level
3. The input level
4. Teacher level
5. School quality
6. Student quality

The researcher sought feedback from the participants, requested permission to record the discussion, and ensured the destruction of the recordings after the data was analyzed and presented.

1.4 Summarizing Discussion Outcomes

The results of the discussion were summarized and submitted to the thesis chairperson and advisory committee members.

1.5 Revising the evaluation indicator system for the educational quality

The researcher revised and refined the evaluation indicator system for the educational quality based on feedback from the expert group discussion, the thesis chairperson, and advisory committee members to ensure the strategies were comprehensive and well-developed.

1.6 Data Analysis

The data were analyzed using content analysis. Expert suggestions were reviewed to establish consensus and applied in revising the draft version of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

Step 2: Selection of Indicators Using the Delphi Technique

2.1 Target Group

Data were collected using the Delphi Technique over two rounds. The participants comprised 17 individuals:

- Six teachers
- Six school administrators
- Five external experts

Purposive sampling was employed to select participants with direct experience and proven expertise in educational quality evaluation. The selection criteria were as follows:

Academic Administrators

- Possess a master's or doctoral degree
- Hold the academic rank of associate professor or above

Managers of Educational Institutions

- Possess a master's or doctoral degree
- Hold the academic rank of associate professor or above

University Teachers

- Possess a master's or doctoral degree
- Hold the academic rank of associate professor or above

The experts were selected for their recognised expertise in educational management and quality assurance. Their professional insights and evaluative feedback were instrumental in confirming the validity, practicality, and alignment of the proposed indicator system with established educational quality standards.

Table 3.4 List of the Delphi Technique individuals

NO	Education Institutions	Focus group Interviewee	Reason
1	Guangxi Normal University of Science and Technology	4	The best application-oriented undergraduate colleges in Western Guangxi
2	Guangxi University of Science and Technology	4	The best application-oriented undergraduate colleges in Central Guangxi
3	Nanning Normal University	3	The best application-oriented undergraduate colleges in Soutern Guangxi
4	Hezhou University	3	The best application-oriented undergraduate colleges in Eastern Guangxi
5	Guilin university of technology	3	The best application-oriented undergraduate colleges in Northern Guangxi
	Total	**17**	

2.2 Research Instruments

This study employed the Delphi method to submit a preliminary set of indicators and criteria for evaluating the educational quality of applied undergraduate colleges to a panel of experts via questionnaires. To ensure that the feedback truly reflected the experts' individual judgments and to avoid the herd mentality that can arise from centralized discussions, the entire expert consultation process was conducted anonymously and independently. This allowed the experts to independently assess the appropriateness and importance of each indicator and criteria, drawing on their own knowledge and practical experience. Based on each

round of feedback, the evaluation system was continuously updated, revised, and adjusted, and the opinions of the experts were again sought. This cycle continued until a high degree of consensus was reached among the experts, and the final evaluation system was finalized.

The draft evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi, developed through focus group discussions, was used to construct a questionnaire.

2.3 Data Collection

1. The researcher obtained permission from Bansomdejchaopraya Rajabhat University to collect data from 17 experts, including 6 teachers, 6 school administrators, and 5 external experts.

2. The finalized questionnaire was distributed to the 17 experts using the Delphi technique in two rounds. Indicators with a median score (Median) of 3.50 or higher and an interquartile range (IQR) of 1.99 or lower were selected. The results of the Delphi method were then used to determine the final components and their associated indicators.

2.4 Data Analysis

The Delphi technique was used to analyze expert opinions on each indicator. The statistical criteria for inclusion were as follows:

Median Score Analysis:

Indicator agreement levels were interpreted using the following scale:

4.50–5.00 = Strongly agree

3.50–4.49 = Agree

2.50–3.49 = Moderately agree

1.50–2.49 = Slightly agree

1.00–1.49 = Strongly disagree

Indicators with a median score of 3.50 or higher were considered acceptable.

Interquartile Range (IQR) Analysis:

The IQR was used to assess the consistency of expert opinions. The interpretation criteria were as follows:

0.01–0.99 = Very high consensus

1.00–1.99 = High consensus

2.00–2.99 = Low consensus

≥ 3.00 = No consensus

Indicators with an IQR of 1.99 or lower were accepted for inclusion in the final indicator system (Okoli & Pawlowski, 2004).

Stage 3: To examine the feasibility and adaptability of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi

The details of the research implementation are as follows:

1. Target Group

The evaluation indicator system for the educational quality of applied undergraduate colleges in Guangxi was rigorously assessed in terms of feasibility and adaptability. Through purposive sampling, five experts with substantial experience and demonstrable authority in educational quality evaluation were selected. The selection criteria were defined as follows:

Academic Administrators

- Possess a master's or doctoral degree
- Hold the academic rank of associate professor or above

Managers of Educational Institutions

- Possess a master's or doctoral degree
- Hold the academic rank of associate professor or above

University Teachers

- Possess a master's or doctoral degree
- Hold the academic rank of associate professor or above

The experts were appointed on the basis of their distinguished expertise in educational management and quality assurance. Their critical insights and evaluative judgements were indispensable in substantiating the validity, practicality, and congruence of the proposed indicator system with established educational quality standards.

Table 3.5 Expert Qualification Criteria for Evaluation Strategies

Eligibility Criteria	Number of experts
Academic administrators with a master's or doctoral degree and a title of associate professor or above	1
Managers of educational institutions with a master's or doctoral degree and a title of associate professor or above	2
Teachers with a master's or doctoral degree and a title of associate professor or above	1
Academic managers with a master's or doctoral degree and a title of associate professor or above	1
Total	**5**

2. Research Instruments

The instruments used in this study include evaluation form.

2.1 Evaluation form

To evaluate the suitability and feasibility of Guangxi applied undergraduate colleges and universities education quality indicator system. The evaluation form is divided into two parts:

Part 1: the personal information of experts classified by work position, work experience, educational background, and academic title.

Part 2: The evaluation form about the suitability and feasibility of Guangxi applied undergraduate colleges and universities education quality indicator

system. The criteria for data interpretation is based on a five-point Likert's scale (1932), The data interpretation is as follows:

5 refers to the feasibility and adaptability of the education quality indicator system at the highest level

4 refers to the feasibility and adaptability of the education quality indicator system at a high level

3 refers to the feasibility and adaptability of the education quality indicator system at a moderate level

2 refers to the feasibility and adaptability of the education quality indicator system at a low level

1 refers to the feasibility and adaptability of the education quality indicator system at the lowest level

2.2 The process of constructing a evaluation form

1. The researcher used the details of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi. as the basis for formulating the questions.

2. The researcher developed a questionnaire to evaluate the suitability and feasibility of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi. using a 5-point rating scale.

3. The researcher submitted the draft questionnaire for assessing the suitability and feasibility of the evaluation indicator system to the thesis advisor and committee chair for review, focusing on appropriateness and language usage.

4. The researcher revised the questionnaire based on feedback from the thesis advisor and committee chair to ensure its suitability and feasibility for evaluating the strategies.

3. Data Collection

To evaluate the suitability and feasibility of Guangxi applied undergraduate colleges and universities education quality evaluation indicator system, quantitative data collection is used. The steps are as follows:

1. The researcher requested an official letter from the Graduate School of Bansomdejchaopraya Rajabhat University to facilitate the collection of evaluation data from five experts, comprising two academic administrators, two educational institution managers, and one university lecturer.

2. The researcher distributed the evaluation forms to the five experts, chose an appropriate time and place to contact the experts, instructed them to score the assessment forms, the evaluation forms were collected 100%.

3. The researcher Invited experts to fill out the evaluation form.

4. Summarized and analyzed the results of the evaluation form.

4. Data Analysis

Quantitative data analysis

Statistical analysis: Statistical analysis software was used to conduct statistical analysis on the data collected from the quantitative survey, including: Mean and standard deviation method: Guangxi applied undergraduate colleges and universities education quality evaluation indicator system ability high. The data interpretation of the mean is based on Rensis Likert (1932). The data interpretation is as follows:

4.50 – 5.00 represents the highest level

3.50 – 4.49 represents the high level

2.50 – 3.49 represents the moderate level

1.50 – 2.49 represents the low level

1.00 – 1.49 represents the lowest level

Summary of research methods in 3 stage as shown in Figure 3.1

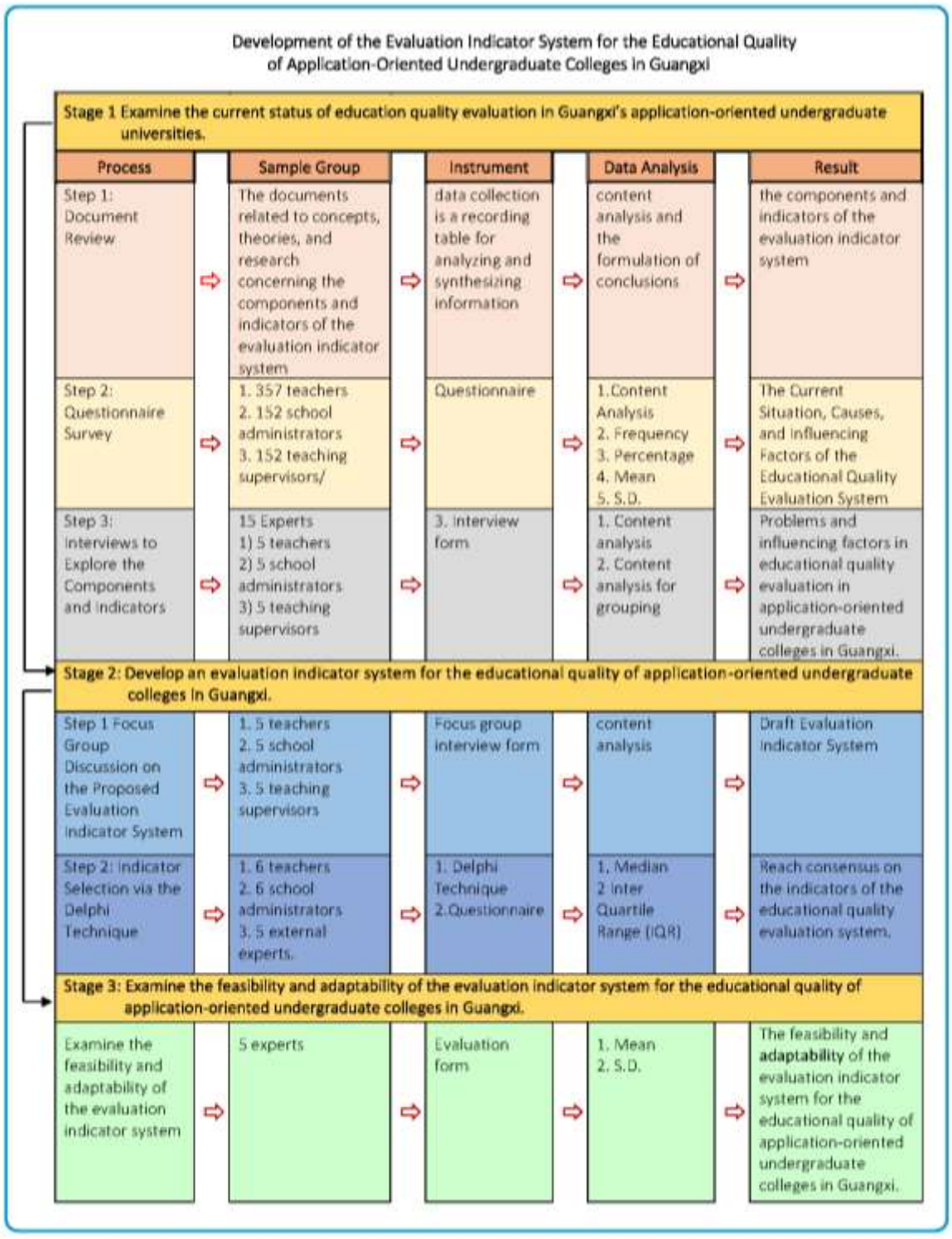

Figure 3.1 Summary of research methods

From Figure 3.1, the research procedures can be summarised as follows:

This study employed literature analysis and questionnaires to investigate the current status and challenges of the evaluation indicator system for educational quality, to develop an appropriate system for application-oriented undergraduate colleges in Guangxi, and to assess its feasibility and adaptability. The research was conducted in three stages:

Stage 1: Investigation of the current status and challenges of the evaluation indicator system, comprising document review, a questionnaire survey, and interviews to identify components and indicators.

Stage 2: Development of the evaluation indicator system through focus group discussions and refinement of indicators using the Delphi technique.

Stage 3: Evaluation of the feasibility and adaptability of the proposed system.

Chapter 4
Results of Analysis

According to the research objectives of the study titled "Development of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi," the research was conducted:

1. To examine the current status of education quality evaluation in Guangxi's application-oriented undergraduate universities.

2. To develop an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

3. To examine the feasibility and adaptability of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

The research was carried out in three stages as follows:

Stage 1: To examine the current status of education quality evaluation in Guangxi's application-oriented undergraduate universities.

This stage involved three key steps:

Step 1: Document Review

A review of relevant literature and official documents was conducted to understand existing frameworks and challenges.

Step 2: Questionnaire Survey

A survey was administered to collect data on the current status and challenges concerning the quality evaluation system in application-oriented undergraduate colleges in Guangxi.

Step 3: In-depth Interviews

Interviews with key stakeholders were conducted to explore essential components and indicators required for an effective evaluation system.

Stage 2: To develop an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

This stage comprised two main steps:

Step 1: Focus Group Discussion

Experts participated in structured discussions to refine the draft of the evaluation indicator system.

Step 2: Delphi Technique

The Delphi method was applied to obtain expert consensus on the evaluation indicators.

Stage 3: To examine the feasibility and adaptability of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

This stage focused on examining the practicality and appropriateness of the developed evaluation indicator system in the context of application-oriented undergraduate colleges in Guangxi.

The research findings are summarized as follows:

Stage 1: examine the current status of education quality evaluation in Guangxi's application-oriented undergraduate universities.

Step 1: Results of the Document Review

The findings from the document review revealed that the components and indicators of the educational quality evaluation indicator system for application-oriented undergraduate colleges consist of six major domains, detailed as follows:

1. Educational Environment

This component refers to both the physical and psychological conditions of the learning setting. It includes the adequacy and quality of facilities, availability of support services, and the overall atmosphere of the campus. A supportive educational environment is fundamental to fostering effective teaching and learning processes.

2. Development Level

This domain reflects the extent to which human, material, and financial resources are allocated to support educational activities. A high development level

indicates effective investment and resource management aimed at enhancing institutional capacity and promoting educational innovation.

3. Input Level

The input level encompasses financial investments and infrastructural support that contribute to the academic mission of the institution. This includes budget allocation for instructional activities, development of physical and digital learning resources, enhancement of laboratory and library facilities, and provision of modern information technology systems.

4. Teacher Level

This component evaluates both the quantity and quality of academic staff. Key indicators include the student-teacher ratio, proportion of full-time faculty members, levels of academic qualifications, percentage of faculty with senior academic titles, and the number of instructors holding postgraduate degrees. These metrics reflect the institution's academic strength and faculty development.

5. School Quality

School quality is often examined through various performance indicators, such as participation and success in teaching competitions, institutional rankings, and official recognition or awards for educational excellence. These indicators provide evidence of institutional prestige and effectiveness.

6. Student Quality

This domain focuses on the outcomes of education in terms of graduate readiness for employment and social contribution. Key indicators include graduate employment rate, employment stability, and levels of social satisfaction with graduates. These factors help measure how well the institution prepares students to meet labor market demands and societal expectations.

Step 2: Results of the Questionnaire Survey

This section presents the analysis of data obtained from the questionnaire and interviews regarding the current status, problems, approaches, and influencing factors in the evaluation of educational quality in application-oriented

undergraduate colleges in Guangxi. The results are presented using descriptive statistics, including frequency, percentage, mean, and standard deviation.

2.1 Analysis of Respondents' Personal Information

This subsection provides an analysis of the demographic characteristics of the respondents, including gender, age, educational background, professional title (position), and years of work experience. The data are presented in the form of frequency and percentage. The results of the demographic analysis are summarized, as shown in Tables 4.1 to 4.3.

Table 4.1 Number of people and percentage of respondents (For teacher)

Personal Information		Frequency	Percentage
Gender	Male	174	48.74
	Female	183	51.26
	Total	**357**	**100.00**
Age	25 years or below	46	12.89
	26 to 35 years	87	24.37
	36 to 45 years	78	21.85
	46 to 55 years	89	24.93
	56 years or above	57	15.96
	Total	**357**	**100.00**
Education	Bachelor's degree	46	12.89
	Master's degree	267	74.79
	Doctoral degree	44	12.32
	Total	**357**	**100.00**

Table 4.1 (Continued)

Personal Information		Frequency	Percentage
Academic position	Teaching assistant	46	12.89
	Lecturer or assistant professor	177	49.58
	Associate professor	105	29.41
	Professor	29	8.12
	Total	**357**	**100.00**
Work Experience	Within 5 years	69	19.33
	5 to 10 years	114	31.93
	11 to 15 years	85	23.81
	16 to 20 years	56	15.69
	More than 20 years	33	9.24
	Total	**357**	**100.00**

According to Table 4.1, in terms of gender, there are 174 males, accounting for 48.74%. There are 183 females, accounting for 51.26%. The proportion of females is slightly higher than that of males. In terms of age, there are 46 people aged 25 and below, accounting for 12.89%; 87 people aged 26 to 35, accounting for 24.37%; 78 people aged 36 to 45, accounting for 21.85%; 89 people aged 46 to 55, accounting for 24.93%; 57 people aged 56 and above, accounting for 15.96%. 26 to 35 and 46 to 55 are the two age groups with the largest number of people. In terms of education level, there are 46 people with bachelor's degrees, accounting for 12.89%; 267 people with master's degrees, accounting for 74.79%; 44 people with doctoral degrees, accounting for 12.32%. The vast majority of people have master's degrees. In terms of academic positions, 46 people are teaching assistants, accounting for 12.89%; 177 people are lecturers or assistant professors, accounting

for 49.58%; 105 people are associate professors, accounting for 29.41%; and 29 people are professors, accounting for 8.12%. Nearly half of the people are lecturers or assistant professors, with the least number of professors. In terms of work experience, 69 people have less than 5 years of work experience, accounting for 19.33%; 114 people have 5 to 10 years of work experience, accounting for 31.93%; 85 people have 11 to 15 years of work experience, accounting for 23.81%; 56 people have 16 to 20 years of work experience, accounting for 15.69%; and 33 people have more than 20 years of work experience, accounting for 9.24%. The most people have 5 to 10 years of work experience, and the least people have more than 20 years of work experience.

Table 4.2 Number of people and percentage of respondents (For school administrators)

Personal Information		Frequency	Percentage
Gender	Male	87	57.24
	Female	65	42.76
	Total	**152**	**100.00**
Age	25 years or below	13	8.55
	26 to 35 years	34	22.37
	36 to 45 years	45	29.61
	46 to 55 years	33	21.71
	56 years or above	27	17.76
	Total	**152**	**100.00**

Table 4.2 (Continued)

Personal Information		Frequency	Percentage
Education	Bachelor's degree	28	18.42
	Master's degree	67	44.08
	Doctoral degree	57	37.50
	Total	**152**	**100.00**
Academic position	Teaching assistant	24	15.79
	Lecturer or assistant professor	43	28.29
	Associate professor	52	34.21
	Professor	33	21.71
	Total	**152**	**100.00**
Work Experience	Within 5 years	11	7.23
	5 to 10 years	26	17.11
	11 to 15 years	30	19.74
	16 to 20 years	33	21.71
	More than 20 years	52	34.21
	Total	**152**	**100.00**

According to Table 4.2, in terms of gender, there are 87 males, accounting for 57.24%; 65 females, accounting for 42.76%. The proportion of males is higher than that of females. In terms of age, there are 13 people aged 25 and below, accounting for 8.55%; 34 people aged 26 to 35, accounting for 22.37%; 45 people aged 36 to 45, accounting for 29.61%; 33 people aged 46 to 55, accounting for 21.71%; 27 people aged 56 and above, accounting for 17.76%. 36 to 45 years old is the largest age group, and the number of people under 25 years old is the least. In

terms of education level, there are 28 people with a bachelor's degree, accounting for 18.42%; 67 people with a master's degree, accounting for 44.08%; 57 people with a doctorate, accounting for 37.50%. The number of people with a master's degree is the largest, and the number of people with a bachelor's degree is the least. In terms of academic positions, there are 24 teaching assistants, accounting for 15.79%; 43 lecturers or assistant professors, accounting for 28.29%; 52 associate professors, accounting for 34.21%; and 33 professors, accounting for 21.71%.

The number of associate professors is the largest, and the number of teaching assistants is the smallest. In terms of work experience, there are 11 people with less than 5 years, accounting for 7.23%; 26 people with 5 to 10 years, accounting for 17.11%; 30 people with 11 to 15 years, accounting for 19.74%; 33 people with 16 to 20 years, accounting for 21.71%; and 52 people with more than 20 years, accounting for 34.21%. The largest number of people have more than 20 years of work experience, and the smallest number of people have less than 5 years.

Table 4.3 Number of people and percentage of respondents (For teaching supervisors)

Personal Information		Frequency	Percentage
Gender	Male	65	49.24
	Female	67	50.76
	Total	**132**	**100.00**
Age	25 years or below	3	2.27
	26 to 35 years	14	10.61
	36 to 45 years	35	26.52
	46 to 55 years	43	32.57
	56 years or above	37	28.03
	Total	**132**	**100.00**

Table 4.3 (Continued)

Personal Information		Frequency	Percentage
Education	Bachelor's degree	6	4.54
	Master's degree	59	44.70
	Doctoral degree	67	50.76
	Total	**132**	**100.00**
Academic position	Teaching assistant	3	2.27
	Lecturer or assistant professor	34	25.76
	Associate professor	62	46.97
	Professor	33	25.00
	Total	**132**	**100.00**
Work Experience	Within 5 years	3	2.27
	5 to 10 years	26	19.70
	11 to 15 years	30	22.73
	16 to 20 years	52	39.39
	More than 20 years	21	15.91
	Total	**132**	**100.00**

According to Table 4.3, for teaching supervisors, in terms of gender, there are 65 males, accounting for 49.24%; 67 females, accounting for 50.76%. The number of females is slightly more than that of males. In terms of age, there are 3 people aged 25 and below, accounting for 2.27%; 14 people aged 26 to 35, accounting for 10.61%; 35 people aged 36 to 45, accounting for 26.52%; 43 people aged 46 to 55, accounting for 32.58%; 37 people aged 56 and above, accounting for 28.03%. The age group with the largest number of people is 46 to 55, and the number of people aged 25 and

below is the least. In terms of education level, there are 6 people with a bachelor's degree, accounting for 4.54%; 59 people with a master's degree, accounting for 44.70%; 67 people with a doctorate, accounting for 50.76%. The doctorate accounts for the largest number, and the bachelor's degree accounts for the least. In terms of academic positions, there are 3 teaching assistants, accounting for 2.27%; 34 lecturers or assistant professors, accounting for 25.76%; 62 associate professors, accounting for 46.97%; and 33 professors, accounting for 25.00%. The number of associate professors is the largest, and the number of teaching assistants is the smallest. In terms of work experience, there are 3 people with less than 5 years of experience, accounting for 2.27%; 26 people with 5 to 10 years, accounting for 19.70%; 30 people with 11 to 15 years, accounting for 22.73%; 52 people with 16 to 20 years, accounting for 39.39%; and 21 people with more than 20 years, accounting for 15.91%.The proportion of work experience between 16 and 20 years is the highest, and the number of people with less than 5 years of work experience is the least. Overall, there are slightly more women, the age is concentrated between 46 and 55 years old, the education level is mainly doctoral, associate professors account for the largest proportion, and the proportion of people with more work experience is higher.

2.2 Questionnaire data analysis of the current status of education quality evaluation of application-oriented undergraduate colleges in Guangxi, presenting data in the form of mean and standard deviation

1) By referring to relevant literature, research reports and data related to variable measurement, the operational definition of variables and the framework of variable measurement were defined. The core themes of the quality evaluation of application-oriented undergraduate education in Guangxi were determined, including context, input, process and output.

2) The questionnaire was sent to authoritative experts in the industry, and the experts tested the scope of the IOC. The content analysis table and questionnaire were submitted to 5 authoritative experts in the industry to check the content validity, and the experts were asked to consider the consistency and applicability of

each question based on appropriate and inappropriate operations, and the definition and suggestions for improving the questionnaire were solicited. Then the indicator (project goal consistency index: IOC) and operational definition corresponding to each question were calculated, and it was found that the index of each question was 1.0, indicating that each question was consistent with the operational definition.

3) Conducting surveys and reliability tests

The questionnaire was administered to 357 teachers, 152 school administrators, and 132 teaching supervisors from application-oriented undergraduate colleges in Guangxi. The collected data were used to assess the quality of the instrument. A validated version of the questionnaire was then piloted with a sample of 30 respondents to test reliability. Cronbach's Alpha coefficient was calculated and found to be above 0.97, indicating a very high level of reliability and internal consistency.

The questionnaire comprised five dimensions, with respondents providing answers based on the actual situation in their institutions. The researchers established criteria for data interpretation and carried out statistical analyses after collecting the questionnaires. Based on the mean and standard deviation of the responses regarding the current status of Guangxi application-oriented undergraduate colleges, the results were classified into four aspects.

Table 4.4 Current status of education quality evaluation in application-oriented undergraduate colleges in Guangxi

Content	$\bar{x}$	S.D.	Level	Rank
1. Context (background and environment)	3.35	0.79	Moderate	2
2. Input	3.37	0.84	Moderate	1
3. Process	3.22	0.85	Moderate	3
4. Output	3.01	0.82	Moderate	4
Total	**3.25**	**0.83**	**Moderate**	

As can be seen from Table 4.4, the current status of Guangxi's application-oriented undergraduate colleges involves four aspects, and the average level is at a moderate level ($\bar{x}$=3.25), among which the average level of input is the highest ($\bar{x}$=3.37), followed by the average level of context (background and environment) ($\bar{x}$=3.35), the average level of process ($\bar{x}$=3.22), and the lowest average level of output ($\bar{x}$=3.01). This shows that the education quality evaluation of Guangxi's application-oriented undergraduate colleges is at a moderate level in all indicators, and there is still a lot of room for improvement. Among them, the product aspect performs well, but the process and product aspects are relatively weak, especially the product aspect needs attention.

Table 4.5 The current status of the Context of the education quality evaluation of application-oriented undergraduate colleges in Guangxi

Content	$\bar{x}$	S.D.	Level	Rank
The university's core goal is to cultivate application-oriented talents	3.56	0.83	High	2
The university takes local economic and industrial needs into full consideration when designing its academic programs	3.63	0.78	High	1
The university’s educational philosophy aligns with the societal requirements for application-oriented talents	2.68	0.88	Moderate	5
The university has established stable partnerships with local enterprises	3.38	0.79	Moderate	4
The university fosters students’ awareness of serving society and industrie	3.49	0.71	Moderate	3
Total	**3.35**	**0.79**	**Moderate**	

According to Table 4.5, the current status of the context (background and environment) of the education quality evaluation of applied undergraduate colleges in Guangxi is at a medium level as a whole ($\bar{x}$=3.35). Among the five main aspects, "the school fully considers the local economy and industrial needs to set up majors" has the highest average level ($\bar{x}$=3.63), followed by the school's orientation to cultivate applied talents as the core goal ($\bar{x}$=3.56), the school cultivates students' awareness of serving society and industry ($\bar{x}$=3.49) and the school has established a stable cooperative relationship with enterprises in the region ($\bar{x}$=3.38). The lowest average level is "the school's educational philosophy is consistent with the society's requirements for applied talents" ($\bar{x}$=2.68).

Table 4.6 Current status of input in the evaluation of education quality in application oriented undergraduate colleges in Guangxi

Content	$\bar{x}$	S.D.	Level	Rank
The university's faculty team has strong practical experience and teaching ability	3.38	0.82	Moderate	2
The university introduces industry mentors or enterprise experts to participate in teaching	3.09	0.87	Moderate	6
The investment in laboratories, training rooms, and other infrastructure is sufficient	3.67	0.79	High	1
The content of academic programs meets the requirements for sustainable education	3.38	0.86	Moderate	3
There are specific courses or practical activities aimed at enhancing innovation and entrepreneurial skills	3.37	0.89	Moderate	4
The university provides adequate resources for student more career guidance and services.	3.30	0.85	Moderate	5
Total	**3.37**	**0.84**	**Moderate**	

Table 4.6 presents the current status of input in the evaluation of educational quality in application-oriented undergraduate colleges in Guangxi. The overall mean score was 3.37 (S.D.=0.84), which corresponds to a moderate level of input across the surveyed dimensions.

Among the six indicators, the highest-rated factor was the sufficiency of investment in laboratories, training rooms, and other infrastructure ($\bar{x}$=3.67, S.D.=0.79), evaluated at a high level. This highlights the relative strength of infrastructure investment in supporting applied undergraduate education. The second-ranked indicator was the practical experience and teaching ability of the faculty team ($\bar{x}$=3.38, S.D.=0.82), followed closely by the alignment of academic programme content with the requirements of sustainable education ($\bar{x}$=3.38, S.D.=0.86). Both were rated at a moderate level, suggesting room for improvement in teaching capacity and curriculum development.

Other aspects such as the provision of courses and activities to enhance innovation and entrepreneurial skills ($\bar{x}$=3.37, S.D.=0.89), career guidance and student services ($\bar{x}$=3.30, S.D.=0.85), and the introduction of industry mentors or enterprise experts into teaching ($\bar{x}$=3.09, S.D.=0.87) were also rated at a moderate level. The lowest score was observed for the integration of external experts, indicating limited collaboration between universities and industry.

In summary, the findings demonstrate that while infrastructure investment is a relative strength, other dimensions of input remain at a moderate level, particularly in industry-university collaboration, innovation training, and student services. These results suggest the need for more balanced development in faculty enhancement, curriculum reform, and external cooperation to raise the overall quality of input in application-oriented undergraduate education.

Table 4.7 Current status of Process in the evaluation of education quality in application-oriented undergraduate colleges in Guangxi

Content	$\bar{x}$	S.D.	Level	Rank
The university frequently organizes off-campus internships and practical training activities	3.07	0.81	Moderate	8
Internship and training activities meet the needs for improving students' practical skills	3.13	0.86	Moderate	6
Teachers adopt project-based teaching, case-based teaching, and other practical teaching methods	3.23	0.78	Moderate	3
Students can participate in enterprise projects or solve problems in real business environments	3.09	0.99	Moderate	7
The teaching process addresses the individual development needs of students	3.23	0.87	Moderate	4
The university organizes various academic competitions	3.42	0.83	Moderate	1
The ratio of theoretical teaching to practical teaching in the curriculum is reasonable	3.16	0.88	Moderate	5
The university provides diverse training programs to enhance teachers' practical teaching capabilities	3.41	0.83	Moderate	2
Total	**3.22**	**0.85**	**Moderate**	

According to Table 4.7, the current status of the education quality evaluation process of application-oriented undergraduate colleges in Guangxi is at a

medium level as a whole ($\bar{x}$=3.22). Among the eight main aspects, “The school organizes many subject competitions” had the highest mean level ($\bar{x}$=3.673), followed by the school carrying out various trainings to improve teachers’ practical teaching ability ($\bar{x}$=3.411), Teachers adopt project-based teaching, case-based teaching, and other practical teaching methods ($\bar{x}$=3.233), The teaching process addresses the individual development needs of students ($\bar{x}$=3.231), The ratio of theoretical teaching to practical teaching in the curriculum is reasonable ($\bar{x}$=3.155), Internship and training activities meet the needs for improving students’ practical skills ($\bar{x}$=3.134) and Students can participate in enterprise projects or solve problems in real business environment ($\bar{x}$=3.091), and “The university frequently organizes off-campus internships and practical training activities” had the lowest mean level ($\bar{x}$=3.072).

Table 4.8 Current status of Output in the evaluation of education quality in application-oriented undergraduate colleges in Guangxi

Content	$\bar{x}$	S.D.	Level	Rank
Graduates are satisfied with the university’s education and training	2.96	0.88	Moderate	5
Graduates’ practical skills meet industry requirements	3.31	0.79	Moderate	1
Graduates’ innovation abilities are fully developed	2.90	0.76	Moderate	6
Graduates can quickly adapt to job requirements	2.79	0.90	Moderate	8
The employment rate of graduates is satisfactory	3.14	0.88	Moderate	2
The quality of graduates’ employment (e.g., job matching, salary levels) is high	3.12	0.79	Moderate	3

Table 4.8 (Continued)

Content	$\bar{x}$	S.D.	Level	Rank
Graduates have promising career development prospects in the industry	2.82	0.76	Moderate	7
Students have sufficient support for innovation and entrepreneurship during their time at the university	3.07	0.79	Moderate	4
Total	**3.01**	**0.82**	**Moderate**	

According to Table 4.8, the current status of the education quality evaluation process of application-oriented undergraduate colleges in Guangxi is at a medium level as a whole ($\bar{x}$=3.01). Among the eight main aspects, "Graduates' practical skills meet industry requirements" has the highest average level ($\bar{x}$=3.31), followed by The employment rate of graduates is satisfactory ($\bar{x}$=3.14), The quality of graduates' employment (e.g., job matching, salary levels) is high. ($\bar{x}$=3.12), Students have sufficient support for innovation and entrepreneurship during their time at the university ($\bar{x}$=3.07), Graduates are satisfied with the university's education and training ($\bar{x}$=2.96), Graduates' innovation abilities are fully developed ($\bar{x}$=2.90) and Graduates have promising career development prospects in the industry ($\bar{x}$=2.82), and "Graduates can quickly adapt to job requirements" has the lowest average level ($\bar{x}$=2.79).

2.3 Interview Data Analysis of Existing Problems, Approaches, and Influencing Components in Application-Oriented Undergraduate Colleges in Guangxi

This study employed a researcher-designed interview outline to collect data through structured interviews. The interviewees were drawn from the study's sample group, with participants selected from Guangxi Normal University of Science

and Technology, Guangxi University of Science and Technology, Nanning Normal University, Hezhou University, and Guilin University of Technology.

All interviewees held at least a master's degree and had more than five years of experience working in application-oriented undergraduate colleges. The participants comprised five teachers responsible for educational quality evaluation, five school administrators, and five teaching supervisors, to talling 15 individuals. A summary of the interview findings from all 15 experts is presented in Table 4.9.

Table 4.9 Interview content analysis table (the problems and influencing factors of the quality evaluation of education in application-oriented undergraduate colleges in Guangxi)

Answer	Interviewers															Frequency	Percentage
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
The main issues in the evaluation of the education quality of applied undergraduate colleges include the following aspects																	
1) The indicator system is not scientific enough	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00
2) The indicator design is too general	√	√		√	√	√	√	√	√		√	√		√	√	12	80.00
3) The indicators are not specific enough		√	√	√		√	√	√	√	√		√	√	√	√	12	80.00
4) Indicators are difficult to quantify and evaluate	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00
5) Improper indicator weight distribution	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00
6) Lack of personalized indicators for application characteristics	√		√	√	√	√		√	√		√	√		√		10	66.67
7) Evaluation data is not updated in time	√	√	√		√		√		√	√	√	√	√	√	√	12	80.00
8) The data may be exaggerated to optimize the evaluation results.	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00
9) Lack of third-party independent evaluation agencies	√	√		√	√	√	√		√	√	√	√	√	√	√	13	86.67

Table 4.9 (Continued)

Answer	Interviewers															Frequency	Percentage
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
10) Lack of focus on practice and outcomes	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00
11) Lack of evaluation of students' practical ability	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00
12) Lack of evaluation of students' employment quality	√		√	√		√	√		√	√		√		√		9	60.00
13) The evaluation of the quality of school-enterprise cooperation lacks depth	√	√	√	√	√	√	√	√		√	√	√	√	√	√	14	93.33
14) Lack of evaluation of students' comprehensive qualities		√	√		√	√		√	√	√	√		√	√	√	11	73.33
15) Lack of evaluation of students' social adaptability	√		√	√	√	√	√		√	√	√	√	√	√	√	13	86.67
16) Lack of qualitative analysis	√	√		√	√		√	√	√	√	√	√	√	√	√	13	86.67
17) Students, parents, and employers contribute less to the evaluation	√	√	√	√	√	√	√	√	√		√	√		√		12	80.00

Table 4.9 (Continued)

Answer	Interviewers															Frequency	Percentage
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
18) Few follow-up surveys on reviews	√		√	√	√	√	√	√	√	√		√	√	√	√	13	86.67
19) Lack of regional and industry-oriented evaluation	√	√	√	√		√	√	√	√	√	√		√	√		12	80.00
20) Pay more attention to short-term data such as enrollment and employment rate	√	√		√	√	√	√	√		√	√	√	√	√	√	13	86.67
21) Ignoring students' long-term development or social contribution	√		√	√	√		√	√	√		√	√		√	√	11	73.33
22) Ignoring the school's innovation capabilities and long-term talent training effects	√	√	√	√	√	√		√	√	√	√	√		√	√	13	86.67
23) Inadequate application of evaluation results	√		√	√	√	√	√		√	√		√	√	√	√	13	86.67
24) Lack of transparency and feedback mechanisms	√	√		√	√	√	√	√		√	√		√	√		11	73.33

Table 4.9 (Continued)

Answer	Interviewers															Frequency	Percentage
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
25) Make Full Use of Evaluation Results to Improve Education Quality	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00
26) The evaluation results fail to fully and truly reflect the school's educational quality	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00
27) The evaluation method of practical results is unscientific and difficult to quantify	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00
28) Students have low participation in the evaluation of education quality and lack subjective experience feedback	√	√		√	√	√	√	√	√	√	√	√	√	√	√	14	93.33
29) The feedback mechanism for evaluation results is not perfect and cannot effectively promote improvement		√		√		√	√		√	√	√		√		√	9	60.00
30) Lack of long-term career develop-ment tracking mechanism for graduates	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00

Table 4.9 (Continued)

Answer	Interviewers															Frequency	Percentage
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
31) Insufficient feedback from employers on talent training in schools, and no closed loop has been formed	√	√	√	√	√	√	√	√		√	√	√	√		√	13	86.67
What do you think are the main ways to improve the education quality evaluation of applied undergraduate colleges?																	
1) Optimize the evaluation indicator system	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00
2) With the help of information technology, we can obtain real data from students, teachers, employers, alumni, enterprises, etc.	√		√		√		√	√		√		√	√	√	√	10	66.67
3) Improve data collection and feedback mechanisms		√	√	√	√	√	√	√	√	√	√	√	√	√	√	14	93.33
4) Use third-party evaluation agencies to participate in data collection and analysis to ensure objectivity	√	√		√	√	√	√	√	√	√		√		√		11	73.33

Table 4.9 (Continued)

Answer	Interviewers															Frequency	Percentage
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
5) Establish a dynamic evaluation system to regularly update data and reflect the school's continuous improvement	√	√	√		√	√		√	√		√	√	√	√	√	12	80.00
6) Conduct follow-up surveys on the long-term development of graduates to provide comprehensive data support for evaluation	√		√		√	√				√	√			√	√	8	53.33
7) Establish a multi-evaluation mechanism	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00
8) Add evaluation indicators for school social service achievements	√	√		√	√	√		√	√	√		√	√	√	√	12	80.00
9) Improve the participation of students, employers, society and parents in the evaluation of education quality	√	√	√		√		√	√	√		√	√	√			10	66.67

Table 4.9 (Continued)

Answer	Interviewers															Frequency	Percentage
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
What do you think are the main Strengths and Weaknesses of the education quality evaluation of applied undergraduate colleges?																	
Strengths																	
1) The regional economy is highly consistent with industrial demand, and local policy support is strong		√			√		√	√	√		√	√	√			8	53.33
2) The university and enterprise cooperation foundation is solid and the social service ability is strong	√		√				√		√			√			√	7	46.67
3) The application-oriented positioning is clear and talent training has certain effects	√	√		√	√		√	√		√	√		√		√	10	66.67
4) The practical ability of the teaching staff has been gradually improved	√	√	√	√	√	√	√		√	√	√	√		√	√	14	93.33
5) The evaluation system has taken shape and has a clear direction	√	√		√		√	√	√	√		√	√		√	√	11	73.33

Table 4.9 (Continued)

Answer	Interviewers															Frequency	Percentage
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
Weaknesses																	
1) Insufficient depth of cooperation between universities and enterprises		√	√		√	√	√		√		√	√		√	√	10	66.67
2) The teaching staff has weak practical ability	√	√	√	√	√	√		√	√	√	√		√	√	√	13	86.67
3) Single evaluation of student development	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00
4) Low level of social services and internationalization	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00
What do you think are the main opportunities and threats in the education quality evaluation of applied undergraduate colleges?																	
Opportunities																	
1) The country vigorously advocates vocational education and the cultivation of applied talents	√	√	√		√		√	√	√		√	√	√		√	11	73.33

Table 4.9 (Continued)

Answer	Interviewers															Frequency	Percentage
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
2) The transformation and upgrading of local economy and industry urgently needs applied talents with practical ability and innovative consciousness	√		√	√		√	√		√			√		√		10	66.67
3) More and more companies are willing to participate in higher education	√		√			√	√		√		√		√			7	46.67
4) Internationalized school philosophy	√	√	√	√	√	√		√	√	√	√	√	√	√	√	14	93.33
5) Artificial Intelligence Empowers Educational Evaluation	√	√	√		√	√		√	√	√			√	√	√	11	73.33
Threats																	
1) The education quality evaluation standards lack a scientific and detailed system for applied undergraduates.	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00
2) The quality of students varies	√	√		√		√		√	√		√		√		√	9	60.00
3) Limited funding	√	√	√		√	√	√	√	√	√	√	√		√	√	13	86.67
4) Increasing competitive pressure	√		√		√	√	√	√		√	√	√		√	√	11	73.33

Table 4.9 (Continued)

Answer	Interviewers															Frequency	Percentage
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
5) Society may not have high recognition of applied undergraduate colleges	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15	100.00
What do you think needs the most improvement in the education quality evaluation of applied undergraduate colleges?																	
1) Increase practice-oriented indicators	√	√	√		√	√	√		√	√	√		√	√	√	13	86.67
2) Introducing a dynamic adjustment mechanism	√		√	√	√		√	√	√		√	√		√		10	66.67
3) Assess the actual effect of cooperation between universities and enterprises		√	√		√	√		√		√			√		√	8	53.33
4) Introducing a third-party evaluation mechanism	√		√	√	√	√	√	√	√		√	√	√		√	13	86.67
5) Increase the assessment of students' innovation ability, practical ability and social service ability	√	√		√		√	√	√		√	√	√		√	√	11	73.33
6) Investigate whether the course content meets the needs of regional industries	√	√		√	√	√	√		√	√		√	√	√	√	12	80.00

Table 4.9 (Continued)

Answer	Interviewers															Frequency	Percentage
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
7) Is the teaching method practice-oriented?	√	√	√	√	√	√	√	√	√		√	√	√		√	13	86.67
8) Introducing peer review and teaching quality supervision	√	√	√		√	√	√	√		√	√		√	√	√	12	80.00
9) Invite industry associations and corporate representatives to participate in the education quality evaluation to ensure that the evaluation is consistent with social needs		√		√		√		√	√	√		√	√	√	√	10	66.67
10) Establish a special agency to regularly collect feedback from society and enterprises on graduates as an important basis for evaluation		√		√	√		√		√	√	√		√	√		9	60.00
11) Introduce intelligent data collection and analysis system to ensure the objectivity and comprehensiveness of data	√	√	√		√	√		√	√	√		√			√	10	66.67

Table 4.9 (Continued)

Answer	Interviewers															Frequency	Percentage
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
12) Regularly publish evaluation results to promote healthy competition and continuous improvement among institutions	√		√	√		√		√			√			√	√	8	53.33

Based on the analysis of in-depth interviews with 15 stakeholders, including teachers, school administrators, and teaching supervisors from application-oriented undergraduate colleges in Guangxi, several key problems and influencing factors related to the current education quality evaluation system were identified. These findings offer valuable insights for refining and constructing a comprehensive and context-sensitive evaluation indicator system.

The interview data highlighted several recurring concerns. The most significant issues include:

1. Lack of scientific rigor and specificity in the current indicator system. Participants indicated that the indicators are too general, lack clarity, and are difficult to quantify and apply effectively.

2. Improper weighting of indicators and an overemphasis on short-term data such as enrollment and employment rates, which fail to capture the broader impact of educational outcomes.

3. Inadequate focus on practical results, including students' hands-on skills, innovation capacity, long-term career development, and social adaptability.

4. Limited participation of stakeholders such as students, employers, and third-party evaluators, resulting in incomplete feedback loops and ineffective application of results.

5. Insufficient evaluation of school-enterprise cooperation and inadequate alignment with regional industry demands.

Among the strengths identified were alignment between institutional missions and regional economic development, strong policy support, and gradual improvements in faculty competency. However, several weaknesses persist, including limited internationalization, one-dimensional student outcome evaluations, and weak transparency and feedback mechanisms.

To address these issues, interviewees proposed several improvement strategies:

1. Optimize and restructure the evaluation indicator system

2. Introduce dynamic and adaptable evaluation mechanisms

3. Emphasize practice-based and outcome-oriented metrics

4. Apply intelligent data systems for more objective and comprehensive evaluations

5. Increase engagement of external stakeholders, including industry and alumni

6. Establish long-term tracking systems for graduate development

The interview findings revealed essential components, challenges, and contextual priorities. These insights guided the planning and conduct of the focus group discussion in Stage 2. The discussion focused on improving the system's scientific rigor, relevance, and feasibility while ensuring that it aligns with institutional practices and regional characteristics in Guangxi.

As a result, the evaluation indicator system was structured around six core dimensions: educational environment, development level, input level, teacher level, school quality, and student quality. Each of these dimensions includes secondary and tertiary indicators that reflect practical needs and policy priorities. The insights from the interviews played a critical role in ensuring that the final system is both comprehensive and practically applicable.

Stage 2: Results of the Development an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

This stage consists of two main steps:

Step 1: Analysis of Focus Group Discussion Data on the Draft Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi

Through the questionnaire survey on the current status of educational quality evaluation in application-oriented undergraduate colleges in Guangxi, along with interviews regarding problems, approaches, and influencing factors. The findings revealed that the overall level of educational quality evaluation in these institutions

remains at a moderate level. Therefore, it is necessary to construct a more scientific, specific, and contextually relevant evaluation indicator system.

Based on the survey results, interview findings, and related literature, the researcher invited 15 participants comprising 5 teachers, 5 school administrators, and 5 teaching supervisors from five sample institutions to participate in a focus group discussion. The discussion focused on six major components and several key issues concerning the draft indicator system. The discussion outcomes are summarized below:

Question 1: What core concepts and principles should guide the formulation of the draft evaluation indicator system for applied undergraduate colleges in Guangxi?

The system should be guided by the following principles to ensure scientific validity, practical applicability, and contextual relevance:

1. Student-centered approach – focusing on students' development, learningoutcomes, practical skills, innovation, and employability.

2. Application-oriented education – emphasizing practical training, school-enterprise collaboration, internships, and skill development.

3. Quality-driven evaluation – aligning indicators with teaching quality improvement, innovation in instruction, and active stakeholder engagement.

4. Comprehensive and systematic evaluation – covering all institutional dimensions such as environment, teaching staff, curriculum, methodologies, student development, and practical experience.

5. Scientific and operable design – ensuring clear standards, reliable data sources, and measurable outcomes.

6. Regional adaptability – reflecting Guangxi’s socioeconomic conditions, industry demands, and cultural characteristics.

7. Dynamic and responsive design – enabling regular adjustments based on policy shifts, societal needs, and technological advances.

8. Multi-stakeholder participation – engaging educational authorities, faculty, students, and external partners to ensure inclusivity and credibility.

Question 2: What aspects should be included in the evaluation of the educational environment?

The educational environment should encompass both physical infrastructure and intangible factors such as a supportive, inclusive, and innovation-friendly campus atmosphere. It should also include humanistic values and digital infrastructure.

Question 3: What aspects should be considered when evaluating the development level of the institution?

The development level should reflect the institution's growth potential, adaptability to economic changes, innovation capacity, and ability to contribute to regional development. Evaluation should address scale, diversification, internationalization, sustainability, and social engagement.

Question 4: What elements should be included in the evaluation of the input level?

The input level should cover investments in infrastructure, faculty development, student welfare, scientific research, IT systems, and partnerships. Resource allocation must align with institutional missions and regional characteristics to ensure effective delivery of educational services.

Question 5: What should be considered in evaluating teacher quality?

Teacher quality should focus on teaching ability, academic qualifications, research performance, professional development, and industry experience. Schools should promote capacity-building through training, recruitment, and collaborative industry engagement.

Question 6: What aspects define school quality in the evaluation process?

School quality should reflect academic standards, management efficiency, integration of internal and external resources, and social recognition. Effective school governance, service capacity, and community partnerships are essential indicators.

Question 7: What indicators best represent student quality?

Student quality should reflect academic performance, practical skills, innovation, professional competence, and career readiness. Evaluation should include long-term outcomes such as employability, social contribution, and entrepreneurial abilities.

Based on the focus group discussion, the researcher developed a proposed evaluation indicator system for the educational quality of applied undergraduate colleges in Guangxi. The system is structured into six first-level indicators, 17 second-level indicators, and 50 third-level indicators. The development process and resulting structure of the Evaluation Indicator System is summarized in Table 4.10.

Table 4.10 Evaluation index system of education quality of application-oriented undergraduate colleges in Guangxi

First-level Indicators	Second-level Indicators	Third-level Indicators
1. Educational environment	1. Human environment	1. Teacher-student relationship
		2. Peer relationship
		3. Campus culture of humanistic care
	2. Physical Environment	4. School area
		5. Proportion of smart classrooms
		6. Number of books in the library
		7. Number of training bases
		8. Number of laboratories
	3. Information environment	9. Application of digital resources
		10. Teaching information system

Table 4.10 (Continued)

First-level Indicators	Second-level Indicators	Third-level Indicators
2. Development level	4. Scale structure	11. Number of enrolled students 12. Scale of academic disciplines
	5. Sustainable development capabilities	13. Sustainability of educational resources 14. Sustainable development capability of management level
	6. Internation-alization	15. Teachers' international perspectives 16. Cultivation of international students 17. Number of international collaboration
3. Investment level	7. Infrastructure	18. Investment in living facilities 19. Investment in application - oriented teaching facilities 20. Investment in practical facilities 21. Sports and cultural facilities
	8. Social resource investment	22. Corporate investment 23. Public donations
	9. Financial investment	24. Educational funding per student 25. Government appropriations
4. Teacher Level	10.Teachers	26. Proportion of application-oriented teachers 27. Teachers' application-oriented skills and professional competence

Table 4.10 (Continued)

First-level Indicators	Second-level Indicators	Third-level Indicators
4. Teacher Level	11. Professional Development	28. Application-oriented education and training
		29. Research on application-oriented teaching
	12. Teachers' treatment	30. Teacher salary and benefits
		31. Teachers' social welfare
		32. Teachers' professional status
5. School Quality	13. School Management	33. Integration of application-oriented features into regulations
		34. Organization of application-oriented work
		35. Mechanism for application-oriented operations
	14. Resource Integration	36. Resource integration of industry-university-society
		37. Collaboration between schools and families
	15. School influence	38. Social reputation
		39. Industry influence
		40. Regional influence

Table 4.10 (Continued)

First-level Indicators	Second-level Indicators	Third-level Indicators
6. Student Quality	16. Student Development	41. Classroom participation
		42. Activity participation
		43. Number of award-winning students in academic competitions
		44. Knowledge and skills
		45. Social adaptability
		46. Students' innovation ability
		47. Students' practical ability
	17. Graduate Quality	48. Fit between people and professions
		49. Quality of graduates' employment
		50. Career development of graduates

According to Table 4.10 Summary of the Evaluation Indicator System for the Educational Quality of application-oriented Undergraduate Colleges in Guangxi

The proposed evaluation indicator system for assessing the educational quality of applied undergraduate colleges in Guangxi is structured into six first-level indicators, which are further divided into 17 second-level indicators, and 50 third-level indicators. This hierarchical system reflects a comprehensive and multi-dimensional approach to quality assessment in applied higher education.

1. Educational Environment

This dimension focuses on the overall conditions supporting student learning and development, encompassing the human, physical, and informational environments. The human environment emphasizes the quality of interpersonal

relationships within the institution, including teacher-student rapport, peer relationships, and the presence of a humanistic and inclusive campus culture. The physical environment includes indicators such as school land area, the proportion of smart classrooms, library book resources, number of training bases, and laboratories, all of which are critical for supporting modern educational practices. The information environment evaluates the integration and usage of digital teaching resources and information systems that facilitate educational management and learning.

2. Development Level

This indicator assesses the institution's growth potential and long-term sustainability. It includes the scale structure, represented by the number of enrolled students and the breadth of academic disciplines offered. Sustainable development capabilities are measured through the sustainability of educational resources and the institutional management system. Internationalization indicators reflect global engagement through teachers' international perspectives, the presence of international students, and collaborative activities with overseas institutions.

3. Investment Level

Investment indicators measure the resources committed to educational development. Infrastructure includes investments in student living facilities, teaching infrastructure tailored to application-oriented learning, practical training facilities, and sports and cultural amenities. Social resource investment captures the level of support from enterprises and the community, including corporate funding and public donations. Financial investment is assessed through per-student educational funding and government appropriations, which are essential for maintaining and enhancing educational quality.

4. Teacher Level

This domain evaluates the quality and development of academic staff. The teaching force is assessed based on the proportion of teachers with application-oriented backgrounds and their industry-relevant competencies. Professional development includes participation in applied education training and involvement

in research related to applied teaching. Teacher treatment indicators reflect salary, benefits, social welfare, and professional status, which influence the institution's ability to attract and retain high-quality educators.

5. School Quality

This component addresses institutional performance from three perspectives. School management examines how application-oriented characteristics are embedded in governance, organizational structures, and operational mechanisms. Resource integration focuses on the institution’s ability to collaborate with industry and families to enhance educational outcomes. School influence assesses the institution’s social, industrial, and regional reputation and its contribution to local development.

6. Student Quality

Student quality reflects the outcomes of the educational process. Student development is measured through indicators such as classroom and extracurricular participation, academic competition awards, knowledge and skill acquisition, social adaptability, innovation ability, and practical competence. Graduate quality includes the alignment between graduates' skills and employment, job placement quality, and long-term career development.

The connotation and standards of the evaluation indicator system of applied education quality in Guangxi

1. The educational environment

The educational environment is an important factor in the quality of education, involving the school's hardware and software conditions and comprehensive cultural atmosphere. Through multi-level inspections of the humanistic environment, physical environment and information environment, it is possible to comprehensively evaluate whether the school provides high-quality educational support for students.

1) The humanistic environment mainly emphasizes the relationship between people on campus and the impact of the campus cultural atmosphere on student

development, including teacher-student relationship, peer relationship, and campus humanistic care cultural atmosphere.

Teacher-student relationship

Connotation: measure whether a harmonious, respectful and trusting relationship has been established between teachers and students.

Requirements: teachers and students interact frequently, teaching and learning are mutually beneficial, students are highly satisfied with teachers, and teachers care for students in place.

Peer relationship

Connotation: evaluate the spirit of cooperation and mutual assistance between students.

Requirements: an atmosphere of mutual help is presented in the student group, without obvious conflicts or isolation.

Campus humanistic care cultural atmosphere

Connotation: examine whether the school has created a cultural environment that respects individuals, is diverse and inclusive, and supports development.

Requirements: rich campus activities, focus on mental health and humanistic education, and students gain a sense of belonging and happiness.

2) The physical environment refers to the infrastructure and practical teaching conditions provided by the school, which directly affects the cultivation of students' learning and practical abilities, including the school's land area, the proportion of smart classrooms, the number of library books, the number of training bases, and the number of laboratories.

School Land Area

Connotation: Whether the total area of the school meets the basic needs of education and teaching.

Requirement: Meet the area standards stipulated by the education department, and the space planning is reasonable.

Smart Classroom Proportion

Connotation: The proportion of smart classrooms in the school among all classrooms.

Requirement: Intelligent teaching equipment is popularized, and the construction of smart classrooms can meet teaching needs.

Library Books

Connotation: The total amount of paper and electronic books in the library.

Requirement: The per capita book ownership meets national or regional standards, with rich varieties and timely updates.

Number of Training Bases

Connotation: The number and quality of professional training bases inside and outside the school.

Requirement: Covering major majors, the base facilities are complete, and meet the needs of students' practical ability cultivation.

Number of Laboratories

Connotation: The number of school laboratories and their professional coverage.

Requirement: There are sufficient laboratories and they are equipped with equipment that meets professional teaching needs.

3) The information environment examines the school's construction in the digitization of educational resources and the application of information technology, reflecting the modernization level of school education, including the application of digital resources and digital information systems.

Digital resource application

Connotation: The utilization rate and effect of the school's digital teaching resources.

Requirements: High frequency of use by teachers and students, complete resource types and high-quality content.

Teaching information system

Connotation: The level of construction of the school's information system for teaching management and teaching support.

Requirements: Complete functions, easy to use, and realize the informatization of teaching and management.

2. Development level

Development level evaluates the school's development, structure, sustainability and internationalization level, reflecting the school's ability to maintain balanced development, ensure long-term survival and improve global competitiveness, including three indicators: scale structure, sustainable development capacity and internationalization.

1) Scale structure evaluates whether the school's scale and structure meet the needs of applied education and regional development, including the number of students and the scale of disciplines and majors.

Number of students in school

Connotation: The total number of students in the school and its growth.

Requirement: Moderate scale, matching school resources and regional needs.

Discipline and major scale

Connotation: The number and coverage of disciplines and majors offered by the school.

Requirement: The discipline setting meets the needs of the regional economy and industry, and the structure is reasonable.

2) Sustainable development capacity examines whether the university has the ability to maintain growth and improve operations over time

Sustainability of school resources

Connotation: The school's sustainable supply capacity in terms of infrastructure, funds, etc.

Requirement: Sustainable investment of resources to ensure the long-term and stable development of the school.

Sustainable development capacity of school management level

Connotation: The sustainability of the school in management system and mechanism.

Requirement: Focus on innovation and improvement, and establish a sound management system.

3) Internationalization measures the degree of international participation and global vision, and reflects the ability of universities to align with international education standards.

Teachers' international vision

Connotation: Teachers' ability to participate in international exchanges and international awareness.

Requirement: Teachers have international education background or cooperation experience.

International student training

Connotation: The scale and quality of international students trained by the school.

Requirement: Attract more international students and provide high-quality education support.

Number of international cooperation

Connotation: The frequency of cooperation and exchanges between the school and overseas institutions or institutions.

Requirement: Continuously expand the international cooperation network **and achieve significant project results.**

3. The input level

The input level is an important guarantee for the development of education quality in applied undergraduate colleges, including infrastructure, social resource investment, and financial investment.

1) Infrastructure investment mainly reflects the degree of perfection of the school's hardware environment construction, which is the material guarantee for the

school to carry out high-quality teaching and scientific research, and directly supports the applied talent training model, including living facilities investment, applied teaching facilities investment, practical facilities investment, sports and cultural facilities.

Living facilities investment

Connotation: Construction investment in basic living facilities such as student dormitories and canteens.

Requirement: Complete facilities and standardized management to meet students' living needs.

Application-oriented teaching facilities investment

Connotation: Investment in facilities construction to support professional teaching.

Requirements: The equipment meets the needs of applied teaching and is updated in a timely manner.

Investment in practical facilities

Connotation: Investment in hardware facilities for experiments and training.

Requirements: Comprehensive coverage of majors to meet the needs of practical teaching.

Sports and cultural facilities

Connotation: Construction investment in sports venues and cultural venues.

Requirements: Complete facilities to ensure the all-round development of students.

2) Social resource investment reflects the degree of support from social forces to the school. It is an important indicator for measuring the depth of cooperation between applied undergraduate colleges and enterprises and the level of social participation, including corporate investment and public welfare donations.

Corporate investment

Connotation: Cooperation and capital investment of enterprises in schools.

Requirements: Establish a stable school-enterprise cooperation relationship and share resources.

Public welfare donations

Connotation: Donations from all walks of life to schools.

Requirements: Standardize the use of donations and improve the efficiency of fund utilization.

3) Fiscal investment is the core part of education funding guarantee, which directly determines the improvement of school conditions and resource allocation, including education funding for each student and funding issued by the government.

Education funding for each student

Connotation: Average annual education funding investment for each student.

Requirements: Meet regional or national standards.

4) Funds issued by the government

Connotation: Special funds provided by the government to schools.

Requirement: The use of funds is standardized to ensure the quality of project completion.

4. Teacher Level

Teacher level is the core dimension of education quality evaluation, which determines the upper limit of school teaching quality and student training quality.

1) Teacher emphasizes whether the number and structure of teachers meet the teaching needs of the school, which directly affects the teaching effect, including the proportion of applied teachers and the professional quality of teachers' applied skills.

Proportion of applied teachers

Connotation: Measures the proportion of full-time teachers in the school with applied backgrounds (such as corporate experience and industry qualifications).

Requirement: The proportion of applied teachers is high, especially for subjects and courses closely related to the major, and teachers with sufficient industry experience background are required.

Professional quality of teachers' applied skills

Connotation: Whether teachers have professional skills, industry experience and practical ability related to applied education.

Requirement: Teachers not only have a disciplinary foundation, but also have practical skills required by the industry.

2) Professional development focuses on the continuous learning and research ability improvement of teachers, including applied education training and applied education teaching research.

Applied education training

Connotation: Whether teachers have participated in special training and learning improvement of applied education.

Requirements: The school regularly carries out training programs for applied education, and teachers actively participate to improve their practical teaching ability.

Research on applied education and teaching

Connotation: Whether teachers participate in scientific research and teaching method research related to applied education.

Requirements: Encourage teachers to conduct innovative research in applied teaching methods, curriculum development, etc., and form practical results.

3) Teacher treatment reflects the school's ability to attract and retain excellent teachers, guarantee teachers' family expenses, and better serve the school.

Teacher salary and benefits

Connotation: The school's guarantee measures for teachers' salary, performance, etc.

Requirements: Teachers' salaries are in line with industry standards, and performance policies are complete, which helps to attract and retain excellent teachers.

Teachers' social welfare

Connotation: Social welfare provided by the school to teachers, such as medical care, housing, insurance and other social security.

Requirements: The welfare measures are sound to ensure the basic life and career stability of teachers.

Teacher status

Connotation: The status and role of teachers in the school, whether they are respected and valued.

Requirements: Teachers play an active role in the school's decision-making, teaching, scientific research, etc., and are recognized by the society.

5. School quality

School quality is mainly evaluated from three aspects: management ability, resource integration ability and social influence.

1) School management focuses on the scientificity and efficiency of the education management model, including the inclusion of applied characteristics in rules and regulations, applied work organization, and applied operation mechanism.

Incorporation of applied characteristics into rules and regulations

Connotation: Whether the school incorporates applied education characteristics into the school's management system and policies.

Requirement: The school's management system should clearly support the development of applied education and form institutional guarantees.

Applied work organization

Connotation: Whether the school has a special organization or team responsible for the planning and implementation of applied education.

Requirement: There is a special department responsible for the promotion and evaluation of applied education to ensure implementation.

Applied operation mechanism

Connotation: Whether the school has established an operation mechanism that adapts to applied education, such as school-enterprise cooperation, industry-university-research integration mechanism, etc.

Requirement: Establish a sound school-enterprise cooperation mechanism, practice base construction, teaching reform and other systems.

2) Resource integration reflects the ability to optimize the allocation of resources inside and outside the school, including industry-university-society resource integration and school-family cooperation.

Industry-university-society resource integration

Connotation: How to integrate resources between schools, industries, and all sectors of society to promote common development.

Requirements: Strengthen cooperation with industries and enterprises, and establish a cooperative platform for resource sharing and mutual benefit.

School-family cooperation

Connotation: How schools cooperate with students' families to jointly promote students' growth and development.

Requirements: Establish a home-school cooperation mechanism to promote the all-round development of students, especially in terms of psychological and career planning support.

3) School influence evaluates the school's social reputation and contribution to the regional economy, including social reputation and regional and industry influence.

Social reputation

Connotation: The recognition and influence of the school in society, including media coverage, social evaluation, etc.

Requirements: The school should continuously improve its social reputation and expand its brand influence, especially in the local and related industries.

Industry influence

Connotation: The reputation and influence of the school in the industry and professional field, especially the connection with enterprises and career development.

Requirements: The school's graduates and scientific research results can have a positive impact on the industry and be recognized by the industry.

Regional influence

Connotation: The school's role in promoting the economy, culture, society and other aspects of the region.

Requirements: The school not only cultivates local talents, but also actively participates in the construction of the local economy and society, becoming an important force for regional development.

6. Student quality

Student quality is a direct indicator for evaluating educational effectiveness, and the core lies in the comprehensive development of students and the quality of graduates.

1) Student development reflects the learning effect and comprehensive ability improvement of students during their time at school, including classroom participation, activity participation, the number of students who won awards in subject competitions, knowledge and skills, social adaptability, student innovation ability, and student practical ability.

Classroom participation

Connotation: The degree of active participation of students in the classroom, including discussions, questions, homework, etc.

Requirements: Students can actively participate in classroom activities, have active thinking, and show high learning enthusiasm.

Activity participation

Connotation: The status of students participating in various activities inside and outside the school, such as cultural and sports activities, academic activities, etc.

Requirements: The school provides a wealth of extracurricular activities, and students actively participate, which is conducive to the cultivation of holistic development.

Number of students who won awards in subject competitions

Connotation: The number and results of students who won awards in various subject competitions.

Requirements: Students are encouraged to participate in subject competitions, and the school provides corresponding support to enhance students' innovation and practical abilities.

Knowledge and skills

Connotation: The professional knowledge and application ability mastered by students.

Requirements: Students can master solid professional knowledge through teaching activities and have strong practical operation capabilities.

Social adaptability

Connotation: The ability of students to adapt to the social environment, integrate into the workplace, communicate and cooperate with others.

Requirement: The school helps students improve their social adaptability through various forms of practical activities, especially workplace communication and teamwork.

Student innovation ability

Connotation: Students' innovative awareness and ability in academic, scientific research and practice.

Requirement: Encourage students to participate in innovative practice, cultivate innovative spirit and ability, especially the application ability in entrepreneurship and scientific research.

Student practical ability

Connotation: Students' ability to solve problems and apply knowledge in a real environment.

Requirement: The school provides abundant internship and training opportunities to help students apply what they have learned to solve practical problems.

2) Graduate quality reflects the social competitiveness of students after leaving school and the success rate of school training, including the match between students and occupations, the employment quality of graduates, and the career development status of graduates

Student and occupation match

Connotation: The degree of match between graduates' professional ability and the occupation they are engaged in.

Requirement: Graduates can quickly adapt to their jobs and demonstrate the application ability of their majors.

Graduate employment quality

Connotation: Graduate employment rate, job quality (match with major, salary level, etc.) Requirements: The employment rate of graduates is high, and the employment positions are in line with their professional development direction, and the salary and benefits are reasonable.

Graduates' career development status

Connotation: Graduates' career promotion and development.

Requirements: Graduates can achieve good career development and promotion in their careers and continuously improve their social value.

Step 2: Selection of Indicators Using the Delphi Technique

The indicators were analyzed based on the opinions of 17 experts regarding the indicators. The analysis involved calculating the median and the interquartile range. The criteria for indicator analysis utilized statistical analysis on an item-by-item basis. The results of the questionnaire analysis using the Delphi Technique in the first round are shown in Table 4.11

Table 4.11 Median and Consistency Values of Indicators (Round 1-2)

Indicators	Round 1		Round 2	
	Mdn.	I.R.	Mdn.	I.R.
Educational environment				
1. Human environment	4.00	1.50	4.00	1.50
2. Physical Environment	4.00	2.00	4.00	2.00
3. Information environment	4.00	1.00	4.00	1.00
Development level				
4. Scale structure	4.00	0.00	4.00	1.50
5. Sustainable development capabilities	4.00	1.50	4.00	1.50
6. Internationalization	4.00	2.00	4.00	2.00
Investment level				
7. Infrastructure	4.00	1.50	4.00	1.50
8. Social resource investment	4.00	0.50	4.00	0.50
9. Financial investment	4.00	1.00	4.00	1.00
Teacher Level				
10. Teachers	4.00	1.50	4.00	1.50
11. Professional Development	4.00	1.00	4.00	1.00
12. Teachers' treatment	4.00	0.50	4.00	1.50
School Quality				
13. School Management	4.00	1.50	4.00	1.50
14. Resource Integration	4.00	1.50	4.00	1.50
15. School influence	4.00	1.00	4.00	1.00
Student Quality				
16. Student Development	4.00	1.50	4.00	1.50
17. Graduate Quality	4.00	1.50	4.00	1.50

This table presents the median (Mdn.) and interquartile range (I.R.) values for each of the 17 proposed indicators following two rounds of expert evaluation using the Delphi technique. The results indicate strong consensus among experts across all six first-level categories: Educational Environment, Development Level, Investment Level, Teacher Level, School Quality, and Student Quality. In both rounds, all indicators maintained a median value of 4.00, suggesting a high level of agreement regarding their relevance and importance. Most indicators demonstrated acceptable consistency levels (I.R. ≤ 1.5), reflecting stability in expert judgments between rounds. Notably, improvements in consistency were observed in several indicators, affirming the reliability and appropriateness of the selected indicators for constructing the evaluation indicator system for educational quality in applied undergraduate colleges in Guangxi.

The final model comprised six first-level, 17 second-level, and 50 third-level indicators, encompassing the educational environment, development level, investment level, teacher level, school quality, and student quality. The system emphasises student-centredness, contextual relevance, and practical applicability. The Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi is summarised in Figure 4.1.

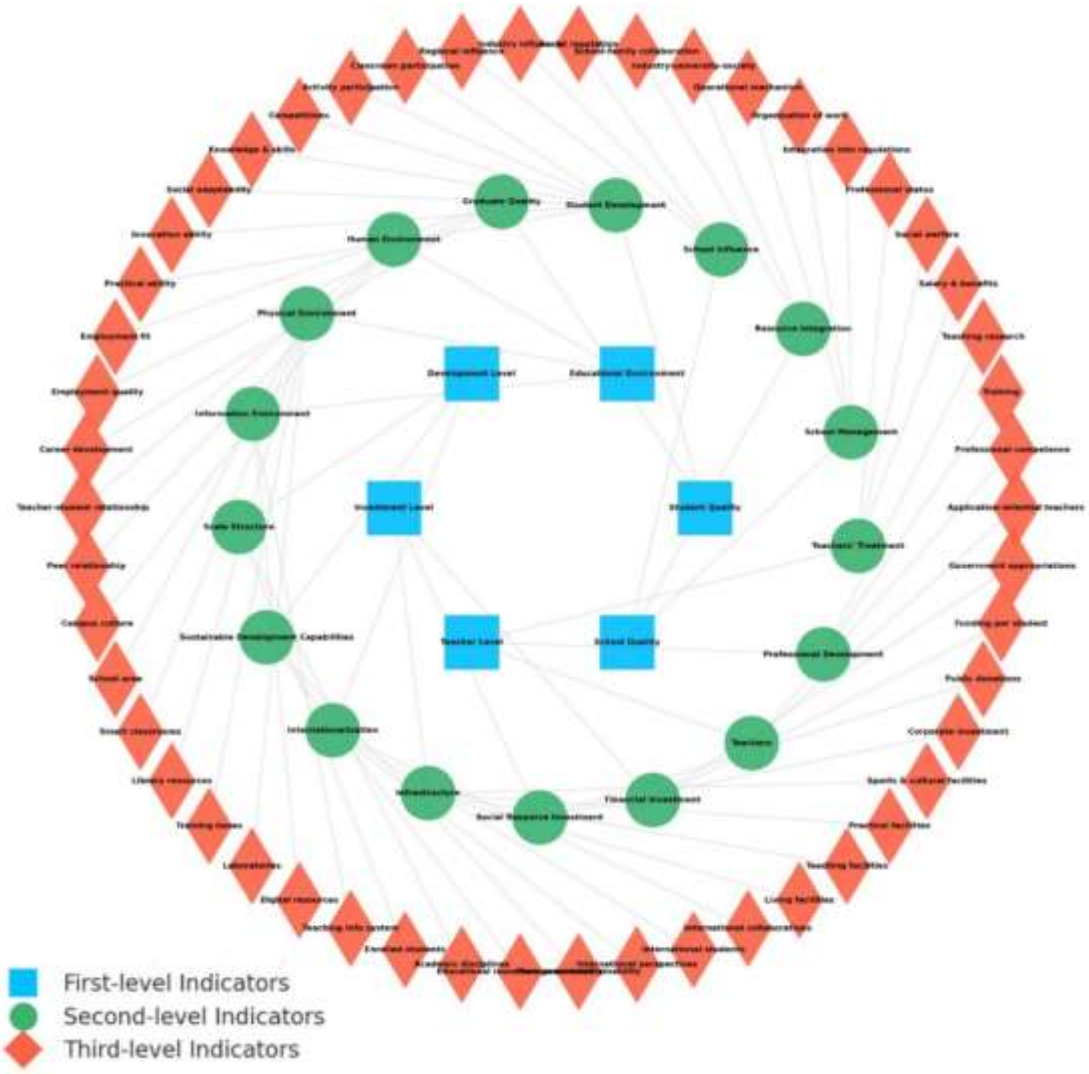

Figure 4.1 The Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi

Stage 3: Examine the feasibility and adaptability of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

The analysis results of this part are evaluated by 5 experts, all of whom have doctoral degrees, including 1 expert with knowledge and experience in the education quality evaluation indicator system, 2 academic managers with the title of associate professor or above, 1 educational institution manager with the title of associate professor or above, and 1 teacher with the title of associate professor or

above. The evaluation adopts a five-level scoring system, and the respondents can only choose one level to evaluate the suitability and feasibility of the education quality evaluation indicator system of Guangxi applied undergraduate colleges. The evaluation results are shown in Table 4.12.

Table 4.12 Effectiveness of the evaluation indicator system for the education quality of application-oriented undergraduate colleges in Guangxi

Indicators	Feasibility			Adaptability		
	$\bar{x}$	S.D.	Result	$\bar{x}$	S.D.	Result
Educational environment						
Human environment	4.20	0.84	High	4.20	0.84	High
Physical Environment	4.60	0.55	Highest	4.40	0.55	High
Information environment	4.40	0.45	High	3.80	0.45	High
Total	**4.40**	**0.61**	**High**	**4.13**	**0.61**	**High**
Development level						
Scale structure	4.20	0.84	High	4.00	0.71	High
Sustainable development capabilities	4.60	0.55	Highest	3.60	0.55	High
Internationalization	3.80	0.45	High	3.80	0.45	High
Total	**4.20**	**0.61**	**High**	**3.80**	**0.57**	**High**
Investment level						
Infrastructure	4.40	0.45	High	4.60	0.55	Highest
Social resource investment	3.60	0.55	High	4.40	0.45	High
Financial investment	4.20	0.84	High	4.60	0.55	Highest
Total	**4.07**	**0.61**	**High**	**4.53**	**0.52**	**Highest**

Table 4.12 (Continued)

Indicators	Feasibility			Adaptability		
	$\bar{x}$	S.D.	Result	$\bar{x}$	S.D.	Result
Teacher Level						
Teachers	4.80	0.45	Highest	3.60	0.55	High
Professional Development	4.60	0.89	Highest	4.40	0.45	High
Teachers' treatment	4.40	0.45	High	4.20	0.84	High
Total	**4.60**	**0.60**	**Highest**	**4.07**	**0.61**	**High**
School Quality						
School Management	4.20	0.98	High	4.40	0.45	High
Resource Integration	4.40	0.45	High	4.60	0.55	Highest
School influence	4.00	0.63	High	3.80	0.71	High
Total	**4.20**	**0.69**	**High**	**4.27**	**0.57**	**High**
Student Quality						
Student Development	4.60	0.55	Highest	3.60	0.84	High
Graduate Quality	4.40	0.45	High	4.60	0.55	Highest
Total	**4.50**	**0.50**	**Highest**	**4.10**	**0.70**	**High**
Overall Total	**4.33**	**0.60**	**High**	**4.15**	**0.60**	**High**

Table 4.12 presents the analysis of the effectiveness of the proposed evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi. The assessment was conducted by five experts who evaluated both feasibility and adaptability using a five-point Likert scale.

The findings indicate that all six first-level indicators received high mean scores ($\bar{x}$≥3.60) in both dimensions, confirming the overall robustness of the

system. Within adaptability, the Investment Level obtained the highest score ($\bar{x}$=4.53, S.D.=0.52), reflecting strong recognition of the importance of infrastructure, financial inputs, and social resource support in strengthening institutional quality. In terms of feasibility, the Teacher Level was rated the highest ($\bar{x}$=4.60, S.D.=0.60), underscoring the central role of teacher competence, professional development, and adequate support in sustaining effective education.

At the second-level, Physical Environment (feasibility: $\bar{x}$=4.60; adaptability: $\bar{x}$=4.40), Professional Development (feasibility: $\bar{x}$=4.60; adaptability: $\bar{x}$=4.40), and Graduate Quality (feasibility: $\bar{x}$=4.40; adaptability: $\bar{x}$=4.60) were consistently identified as vital indicators, highlighting their impact on student learning outcomes and institutional effectiveness.

In summary, the evaluation results confirm that the proposed indicator system is both adaptable to the specific context of applied undergraduate education in Guangxi and feasible for implementation. These findings validate the system's comprehensiveness, practicality, and alignment with institutional and regional development needs, thus providing a strong foundation for adoption in future educational evaluation and governance.

The results of examining the feasibility and adaptability of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi are summarised in Table 4.13.

Table 4.13 Overview of the Feasibility and Adaptability of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi

Indicators	Feasibility			Adaptability		
	$\bar{x}$	S.D.	Result	$\bar{x}$	S.D.	Result
Educational environment	4.40	0.61	High	4.13	0.61	High
Development level	4.20	0.61	High	3.80	0.57	High
Investment level	4.07	0.61	High	4.53	0.52	Highest
Teacher Level	4.60	0.60	Highest	4.07	0.61	High
School Quality	4.20	0.69	High	4.27	0.57	High
Student Quality	4.50	0.50	Highest	4.10	0.70	High
Total	**4.33**	**0.60**	**High**	**4.15**	**0.60**	**High**

Overview of the Feasibility and Adaptability of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi

The results demonstrate that the evaluation indicator system exhibits a high degree of feasibility ($\bar{x}$=4.33, S.D.=0.60) and adaptability ($\bar{x}$=4.15, S.D.=0.60). At the individual dimension level, teacher quality ($\bar{x}$=4.60, S.D.=0.60) and student quality ($\bar{x}$=4.50, S.D.=0.50) received the highest feasibility ratings, while investment level ($\bar{x}$=4.53, S.D.=0.52) was rated highest in terms of adaptability. All other dimensions, including educational environment, development level, and school quality, were consistently rated at a high level. Overall, the findings confirm that the proposed indicator system is both feasible and adaptable, offering practical applicability for assessing and improving the quality of application-oriented undergraduate education in Guangxi.

Chapter 5
Conclusion Discussion and Recommendations

The purpose of this study includes three aspects: 1) To examine the current status of education quality evaluation in Guangxi's application-oriented undergraduate universities, 2) To develop an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi, and 3) To examine the feasibility and adaptability of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

On this basis, the researcher took Education for Sustainable Development management, Educational Quality, Evaluation Of Education Quality, the evaluation indicator system for the educational quality, Application-oriented undergraduate as theoretical support, conducted a questionnaire survey on the current status of education quality evaluation in Guangxi applied undergraduate colleges and interviewed the problems, approaches and influencing factors of education quality evaluation in Guangxi applied undergraduate colleges, and then interviewed 15 experts to provide reference for the formulation of education quality evaluation, thus proposing an education quality evaluation indicator system with 6 first-level indicators of education environment, development level, investment level, teacher level, school quality and student quality, which promoted the evaluation indicator system for education quality in Guangxi applied undergraduate colleges.

The details are as follows.

Conclusion

1. Results of the examination of the current status of education quality evaluation in Guangxi's application-oriented undergraduate universities.

The analysis of the current status of education quality evaluation in Guangxi's application-oriented undergraduate universities revealed that the overall level remains **moderate** ($\bar{x}$=3.25). Across the four dimensions**, input** scored the

highest ($\bar{X}$=3.37), followed by **context** ($\bar{X}$=3.35), **process** ($\bar{X}$=3.22), and **output**, which recorded the lowest mean score ($\bar{X}$=3.01). This indicates that, while educational quality evaluation in these institutions demonstrates certain strengths, significant room for improvement remains.

In terms of **context,** results show moderate alignment between academic programmes and regional economic development ($\bar{X}$=3.63) and industrial needs ($\bar{X}$=3.56). However, weaknesses were observed in the consistency between educational philosophy and societal expectations for applied talent ($\bar{X}$=2.68).

The **input dimension** emerged as the strongest, particularly regarding infrastructure investment in laboratories and training facilities ($\bar{X}$=3.67, high level). However, other areas, such as the involvement of industry mentors ($\bar{X}$=3.09) and the provision of innovation and entrepreneurial training ($\bar{X}$=3.37), remain at a moderate level, pointing to insufficient collaboration between universities and industry.

With respect to the **process dimension,** although some practices such as subject competitions ($\bar{X}$=3.67) and teacher training ($\bar{X}$=3.41) were rated relatively high, persistent limitations were noted. These include inadequate opportunities for off-campus internships ($\bar{X}$=3.07), limited integration of enterprise projects ($\bar{X}$=3.09), and weak responsiveness of teaching methods to individual student needs ($\bar{X}$=3.23).

The **output dimension** was the weakest, with graduates' ability to adapt quickly to job requirements rated lowest ($\bar{X}$=2.79). Other indicators such as graduate satisfaction ($\bar{X}$=2.96) and innovation ability ($\bar{X}$=2.90) also remained unsatisfactory, reflecting limited effectiveness in preparing students for long-term employability and industry requirements.

Insights from **in-depth interviews** with 15 stakeholders (teachers, administrators, and teaching supervisors) reinforced these findings. Key challenges identified include a lack of scientific rigour and specificity in the current indicators, excessive reliance on short-term outcomes, limited stakeholder involvement, and insufficient attention to practical skills, innovation capacity, and graduate development.

Despite these limitations, strengths such as alignment with regional development strategies, policy support, and gradual improvements in faculty competency were recognised. Stakeholders recommended restructuring the evaluation indicator system to be more dynamic, outcome-oriented, and practice-based, while integrating intelligent data systems, expanding stakeholder participation, and introducing graduate tracking mechanisms.

Overall, the results confirm that while Guangxi's application-oriented universities have made progress in infrastructure development and contextual alignment, the **process and output dimensions remain relatively weak.** Enhancing practical training, strengthening school–industry collaboration, and improving long-term evaluation mechanisms are essential for raising the quality of education in these institutions.

2. Results of the Development of an Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi

The development of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi was undertaken through a rigorous, systematic, and multi-phased process. This process encompassed the analysis of the current situation, expert interviews, focus group discussions, and expert validation using the Delphi technique. The primary objective was to establish a scientifically grounded, comprehensive, and contextually relevant framework that could effectively assess and enhance the quality of education in these institutions.

The initial stage involved assessing the current situation through questionnaire surveys and in-depth interviews with stakeholders. The findings revealed several critical challenges in the existing evaluation system, including excessively broad indicators, lack of clarity in standards, limited involvement of stakeholders, and insufficient emphasis on practical outcomes. These results highlighted the need for a more refined and outcome-oriented evaluation framework tailored to the application-oriented context of Guangxi.

To strengthen the design of the framework, focus group discussions were conducted with 15 participants, including teachers, school administrators, and teaching supervisors. These discussions generated eight guiding principles to underpin the indicator system: (1) student-centredness, (2) emphasis on application-oriented education, (3) quality-driven assessment, (4) comprehensiveness, (5) scientific and measurable design, (6) adaptability to regional characteristics, (7) responsiveness to change, and (8) inclusive stakeholder participation. Guided by these principles, the proposed system was structured into six first-level indicators, 17 second-level indicators, and 51 third-level indicators. The six dimensions comprised educational environment, development level, investment level, teacher level, school quality, and student quality.

Subsequently, the proposed indicator system underwent validation through two rounds of Delphi analysis, involving 17 experts. The results demonstrated strong consensus across all indicators. Each indicator maintained a median score of 4.00, and interquartile ranges (I.R.) remained within acceptable limits (I.R. ≤ 1.5), indicating a high level of agreement among experts. Notably, consistency improved in several indicators between the two rounds, further reinforcing the reliability, validity, and feasibility of the system.

The results, summarised in Table 4.10, confirmed that the finalised evaluation indicator system comprised six first-level, 17 second-level, and 50 third-level indicators. The system integrates a multi-dimensional and hierarchical framework encompassing the following components:

Educational Environment: Human, physical, and informational conditions that support student learning and development.

Development Level: Institutional growth capacity, sustainability, and internationalisation.

Investment Level: Infrastructure, financial resources, and social resource contributions.

Teacher Level: Professional quality, development, and welfare of academic staff.

School Quality: Management systems, resource integration, and institutional influence.

Student Quality: Student development and graduate outcomes as indicators of educational effectiveness.

The Delphi results, presented in Table 4.11, reaffirmed the robustness of the system. Across all six dimensions, indicators consistently achieved median scores of 4.00, with stable and acceptable levels of consensus among experts. The high degree of agreement and reliability validated the selection and refinement of indicators, establishing a strong foundation for their application in practice.

In conclusion, the evaluation indicator system developed through this study offers a comprehensive and practical tool for assessing the quality of education in application-oriented undergraduate colleges in Guangxi. It reflects regional characteristics, aligns with national educational development policies, and supports continuous institutional improvement through evidence-based assessment and decision-making. The system emphasises student-centredness, contextual relevance, and practical applicability, making it well-suited for advancing educational quality in the applied higher education sector.

3. Results on the Feasibility and Adaptability of the Evaluation Indicator System

The analysis of the proposed evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi was conducted by five experts, who assessed both feasibility and adaptability using a five-point Likert scale.

The results show that all six first-level indicators achieved high mean scores ($\bar{x}$≥3.60) across both dimensions, confirming the overall robustness and practical value of the system. In terms of adaptability, the *Investment Level* obtained the highest score ($\bar{x}$=4.53, S.D.=0.52), reflecting strong recognition of the role of infrastructure, financial resources, and external support in strengthening institutional quality. For feasibility, the *Teacher Level* received the highest score ($\bar{x}$=4.60,

S.D.=0.60), underscoring the importance of teacher competence, professional development, and institutional support in sustaining effective education.

At the second-level, *Physical Environment* (feasibility: $\bar{x}$=4.60; adaptability: $\bar{x}$=4.40), *Professional Development* (feasibility: $\bar{x}$=4.60; adaptability: $\bar{x}$=4.40), and *Graduate Quality* (feasibility: $\bar{x}$=4.40; adaptability: $\bar{x}$=4.60) were consistently identified as key indicators, emphasising their impact on student outcomes and overall institutional effectiveness.

The overall analysis indicates that the system demonstrates a high degree of feasibility ($\bar{x}$=4.33, S.D.=0.60) and adaptability ($\bar{x}$=4.15, S.D.=0.60). Within these dimensions, *Teacher Quality* ($\bar{x}$=4.60, S.D.=0.60) and *Student Quality* ($\bar{x}$=4.50, S.D.=0.50) obtained the highest feasibility ratings, while *Investment Level* ($\bar{x}$=4.53, S.D.=0.52) was rated highest in terms of adaptability. Other dimensions, including *Educational Environment, Development Level, and School Quality,* were also evaluated positively.

In summary, the findings confirm that the proposed evaluation indicator system is both feasible and adaptable. It provides a comprehensive, practical, and context-sensitive framework for assessing and enhancing the quality of application-oriented undergraduate education in Guangxi, while aligning with institutional and regional development needs.

Discussion

1. Discussion of Findings on the Current Status of Education Quality Evaluation in Application-Oriented Undergraduate Universities in Guangxi

The findings from the first phase of this study revealed that the current status of education quality evaluation in application-oriented undergraduate universities in Guangxi is at a moderate level across four major dimensions: context, input, process, and output. Among these, the input dimension demonstrated the strongest performance, particularly in areas such as infrastructure investment, laboratory development, recruitment of qualified teaching staff, and initiatives designed to promote practical skill development. In contrast, the process and

output dimensions were identified as the weakest, characterised by insufficient off-campus training opportunities, limited alignment between institutional educational philosophy and labour market expectations, and low levels of graduate readiness.

These findings are consistent with the observations of Zhao and Zhang (2020), who noted that application-oriented institutions tend to prioritise foundational investments, such as physical resources and faculty recruitment, while often overlooking the effectiveness of teaching processes and graduate outcomes. This imbalance underscores a broader structural issue within applied education systems, where input-based development is emphasised at the expense of results-driven strategies.

The identified weaknesses in the process and output dimensions also align with the arguments of Xu and Zhou (2010), who proposed that a balanced evaluation system must integrate input, process, and output indicators equally. Their hierarchical framework reinforces the view that institutional quality cannot be comprehensively assessed without considering student engagement, teaching effectiveness, and the long-term impact of education.

Moreover, the limited stakeholder participation and over-reliance on narrow performance metrics observed in this study echo the concerns raised by Liu (2011), who argued that evaluation systems lacking theoretical rigour and stakeholder inclusivity tend to produce outcomes disconnected from practical needs. The interview data collected in this research further highlighted the necessity of restructuring the current evaluation system to be more dynamic, inclusive, and data-informed. This resonates with the recommendations of Yu (2016), who stressed the importance of contextual responsiveness and the integration of external perspectives in education quality frameworks.

In summary, the current evaluation practices in Guangxi's application-oriented undergraduate universities remain overly input-oriented and insufficiently focused on measurable outcomes. Addressing these limitations requires the establishment of an evaluation indicator system that is evidence-based, student-centred, and explicitly oriented towards demonstrable outputs. Such a system

should not only align with regional development priorities but also conform to international quality standards. This conclusion reinforces the theoretical foundations discussed in Chapter 2 and provides a concrete framework to guide institutional reform, policy development, and the achievement of tangible educational results. The expected outputs include improved teaching quality, enhanced student learning outcomes, and strengthened institutional accountability, thereby ensuring that higher education in Guangxi contributes effectively to sustainable regional and national development.

Importantly, these findings also reflect the broader objectives of the United Nations Sustainable Development Goals. The need for more equitable, inclusive, and high-quality education directly contributes to SDG4 (Quality Education), particularly by improving teaching effectiveness, enhancing student learning outcomes, and ensuring stronger alignment between education and employability. Furthermore, by strengthening the process and output dimensions, especially in terms of graduate readiness, labour market integration, and industry collaboration, the study aligns with SDG8 (Decent Work and Economic Growth). This goal highlights the importance of equipping students with skills relevant to sustainable employment and economic productivity. Thus, the reformed evaluation indicator system not only supports institutional and regional development but also contributes meaningfully to global educational and economic sustainability agendas.

2. Discussion of the Development of an Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi

The development of the evaluation indicator system for educational quality in application-oriented undergraduate colleges in Guangxi was accomplished through a methodologically rigorous and context-sensitive process. By combining literature analysis, stakeholder interviews, focus group discussions, and expert validation via the Delphi technique, this study produced a comprehensive framework consisting of six first-level indicators, 17 second-level indicators, and 51

third-level indicators. These indicators collectively address educational environment, development level, input level, teacher quality, school quality, and student quality, thereby ensuring a holistic assessment of institutional performance.

The process undertaken in this study aligns with international best practices in higher education evaluation. The multi-phase and participatory design mirrors the approach promoted by the European University Association (EUA, 2015), which emphasises inclusivity, methodological diversity, and the importance of continuous internal development in quality assurance. The integration of expert consensus through the Delphi method not only enhances scientific rigour but also ensures contextual relevance, consistent with Liu's (2015) argument that credible systems must be both comprehensive and adaptable to local realities.

The inclusion of indicators reflecting input, process, and outcome dimensions also supports the hierarchical evaluation framework proposed by Xu and Zhou (2010), which stresses the interdependence of context, input, process, and output in assessing institutional quality. Similarly, the multi-dimensional structure resonates with the evaluation model of Wang and Ding (2019), who highlighted the necessity of integrating human resources, infrastructure, and student development into higher education quality frameworks. By incorporating such diverse dimensions, this study's indicator system ensures that institutional quality is measured beyond academic results alone, reflecting the complexity of applied undergraduate education.

Moreover, the orientation of the system towards application-based outcomes reinforces the theoretical perspective of Zhao and Zhang (2007), who characterised application-oriented education as focusing on practical competence and technical skills over theoretical abstraction. In line with Pan (2010), the student-centred nature of this framework, particularly its emphasis on employability and socio-economic alignment, highlights its responsiveness to regional labour market demands and its contribution to local development in Guangxi. This alignment underscores the dual mission of application-oriented universities: to enhance individual student success while contributing to regional economic and social advancement.

In summary, the evaluation indicator system developed through this study is theoretically grounded, empirically validated, and regionally adapted. It advances the practice of educational quality evaluation by offering a structured, evidence-based, and contextually sensitive framework that is consistent with both national education reform priorities and international benchmarks. The findings not only address the study's second objective but also provide practical guidance for policymakers and institutions seeking to improve educational quality in application-oriented undergraduate colleges.

3. Discussion of the Feasibility and Adaptability of the Evaluation Indicator System

The results of this study confirm that the proposed evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi is both feasible and adaptable. All six first-level indicators obtained high mean scores ($\bar{x}$≥3.60), which indicates expert consensus on the robustness and practical relevance of the framework. Notably, the *Investment Level* received the highest adaptability score ($\bar{x}$=4.53), while *Teacher Level* was rated the highest in feasibility ($\bar{x}$=4.60). These findings underscore the importance of resource investment and teacher development as critical foundations for sustaining institutional quality.

This conclusion is consistent with Xu and Zhou (2010), who argued that a comprehensive evaluation system must balance inputs, processes, and outcomes to ensure effectiveness across all dimensions of education. The prominence of teacher-related indicators also aligns with the work of Wang and Ding (2019), who emphasised the pivotal role of teacher quality and professional development in driving the effectiveness of application-oriented institutions. Similarly, the emphasis on investment and infrastructure echoes the findings of Zhao and Zhang (2020), who identified physical resources and financial support as essential drivers of educational sustainability.

At the second-level, the strong recognition of *Physical Environment*, *Professional Development*, and *Graduate Quality* reflects the increasing demand for outcome-based indicators. This corresponds with Pan (2010), who highlighted that application-oriented education should prioritise graduate readiness and employability, thereby strengthening the link between education and socio-economic development. The high feasibility ratings for teacher and student quality indicators further reinforce the argument made by Liu (2011) that evaluation systems must move beyond narrow performance metrics to capture broader aspects of student development and institutional impact.

Moreover, the overall feasibility ($\bar{x}$=4.33) and adaptability ($\bar{x}$=4.15) of the system demonstrate its contextual sensitivity to Guangxi's regional characteristics, particularly the balance between institutional development and local labour market demands. This aligns with the perspective of Yu (2016), who advocated for evaluation systems that integrate external perspectives and respond dynamically to regional and industrial needs.

In summary, the findings validate the comprehensiveness and practicality of the developed system. The evidence suggests that the framework not only provides a scientifically rigorous structure for evaluating educational quality but also offers practical pathways for aligning institutional performance with regional development strategies and international standards such as SDG4 (quality education) and SDG8 (decent work and economic growth).

Conclusion and Discussion

This study developed and validated an evaluation indicator system for the educational quality of application-oriented undergraduate universities in Guangxi. The findings revealed that while input factors such as infrastructure, teacher recruitment, and investment were relatively strong, process and output dimensions-particularly graduate readiness and labour market alignment-remained weaker, consistent with Zhao and Zhang (2020) and Xu and Zhou (2010). The proposed system, comprising six first-level, 17 second-level, and 51 third-level indicators, was confirmed by experts to be both feasible and adaptable ($\bar{x}$≥3.60), with teacher

quality rated highest for feasibility and investment level for adaptability. The system provides a practical and evidence-based framework that aligns with SDG4 (Quality Education) and SDG8 (Decent Work and Economic Growth), offering clear direction for institutional reform, policy development, and sustainable educational improvement in Guangxi.

Recommendations

1. Recommendations for Utilizing Research Findings

1.1 Institutional Integration:

Higher education institutions should incorporate the developed evaluation indicator system into their standard quality assurance and internal evaluation procedures. This integration will enhance educational planning, monitoring, and continuous improvement, as aligned with the study's goal of improving management efficiency and quality assurance.

1.2 Strategic Focus on Identified Weaknesses

Education administrators should prioritize interventions in areas identified as relatively weak-particularly the process and output dimensions. Addressing these gaps through targeted strategies can promote a more balanced and outcome-driven educational environment, in line with the student-centered and practice-oriented nature of the evaluation system.

1.3 Stakeholder Collaboration

Meaningful collaboration among key stakeholders (including administrators, faculty, students, and policymakers) should be encouraged. A participatory approach will enhance the system's relevance and utility while supporting the study's goal of contributing to national education reform and policy development.

1.4 Capacity Building and Training

Regular training and professional development programmes should be organised by relevant authorities, such as the Provincial Department of Education in collaboration with universities and specialised quality assurance agencies. These

initiatives should aim to familiarise educational personnel with the conceptual foundations, structure, and application of the indicator system. Such training will ensure its effective implementation and support institutions in meeting both internal and external evaluation standards.

1.5 Providing support to government agencies

Developing an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi can provide government authorities and the regional Department of Education with a standardized and evidence-based framework for assessing institutional performance. Grounded in the Delphi method, the system integrates expert consensus to ensure that the selected indicators are scientifically valid, contextually relevant, and aligned with the developmental goals of higher education in Guangxi.

Such a system enables policymakers to identify strengths, weaknesses, and developmental gaps across institutions, thus offering a solid empirical basis for targeted interventions and strategic planning. It also supports the optimization of resource allocation, the formulation of policies that encourage teaching innovation, and the establishment of mechanisms for continuous quality improvement.

In the long term, this indicator system can function as both a monitoring tool and a benchmark, allowing the government and the Department of Education to track progress, evaluate policy effectiveness, and ensure accountability. By linking evaluation results to policy decisions and funding priorities, the system can effectively drive the enhancement of educational quality and competitiveness of application-oriented undergraduate education in Guangxi.

2. Recommendations for Future Research

2.1 Refinement through Practical Feedback

Future research should focus on refining the evaluation index system by collecting and analyzing feedback from its implementation in various institutional contexts. This will help ensure the system’s adaptability and contextual relevance.

2.2 Empirical Validation through Advanced Statistical Techniques

It is recommended to empirically validate the indicator system using advanced statistical methods, such as structural equation modeling (SEM). SEM is a comprehensive technique that enables researchers to analyze complex relationships among multiple variables simultaneously. It also allows for the examination of both direct and indirect effects, thereby enhancing the system's reliability, internal coherence, and theoretical robustness.

2.3 Comparative Studies across Regions or Countries

Comparative studies between applied undergraduate colleges in Guangxi and those in other provinces or international settings could provide valuable benchmarks and broader insights, helping to identify best practices and region-specific challenges.

2.4 Evaluation of Long-Term Impact

Future studies should examine the long-term effects of using the evaluation indicator system, particularly in terms of institutional performance, quality assurance mechanisms, and student learning outcomes. This will help determine the sustainability and strategic value of the system over time.

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Appendices

Appendix A

List of Specialists and Letters of Specialists Invitation

for IOC Verification

List of Specialists Invitation for IOC Verification

NO.	Name	Position
1	Assistant Professor Dr. Luxana Keyuraphan	Ph.D. Development Education of Bansomdejchaopraya Rajabhat University
2	Assistant Professor Dr. Sahapat Insee	Ph.D. Development Education of Bansomdejchaopraya Rajabhat University
3	Assistant Professor Dr. Sunate Thaveethavornsawat	Ph.D. Technology Management of Bansomdejchaopraya Rajabhat University
4	Zhu Xin Professor	Professor of Guangxi University of Science and Technology
5	Cai Liang	Professor of Guangxi University of Science and Technology

List of Interview Experts Invitation

NO	Workplace	Name
1	Guangxi Normal University of Science and Technology	Huang Qunying
2	Guangxi Normal University of Science and Technology	Zhu Guangsheng
3	Guangxi Normal University of Science and Technology	Chen Kewen
4	Guangxi University of Science and Technology	Liu Ala
5	Guangxi University of Science and Technology	Wu Bo
6	Guangxi University of Science and Technology	Huang Liuyun
7	Nanning Normal University	Yang Xiaoyun
8	Nanning Normal University	Guo Liang
9	Nanning Normal University	Xiong Shaoqin
10	Hezhou University	Mo Zhichao
11	Hezhou University	She Shaohua
12	Hezhou University	Li Jiangnan
13	Guilin university of technology	Jiang Caiyun
14	Guilin university of technology	Mo Zhihui
15	Guilin university of technology	Tan Lu

List of Focus Group Interviewees

NO	Workplace	Name
1	Guangxi Normal University of Science and Technology	Huang Qunying
2	Guangxi Normal University of Science and Technology	Zhu Guangsheng
3	Guangxi Normal University of Science and Technology	Chen Kewen
4	Guangxi University of Science and Technology	Liu Ala
5	Guangxi University of Science and Technology	Wu Bo
6	Guangxi University of Science and Technology	Huang Liuyun
7	Nanning Normal University	Yang Xiaoyun
8	Nanning Normal University	Guo Liang
9	Nanning Normal University	Xiong Shaoqin
10	Hezhou University	Mo Zhichao
11	Hezhou University	She Shaohua
12	Hezhou University	Li Jiangnan
13	Guilin university of technology	Jiang Caiyun
14	Guilin university of technology	Mo Zhihui
15	Guilin university of technology	TancLu

List of Specialists Invitation for Indicator System Evaluation

The following list was invited as evaluation experts to evaluate the feasibility and adaptability of development of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in guangxi

NO.	Name	Position
1	Assistant Professor Dr. Phisanu Bangkheow	Ph.D. Educational Administration of Bansomdejchaopraya Rajabhat University
2	Assistant Professor Dr. Phadet KaKham	Ph.D. Education for Local Development of Bansomdejchaopraya Rajabhat University.
3	Associate Professor Dr. Jittawisut Wimttipanya	Ph.D. Curriculum and Instruction of Bansomdejchaopraya Rajabhat University.
4	Associate Professor Dr. Phatchareephorn Bangkheow	Ph.D. Vocational and Technical Education Management of Bansomdejchaopraya Rajabhat University
5	Assistant Professor Dr. Sarayut Setthakhoncharoen	Ph.D. Educational Administration of Bansomdejchaopraya Rajabhat University

Appendix B

Official Letter

MHESI 0643.14/ว.๔๙

Bansomdejchaopraya
Rajabhat University
1061 Soi Itsaraphap 15,
Itsaraphap Road, Hiranruchi,
Thonburi, Bangkok, Thailand
10600

4 February 2025

Subject Invitation to validate research instrument

Dear Assistant Professor Dr. Luxana Keyuraphan

Regarding Mrs. Xiao Lin with student code 6473139011, a doctoral student majoring in Sustainable Development Education Management at Bansomdejchaopraya Rajabhat University. The thesis is entitled "Development of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi" The thesis committee is as follows:

1. Associate Professor Dr. Touchakorn Suwancharas — Major Advisor
2. Associate Professor Dr. Narongwat Mingmit — Co-Advisor
3. Assistant Professor Dr. Areeya Juichamlong — Co-Advisor

In this research, the researcher requires to check the content validity of the instrument to get the most complete research instrument. Knowing your experience in the field of the said research, the researcher would like to ask for your assistance in validating the said instrument. Your suggestions will be useful for improving the quality and suitability of research instruments for use in collecting data for this research.

Thank you for your kind considerations.

Yours faithfully

(Asst. Prof. Dr.Tanaput Chancharoen)
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Thonburi, Bangkok, Thailand
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4 February 2025

Subject Invitation to validate research instrument

Dear Assistant Professor Dr. Sahapat Insee

Regarding Mrs. Xiao Lin with student code 6473139011, a doctoral student majoring in Sustainable Development Education Management at Bansomdejchaopraya Rajabhat University. The thesis is entitled "Development of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi" The thesis committee is as follows:

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4 February 2025

Subject Invitation to validate research instrument

Dear Assistant Professor Dr. Sunate Thaveethavornsawat

Regarding Mrs. Xiao Lin with student code 6473139006, a doctoral student majoring in Sustainable Development Education Management at Bansomdejchaopraya Rajabhat University. The thesis is entitled "Development of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi" The thesis committee is as follows:

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2. Associate Professor Dr. Narongwat Mingmit — Co-Advisor
3. Assistant Professor Dr. Areeya Juichamlong — Co-Advisor

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4 February 2025

Subject Invitation to validate research instrument

Dear Zhu Xin Professor

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Subject Invitation to validate research instrument

Dear Cai Liang Professor

Regarding Mrs. Xiao Lin with student code 6473139011, a doctoral student majoring in Sustainable Development Education Management at Bansomdejchaopraya Rajabhat University. The thesis is entitled "Development of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi" The thesis committee is as follows:

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3. Assistant Professor Dr. Areeya Juichamlong — Co-Advisor

In this research, the researcher requires to check the content validity of the instrument to get the most complete research instrument. Knowing your experience in the field of the said research, the researcher would like to ask for your assistance in validating the said instrument. Your suggestions will be useful for improving the quality and suitability of research instruments for use in collecting data for this research.

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4 February 2025

Subject Invitation to join an interview as an expert

Dear Mo ZhiHui Professor

Mrs. Xiao Lin is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. She is undertaking research entitled "Development of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi", supervised by the thesis advisory committee as follows.

1. Associate Professor Dr. Touchakorn Suwancharas Major Advisor
2. Associate Professor Dr. Narongwat Mingmit Co-Advisor
3. Assistant Professor Dr. Areeya Juichamlong Co-Advisor

The thesis advisory committee and the student have considered that you are an expert in this field. Therefore, Graduate School would like to invite you to be an expert to interview to provide the student with suggestions for her research.

Thank you for your kind considerations.

Yours faithfully

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4 February 2025

Subject Invitation to join an interview as an expert

Dear Li JiangNan Associate Professor

Mrs. Xiao Lin is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. She is undertaking research entitled "Development of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi", supervised by the thesis advisory committee as follows.

1. Associate Professor Dr. Touchakorn Suwancharas Major Advisor
2. Associate Professor Dr. Narongwat Mingmit Co-Advisor
3. Assistant Professor Dr. Areeya Juichamlong Co-Advisor

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4 February 2025

Subject Invitation to join an interview as an expert

Dear Tan Lu Professor

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Dear Chen KeWen Professor

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Dear Huang LiuYun Professor

Mrs. Xiao Lin is a graduate student in the Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. She is undertaking research entitled "Development of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi", supervised by the thesis advisory committee as follows.

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Thank you for your kind considerations.

Yours faithfully

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4 February 2025

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Dear Wu Bo Professor

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Dear Liu Ana Associate Professor

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4 February 2025

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Dear Chen KeWen Professor

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Dear Zhu GuangSheng Associate Professor

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Subject Invitation to participate in the indicator system evaluate as an expert

Dear Associate Professor Dr. Phatchareephorn Bangkheow

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4 February 2025

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Dear Assistant Professor Dr. Sarayut Setthakhoncharoen

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Appendix C

Research Instrument

Questionnaire on the Current Status of Education Quality Evaluation in Application-Oriented Undergraduate Institutions

Description:

There is are no right or wrong answers to the questions in this questionnaire. The responses you provide will be used solely for overall statistical analysis and will never be processed or published separately. Your information will be kept strictly confidential and will not be disclosed to anyone. You do not need to provide your personal name when filling out the questionnaire, please feel free to answer the questions.

Part I Respondents' Personal Information

1.Gender:

❒Male ❒Female

2.Age:

❒25 years or below ❒26 to 35 years ❒36 to 45 years

❒46 to 55 years ❒56 years or above

3.Education:

❒Bachelor's degree ❒Master's degree ❒Doctoral degree

4.Academic position:

❒Teaching assistant ❒Lecturer or assistant professor

❒Associate professor ❒Professor

5. Work experience:

❒Within 5 years ❒5 to 10 years

❒11 to 15 years ❒16 to 20 years

❒More than 20 years

6. Expert category:

❒teacher

❒school administrator

❒teaching supervisors

Part II Survey on the Current Status of Education Quality Evaluation in Application-Oriented Undergraduate Institutions Based on the CIPP Model

Instructions: Please read the following items (questions 1-22) carefully and select one of the five levels based on the actual situation according to the following criteria. Details are as follows:

5 means you STRONGLY agree with the contents.

4 means you QUITE agree with the contents.

3 means you remain NEUTRAL with the contents.

2 means you DO NOT QUITE agree with the contents.

1 means you DO NOT STRONGLY agree with the contents.

NO.	Contents	Evaluation level				
		5	4	3	2	1
Context						
1	The university's core goal is to cultivate application-oriented talents					
2	The university takes local economic and industrial needs into full consideration when designing its academic programs					
3	The university’ s educational philosophy aligns with the societal requirements for application-oriented talents					
4	The university has established stable partnerships with local enterprises					

NO.	Contents	Evaluation level				
		5	4	3	2	1
5	The university fosters students' awareness of serving society and industries					
Input						
1	The university' s faculty team has strong practical experience and teaching ability.					
2	The university introduces industry mentors or enterprise experts to participate in teaching.					
3	The investment in laboratories, training rooms, and other infrastructure is sufficient.					
4	The content of academic programs meets the requirements for sustainable education.					
5	There are specific courses or practical activities aimed at enhancing innovation and entrepreneurial skills					
6	The university provides adequate resources for student more career guidance and services					
Process						
1	The university frequently organizes off-campus internships and practical training activities					
2	Internship and training activities meet the needs for improving students' practical skills.					
3	Teachers adopt project-based teaching, case-based teaching, and other practical teaching methods					
4	Students can participate in enterprise projects or solve problems in real business environments					
5	The teaching process addresses the individual development needs of students.					
6	The university organizes various academic competitions.					

NO.	Contents	Evaluation level				
		5	4	3	2	1
7	The ratio of theoretical teaching to practical teaching in the curriculum is reasonable.					
8	The university provides diverse training programs to enhance teachers' practical teaching capabilities.					
Product						
1	Graduates are satisfied with the university's education and training.					
2	Graduates' practical skills meet industry requirements.					
3	Graduates' innovation abilities are fully developed.					
4	Graduates can quickly adapt to job requirements.					
5	The employment rate of graduates is satisfactory					
6	The quality of graduates' employment (e.g., job matching, salary levels) is high.					
7	Graduates have promising career development prospects in the industry.					
8	Students have sufficient support for innovation and entrepreneurship during their time at the university.					

Interview existing problems, approaches and influencing factors in application-oriented undergraduate colleges in Guangxi

Part I Information of interviewees

1. Name (interviewee):

2. Education:

❒Master's degree ❒ Doctoral degree

3. Academic position:

❒Teaching assistant ❒Lecturer or assistant professor

❒Associate professor ❒Professor

4. Expert category:

❒teacher

❒school administrator

❒teaching supervisors

Part II Questionnaire to Interview existing problems, approaches and influencing factors in application-oriented undergraduate colleges in Guangxi

Question	Yes or No
The main issues in the evaluation of the education quality of applied undergraduate colleges include the following aspects	
1) The indicator system is not scientific enough	
2) The indicator design is too general	
3) The indicators are not specific enough	
4) Indicators are difficult to quantify and evaluate	

Question	Yes or No
5) Improper indicator weight distribution	
6) Lack of personalized indicators for application characteristics	
7) Evaluation data is not updated in time	
8) The data may be exaggerated to optimize the evaluation results.	
9) Lack of third-party independent evaluation agencies	
10) Lack of focus on practice and outcomes	
11) Lack of evaluation of students' practical ability	
12 Lack of evaluation of students' employment quality	
13) The evaluation of the quality of school-enterprise cooperation lacks depth	
14) Lack of evaluation of students' comprehensive qualities	
15) Lack of evaluation of students' social adaptability	
16) Lack of qualitative analysis	
17) Students, parents, and employers contribute less to the evaluation	
18) Few follow-up surveys on reviews	
19) Lack of regional and industry-oriented evaluation	
20) Pay more attention to short-term data such as enrollment and employment rate	
21) Ignoring students’ long-term development or social contribution	
22) Ignoring the school's innovation capabilities and long-term talent training effects	
23) Inadequate application of evaluation results	

Question	Yes or No
24) Lack of transparency and feedback mechanisms	
25) Make Full Use of Evaluation Results to Improve Education Quality	
26) The evaluation results fail to fully and truly reflect the school's educational quality	
27) The evaluation method of practical results is unscientific and difficult to quantify	
28) Students have low participation in the evaluation of education quality and lack subjective experience feedback	
29) The feedback mechanism for evaluation results is not perfect and cannot effectively promote improvement	
30) Lack of long-term career development tracking mechanism for graduates	
31) Insufficient feedback from employers on talent training in schools, and no closed loop has been formed	
What do you think are the main ways to improve the education quality evaluation of applied undergraduate colleges?	
1) Optimize the evaluation index system	
2) With the help of information technology, we can obtain real data from students, teachers, employers, alumni, enterprises, etc.	
3) Improve data collection and feedback mechanisms	
4) Use third-party evaluation agencies to participate in data collection and analysis to ensure objectivity	
5) Establish a dynamic evaluation system to regularly update	

Question	Yes or No
data and reflect the school's continuous improvement	
6) Conduct follow-up surveys on the long-term development of graduates to provide comprehensive data support for evaluation	
7) Establish a multi-evaluation mechanism	
8) Add evaluation indicators for school social service achievements	
9) Improve the participation of students, employers, society and parents in the evaluation of education quality	
What do you think are the main Strengths and Weaknesses of the education quality evaluation of applied undergraduate colleges?	
Strengths	
1) The regional economy is highly consistent with industrial demand, and local policy support is strong	
2) The university and enterprise cooperation foundation is solid and the social service ability is strong	
3)The application-oriented positioning is clear and talent training has certain effects	
3) The practical ability of the teaching staff has been gradually improved	
4) The evaluation system has taken shape and has a clear direction	
Weaknesses	
1) Insufficient depth of cooperation between universities and enterprises	
2) The teaching staff has weak practical ability	

Question	Yes or No
3) Single evaluation of student development	
4) Low level of social services and internationalization	
What do you think are the main opportunities and threats in the education quality evaluation of applied undergraduate colleges?	
opportunities	
1) The country vigorously advocates vocational education and the cultivation of applied talents	
2) The transformation and upgrading of local economy and industry urgently needs applied talents with practical ability and innovative consciousness	
3) More and more companies are willing to participate in higher education	
4) Internationalized school philosophy	
5) Artificial Intelligence Empowers Educational Evaluation	
threats	
1) The education quality evaluation standards lack a scientific and detailed system for applied undergraduates.	
2) The quality of students varies	
3) Limited funding	
4) Increasing competitive pressure	
5) Society may not have high recognition of applied undergraduate colleges	
What do you think needs the most improvement in the education quality evaluation of applied undergraduate colleges?	

Question	Yes or No
1) Increase practice-oriented indicators	
2) Introducing a dynamic adjustment mechanism	
3) Assess the actual effect of cooperation between universities and enterprises	
4) Introducing a third-party evaluation mechanism	
5) Increase the assessment of students' innovation ability, practical ability and social service ability	
6) Investigate whether the course content meets the needs of regional industries	
7) Is the teaching method practice-oriented?	
8) Introducing peer review and teaching quality supervision	
9) Invite industry associations and corporate representatives to participate in the education quality evaluation to ensure that the evaluation is consistent with social needs	
10) Establish a special agency to regularly collect feedback from society and enterprises on graduates as an important basis for evaluation	
11) Introduce intelligent data collection and analysis system to ensure the objectivity and comprehensiveness of data	
12) Regularly publish evaluation results to promote healthy competition and continuous improvement among institutions	

Interview outline for focus group discussion interview “the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi”

Part I Information of interviewees

1. Name (interviewee):

2. Education:

❒Master’s degree ❒ Doctoral degree

3. Academic position:

❒Teaching assistant ❒Lecturer or assistant professor

❒Associate professor ❒Professor

4. Expert category:

❒teacher

❒school administrator

❒teaching supervisors

Part II Questionnaire to focus group discussion interview “the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi”

Question 1: What core concepts and principles should guide the formulation of the draft evaluation indicator system for applied undergraduate colleges in Guangxi?

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Question 2: What aspects should be included in the evaluation of the educational environment?

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Question 3: What aspects should be considered when evaluating the development level of the institution?

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Question 4: What elements should be included in the evaluation of the input level?

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Question 5: What should be considered in evaluating teacher quality?

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Question 6: What aspects define school quality in the evaluation process?

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Question 7: What indicators best represent student quality?

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.....

Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi Delphi Expert Consultation Questionnaire

The questionnaire consists of two parts: (1) The first part is your personal information. Please tick the corresponding number. (2) The second part is the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi. We will now investigate and judge the importance of the 17 secondary indicators in the Development of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi. Please rate the rationality of the indicators established in this study on a five-level scale. For each indicator, only select "one level". The rationality of the indicators is divided into five levels: "very reasonable", "reasonable", "general", "unreasonable", and "very unreasonable", and assign scores of 5, 4, 3, 2, and 1 accordingly. Please tick the appropriate **column.**

Part I Information of interviewees

Name:

University:

Part II Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi

Indicators	Reasonableness and corresponding scores				
	5	4	3	2	1
Educational environment					
1. Human environment					
2. Physical Environment					
3. Information environment					
Development level					

Indicators	Reasonableness and corresponding scores				
	5	4	3	2	1
4. Scale structure					
5. Sustainable development capabilities					
6. Internationalization					
Investment level					
7. Infrastructure					
8. Social resource investment					
9. Financial investment					
Teacher Level					
10. Teachers					
11.Professional Development					
12. Teachers' treatment					
School Quality					
13. School Management					
14. Resource Integration					
15. School influence					
Student Quality					
16. Student Development					
17. Graduate Quality					

Evaluation Form for Development of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi

The tool used this time is a questionnaire to evaluate Development of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi

Please check each comment box, the score is as follows:

5 indicates the highest adaptability and feasibility.

4 indicates high adaptability and feasibility.

3 indicates average adaptability and feasibility.

2 indicates low adaptability and feasibility.

1 indicates the lowest adaptability and feasibility.

Evaluation checklist	Adaptability					Feasibility				
	5	4	3	2	1	5	4	3	2	1
Human environment										
Physical Environment										
Information environment										
Scale structure										
Sustainable development capabilities										
Internationalization										
Investment level										
Infrastructure										
Social resource investment										
Financial investment										
Teacher Level										

Evaluation checklist	Adaptability					Feasibility				
	5	4	3	2	1	5	4	3	2	1
Teachers										
Professional Development										
Teachers' treatment										
School Management										
Resource Integration										
School influence										
Student Development										
Graduate Quality										

Appendix D

The Results of the Quality Analysis of Research Instruments

The Quality Analysis Results of Research Instruments

NO.	Contents	Experts					IOC	Conclusion
		5	4	3	2	1		
	Context							
1	The university's core goal is to cultivate application-oriented talents	1	1	1	1	1	1.00	consistent
2	The university takes local economic and industrial needs into full consideration when designing its academic programs	1	1	1	1	1	1.00	consistent
3	The university’s educational philosophy aligns with the societal requirements for application-oriented talents	1	1	1	1	1	1.00	consistent
4	The university has established stable partnerships with local enterprises	1	1	1	1	1	1.00	consistent
5	The university fosters students’ awareness of serving society and industries	1	1	1	1	1	1.00	consistent
	Input							
1	The university’s faculty team has strong practical experience and teaching ability.	1	1	1	1	1	1.00	consistent
2	The university introduces industry mentors or enterprise experts to participate in teaching.	1	1	1	1	1	1.00	consistent
3	The investment in laboratories, training rooms, and other infrastructure is sufficient.	1	1	1	1	1	1.00	consistent

NO.	Contents	Experts					IOC	Conclusion
		5	4	3	2	1		
4	The content of academic programs meets the requirements for sustainable education.	1	1	1	1	1	1.00	consistent
5	There are specific courses or practical activities aimed at enhancing innovation and entrepreneurial skills	1	1	1	1	1	1.00	consistent
6	The university provides adequate resources for student more career guidance and services	1	1	1	1	1	1.00	consistent
	Process							
1	The university frequently organizes off-campus internships and practical training activities	1	1	1	1	1	1.00	consistent
2	Internship and training activities meet the needs for improving students' practical skills.	1	1	1	1	1	1.00	consistent
3	Teachers adopt project-based teaching, case-based teaching, and other practical teaching methods	1	1	1	1	1	1.00	consistent
4	Students can participate in enterprise projects or solve problems in real business environments	1	1	1	1	1	1.00	consistent
5	The teaching process addresses the individual development needs of students.	1	1	1	1	1	1.00	consistent
6	The university organizes various academic competitions.	1	1	1	1	1	1.00	consistent

NO.	Contents	Experts					IOC	Conclusion
		5	4	3	2	1		
7	The ratio of theoretical teaching to practical teaching in the curriculum is reasonable.	1	1	1	1	1	1.00	consistent
8	The university provides diverse training programs to enhance teachers' practical teaching capabilities.	1	1	1	1	1	1.00	Consistent
	Output							
1	Graduates are satisfied with the university’s education and training.	1	1	1	1	1	1.00	consistent
2	Graduates’ practical skills meet industry requirements.	1	1	1	1	1	1.00	consistent
3	Graduates’ innovation abilities are fully developed.	1	1	1	1	1	1.00	consistent
4	Graduates can quickly adapt to job requirements.	1	1	1	1	1	1.00	consistent
5	The employment rate of graduates is satisfactory	1	1	1	1	1	1.00	consistent
6	The quality of graduates’ employment (e.g., job matching, salary levels) is high.	1	1	1	1	1	1.00	consistent
7	Graduates have promising career development prospects in the industry.	1	1	1	1	1	1.00	consistent
8	Students have sufficient support for innovation and entrepreneurship during their time at the university.	1	1	1	1	1	1.00	consistent

Reliability analysis of research instruments

Reliability

Case handling summary			
		N	%
case	effective	641	100
	Excluded[a]	0	0
	Total	641	100
a. List deletion based on all variables in this program.			

Results of variable reliability correlation analysis

Scale: all variables

Reliability statistics		
Cronbach's Alpha	Based on standardized items Cronbachs Alpha	Number of terms
0.951	0.951	641

Reliability and validity analysis of research instruments

Appendix E

Certificate of English

BANSOMDEJCHAOPRAYA
RAJABHAT UNIVERSITY

This is to certify that

Mrs.Lin Xiao

Achieved BSRU English Proficiency Test (BSRU-TEP) level

C1

Given on 12th February 2022

(Assistant Professor Dr Kulsirin Aphiratvoradej)

Director

Appendix F

The Document for Acceptance Research

AUSTRALIAN INTERNATIONAL ACADEMIC CENTRE PTY. LTD.
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ACCEPTANCE OF MANUSCRIPT

Date: March 10, 2025

Dear Authors,

I am pleased to inform you that your paper has passed the review process after a careful and thorough perusal of the manuscript. The journal Editor-in-Chief, and reviewers have recommended your manuscript, titled **Development of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi**, authored by **Lin Xiao, Touchakorn Suwancharas, Narongwat Mingmit** and **Areeya Juichamlong** for publication in *International Journal of Education & Literacy Studies*. It is an excellent paper that will improve the readership of the journal. The paper will be published in Volume 13 Issue 2 of *IJELS* on March 31, 2025.

Yours sincerely,

Vahid Nimehchisalem, PhD
Editor-in-Chief
International Journal of Education & Literacy Studies

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AIAC

Development of the Evaluation Indicator System for the Educational Quality of Application-Oriented Undergraduate Colleges in Guangxi

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ABSTRACT

This study aimed to (1) examine the current status of education quality evaluation in Guangxi's application-oriented undergraduate universities, (2) develop an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi, and (3) examine the feasibility and adaptability of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi. A mixed-method approach combined qualitative research (field studies, in-depth interviews, focus groups, and Delphi Technique) with quantitative research (surveys). The research was conducted in three stages: (1) Analysis of the current state using document review, in-depth interviews, and surveys with 641 participants. Data were analyzed qualitatively (content analysis) and quantitatively (*M* and *SD*). (2) Development of the evaluation indicator system through focus group discussions with 15 experts and the Delphi technique with 17 participants, including experts, administrators, and professionals. The findings from Stage 1 helped refine the system, which was analyzed using averages and medians. (3) Evaluation of the system's feasibility and adaptability with five experts using a Likert scale. Data were analyzed to assess feasibility and adaptability. The results revealed (1) education quality in Guangxi's applied undergraduate colleges is moderate, with the input dimension performing best, followed by background/environment, process, and output; (2) the developed evaluation system includes six first-level, 17 second-level, and 50 third-level indicators, addressing resources, processes, and outcomes, and (3) the system's feasibility and adaptability were high level, confirming its practical use for improving education quality.

Key words: Evaluation Indicator, Educational Quality, Application-Oriented Undergraduate Colleges

INTRODUCTION

The development of higher education in China has seen significant growth since 2000, with enrollment expansion marking a notable trend (Liao, 2007). This development has placed China on the path to becoming a global leader in higher education. However, while the expansion has achieved widespread accessibility, challenges remain in meeting international quality standards. Under the dynamics of global economic integration and the Belt and Road Initiative, enhancing the quality of higher education is paramount to transforming China into a "strong country" in education rather than merely a "big country" in terms of scale (Wilkins, 2019).

The Chinese government has prioritized the quality of higher education by issuing numerous policies to reform colleges and universities. For instance, the Outline of the National Medium and Long-term Education Reform and Development Plan (2010–2020) emphasized improving education's quality and development awareness. Additionally, the Overall Plan for Deepening the Reform of Education Evaluation in the New Era sought to establish standards for application-oriented undergraduate institutions, particularly those in ethnic regions such as Guangxi. Despite these initiatives, challenges persist, particularly in bridging the gap between policy goals and practical implementation.

One critical issue lies in the evaluation system for higher education. Evaluation systems often emphasize outcomes

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such as employment rates, degree completions, and resource inputs like faculty and facilities while neglecting process-oriented indicators such as student motivation, engagement, and the quality of teaching-learning interactions (Tian et al., 2022). This imbalance has led to one-sided student development, as evaluation mechanisms fail to capture the nuances of educational processes that foster comprehensive learning and application.

Applied undergraduate colleges in Guangxi face additional challenges due to their unique context within China's education system. As ethnic regions often grapple with limited resources and diverse student populations, there is a pressing need to design evaluation systems that reflect these specific realities. The current evaluation frameworks lack the depth and adaptability required to address the developmental needs of these institutions, resulting in a misalignment between the goals of fostering practical skills and the existing assessment methods (Song, 2021).

The limitations in existing systems create a clear gap between the aspirational goals of education reform and the actual practices observed in institutions. This gap highlights the need for a more robust, process-oriented evaluation indicator system tailored to the unique contexts of applied undergraduate colleges, particularly in ethnic areas such as Guangxi. Addressing this gap is critical to ensuring these institutions meet national standards while catering to local educational needs.

Developing a comprehensive evaluation indicator system is essential to promote quality assurance and align institutional practices with broader national and global education standards. A well-designed system would provide actionable insights into education's process and outcomes, offering a balanced view of institutional performance. Furthermore, it would empower colleges to address gaps in student development and teacher effectiveness, fostering an environment conducive to holistic education.

As proposed by B. Chen (2014) states that the evaluation index system acts as a "baton" for guiding institutional priorities. A scientific and reasonable system promotes positive educational practices, whereas a poorly constructed framework risks hindering development. Thus, this research seeks to design an evaluation indicator system that prioritizes cultivating professional competencies and practical application skills, addressing both institutional and regional specificities.

Expected Contributions: This research is anticipated to contribute significantly to the education quality assurance field. First, it will provide a model for evaluating the educational quality of applied undergraduate colleges that incorporates both outcome-based and process-based indicators. Second, it will offer policy recommendations to enhance the alignment of evaluation systems with institutional objectives and regional needs. Finally, the findings will support the broader goal of elevating China's higher education quality, particularly in ethnic regions, to meet international benchmarks.

In summary, the gap between the intended goals of education quality assurance and the realities faced by applied undergraduate colleges in Guangxi underscores the necessity of this research. By developing a tailored evaluation indicator system, this study aims to bridge these gaps, enabling institutions to achieve their educational objectives and contribute to the national strategy of strengthening the quality of higher education. The research outcomes will benefit Guangxi and provide valuable insights for similar contexts, advancing the broader agenda of educational reform and quality assurance.

Research Objectives

1. To examine the current status of education quality evaluation in Guangxi's application-oriented undergraduate universities.
2. To develop an evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.
3. To examine the feasibility and adaptability of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi.

Research Question

1. What is the current status of education quality evaluation in Guangxi's application-oriented undergraduate universities?
2. How does the evaluation indicator system develop for the educational quality of application-oriented undergraduate colleges in Guangxi?
3. To what extent is the feasibility and adaptability of the evaluation indicator system for the educational quality of application-oriented undergraduate colleges in Guangxi?

LITERATURE REVIEW

Concept of Education for Sustainable Development

Education for Sustainable Development (ESD) integrates sustainable development principles into educational systems, fostering competencies for addressing global challenges. Stemming from the United Nations' 2030 Agenda for Sustainable Development, ESD aligns with Sustainable Development Goal 4, emphasizing inclusive and equitable quality education. It aims to develop cognitive, socio-emotional, and behavioral skills, equipping learners with cross-cutting competencies essential for sustainable economic, social, and environmental development (UNESCO, 2020).

Key competencies identified by UNESCO include critical thinking, creativity, communication, collaboration, interdisciplinary thinking, self-awareness, responsibility, and global citizenship. These competencies prepare learners to address complex challenges, promote sustainability, and contribute to societal transformation. Furthermore, higher education institutions play a pivotal role by integrating sustainability into curricula, research, operations, and policies, thereby advancing global sustainable development goals (Lozano et al., 2015; Q. Wang, 2015).

Concept of Quality of Education

Education quality is multifaceted, encompassing educational processes' effectiveness, efficiency, and outcomes. Educational quality is also tied to institutional resources, student outcomes, and value-added development (Astin, 1991)—scholars such as Y. Chen (2003) and Pan (2000) further link it to meeting societal needs and cultivating well-rounded talents, including moral and innovative capacities. Similarly, J. Wang (2002) highlights the alignment of education with sustainable societal and personal development. The International Standards Organization (ISO 8402, 1994) frames quality as the extent to which educational attributes meet developmental and social goals, while other scholars like Feigenbaum (1994) and Sallis (2005) emphasize competitiveness, ethics, and professionalism. Commission on Higher Education (CHED, 2014) adds that quality reflects alignment with institutional missions and the delivery of excellent learning outcomes.

In summary, education quality involves professional teaching, effective learning methods, equitable resource allocation, and fostering students' knowledge, skills, and values for future societal contributions. Continuous improvement and fair resource distribution are essential for ensuring high-quality education and cultivating globally competent talents.

Education Evaluation Indicator Systems

The development of education quality evaluation indicator systems focuses on three key research areas: (1) institutional guidelines from international organizations or national agencies, (2) practical applications of these indicators, and (3) theoretical perspectives on their construction. Examples include the U.S. Perkins Vocational Education and Technology Act (PVETA), which evaluates vocational education quality based on academic achievement, technical skills, and employment rates, and the UK's Education Inspection Framework (EIF), which emphasizes school self-assessment through indicators like student achievement, curriculum design, and school-enterprise cooperation. Scholars such as Visser (2015) and Liu (2011) highlight the importance of tailoring these systems to the unique characteristics of students, institutions, and faculty quality while integrating theoretical and practical considerations.

The Component of the Evaluation Indicator Systems of the Educational Quality

This article discusses the development of evaluation indicators for assessing the quality of higher education. Various scholars propose comprehensive indicator systems incorporating funding, student quality, teacher qualifications, education environment, and institutional performance. Key frameworks emphasize primary indicators like input, process, and output, with sub-indicators addressing aspects such as education funding, teaching resources, academic performance, and societal contributions. The systems aim to evaluate and improve education quality through structured methodologies, ensuring feedback mechanisms guide continuous improvement.

Application-Oriented Undergraduate

Applied undergraduate education in China focuses on cultivating high-level, application-oriented talents to meet the needs of regional economic and social development. Proposed in 1998, this education model distinguishes itself from traditional academic and vocational institutions by emphasizing practical skills, industry-university cooperation, and a curriculum tailored to local and national demands. Key features include integrating academic and technical training, fostering innovation, and aligning with the needs of industries and local economies. Policies like the 2015 "Guiding Opinions" further support the transformation of undergraduate colleges into applied institutions, aiming to cultivate skilled, innovative professionals. Guangxi's applied undergraduate colleges exemplify this educational approach.

Based on the review of documents and related research, the research framework can be summarized as in Figure 1.

As shown in Figure 1, the flowchart outlines the development of an evaluation indicator system for assessing the educational quality of application-oriented undergraduate colleges in Guangxi. It begins by drawing from related theories on evaluation index systems for applied undergraduate education quality.

Key components include evaluating educational quality and creating a tailored indicator system for application-oriented universities. The process involves three major steps:

1) Studying Current Challenges

A mixed-method approach combines questionnaires and case studies to analyze educational quality evaluation systems' current situation and challenges. The study focuses on specific application-oriented colleges in Guangxi.

2) Developing the Indicator System

This involves creating an evaluation framework based on Delphi methodology, refining key indicators through expert consensus, and conducting focus group discussions. The indicators are categorized into five main areas: educational environment, teaching quality, management, faculty and staff quality, and student outcomes.

3) Testing Feasibility and Adaptability

Trials in selected institutions assess the system's practicality and relevance to ensure it is adaptable to the needs of application-oriented colleges and universities.

RESEARCH METHODOLOGY

This study employs a mixed-method approach, incorporating qualitative research through field studies with in-depth interviews, focus groups, Delphi Technique, and quantitative research through survey methods. The research process is divided into three main steps:

1. Analyzing the current state
2. Developing the indicator system through focus group discussions and the Delphi Technique.

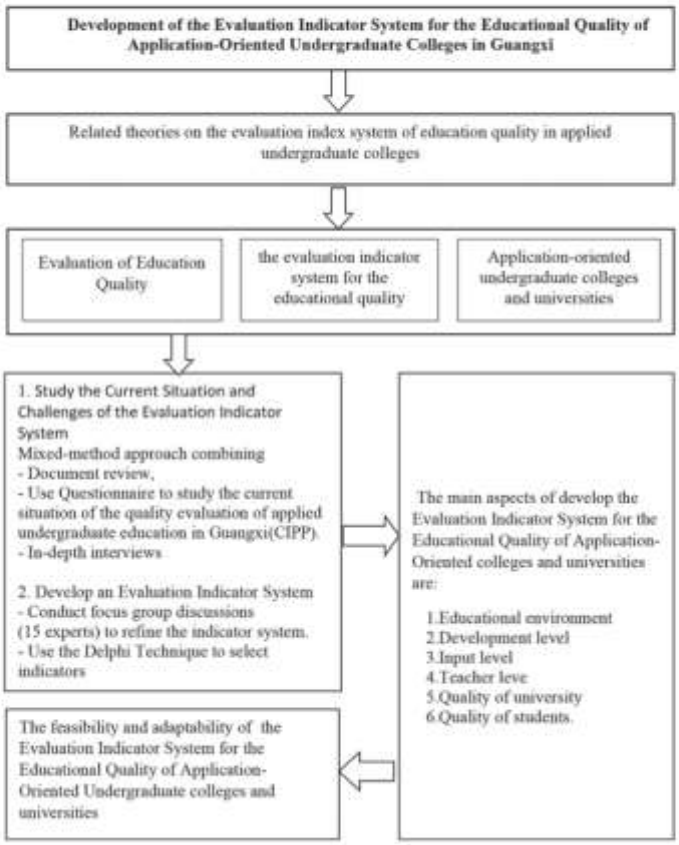

Figure 1. Summarize the research framework

3. Evaluating the system's feasibility and suitability to ensure its effectiveness.

The sample

The samples were 15 experts and the Delphi technique with 17 participants, including experts, administrators, and professionals. The details of the research implementation for each stage are as follows:

Study the current state and challenges of the evaluation indicator system

We used mixed-methods approach combining document review, in-depth interviews, and surveys by:

1. Reviewing documents to identify components and indicators,
2. Collecting quantitative data through questionnaires (sample of 641 participants, using stratified random sampling), and
3. Analyzing data qualitatively (content analysis) and quantitatively (mean and standard deviation).

Develop an evaluation indicator system

We developed the indicator system by conducting focus group discussions (15 experts) to refine the indicator system and using the Delphi Technique to select indicators (17 participants, including experts, administrators, and external professionals).

To completed this stage we:

1. Utilized the findings from Stage 1 to draft the indicator system, and
2. Analyzed the data using averages, medians, and interquartile ranges to finalize the indicators.

Assess the feasibility and suitability of the indicator system

We used an evaluation form to assess the feasibility and suitability of the system with five experts. We collected

quantitative data using a Likert scale and analyzed the data using mean and standard deviation values to interpret the level of feasibility and suitability.

RESULTS

This study focused on developing and evaluating an education quality evaluation index system for applied undergraduate colleges in Guangxi. The conclusions are summarized into three key parts:

Current State of Education Quality

The education quality of applied undergraduate colleges in Guangxi was assessed across four dimensions, with an overall moderate level. Among these, the input dimension ranked highest, followed by the background/environment, process, and output dimensions. The results highlight significant room for improvement, especially in the process and output dimensions, which require immediate attention.

Development of the Evaluation Indicators System

A comprehensive evaluation index system was constructed using a combination of literature review, interviews, focus groups, and the Delphi method: Experts independently propose initial evaluation indicators based on their expertise or literature review; Consensus and Finalization: After several iterations (usually two to three rounds), a refined, consensus-based set of evaluation indicators is finalized, ready for practical implementation.Finally, the system includes 6 first-level indicators, 17 second-level indicators, and 50 third-level indicators, covering educational resources, processes, and outcomes. This structure ensures the system is both scientific and systematic, as summarized in Table 1.

Table 1 shows 6 indicators of the first level, 17 indicators of the second level, and 50 indicators of the third level.

Feasibility and Adaptability of the Index System

The system's adaptability and feasibility were rated highly, with average scores ranging from 3.60 to 4.80 for applicability and 4.00 to 4.80 for feasibility. These findings confirm that the developed index system is practical, reliable, and suitable for evaluating and improving education quality in applied undergraduate colleges in Table 2.

Table 2 shows the results of the analysis of the effectiveness of the evaluation index system for the education quality of applied undergraduate colleges in Guangxi revealed that the Adaptability M=4.17, SD=0.60. The Feasibility M=4.32, SD=0.59. The value of Adaptability and Feasibility was high.

DISCUSSION

The results of this study on the evaluation index system for education quality in applied undergraduate colleges in Guangxi can be discussed in three main parts, highlighting the current state of education quality, the construction of the evaluation index system, and its effectiveness.

Current State of Education Quality in Guangxi Applied Undergraduate Colleges

The findings reveal that the education quality in Guangxi applied undergraduate colleges is moderate across four aspects: input, background and environment, process, and output. Notably, the input aspect exhibits the highest performance, followed by background and environment, while the process and output aspects remain weaker. This aligns with previous research emphasizing the challenges of ensuring effective processes and impactful outcomes in applied undergraduate education systems (Zhao & Zhang, 2020). The emphasis on input factors, such as financial and human resources, indicates the institutions' prioritization of foundational investments. However, greater attention is needed to strengthen teaching practices and graduate success rates.

Construction of the Evaluation Indicator Systems

Using literature reviews, interviews, and the Delphi method, the study developed a comprehensive evaluation index system encompassing 6 first-level indicators, 17 second-level indicators, and 50 third-level indicators. This system effectively integrates educational resources, processes, and outcomes, offering a holistic perspective on education quality. The findings are consistent with the work of Korhonen et al. (2019), who also highlighted the importance of multi-dimensional evaluation frameworks to reflect the complex nature of applied undergraduate education. Including diverse indicators—from school environment and investment levels to student development—underscores the need for an interconnected approach to education quality assessment.

Effectiveness and Applicability of the Index System

The study demonstrated that the evaluation index system possesses high applicability and feasibility, with average scores between 3.60 and 4.80. These results indicate that the system is practical and adaptable for Guangxi-applied undergraduate colleges. Previous studies by Rado (2020) support the significance of such adaptable systems, emphasizing their role in guiding institutional improvements and policy development. Moreover, the student-centered philosophy embedded in this system reflects a modern approach to education quality, ensuring alignment with global education quality standards.

Implications for Practice

The findings highlight several practical implications. First, education stakeholders must collaborate to ensure accurate data collection and informed decision-making. Second, the guiding role of the evaluation results should be utilized to target improvements in weaker areas, particularly in teaching processes and student outcomes. Lastly, institutions should integrate quality dimensions, such as school environment, investment, teaching staff, and student quality, to create a synergistic effect that enhances overall education quality.

Table 1. Evaluation index system of education quality of applied undergraduate colleges in Guangxi

First-level Indicators	Second-level Indicators	Third-level Indicators
Educational environment	Human environment	Teacher-student relationship
		Peer relationship
		The campus culture of humanistic care
	Physical Environment	School area
		Proportion of smart classrooms
		Number of books in the library
		Number of training bases
		Number of laboratories
	Information environment	Application of digital resources
		Teaching information system
Development Level	Scale structure	Number of enrolled students
		The scale of academic disciplines
	Sustainable development capabilities	Sustainability of educational resources
		Sustainable development capability of management level
	Internationalization	Teachers' international perspectives
		Cultivation of international students
		Number of international collaborations
Investment Level	Infrastructure	Investment in living facilities
		Investment in application-oriented teaching facilities
		Investment in practical facilities
		Sports and cultural facilities
	Social resource investment	Corporate investment
		Public donations
	Financial investment	Educational funding per student
		Government appropriations
Teacher Level	Teachers	Proportion of application-oriented teachers
		Teachers' application-oriented skills and professional competence
	Professional Development	Application-oriented education and training
		Research on application-oriented teaching
	Teachers' treatment	Teacher salary and benefits
		Teachers' social welfare
		Teachers' professional status
School Quality	School Management	Integration of application-oriented features into regulations
		Organization of application-oriented work
		Mechanism for application-oriented operations
	Resource Integration	Resource integration of industry-university-society
		Collaboration between schools and families
	School influence	Social Reputation
		Industry influence
		Regional influence
Student Quality	Student Development	Classroom participation
		Activity participation
		Number of award-winning students in academic competitions
		Knowledge and skills
		Social adaptability
		Students' innovation ability
		Students' practical ability

(Contd...)

Table 1. *(Continued)*

First-level Indicators	Second-level Indicators	Third-level Indicators
	Graduate Quality	Fit between people and professions
		Quality of graduates' employment
		Career development of graduates

Table 2. Effectiveness of the evaluation index system for the education quality of applied undergraduate colleges in Guangxi

Indicators	Adaptability			Feasibility		
	M	*SD*	Result	*M*	*SD*	Result
Educational environment						
Human environment	4.20	0.83	High	4.20	0.83	High
Physical Environment	4.40	0.54	High	4.60	0.54	Highest
Information environment	3.80	0.44	High	4.40	0.44	High
Total	4.13	0.67	High	4.40	0.61	High
Development Level						
Scale structure	4.00	0.70	High	4.20	0.83	High
Sustainable development capabilities	3.60	0.54	High	4.60	0.54	Highest
Internationalization	3.80	0.44	High	3.80	0.44	High
Total	3.95	0.56	High	4.20	0.61	High
Investment Level						
Infrastructure	4.60	0.54	Highest	4.40	0.44	High
Social resource investment	4.40	0.44	High	3.60	0.54	High
Financial investment	4.60	0.54	Highest	4.20	0.83	High
Total	4.53	0.51	High	4.06	0.61	High
Teacher Level						
Teachers	3.60	0.54	High	4.80	0.44	Highest
Professional Development	4.40	0.44	High	4.60	0.89	Highest
Teachers' treatment	4.20	0.83	High	4.40	0.44	High
Total	4.06	0.61	High	4.60	0.54	Highest
School Quality						
School Management	4.40	0.44	High	4.20	0.97	High
Resource Integration	4.60	0.54	Highest	4.40	0.44	High
School influence	3.80	0.70	High	4.00	0.63	High
Total	4.26	0.56	High	4.20	0.68	High
Student Quality						
Student Development	3.60	0.83	High	4.60	0.54	Highest
Graduate Quality	4.60	0.54	Highest	4.40	0.44	High
Total	4.10	0.69	High	4.50	0.49	High
Overall total	4.17	0.60	High	4.32	0.59	High

CONCLUSION

The following conclusions can be made based on our findings:

1. Institutions should integrate the developed evaluation index system into their routine assessment practices to monitor and improve educational quality.
2. Education administrators should prioritize areas identified as weaker—particularly process and output—and implement targeted strategies to address these challenges.
3. Collaboration among stakeholders, including educators, policymakers, and students, should be encouraged to ensure the effective application of the evaluation framework.
4. Regular training sessions for education administrators and staff should be conducted to familiarize them with the evaluation index system and its practical applications.

The following recommendations can be presented based on our findings:

1. Further research should focus on refining the evaluation index system by incorporating feedback from its practical application in different educational settings.
2. Empirical validation of the system using structural equation modelling and other advanced statistical techniques is recommended.
3. Comparative studies between applied undergraduate colleges in Guangxi and those in other regions or countries could provide broader insights and benchmarks.
4. Future studies should explore the long-term impact of using the evaluation index system on institutional performance and student outcomes.

Future studies could focus on developing specific evaluation scales based on this index system and testing its structural validity using empirical methods such as structural equation modelling. Additionally, case studies of selected schools could provide insights into the system's practical implementation and suggest refinements for greater effectiveness. This approach aligns with emerging research trends advocating for the iterative development of education quality evaluation frameworks (S. Chen, 2014).

This study developed a scientifically rigorous and systematic evaluation indicator system to assess the educational quality of application-oriented undergraduate colleges in Guangxi. The system comprises 6 first-level indicators, 17 second-level indicators, and 50 third-level indicators, ensuring a comprehensive evaluation framework. It focuses on three key dimensions of education quality: input, process, and output. The findings reveal that the current educational quality in these institutions is moderate, with strengths in input but significant weaknesses in process and output, highlighting areas for improvement.

The indicator system demonstrated high applicability and feasibility, with strong ratings confirming its suitability for practical implementation. A key feature of the framework is its student-centered approach, which emphasizes student development as the primary objective of educational quality enhancement. This system provides actionable insights for policymakers and institutions to address weaknesses and use the evaluation results to guide continuous improvement in education quality.

Future research can further refine and validate the system through empirical studies and case-specific applications, ensuring its operability and effectiveness in various educational contexts.

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  Degree: Master’s Degree

- January 2022 – July2025

  Bansomdejchaopraya Rajabhat University

  Major: Doctoral in Educational Management for Sustainable Development

  Degree: Doctoral Candidate